COVER PAGE

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Project Credit Checklist[1]

SCA School Construction Authority

NYC Green Schools Rating System 2019

		SD	DD	60%	100%	Design	Const
Project:	PS 123A						
Address | Zip Code:	345 Example St	Date last updated:					
LLW #:	123456	Select if interior fit-out[13]				☐	
Design #:	123456						
Architect:	Architect						

Impact Area	BD&C Reference LEED for Schools v4[2]	CHPS Reference	NYC GSG 2019[3]	Credit Name	Credits with 0 Points Required for all projects[5]	Credit with Points Required for all Projects	Required if Feasible	Additional Credits	Regional Priority[6]	Credit submissions required for Design and Construction[7]: Design Phase	Const. Phase
Integrative Process										1 Point	
	IPc1		P1.1R	**Integrative Design Process**		1				1	
Integrative Process Category Sub-Total:					0NP	1	0	0	0	1	0
Location & Transportation										16 Points	
Site Selection	LTc2		L1.1R	**Sensitive Land Protection**		1				1	
	LTc3		L1.2	**High Priority Site**			2		1	2	
	LTc4		L1.3	**Surrounding Density**			3			2	
	LTc4		L1.4R	**Diverse Uses**		2				2	
Transportation	LTc5		L2.1R	**Access to Quality Transit**		2	2			4	
	LTc6		L2.2	**Bicycle Facilities**			1			1	
	LTc7		L2.3R	**Reduced Parking Footprint**		1				1	
			L2.4P	**Green Vehicles, Charging Station Infrastructure**	NP					N	
	LTc8		L2.5A	**Green Vehicles, Charging Station Installation**				1		0	
Location & Transportation Category Sub-Total:					1NP	6	8	1	1	13	0
Site										11 Points	
Site Assessment	SSpr2		S1.1P	**Environmental Site Assessment**	NP					Y	
	SSc1		S1.2R	**Enhanced Site Assessment**		1				1	
Minimize Site Impact	SSpr1		S2.1P	**Construction Activity Pollution Prevention**	NP						Y
	SSc3		S2.2	**Open Space**			1			1	
			S2.3P	**Green Infrastructure Assessment**	NP					Y	
	SSc4		S2.4	**Rainwater Management**				3	1	0	
	SSc5		S2.5	**Heat Island Reduction**			2			2	
	SSc6		S2.6	**Light Pollution Reduction**			1			1	
Facility Use	SS 8	1.1.2	S3.1R	**Joint Use of Facilities,** Community Access		1				1	
	IEQpc78		S3.2	**Active Design in a School Environment**			1			1	
Site Category Sub-Total:					3NP	2	5	3	1	7	0
Water										10 Points	
Outdoor Systems	WEpr1		W1.1P	**Outdoor Water Use Reduction,** Reduce 30%	NP					Y	
	WEc1		W1.2R	**Outdoor Water Use Reduction,** Reduce Potable 50%-100%		2				2	
Indoor Systems	WEpr2		W2.1P	**Indoor Water Use Reduction,** 20% Reduction	NP					Y	
	WEc2		W2.2R	**Indoor Water Use Reduction,** 25%-50% Reduction		2	1	2		3	
Metering	WEp3		W3.1P	**Water Metering,** Building Level	NP					Y	
	WEc4		W3.2R	**Water Metering,** Advanced		1				1	
Cooling Tower	WEc3		W4.1A	**Cooling Tower Water Use** (only projects with cooling tower)				2		0	
Water Category Sub-Total:					3NP	5	1	4	0	6	0
Energy										35 Points	
Commissioning	EApr1		E1.1P	**Fundamental Commissioning & Verification**	NP						Y
	EAc1		E1.2A	**Enhanced Cx & Monitoring Based Cx**				4			0
	EAc1		E1.3A	**Envelope Commissioning**				2			0
Refrigerant Management	EAp3		E2.1P	**Fundamental Refrigerant Management**	NP					Y	
	EAc6		E2.2	**Enhanced Refrigerant Management**			1			1	
Energy Efficiency	EAp2		E3.1P	**Minimum Energy Performance**	NP					Y	
	EAc2		E3.2R	**Optimize Energy Performance,** 6%-50% New, 4%-48% Renovations[8]		3		15		6	
		3.1.2	E3.3R	**HVAC System Sizing,** Avoid Oversizing	NP					Y	
Energy Management		3.3.5	E4.1R	**Energy Management System Controls**	NP					Y	
	EAc4		E4.2A	**Demand Response**				2	1		0
Metering	EApr3	3.3.8	E5.1P	**Energy Metering,** Building Level	NP						Y
	EAc3		E5.2R	**Energy Metering,** Advanced		1					1
Power	EAc5		E6.1P	**Feasibility of Renewable Energy**	NP					Y	
			E6.2A	**Production of Renewable Energy**				4			2
	EAc7		E6.3R	**Green Power & Carbon Offsets**		1		1		1	
Energy Category Sub-Total:					7NP	5	1	28	1	8	3

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Revision II - February 26, 2021

Project Credit Checklist[1]

SCA School Construction Authority

NYC Green Schools Rating System 2019

			SD	DD	60%	100%	Design	Const
Project:	PS 123A							
Address | Zip Code:	345 Example St		Date last updated:					
LLW #:	123456		Select if interior fit-out[13]				☐	
Design #:	123456							
Architect:	Architect							

Impact Area	BD&C Reference LEED for Schools v4[2]	CHPS Reference	NYC GSG 2019[3]	Credit Name	Credits with 0 Points Required for all projects[5]	Credit with Points Required for all Projects	Required if Feasible	Additional Credits	Regional Priority[6]	Credit submissions required for Design and Construction[7]: Design Phase	Const. Phase
Materials										12 Points	
Efficient Material Use	MRpr1		M1.1P	**Storage & Collection of Recyclables**	NP					Y	
	MRpr2		M1.2P	**Construction & Demolition Waste,** Planning	NP						Y
	MRc5		M1.3R	**Construction & Demolition Waste,** 50%- 75% Diversion		1	1				2
				Long-Term Commitment[14]			0			0	
Materials Reporting & Optimization	MRc3		M2.1A	**Material Extraction Reporting**				1			1
	MRc3		M2.2A	**Material Extraction Optimization**				1			0
	MRc2		M2.3	**Material Environmental Reporting**			1				1
	MRc2		M2.4A	**Material Environmental Optimization**				1			0
	MRc4		M2.5	**Material Ingredient Reporting**			1				1
	MRc4		M2.6A	**Material Ingredient Optimization**				1			0
Material Life-Cycle Impacts	MRc1		M3.1A	**Life-Cycle Impact Reduction,** Whole Building LCA[9]				3	1		0
	MRc1		M3.2	Life-Cycle Impact Reduction, Building and Material Reuse[10]			0				0
		4.1.1	M4.1R	**Wallboard & Roof Deck Products,** Mold Resistance	NP					Y	
Materials Category Sub-Total:					3NP	1	3	7	1	0	5
Indoor Environmental Quality										16 Points	
Design Indoor Air Quality	IEQpr1		Q1.1P	**Minimum IAQ Performance**	NP					Y	
	IEQc1		Q1.2R	**Enhanced IAQ Source Control**[11]		1			1	2	
	IEQc1		Q1.3A	**Enhanced IAQ Ventilation & Monitoring**[11]				1		0	
Construction Indoor Air Quality	IEQc3		Q2.1R	**Construction IAQ Management Plan**		1					1
	IEQc4		Q2.2R	**Building IAQ Flush-Out**		1					1
Post Construction Indoor Air Quality		5.3.5	Q3.1	**Electric Ignition Stoves**	NP					N	
		6.2.4	Q3.2R	**Post Construction Indoor Air Quality**	NP						Y
Material Emissions	IEQc2		Q4.1	**Low-Emitting Materials,** 3-5 Categories			2				2
	IEQc2		Q4.2A	**Low-Emitting Materials,** 6 Categories				1			0
Thermal Comfort	IEQc5		Q5.1R	**Thermal Comfort**		1				1	
Lighting Quality	IEQc6		Q6.1R	**Interior Lighting,** Control		1				1	
	IEQc6		Q6.2	**Interior Lighting,** Quality			1			1	
		5.2.1	Q6.3R	**Visual Performance,** Artificial Direct-Indirect Lighting	NP					Y	
Daylight and Views	IEQc7		Q7.1	**Daylight,** 55%-75%			3			0	
	IEQc8		Q7.2	**Quality Views**			1			1	
Acoustics	IEQpr3	5.5.1	Q8.1P	**Minimum Acoustical Performance**	NP					Y	
	IEQ 9	5.5.2	Q8.2	**Enhanced Acoustical Performance**			1			0	
IEQ Category Sub-Total:					5NP	5	8	2	1	6	4
Innovation										2 Points	
Accreditation	IDc2		I1.1R	**LEED® Accredited Professional**		1					1
Above & Beyond	IDc1		I1.2A	**Innovation or Pilot Credit**				1		0	
Additional Credits Sub-Total:					0NP	1	0	1	0	0	1
					22NP	26	26	46	5	41	13
LEED® Equivalent Point Total[12]:										103	

1. The NYC GSG requires that all credits be attempted and proof through calculation for those which are not-feasible.
2. LEED reference numbers are based on the order of credits in the LEED for Schools v4 Rating System.
3. Letter prefix indicates credit section (P, L, S, W, E, M, Q, I)
   First number indicates the category within the section
   Second number indicates the specific credit within the section category
   Suffix "P" is added for credits that are LEED® prerequisites and therefore required of all projects
   Suffix "R" is added for credits that are required of all projects
   Suffix "A" indicates credits that are additional and may only be pursued with SCA direction/permission.
4. Select if feasible or not, first, in column F. If feasible complete column G using the drop down options.
5. To be consistent with LEED®, the NYC GSG assigns no point "NP" value to prerequisites or non-LEED® credits.
6. If the referenced Regional Priority Credit is achieved, the project will receive the additional point for "RP".
7. Indicates the submission phase for each credit. Columns will automatically fill with point values for credits being pursued (exception E 3.2 R).
8. This credit requires project-specific energy modeling and can not be achieved by use of proto-typical modeling. Select number of pts pursuing from column F dropdown menu. Since project-specific modeling is based on ASHRAE 90.1-2010 , minimum required threshold is 10%.
9. M3.1A is only applicable to new construction. Regional Priority is earned by achieving either M3.1A or 3.2A.
10. M3.2A is only applicable to renovations/remodels. Regional Priority is earned by achieving either M3.1A or 3.2A.
11. Projects need to achieve both Q1.2R and Q1.3A to earn the Regional Priority point.
12. LL32/16 requires Certified LEED® v4 for Schools or equivalent of a no-less stringent rating system - Minimum 40 Points.
13. Upon selection of interior fit-out, the checklist updates in accordance with Appendix C. Points, drop-down menus and credit applicability update automatically. Long Term Commitment is new credit in the checklist only and applicable to Interior Fit-out projects only.
14.

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CAPACITY 160

SCA AUTHORIZED OFFICIAL PROGRAM -- DO NOT REVISE LOCKED

DIRECTION to DESIGNER--PLEASE READ BEFORE UPDATING
- Designer to verify program spaces provided meet SCA Design Requirements 1.3.1.3 for 5% tolerance in the individual programmed square footage.
- Designers to enter the number of rooms in the location columns i.e. new units in addition, new units in existing building and existing units to remain within each category.
- Designers to enter the total sf of new units in addition.
- Designers to enter the total sf in the column "renovation in existing building" for those new room that are located in existing building and will require substantial construction work. e.g converting two existing classrooms into a new admin office
- **Note** that there is no need to include area for those existing spacesthat are a) to remain as is o b) those spaces that are relabelled as new rooms but do not require any construction work e.g. renaming an existing first grade CR to a third grade CR.

DO NOT REVISE - LOCKED

Occupant Loads for Ventilation Calculations

Occupant load for rooms of instruction is based on maximum number of students per CR based on UFT regulations. Occupant loads for other spaces is based on greater of seating plan or BC 1004.

DETAILED PROGRAM OF REQUIREMENTS

ROOM LAYOUT	ROOM TYPE	DISTRIBUTION OF SPACES & CAPACITY: Unit Area	No of existing units as per current usage of existing building	No of new units added	No of Total units	CAPACITY PER UNIT	CAPACITY ADDED	Program Area	DISTRIBUTION OF SPACES/CORRESPONDING AREA: New Units in addition	New Units in existing	Existing Units to remain	Total New Area in addition	Total (net) SF renovated in existing building	Comments	Program areas of renovated spaces located in existing building	CAPACITY: Students Per unit	Adults Per unit	Total Total per unit
	GROUP 1- INSTRUCTION																	
1-10	Pre-Kindergarten (w/ toilets)	1,000	0	2	**2**	18	36	2,000								25	2	27
1-11	Kindergarten (w/ toilets@ first fl. If possible)	1,000	0	2	**2**	20	40	2,000								25	2	27
1-35	Typical Classrooms - Grade 1	750	2	0	**2**	20	0	0								32	1	33
1-35	Typical Classrooms - Grade 2	750	2	0	**2**	20	0	0								32	1	33
1-14	Typical Classrooms - Grade 3	750	2	0	**2**	20	0	0								32	1	33
1-15	Typical Classrooms - Grade 4	750	2	0	**2**	28	0	0								32	1	33
1-15	Typical Classrooms - Grade 5	750	2	0	**2**	28	0	0								32	1	33
1-15	Regular Classroom	750	1	0	**1**	28	0	0						Re-purpose main office 150 to an extra classroom		32	1	33
1-30	CSD Special Education Classrooms (must be 500 SF Min)	500	1	0	**1**	12	0	0										25
1-31/32	Reading/Speech Resource Room	375	1	0	**1**	---	---	0						Re-purpose classroom 305 to a resource room	242			19
															242			
	GROUP 2- SPECIALIZED INSTRUCTION																	
2-25	Art Classroom w/ 125 sf storage	1,125	0	1	**1**	28	28	1,125								32	1	33
2-30m	Music classroom w/ instrument storage within CR	875	0	1	**1**	28	28	875								32	1	33
	GROUP 3- SCIENCE																	
3-11,3-13	Science Resource room w/ storage	875	0	1	**1**	28	28	875								32	1	33
	GROUP 4/GROUP 5 - PHYSICAL EDUCATION/ASSEMBLY																	
	PLAYGROUND: 3,000 sf ECC Playground separate from larger yard; Hard-surface General Playground @ 30 sf/student if possible (exclude Pre-K & K count)																	
4-10	Gymnasium	3,000	0	1	**1**			3,000										200
4-55	Gym Instructor Office	150	0	1	**1**			150									2	2
4-53	Gym Storage	100	0	1	**1**			100										0
	Exercise Room		0	0	**1**	---	---	0						Re-purpose existing student dining				
	GROUP 6 - LIBRARY																	
6-13or6-14	Library	900	1	0	**1**	---	---	0						Repurpose classroom 203 back to library		32	1	33
	GROUP 7 - LOBBY																	
7-10	Lobby	750	0	1	**1**	---	---	750										
	GROUP 8 - STUDENT SUPPORT																	
8-10	Guidance/SBST Suite	500	1	0	**1**	---	---							Re-purpose room 103 to a guidance office				5
8-10.1	Guidance Office	100				---	---											
8-30.1	SBST Office	100				---	---											
8-30.2	Interview/Conference Room	150				---	---											
8-10.3	Store Room	50				---	---											
8-10.4	Waiting Room	100				---	---											
8-50	Medical Suite	500	0	1	**1**	---	---	500										5
	GROUP 9 - STORAGE																	
	educational /supply closet- books etc	50	various	3	various			150										0
9-19	Grounds Equipment Storeroom	125	0	1	1	---	---	125										0
9-24	Refuse and Recycling room (w/floor drain and hose bib) (on 1st floor if possible)	450	0	1	**1**		---	450										0
9-21	Audio-Visual/Secure Storeroom	200	0	1	**1**	---	---	150										0
	Bicycle storage	60	0	1	**1**			60										0
																0	0	0
	GROUP 10 - ADMINISTRATION															0	0	0
	Administration Suite	1,025	0	1	**1**	---	---	1,025										
10-11	General Office,Waiting Rm, mail/time/duplicating	500														0	5	5

ROOM LAYOUT	ROOM TYPE	Unit Area	NO OT existing units as per current usage of existing building	No of new units added	No of Total units	CAPACITY PER UNIT	CAPACITY ADDED	Program Area	New Units in addition	New Units in existing	Existing Units to remain	Total New Area in addition	Total (net) SF renovated in existing building	Comments	Program areas of renovated spaces located in existing building	Students Per unit	Adults Per unit	Total Total per unit
10-13	Principal's Office /Conference	375														0	4	4
10-14	Records Room	150														0	0	0
	Supervisory	150	Various	0	**arious**	---	---	0								0	2	2
10-25	Parents / Community Room	250	0	1	**1**	---	---	0						Re-purpose existing Principal's Office	212	0	3	3
	GROUP 11 - CAFETERIA/STAFF LUNCH															0	0	0
11-10	Students' Dining Area existing area to be reused towards new program space	1,950	-1	1	**1**	130	---	1,950										130
10-24/11-1	Staff work room plus Staff Lunch / Conference Room	500	-1	0	**1**	---	---							Repurpose existing room B2 and B3	500	0	24	24
	GROUP 12 - CUSTODIAL																	
	Custodial Locker	175	0	1	**1**	---	---	175								0	0	0
12-11	Custodian's Office	275	0	1	**1**	---	---	275								0	3	3
12-14,16	Custodian's Storage/workshop -existing	375	1	0	**1**	---	---	0										
	Storage	500	0	1	**1**	---	---	500										
12-17	Janitor's Sink Closet		Various		**Various** (1 per floor)-in addition											0	0	0
12-22	Shared unsex toilet w/ shower and lockers for Bike users	135	0	1	**1**			135										0
12-25	Telecommunications Room	300		1	**1**	---	---	300										0
12-26	Telecommunications Switch Closet (@ floors w/o tel. room)	100		2	**2**	---	---	200										0
	GROUP K - KITCHEN																	
K1	Kitchen Complex (refer to K1 for gross area)	1,826	0	1	**1**	---	---	1,588						Note kitchen gross should be 1,826 including 15% circulatio			8	8
k2	Cooking area																	
k3	Servery- one serving line																	
	Dietician desk																	
K8	Help Locker Room - M/F				**2**													
	Food Storage (75% may be remote from kitchen)				**2**													
	TOTAL PROGRAMMED AREA (62% Gross)							**18,458**				**0**	**0**					
	Existing Spaces to be repurposed														1,196			
	PROGRAM AREA FOR ADDITION							18,458										
	TOTAL CORE AREA FOR ADDITION (38% Gross)							**11,313**				**0**		(designer input designed net minus actual building gross)				
	TOTAL GROSS AREA FOR ADDITION(100%)							**29,771**	**Addition Gross area**					(designer input sum of all gross floor plan areas)				
	TOTAL ADJUSTED CAPACITY:						160											
	Unadjusted Capacity:						160											
	TOTAL SF PER PUPIL:																	

NYC Green Schools Rating System | **SCA School Construction Authority**

PS 123A

Schematic Design

Project Name:	PS 123A		
Submission Phase:	Schematic Design	Submission Date:	3/1/3021
Address:	345 Example St	Architect:	Architect
LLW #:	123456	Preparer:	
Design #:	123456	Form Revision Date:	

Building Summary

Building Type	New Construction	Number of Stories above Grade:	4
Number of Buildings within Project Scope:	1	Number of Stories below Grade:	1
Building Total Gross Floor Area (SF):	38,268	Project Phase Cost Estimate	
Instructional Days School Year	180		
Instructional Days Summer	30		

Site Summary

Pre-project Site Condition:	Previously developed	Total Site Area (SF):	44,863
Building Footprint (SF):	11,763	Open Site Area (SF):	33,100
Hardscaped Site Area (SF):	27,341	Parking Area (SF):	800
		Parking Spaces:	25

Space Use Summary (Complete based on attached POR)

New Construction Gross Floor Area (SF):	38,268	(100%)	Regularly Occupied Spaces Total Floor Area:			(0%)
Renovated Gross Floor Area (SF):	0	(0%)	Unoccupied Total Floor Area:			(0%)
Unrenovated Gross Floor Area (SF):	0			Y	N	
Date of last POR update	02.25.20		POR Attached	X		

User Summary (Complete based on attached POR)

Students (Unadjusted Capacity):	160	Pre-K student population	36
Transients:	0	Kindergarten student population	40
Staff:	40	1st to 3rd grade student population	0

Utility Summary

Energy Systems		Water Systems		
X	Electricity	X	Municipal Drinking Water	
X	Natural Gas	X	Combined Sewage System	☐ Separate Sanitary and Storm Sewage System
	Fuel Oil	X	Rainwater	
	Biofuels		Graywater	
	District/Campus Heating	**Renewable Energy Systems**		
	District/Campus Cooling	X	Renewables on Site	☐ Off-Site

OVERVIEW

PS 123A

Schematic Design

Project:	PS 123A	Submission Phase:	Schematic Design
Address:	345 Example St	Architect:	Architect
LLW #:	123456	Preparer:	
Design #:	123456	Form Revision Date:	

Design Team

ARCHITECT		MEP ENGINEER	
Firm Name:	Architect	Firm Name:	Mechanical, Electrical, Plumbing
Address:	123 Example Street	Address:	123 Example Street
	New York NY		New York NY
Telephone:	123-456-7890	Telephone:	123-456-7890
Email:	example@example.com	Email:	example@example.com

CIVIL ENGINEER		LIGHTING CONSULTANT		LANDSCAPE ARCHITECT	
Firm Name:	Civil	Firm Name:	Lighting	Firm Name:	Landscape
Address:	456 Example Street	Address:	456 Example Street	Address:	456 Example Street
	New York NY		New York NY		New York NY
Telephone:	123-456-7890	Telephone:	123-456-7890	Telephone:	123-456-7890
Email:	example@example.com	Email:	example@example.com	Email:	example@example.com

DESIGN SUSTAINABILITY CONSULTANT		ENERGY MODELER		ACOUSTICAL CONSULTANT	
Firm Name:	Sustainability Consultant	Firm Name:	Energy Modeler	Firm Name:	Acoustical Consultant
Address:	123 Example Street	Address:	456 Example Street	Address:	456 Example Street
	New York NY		New York NY		New York NY
Telephone:	123-456-7890	Telephone:	123-456-7890	Telephone:	123-456-7890
Email:	example@example.com	Email:	example@example.com	Email:	example@example.com

SCA Team

DESIGN MANAGER		DESIGN PROJECT MANAGER	
Name:	Example Design Manager	Name:	Example PDM
Telephone:	123-456-7890	Telephone:	123-456-7890
Email:	example@example.com	Email:	example@example.com

COMMISSIONING	
Name:	Example CxA
Telephone:	123-456-7890
Email:	example@example.com

OVERVIEW

Project:	PS 123A	Submission Date:	3/1/3021
Address:	345 Example St	Architect:	Architect
LLW #:	123456	Preparer:	
Design #:	123456		

P1.1R - Integrative Design Process

This pre-requisite will be met. IDP Workshop was held on February 15, 2021. The following discoveries were evaluated: energy and daylight-related and water system analysis, preliminary life-cycle assessment, active design, acoustics and climate resiliency analyses. IDP Report was included in the Appendix A. Integrative Design Report was revised to include attendance, meeting minutes, design impacts for each discovery and updated IDP report as per meeting minutes.

Supporting Documentation:

P1.1R-Integrative Design Credit Form (page 13)
Appendix A- IDP Report (page 130)

L1.1R Sensitive Land Protection

Credit is feasible. Option 1- the development footprint is located on land that has been previously developed. As shown on the aerial map, the area of the project is currently occupied by playground areas located to the east of the existing school.

SCA Design Requirements

1.1.2.1 Feasibility Study
1.1.3.2. Test Fit/Sketch Studies

Supporting Documentation:

Aerial Map (page 15)

L1.2 - High Priority Site

Credit is feasible for Option 2 priority designation. Site in not in a historic district and is not a designated brownfield. The site is shown as a Difficult Development Area on the US Dept. of Housing and Urban Development map, qualifying for 1 point. See attached DDA map.

SCA Standards:

02010 Environmental Site Assessment Reports
02090 Environmental Management of Excavated Material
02200 Earthwork
02220 Gas Vapor Barrier (Fluid Applied)

Supporting Documentation:

DDA/QCT Map (page 17)

L1.3 – SURROUNDING DENSITY

Credit is feasible. The buildable land area within a 0.25 mile (1,320 SF) radius of the project has sufficient residential unit density and mixed-use and non-residential FAR to achieve 3 points under this credit, as shown in the neighborhood map and tabulation of residential units and lot and building areas below. The buildable land excludes park land, a cemetery, and an LIRR right of way.

SCA Design Requirements

1.1.2.1 Feasibility Study

Supporting Documentation:

Surrounding Density Credit Form (page 19)
Density Map (page 20)
Tabulations of residential, non-residential and mixed use buildings (pages 21-24)

L1.4R – DIVERSE USES

The project complies with the requirements to earn two points for this credit. The following map shows 10 diverse uses, from 4 use categories, and their locations relative to the school. All 10 are less than a 0.5 mile (2,640 ft.) walking distance from the project's main entrance.

SCA Design Requirements
1.1.2.1 Feasibility Study
1.1.3.2. Test Fit/Sketch Studies
Supporting Documentation:
Diverse Uses Credit Form (page 26)
Site Vicinity Map (page 27)
Walking Path Map to each diverse use (pages 28-37)

L2.1R – ACCESS TO QUALITY TRANSIT

Option 1 will be pursued: There are MTA Subway stations using train line 1. As well as Bus route M100, within the ¼ mile of walking distance from the main entrance and a 'BxM1' Express Bus within the 1/2 mile walking distance from the main entrance (see attached diagram). Subway train station 1 runs every 3 - 6 minutes on the weekdays. During school hours, 7:30am to 3:30pm, there are 38 stops in one direction, for a total of 76 stops. MTA Bus M100 runs every 5 - 8 minutes on the weekdays. During school hours, 7:30am to 3:30pm, there are 54 stops to E Harlem 2 Av-127 St and 52 stops to Inwood 220 St Via Amsterdam Via Broadway for a total of 106 stops. MTA Bus BxM1 runs every 16 - 20 minutes on the weekdays. During school hours, 7:30am to 3:30pm, there are 25 stops to one direction, for a total of 50 stops. Based on the above, a total of 232 stops per weekday will earn two (2) credit points.

SCA Design Requirements:
1.1.3.2 Test Fit/ Sketch Studies
Supporting Documentation:
Area Plan (page 39)
Transit Map (page 40
Walking Distance Map to bus stops (pages 41-42)

L2.2 – BICYCLE FACILITIES

The main entry to the project on Deisius Street is located within a 200-yard walking/biking distance of Kingdom Avenue, a local road (functional class 19 per NYSDOT Urban Code) with City-mandated 25mph speed limit. Kingdom Avenue connects to Hylan Avenue to the south, which has a dedicated bike lane that connects to other north-south local roads (25mph speed limit applies). The cycling route from Kingdom Avenue at Deisius Street to the Prince's Bay station on the Staten Island Railway, via this bike network, is 2.4 miles, within the 3-mile required distance. The Staten Island Railway is a commuter rail serving Staten Island. The project is a 44,136-SF three-story addition to an existing 50,664-SF three-story school building, which is greater than 50% of the existing building. Covered bike racks must be provided within 100-feet walking distance of the main project entries on Deisius Street. Uncovered bike racks will be provided for existing building. Interior racks will be located on the first floor, adjacent to the main entry vestibule at Deisius Street, in a dedicated, protected 78-SF bike storage room. The exterior racks are located adjacent to the main entry vestibule at Deisius Street. The unisex toilet with shocker and lockers is located on the fi rst fl oor off the central corridor. Bicycle riders can connect to all of the services shown in L1.4R (within 1/2 mile) as well as many additional ones within 3 miles.

SCA Design Requirements
1.3.1.12 Bicycle Storage
2.3.3 Bicycle Racks (updated 7/31/20)
SCA Standard Specifications
02870 Site and Street Furnishings
05700 Ornamental Metal
Supporting Documentation:
Site Plan including bike path and bike parking spaces (page 44)
Floor Plan including interior bike storage (page 45)
Floor Plan including shower/changing room (page 46)

L2.3R – REDUCED PARKING FOOTPRINT

Credit is feasible through Option 1 as no new parking is provided on site.

SCA Design Requirements:
1.1.2.1 Feasibility Study
1.1.3.2. Test Fit/Sketch Studies

L2.4P – GREEN VEHICLES, CHARGING STATION INFRASTRUCTURE

Credit is not feasible as there is no parking provided on site.

L2.5A – GREEN VEHICLES, CHARGING STATION INSTALLATION

Credit is not feasible as there is no parking provided on site.

S1.1P – ENVIRONMENTAL SITE ASSESSMENT

Credit is feasible. Phase I and II ESA were conducted. Executive Summaries are attached with recommendations including soil vapor barrier, minimized dewatering, soil excavation disposal, 2' fill covering of landscaped areas, management of any suspected ACM, LBP, or PCB containing materials, and repair of water damaged materials. Additional site investigation is not recommended.

Supporting Documentation:
ESA Phase I, Executive Summary (pages 48-51)
ESA Phase II, Executive Summary (pages 52 - 55)

S1.2R – ENHANCED SITE ASSESSMENT

Credit is feasible. An Enhanced Site Assessment was performed. Topography, Hydrology, Climate, Vegetation, Soils, Human Use, and Human Health Effects were evaluated.

Supporting Documentation:
Enhanced Site Assessment Credit Form (page 59)
Site Assessment Summary (page 57-58)
Additional Maps and documentation (page 60-81)

S2.2 – OPEN SPACE

Credit is feasible. The site contains more than 30% open space and sufficient vegetated space at the ground plane, as shown on the open space plan. The sidewalks along Lincoln Street and Rockaway Blvd will be replaced (concrete pavement with steel faced concrete curb). A 5' strip of permeable pavers is shown at the sidewalk along both streets. Outdoor space must meet certain criteria (pedestrian or recreation oriented, or a garden space with year round visual interest). Based on 30% of the project area (44,863 sf X 30%) a minimum of 13,459 sf of minimum open space is required of which 25% or 3,365 sf must be vegetated. The hardscape/playground areas are 22,194sf and the vegetated areas total 4,922sf. See attached diagram.

SCA Design Requirements
1.1.2.1 Feasibility Study
1.1.3.2. Test Fit/Sketch Studies
1.3.1.1. Building Location and Orientation

Supporting Documentation:
Open Space Diagram (page 83)

S2.3P – GREEN INFRASTRUCTURE ASSESSMENT

This pre-requisite will be met. The Civil Engineer completed a Green Infrastructure Feasibility Assessment in accordance with the requirements of LL97/17. The Green Infrastructure Assessment Study will be performed at DD phase to satisfy the requirements of S2.3P.

SCA Standards Incorporated:
02723 Storm Drainage Systems
02900 Landscaping

S2.4 - RAINWATER MANAGEMENT

Credit is not feasible. The total site developed storm flow will be calculated according to NYC DEP guidelines for design and construction of storm water management systems dated July 2012 and LL 97/17. Subsurface system, storage vaults, shall be used for rainwater management. The detention facility (storage vaults) will be designed to provide the maximum volume required for the storm with a 10 year (yr.) return frequency. The allowable flow in cubic feet per second (cfs) is computed in accordance with the Rational Method. The site storm water release rate to the combined sewer will be the greater of 0.25 cfs or 10% of the allowable flow. If allowable flow is less than 0.25 cfs, the storm water release rate shall be the allowable flow. This project does not meet all of the NYC DEP requirements to support a full on-site detention system using bio swales or rain gardens

SCA Standards Incorporated:
02723 Storm Drainage Systems
02900 Landscaping

Supporting Documentation:
Rainwater Management Credit Form (page 85)
Civil Engineer Report (page 86-94)

S3.1R – JOINT USE OF FACILITIES□

This project will have a Cafeteria on the first floor, a Gymatorium on the third floor, and a Library on fifth floor that can be used by the public for voting, community meetings, after school activities and similar events. All three spaces are easily accessible by the main stair or elevator. The design will follow Design Requirement 1.3.1.1 Building Location and Orientation and 1.3.5.1 Cafeteria PK to 8th Grade.

SCA Standards Incorporated:

1.3.1.1 Building Location and Orientation
1.3.5.1 Cafeteria PK-8 and HS

S3.2 – ACTIVE DESIGN IN A SCHOOL ENVIRONMENT□

This project will have a Cafeteria on the first floor, a Gymatorium on the third floor, and a Library on fifth floor that can be used by the public for voting, community meetings, after school activities and similar events. All three spaces are easily accessible by the main stair or elevator. The design will follow Design Requirement 1.3.1.1 Building Location and Orientation and 1.3.5.1 Cafeteria PK to 8th Grade.

SCA Standards Incorporated:

1.3.1.1 Building Location and Orientation
1.3.5.1 Cafeteria PK-8 and HS

E6.1P – RENEWABLE ENERGY FEASIBILITY□

Credit is feasible. A study has been performed to determine the feasibility of designing and constructing the project as a Net Zero Energy Building as per Local Law 31/16 since it is 3 stories above grade. The solar PV system proposed in the Net Zero Energy Building Feasibility report has been sized to cover the estimated annual electricity demand for the building (323,781 kWh/year) and contains a 119 kW(DC) rooftop mounted array and 150kW(DC) canopy/ground mounted array. The combined generation potential for the two systems is 330,159 kWh/year. A solar PV system capable of generating enough electricity to cover the equivalent amount of natural gas energy would require a significantly larger canopy or ground mounted system. Installation of a solar PV system will result in immediate carbon footprint reductions and potentially maintain the building's compliance with Local Law 97 of 2019 (LL97/2019) until the mid-2040s. At some point before 2050, the project may need to consider carbon offsets, increased solar PV capacity and/or electrification to mitigate fines due to LL97/2019. Based on the potential for on-site solar PV electricity generation, the project is well placed to pursue credit E6.2 Renewable Energy Production to its highest threshold of 15% of building energy use. Credit E6.2 will be explored further during Design Development.

SCA Standards:

13602 Photovoltaic System

Supporting Documentation

Net Zero Energy Building Feasibility report (for 3 stories or less, pages 96-108))
Onsite Energy Generating Building (for more then 3 stories, pages 109-119)

Q1.1P – MINIMUM IAQ PERFORMANCE □

This pre-requisite will be met. An outdoor air assessment was conducted per ASHRAE 62.1-2010 Section 4 on November 28, 2018 by D&B Engineers and Architects. The assessment concluded that there were no source pollutants of concern or other facilities that may degrade outdoor air quality.

SCA Standards:

01550 Indoor Air Quality Requirements
15781 Packaged Heating and Cooling Units
15852 Air Handling Units
15853 Custom Packaged Rooftop Heating and Cooling Units (Variable Air Volume System)
15854 Custom Packaged Rooftop Heating and Cooling Units (Constant Volume System)
15855 Commercial Packaged Rooftop Heating and Cooling Units
15933 Dedicated Outside Air System (DOAS) Air Handling Units
15934 Rooftop Air Handling Units for Public Assembly Spaces (Constant Volume System)
15970 Temperature Control System (BACnet BMS/DDC with School Operating Console)
15985 Sequence of Operations
15992 Cleaning and Testing
15993 Balancing of Systems

Supporting Documentation

ASHRAE Outdoor Air Assessment Report (no CFD modeling required, pages 121-123)
ASHRAE Outdoor Air Assessment Report (no CFD modeling required, pages 124-126)

I1.1R – LEED® ACCREDITED PROFESSIONAL□

Credit is feasible. Lisa Ross from Vidaris will act as LEED AP for this project. LEED AP BD+ certificate is included.

Supporting Documentation

LEED AP BD+C Certificate (page 128)

SUPPORTING DOCUMENTATION

P1.1R-Integrative Design Process

NYC Green Schools Rating System
INTEGRATIVE DESIGN PROCESS
CREDIT FORM
Credit P1.1R

SCA School Construction Authority

RESPONSIBLE PARTY:

NITIAL SUBMISSION PHASE: SD | DD | 60% | 100% | CA

Project:	PS 123A	Submission Phase:	Schematic Design
Address:	345 Example St	Architect:	Architect
LLW #:	123456	Preparer:	
Design #:	123456	Form Revision Date:	3/30/2021

IDP Workshop

	Y	N
IDP Workshop Report included in this submittal package	X	

Discovery #1 Energy and Daylight Related Systems

Energy Target (source EUI):	70
Renewable Energy Potential	
Total Roof Area (SF)	12665
Sustainable Roofing Zone (SF)	6,767
Roof Area PV Potential (SF)	5,898
kW of PV	99
kWh/year	141423

Definitions

Roof Area PV Potential (SF) Areas of the roof assembly where solar photolvatic electricity generation system is feasible

Sustainable Roofing Zone (SF) - area that requires a roof assembly where either a solar photovoltaic electricity generating system, a green roof system, or a combination thereof, is installed. Refer to the exceptions noted in Local Law 94 of 2019 for allowable SF exclusions (FDNY access, mechanical equipment and other Code mandated exclusions).

	Y	N
Geothermal System Feasibility Report required	X	

Provide a brief explanation of how the research and analysis uncovered through discovery influenced the project design and/or changes to the design. If applicable, give reasons for not addressing these topics:

Site Conditions	Heat island mitigation measures are included. Permeable pavers and a subsurface retention system address stormwater. All runoff from the site will discharge to the subsurface retention system. Solar studies indicate South and East Elevations will receive the most sun, playground along north side of site will receive sun mostly in the afternoon
MEP Layout Optimization	The geothermal feasibility tool indicates full system for closed loop, and open loop systems are feasible. A geothermal feasibility study will be performed at DD. Acoustic considerations will impact HVAC design.
Daylight Design Strategies for the School, including Gymnasium	Window head height to be as high as possible to maximize daylighting and views. Framing should be minimized. The gym is located at the second floor with two window walls available (East and West).

Discovery #2 Water Related Systems

	Y	N	
Water related system assessment performed	X		**Indoor Fixture Use, Irrigation, Stormwater Collection**
			Topics addressed

Discovery #3 Preliminary Life-Cycle Impact Assessment (LCA)

	Y	N
LCA Assessment performed	X	

Discovery #4 Active Design

	Y	N
Active Design Plan provided	X	

Discovery #5 Acoustics

	Y	N
Q8.1P and Q8.2 Risk Assessment performed	X	

Discovery #6 Climate Resiliency

	Y	N
Climate Resiliency discovery analysis provided	X	

Revision I - September 2019
Revision II - February 26, 2021

L1.1R – SENSITIVE LAND PROTECTION

L1.1R - Aerial map of previously developed site

L1.2 – HIGH PRIORITY SITE

L1.2 – DDA/QCT Map

Map Options : Clear | Reset | Full Screen

QCT Legend: Tract Outline | LIHTC Project | 2021 Qualified Census Tracts

SADDA Legend: FMR Boundary | ZCTA Boundary | 2021 Small DDA | Part DDA | Non Metro DDA

Hide the overview

The 2021 Qualified Census Tracts (QCTs) and Difficult Development Areas (DDAs) are effective January 1, 2021. The 2021 designations use data from the 2010 Decennial census. The designation methodology is explained in the federal Register notice published September 23, 2020

Map Options

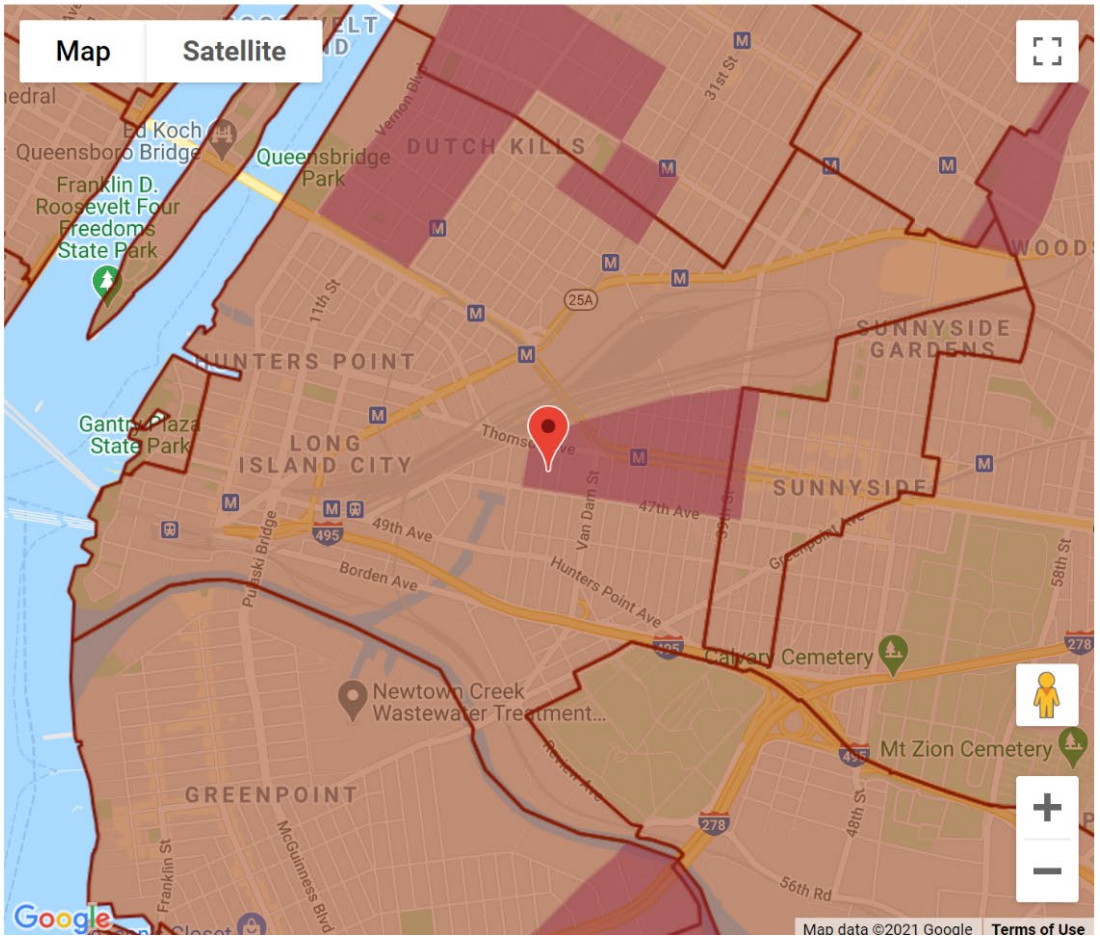
14 Current Zoom Level

- [x] Show Difficult Development Areas (Zoom 7+)
- [x] Color QCT Qualified Tracts (Zoom 7+)
- [ ] Show Tracts Outline (Zoom 11+)
- [ ] Show FMR Outlines (Zoom 4+)
- [ ] Show LIHTC Projects (Zoom 11+)

Click here for full screen map

Select Year

- (•) 2021
- ( ) 2020



L1.3 – SURROUNDING DENSITY

NYC Green Schools Rating System

SURROUNDING DENSITY

CREDIT FORM

Credit L1.3

SCA School Construction Authority

RESPONSIBLE PARTY:

INITIAL SUBMISSION PHASE: SD | DD | 60% | 100% | Design | CA

Project:	PS 123A	Submission Phase:	Schematic Design
Address:	345 Example St	Architect:	MGA Architect
LLW #:	123456	Preparer:	
Design #:	123456	Form Revision Date:	3/30/2021

INSTRUCTIONS:

Designer to select Option 1 or Option 2:

Option 1) The project will document surrounding density with combined residential and nonresidential densities.
Step 1) Insert Total Building Area and Total Buildable Land. Check compliance

Option 2) The project will document surrounding density with separate residential and nonresidential densities.
Step 1) Residential-only Buildings: If there are residential-only buildings, fill in Number of Dwelling Units and Land Area in acres. If there are no residential-only buildings within 1/4 mile enter 0
Step 2) Non-residential Buildings: If there are nonresidential buildings, fill in Building Area in SF and Land Area in acres. If there are no nonresidential buildings within 1/4 mile enter 0

Option 1: Combined Residential and Nonresidential Densities

Complete the table below. Include all buildings and buildable land within 1/4 mile of the project boundary. Exclude the project site area and building(s).

Step 1:

Total building area (SF)	3,399,828
Total buildable land (acres)	132.40
SF per acre of buildable land	25,678
POINTS	2

Option 2: Separate Residential and Nonresidential Densities

Step 1) Complete the table below for all mixed-use buildings (i.e. those with residential and nonresidential components) within 1/4 mile of the project boundary. Exclude the project site area and building.

Step 1: Residential-only Buildings

Number of dwelling units in residential-only buildings	3,171
Land area of residential-only buildings (acres)	129.9

Step 2: Nonresidential Buildings

Nonresidential-only building area (SF)	25,835
Nonresidential-only land area (acres)	2.3

Step 3: Mixed Use Buildings

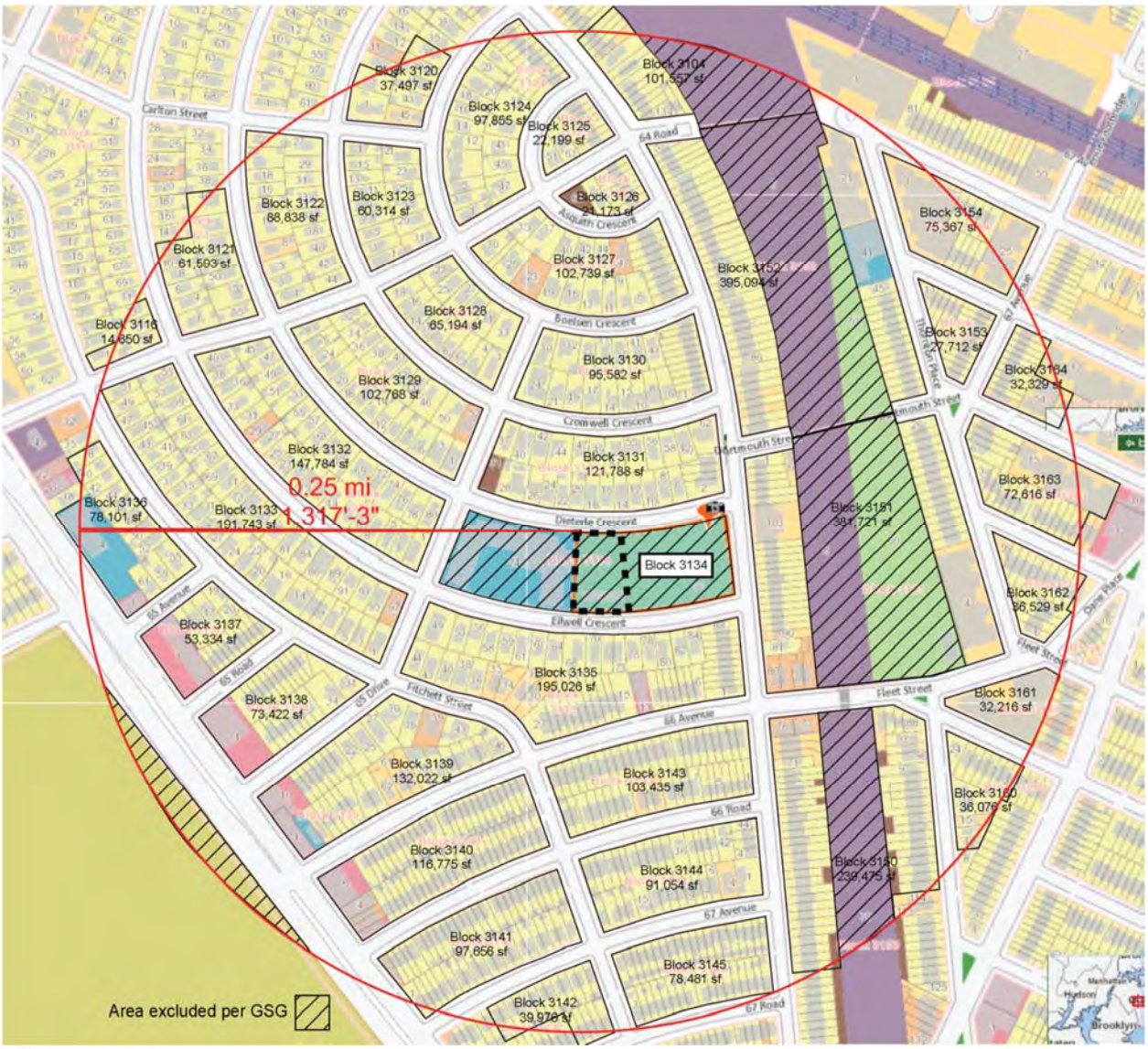
Mixed-use building area (SF)	Residential SF	3,735
	Nonresidential SF	3,735
Total mixed-use building area (SF)		7,470
Percentage of mixed-use building area (%)	Residential %	50
	Nonresidential %	50
Total mixed-use building land area (acres)		10,844.00
Weighted mixed-use land area (acres)	Residential acres	5,422.00
	Nonresidential acres	5,422.00
Residential dwelling units in mixed-use buildings		4

If there are no mixed-use building within a 1/4 mile, enter 0 for all fields.

Step 2) Complete the tables below for all residential and nonresidential buildings and land within 1/4 mi of the project boundary. Exclude the project site area and building(s).

Summary

Total residential density (DU/acre)	*0.57*
Total nonresidential density (FAR)	*0.00*
POINTS	0


Block 3120
37,497 sf
Block 3124
97,855 sf
Block 3125
22,199 sf
Block 3104
101,557 sf
Carlton Street
64 Road
Block 3122
88,838 sf
Block 3123
60,314 sf
Block 3126
21,173 sf
Asquith Crescent
Block 3154
75,367 sf
Block 3121
61,593 sf
Block 3127
102,739 sf
Block 3752
395,094 sf
Block 3116
14,650 sf
Block 3128
65,194 sf
Boelsen Crescent
Block 3153
27,712 sf
Block 3130
95,582 sf
Block 3164
32,329 sf
Block 3129
102,768 sf
Cromwell Crescent
Dartmouth Street
Block 3132
147,784 sf
Block 3131
121,788 sf
0.25 mi
1,317'-3"
Block 3136
78,101 sf
Block 3133
191,743 sf
Dieterle Crescent
Block 3134
Block 3181
384,721 sf
Block 3163
72,616 sf
Block 3162
56,529 sf
65 Avenue
Block 3137
53,334 sf
Elwell Crescent
65 Road
Block 3135
195,026 sf
Block 3138
73,422 sf
Fitchett Street
66 Avenue
Fleet Street
Block 3161
32,216 sf
Block 3139
132,022 sf
Block 3143
103,435 sf
66 Road
Block 3160
36,076 sf
Block 3140
116,775 sf
Block 3144
91,054 sf
Block 3150
239,475 sf
67 Avenue
Block 3141
97,656 sf
Block 3145
78,481 sf
Block 3142
39,978 sf
67 Road
Area excluded per GSG
nyc oasis
Legend
Location Report (6)
Site Search
Community Data
Land Use
Show All
Block/Lot Boundaries
(Building footprints in gray)
Land Use
All land use categories
2003 2005 2007 2009 2014 2018
1 & 2 Family Residential
Multi-family Residential
Mixed Use
Open space & outdoor recreation
Commercial
Institutions
Industrial
Parking
Transportation / Utilities
Vacant Lots

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7117	2R	189-15 73 Ave	1,002,000	483,292	516		
7117	3R	188-02 64 Ave	1,370,000	1,228,778	1,201		
7117	6R	194-05 67 Ave	790,500	410,788	410		
7117	7	195-05 69 Ave	99,950	25,835			
7117	8	67-00 192 St	392,900	205,744	215		
7117	20	195-00 67 Ave	59,358	12,470	12		
7117	51R	196-66 69 Ave	217,000	11,000	140		
7117	401R	196-14 69 Ave	225,750	116,000	148		
7117	421	195-02 69 Ave	Project Site Excluded				
7117	537	194-23 73 Ave	4,230	1,500	1		
7117	539	194-15 73 Ave	9,210	3,360	1		
7126	1	67-01 197 St	2,221	1,106	1		
7126	6	67-02 198 St	1,700	1,600	1		
7126	7	67-04 198 St	1,700	1,600	1		
7126	8	67-06 198 St	1,700	1,600	1		
7126	9	67-08 198 St	1,700	1,600	1		
7126	10	67-10 198 St	1,700	1,600	1		
7126	11	67-12 198 St	1,700	1,600	1		
7126	12	67-14 198 St	1,700	1,600	1		
7126	13	67-16 198 St	1,700	1,760	1		
7126	14	67-18 198 St	1,700	1,600	1		
7126	15	67-20 198 St	1,700	1,600	1		
7126	16	67-22 198 St	1,700	1,600	1		
7126	17	67-24 198 St	1,700	1,600	1		
7126	18	67-26 198 St	1,700	1,760	1		
7126	19	67-28 198 St	1,700	1,760	1		
7126	20	67-30 198 St	1,700	1,600	1		
7126	21	67-32 198 St	1,700	1,600	1		
7126	22	67-34 198 St	1,700	1,600	1		
7126	23	67-36 198 St	1,700	1,600	1		
7126	24	67-38 198 St	1,700	1,600	1		
7126	25	67-40 198 St	1,700	1,760	1		
7126	26	67-42 198 St	1,700	1,600	1		
7126	27	67-44 198 St	1,700	1,600	1		
7126	28	67-46 198 St	1,700	1,760	1		
7126	29	67-48 198 St	1,700	1,600	1		
7126	30	67-50 198 St	1,700	1,600	1		
7126	31	67-52 198 St	1,700	1,760	1		
7126	32	67-54 198 St	1,700	1,600	1		
7126	33	67-56 198 St	1,700	1,600	1		
7126	34	67-58 198 St	1,700	1,600	1		
7126	35	67-60 198 St	1,700	1,600	1		
7126	36	67-62 198 St	1,700	1,600	1		
7126	37	67-59 197 St	3,417	1,520	1		
7126	39	67-55 197 St	2,221	1,024	1		
7126	41	67-53 197 St	2,221	1,024	1		
7126	42	67-49 197 St	2,221	1,024	1		
7126	43	67-47 197 St	2,221	1,024	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7126	45	67-45 197 St	2,221	1,024	1		
7126	46	67-41 197 St	2,221	1,024	1		
7126	47	67-39 197 St	2,221	1,024	1		
7126	49	67-35 197 St	2,221	1,024	1		
7126	50	67-33 197 St	2,221	1,024	1		
7126	51	67-31 197 St	2,221	1,024	1		
7126	52	67-29 197 St	2,221	1,024	1		
7126	54	67-27 197 St	2,221	1,024	1		
7126	55	67-25 197 St	2,221	1,024	1		
7126	56	67-21 197 St	2,221	1,024	1		
7126	58	67-19 197 St	2,221	1,184	1		
7126	59	67-17 197 St	2,221	1,088	1		
7126	60	67-15 197 St	2,221	1,152	1		
7126	61	67-11 197 St	2,221	2,016	1		
7126	63	67-09 197 St	2,221	1,174	1		
7126	64	67-05 197 St	2,221	1,024	1		
7126	66	67-03 197 St	2,221	1,204	1		
7127	1	67-01 198 St	1,720	1,925	1		
7127	6	67-02 199 St	2,250	1,136	1		
7127	7	67-04 199 St	2,236	1,024	1		
7127	9	67-06 199 St	2,236	896	1		
7127	10	67-10 199 St	2,236	896	1		
7127	11	67-12 199 St	2,236	896	1		
7127	12	67-14 199 St	2,236	896	1		
7127	14	67-16 199 St	2,236	1,120	1		
7127	15	67-20 199 St	2,236	1,120	1		
7127	16	67-22 199 St	2,236	1,146	1		
7127	18	67-24 199 St	2,236	896	1		
7127	19	67-28 199 St	2,236	896	1		
7127	20	67-30 199 St	2,236	896	1		
7127	22	67-32 199 St	2,236	896	1		
7127	23	67-36 199 St	2,236	896	1		
7127	24	67-38 199 St	2,236	1,024	1		
7127	26	67-40 199 St	2,236	896	1		
7127	27	67-44 199 St	2,236	896	1		
7127	28	67-46 199 St	2,236	896	1		
7127	29	67-48 199 St	2,236	896	1		
7127	31	67-50 199 St	2,236	896	1		
7127	32	67-54 199 St	2,236	896	1		
7127	33	67-56 199 St	2,236	896	1		
7127	35	67-60 199 St	3,633	1,900	1		
7127	37	67-61 198 St	1,713	1,925	1		
7127	38	67-59 198 St	1,713	1,925	1		
7127	39	67-57 198 St	1,713	1,925	1		
7127	40	67-55 198 St	1,713	1,925	1		
7127	41	67-53 198 St	1,708	1,925	1		
7127	42	67-51 198 St	1,713	1,925	1		
7127	43	67-49 198 St	1,713	1,925	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7127	44	67-47 198 St	1,713	1,925	1		
7127	45	67-45 198 St	1,713	1,925	1		
7127	46	67-43 198 St	1,713	1,925	1		
7127	47	67-41 198 St	1,713	1,925	1		
7127	48	67-39 198 St	1,713	1,925	1		
7127	49	67-37 198 St	1,713	1,925	1		
7127	50	67-35 198 St	1,713	1,925	1		
7127	51	67-33 198 St	1,713	1,925	1		
7127	52	67-31 198 St	1,713	1,925	1		
7127	53	67-29 198 St	1,713	1,925	1		
7127	54	67-27 198 St	1,713	1,925	1		
7127	55	67-25 198 St	1,713	1,925	1		
7127	56	67-23 198 St	1,713	1,925	1		
7127	57	67-21 198 St	1,713	1,925	1		
7127	58	67-19 198 St	1,713	1,925	1		
7127	59	67-17 198 St	1,713	1,925	1		
7127	60	67-15 198 St	1,715	1,760	1		
7127	61	67-13 198 St	1,715	1,760	1		
7127	62	67-11 198 St	1,715	1,760	1		
7127	63	67-09 198 St	1,720	1,925	1		
7127	64	67-07 198 St	1,720	1,925	1		
7127	65	67-05 198 St	1,720	1,925	1		
7127	66	67-03 198 St	1,720	1,925	1		
7150	1	69-01 197 St	1,705	1,925	1		
7150	4	69-02 198 St	1,684	1,828	1		
7150	5	69-04 198 St	1,684	1,828	1		
7150	6	69-06 198 St	1,684	1,828	1		
7150	7	69-08 198 St	1,684	1,828	1		
7150	8	69-10 198 St	1,684	1,828	1		
7150	9	69-12 198 St	1,679	1,828	1		
7150	10	69-14 198 St	1,679	1,828	1		
7150	11	69-16 198 St	1,679	1,828	1		
7150	12	69-18 198 St	1,679	1,828	1		
7150	13	69-20 198 St	1,674	1,828	1		
7150	14	69-22 198 St	1,674	1,828	1		
7150	15	69-24 198 St	1,672	1,828	1		
7150	16	69-26 198 St	1,672	1,828	1		
7150	17	69-28 198 St	1,672	1,828	1		
7150	18	69-30 198 St	1,671	1,828	1		
7150	19	69-32 198 St	1,671	1,828	1		
7150	20	69-34 198 St	1,671	1,828	1		
7150	21	69-36 198 St	1,669	1,828	1		
7150	22	69-38 198 St	1,667	1,828	1		
7150	23	69-40 198 St	1,667	1,828	1		
7150	24	69-42 198 St	1,666	1,828	1		
7150	25	69-44 198 St	1,666	1,828	1		
7150	26	69-46 198 St	1,666	1,828	1		
7150	27	69-48 198 St	1,664	1,828	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7150	28	69-50 198 St	1,664	1,828	1		
7150	29	69-52 198 St	1,664	1,828	1		
7150	30	69-54 198 St	1,662	1,828	1		
7150	31	69-56 198 St	1,659	1,828	1		
7150	32	69-58 198 St	1,659	1,828	1		
7150	33	69-60 198 St	1,659	1,828	1		
7150	34	69-62 198 St	1,659	1,828	1		
7150	35	69-64 198 St	1,680	3,045	1		
7150	36	69-63 197 St	1,680	3,045	1		
7150	37	69-61 197 St	1,680	1,925	1		
7150	38	69-59 197 St	1,680	1,925	1		
7150	39	69-57 197 St	1,680	1,925	1		
7150	40	69-55 197 St	1,680	1,925	1		
7150	41	69-53 197 St	1,680	1,925	1		
7150	42	69-51 197 St	1,680	1,925	1		
7150	43	69-49 197 St	1,680	1,925	1		
7150	44	69-47 197 St	1,680	1,925	1		
7150	45	69-45 197 St	1,685	1,925	1		
7150	46	69-43 197 St	1,687	1,925	1		
7150	47	69-41 197 St	1,687	1,925	1		
7150	48	69-39 197 St	1,688	1,925	1		
7150	49	69-37 197 St	1,688	1,925	1		
7150	50	69-35 197 St	1,690	1,925	1		
7150	51	69-33 197 St	1,690	1,925	1		
7150	52	69-31 197 St	1,692	1,925	1		
7150	53	69-29 197 St	1,692	1,925	1		
7150	54	69-27 197 St	1,692	1,925	1		
7150	55	69-25 197 St	1,693	1,925	1		
7150	56	69-23 197 St	1,693	1,925	1		
7150	57	69-21 197 St	1,693	1,925	1		
7150	58	69-19 197 St	1,695	1,925		963	963
7150	59	69-17 197 St	1,700	1,925	1		
7150	60	69-15 197 St	1,700	1,925	1		
7150	61	69-13 197 St	1,700	1,925	1		
7150	62	69-11 197 St	1,700	1,925	1		
7150	63	69-09 197 St	1,700	1,925	1		
7150	64	69-07 197 St	1,703	1,925	1		
7150	65	69-05 197 St	1,703	1,925	1		
7150	66	69-03 197 St	1,705	2,100	1		
7151	1	69-01 198 St	1,756	1,925	1		
7151	2	69-02 199 St	2,333	1,072	1		
7151	5	69-04 199 St	2,261	1,184	1		
7151	6	69-08 199 St	2,236	896	1		
7151	7	69-10 199 St	2,236	896	1		
7151	8	69-12 199 St	2,255	896	1		
7151	10	69-16 199 St	2,240	896	1		
7151	11	69-18 199 St	2,243	1,083	1		
7151	12	69-20 199 St	2,236	896	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7151	13	69-24 199 St	2,236	896	1		
7151	15	69-26 199 St	2,247	896	1		
7151	16	69-28 199 St	2,236	896	1		
7151	17	69-32 199 St	2,249	896	1		
7151	18	69-34 199 St	2,249	1,720	1		
7151	20	69-36 199 St	2,251	1,168	1		
7151	21	69-40 199 St	2,251	896	1		
7151	22	69-42 199 St	2,268	896	1		
7151	23	69-44 199 St	2,268	1,054	1		
7151	25	69-46 199 St	2,270	1,120	1		
7151	26	69-50 199 St	2,270	1,120	1		
7151	27	69-52 199 St	2,262	1,120	1		
7151	28	69-54 199 St	2,262	1,156	1		
7151	30	69-56 199 St	2,284	896	1		
7151	31	69-60 199 St	2,262	896	1		
7151	33	69-62 199 St	2,349	1,208	1		
7151	34	69-63 198 St	1,755	1,925	1		
7151	35	69-61 198 St	1,711	1,828	1		
7151	36	69-59 198 St	1,711	2,294	1		
7151	37	69-57 198 St	1,711	2,294	1		
7151	38	69-55 198 St	1,711	1,828	1		
7151	39	69-53 198 St	1,711	1,828	1		
7151	40	69-51 198 St	1,706	1,828	1		
7151	41	69-49 198 St	1,706	1,828	1		
7151	42	69-47 198 St	1,706	2,294	1		
7151	43	69-45 198 St	1,704	1,828	1		
7151	44	69-43 198 St	1,704	1,828	1		
7151	45	69-41 198 St	1,704	1,828	1		
7151	46	69-39 198 St	1,703	1,828	1		
7151	47	69-37 198 St	1,703	1,828	1		
7151	48	69-35 198 St	1,701	1,828	1		
7151	49	69-33 198 St	1,704	1,828	1		
7151	50	69-31 198 St	1,701	1,828	1		
7151	51	69-29 198 St	1,700	1,828	1		
7151	52	69-27 198 St	1,700	1,828	1		
7151	53	69-25 198 St	1,700	1,828	1		
7151	54	69-23 198 St	1,695	1,828	1		
7151	55	69-21 198 St	1,695	1,828	1		
7151	56	69-19 198 St	1,696	1,828	1		
7151	57	69-17 198 St	1,696	1,828	1		
7151	58	69-15 198 St	1,696	1,828	1		
7151	59	69-13 198 St	1,695	1,828	1		
7151	60	69-11 198 St	1,695	1,828	1		
7151	61	69-09 198 St	1,695	1,828	1		
7151	62	69-07 198 St	1,714	1,828	1		
7151	63	69-05 198 St	1,691	1,828	1		
7151	64	69-03 198 St	1,691	1,828	1		
7186	1	73-03 198 St	2,970	1,848		924	924

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7186	5	73-04 199 St	2,958	1,848	1		
7186	6	73-08 199 St	2,924	1,848	1		
7186	7	73-10 199 St	2,881	1,848	1		
7186	8	73-12 199 St	2,881	1,848	1		
7186	10	73-16 199 St	2,924	1,848	1		
7186	12	73-20 199 St	2,890	1,848	1		
7186	14	73-24 199 St	2,897	1,848	1		
7186	16	73-28 199 St	2,897	1,848	1		
7186	18	73-30 199 St	2,925	1,848	1		
7186	20	73-34 199 St	2,891	1,848	1		
7186	22	73-38 199 St	2,898	1,848	1		
7186	24	73-40 199 St	2,898	1,848	1		
7186	26	73-44 199 St	2,905	1,848	1		
7186	28	73-48 199 St	2,905	1,848	1		
7186	30	73-50 199 St	2,912	1,848	1		
7186	56	73-57 198 St	2,904	1,848	1		
7186	58	73-53 198 St	2,877	1,848	1		
7186	60	73-49 198 St	2,912	1,848	1		
7186	62	73-47 198 St	2,905	1,848	1		
7186	64	73-43 198 St	2,905	1,848	1		
7186	66	73-39 198 St	2,898	1,848	1		
7186	68	73-37 198 St	2,898	1,848	1		
7186	70	73-33 198 St	2,891	1,848	1		
7186	72	73-29 198 St	2,925	1,848	1		
7186	74	73-27 198 St	2,897	1,848	1		
7186	76	73-23 198 St	2,897	1,848	1		
7186	78	73-19 198 St	2,890	1,848	1		
7186	80	73-15 198 St	2,924	1,848	1		
7186	82	73-11 198 St	2,881	1,848	1		
7186	84	73-09 198 St	2,881	1,848	1		
7186	86	73-07 198 St	2,838	1,848	1		
7185	1	73-03 197 St	3,179	1,848		924	924
7185	6	73-04 198 St	2,994	1,848	1		
7185	7	73-08 198 St	2,925	1,848	1		
7185	9	73-10 198 St	2,925	1,848	1		
7185	10	73-14 198 St	2,925	1,600	1		
7185	12	73-18 198 St	2,925	1,848	1		
7185	14	73-20 198 St	2,891	1,864	1		
7185	16	73-24 198 St	2,891	1,864	1		
7185	17	73-28 198 St	2,891	1,864	1		
7185	19	73-30 198 St	2,891	1,848	1		
7185	21	73-34 198 St	2,891	1,848	1		
7185	23	73-38 198 St	2,891	1,848	1		
7185	25	73-40 198 St	2,857	1,848	1		
7185	27	73-44 198 St	2,857	1,864	1		
7185	29	73-48 198 St	2,857	1,864	1		
7185	31	73-50 198 St	2,857	1,848	1		
7185	33	73-54 198 St	2,857	1,848	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7185	35	73-58 198 St	2,857	1,848	1		
7185	37	73-60 198 St	2,857	1,848	1		
7185	39	73-64 198 St	2,822	1,848	1		
7185	41	73-68 198 St	2,822	1,848	1		
7185	48	73-73 197 St	3,089	1,860	1		
7185	50	73-67 197 St	3,089	1,848	1		
7185	52	73-65 197 St	3,089	1,848	1		
7185	54	73-61 197 St	3,089	1,848	1		
7185	56	73-59 197 St	3,089	1,848	1		
7185	58	73-53 197 St	3,089	1,848	1		
7185	60	73-51 197 St	3,089	1,848	1		
7185	62	73-45 197 St	3,089	1,848	1		
7185	64	73-43 197 St	3,089	1,848	1		
7185	66	73-37 197 St	3,089	1,848	1		
7185	68	73-35 197 St	3,089	1,848	1		
7185	70	73-29 197 St	3,089	1,848	1		
7185	72	73-27 197 St	3,089	1,848	1		
7185	74	73-21 197 St	3,089	1,848	1		
7185	76	73-19 197 St	3,089	1,848	1		
7185	78	73-13 197 St	3,089	1,848	1		
7185	80	73-11 197 St	3,089	1,848	1		
7185	82	73-05 197 St	3,089	1,864	1		
7184	1	73-03 196 Pl	5,700	1,910	1		
7184	6	73-04 197 St	2,900	1,848	1		
7184	8	73-06 197 St	3,000	1,848	1		
7184	9	73-10 197 St	3,000	1,848	1		
7184	11	73-12 197 St	3,000	1,848		924	924
7184	12	73-16 197 St	3,000	1,848	1		
7184	14	73-18 197 St	3,000	1,848	1		
7184	15	73-22 197 St	3,000	1,848	1		
7184	17	73-24 197 St	3,000	1,848	1		
7184	18	73-28 197 St	3,000	1,872	1		
7184	20	73-30 197 St	3,000	1,872	1		
7184	21	73-34 197 St	3,000	1,872	1		
7184	23	73-36 197 St	3,000	1,848	1		
7184	24	73-40 197 St	3,000	1,848	1		
7184	26	73-42 197 St	3,000	1,848	1		
7184	27	73-46 197 St	3,000	1,872	1		
7184	29	73-48 197 St	3,000	1,872	1		
7184	30	73-52 197 St	3,000	1,848	1		
7184	32	73-54 197 St	3,000	1,848	1		
7184	33	73-58 197 St	3,000	1,848	1		
7184	35	73-60 197 St	3,000	1,848	1		
7184	36	73-64 197 St	3,000	1,848	1		
7184	38	73-66 197 St	3,000	1,848	1		
7184	39	73-70 197 St	3,000	1,848	1		
7184	41	73-72 197 St	3,000	1,848	1		
7184	42	73-76 197 St	3,000	1,848	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7184	46	73-73 196 Pl	5,500	3,174	1		
7184	49	73-67 196 Pl	6,000	1,737	1		
7184	52	73-61 196 Pl	5,500	1,512	1		
7184	55	73-55 196 Pl	6,000	1,512	1		
7184	59	73-49 196 Pl	5,500	1,512	1		
7184	60	73-45 196 Pl	6,400	1,512	1		
7184	63	73-39 196 Pl	5,500	1,512	1		
7184	66	73-33 196 Pl	5,800	3,235	1		
7184	69	73-27 196 Pl	5,700	2,137	1		
7184	72	73-21 196 Pl	6,000	1,512	1		
7184	75	73-15 196 Pl	5,500	2,750	1		
7184	78	73-09 196 Pl	6,000	1,512	1		
7183	1	73-03 196 St	4,149	1,458	1		
7183	6	73-04 196 Pl	5,625	1,381	1		
7183	9	73-10 196 Pl	6,000	1,357	1		
7183	12	73-16 196 Pl	5,500	3,240	1		
7183	15	73-22 196 Pl	6,000	1,357	1		
7183	19	73-28 196 Pl	5,500	2,747	1		
7183	20	73-34 196 Pl	6,000	1,357	1		
7183	23	73-40 196 Pl	5,500	2,993	1		
7183	26	73-46 196 Pl	5,500	2,993	1		
7183	29	73-50 196 Pl	5,500	2,732	1		
7183	32	73-56 196 Pl	6,000	3,180	1		
7183	36	73-62 196 Pl	5,500	2,916	1		
7183	37	73-68 196 Pl	6,000	1,357	1		
7183	40	196-15 75 Ave	5,500	2,760	1		
7183	44	73-71 196 St	4,000	2,040	1		
7183	46	73-67 196 St	5,177	2,040	1		
7183	51	73-63 196 St	5,000	2,240	1		
7183	52	73-59 196 St	4,000	1,320	1		
7183	54	73-55 196 St	4,000	1,418	1		
7183	56	73-51 196 St	4,000	2,126	1		
7183	58	73-47 196 St	4,000	1,824	1		
7183	60	73-43 196 St	4,000	1,634	1		
7183	62	73-39 196 St	4,000	1,776	1		
7183	64	73-35 196 St	4,000	1,776	1		
7183	66	73-31 196 St	4,000	1,458	1		
7183	68	73-27 196 St	4,000	1,458	1		
7183	70	73-23 196 St	4,000	1,320	1		
7183	72	73-19 196 St	4,000	2,560	1		
7183	74	73-15 196 St	4,000	1,600	1		
7183	76	73-11 196 St	4,000	1,418	1		
7183	78	73-07 196 St	4,000	1,418	1		
7182	1	73-03 195 St	4,100	1,521	1		
7182	6	73-04 196 St	3,900	1,768	1		
7182	8	73-08 196 St	4,000	1,776	1		
7182	10	73-12 196 St	4,000	1,458	1		
7182	12	73-16 196 St	4,000	1,876	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7182	14	73-20 196 St	4,000	2,016	1		
7182	16	73-24 196 St	4,000	1,600	1		
7182	18	73-28 196 St	4,000	1,900	1		
7182	20	73-32 196 St	4,000	1,728	1		
7182	22	73-36 196 St	4,000	1,552	1		
7182	24	73-40 196 St	4,000	1,758	1		
7182	26	73-44 196 St	4,000	1,650	1		
7182	28	73-48 196 St	4,000	1,768	1		
7182	30	73-52 196 St	4,000	1,428	1		
7182	32	73-56 196 St	4,000	1,600	1		
7182	34	73-60 196 St	3,957	1,744	1		
7182	36	73-64 196 St	5,000	1,458	1		
7182	41	73-68 196 St	4,975	2,400	1		
7182	42	73-72 196 St	4,000	2,000	1		
7182	44	73-71 195 St	4,000	2,536	1		
7182	46	73-67 195 St	5,000	1,768	1		
7182	50	73-63 195 St	4,000	1,816	1		
7182	51	73-59 195 St	4,000	1,850	1		
7182	53	73-55 195 St	4,000	1,510	1		
7182	55	73-51 195 St	4,000	1,800	1		
7182	57	73-47 195 St	4,000	1,384	1		
7182	59	73-43 195 St	4,400	1,768	1		
7182	61	73-39 195 St	4,000	1,693	1		
7182	63	73-35 195 St	4,000	1,880	1		
7182	65	73-31 195 St	4,000	1,690	1		
7182	67	73-27 195 St	4,000	1,328	1		
7182	69	73-23 195 St	4,000	1,792	1		
7182	71	73-19 195 St	4,000	1,783	1		
7182	73	73-15 195 St	4,000	1,496	1		
7182	75	73-11 195 St	4,000	1,320	1		
7182	77	73-07 195 St	4,000	1,800	1		
7181	1	73-03 194 St	4,100	1,780	1		
7181	6	73-04 195 St	4,100	1,458	1		
7181	8	73-08 195 St	4,100	1,352	1		
7181	10	73-12 195 St	4,000	2,200	1		
7181	12	73-16 195 St	4,000	2,238	1		
7181	14	73-20 195 St	4,000	1,352	1		
7181	16	73-24 195 St	4,000	1,352	1		
7181	18	73-28 195 St	4,000	1,768	1		
7181	20	73-32 195 St	4,000	1,418	1		
7181	22	73-36 195 St	4,000	2,154	1		
7181	24	73-40 195 St	4,000	1,418	1		
7181	26	73-44 195 St	4,000	1,458	1		
7181	28	73-48 195 St	4,000	1,448	1		
7181	30	73-52 195 St	4,500	1,850	1		
7181	32	73-56 195 St	4,000	1,728	1		
7181	34	73-60 195 St	4,000	1,482	1		
7181	36	73-64 195 St	4,000	1,352	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7181	38	73-68 195 St	4,500	1,828	1		
7181	40	73-72 195 St	4,000	1,716	1		
7181	42	73-71 194 St	4,000	1,418	1		
7181	44	73-67 194 St	4,000	1,408	1		
7181	46	73-63 194 St	4,000	1,600	1		
7181	48	73-59 194 St	4,000	1,352	1		
7181	50	73-55 194 St	4,700	2,800	1		
7181	52	73-51 194 St	4,000	1,352	1		
7181	54	73-47 194 St	4,000	1,418	1		
7181	56	73-43 194 St	4,000	1,352	1		
7181	58	73-39 194 St	4,000	1,352	1		
7181	60	73-35 194 St	4,000	1,424	1		
7181	62	73-31 194 St	4,000	1,985	1		
7181	64	73-27 194 St	4,000	1,720	1		
7181	66	73-23 194 St	4,000	1,770	1		
7181	68	73-19 194 St	4,000	1,418	1		
7181	70	73-15 194 St	4,000	1,458	1		
7181	72	73-11 194 St	4,000	1,996	1		
7181	74	73-07 194 St	4,000	1,424	1		
7180	1	73-03 193 St	3,700	1,418	1		
7180	6	73-04 194 St	4,000	1,600	1		
7180	8	73-08 194 St	4,000	1,652	1		
7180	10	73-12 194 St	4,000	1,852	1		
7180	12	73-16 194 St	4,000	1,134	1		
7180	14	73-20 194 St	4,000	2,348	1		
7180	16	73-24 194 St	4,000	1,670	1		
7180	18	73-28 194 St	4,000	2,052	1		
7180	20	73-32 194 St	4,000	1,643	1		
7180	22	73-36 194 St	4,000	1,424	1		
7180	24	73-40 194 St	4,000	1,568	1		
7180	26	73-44 194 St	4,000	1,720	1		
7180	28	73-48 194 St	4,300	1,754	1		
7180	30	73-52 194 St	4,000	1,683	1		
7180	32	73-56 194 St	4,000	1,432	1		
7180	34	73-60 194 St	4,000	1,492	1		
7180	36	73-64 194 St	4,000	1,470	1		
7180	38	73-68 194 St	4,000	1,772	1		
7180	40	73-72 194 St	4,000	1,720	1		
7180	42	73-71 193 St	4,000	1,544	1		
7180	44	73-67 193 St	4,000	1,408	1		
7180	46	73-63 193 St	4,000	1,418	1		
7180	48	73-59 193 St	4,000	1,422	1		
7180	50	73-55 193 St	4,000	1,538	1		
7180	52	73-51 193 St	4,000	1,395	1		
7180	54	73-47 193 St	4,000	1,800	1		
7180	56	73-43 193 St	4,000	1,072	1		
7180	58	73-39 193 St	4,000	1,772	1		
7180	60	73-35 193 St	4,000	1,418	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7180	62	73-31 193 St	4,000	1,072	1		
7180	64	73-27 193 St	4,000	1,418	1		
7180	66	73-23 193 St	4,000	1,720	1		
7180	68	73-19 193 St	4,000	1,760	1		
7180	70	73-15 193 St	4,000	1,992	1		
7180	72	73-11 193 St	4,000	1,775	1		
7180	74	73-07 193 St	4,000	1,352	1		
7179	1	73-03 192 St	4,000	1,760	1		
7179	6	73-04 193 St	3,700	1,560	1		
7179	8	73-08 193 St	3,942	1,560	1		
7179	10	73-12 193 St	3,942	1,560	1		
7179	12	73-16 193 St	3,942	2,048	1		
7179	14	73-20 193 St	3,942	1,643	1		
7179	16	73-24 193 St	3,942	1,392	1		
7179	18	73-28 193 St	3,942	1,768	1		
7179	20	73-32 193 St	3,942	1,208	1		
7179	22	73-36 193 St	3,942	1,608	1		
7179	24	73-40 193 St	3,942	1,418	1		
7179	26	73-44 193 St	3,942	1,482	1		
7179	28	73-48 193 St	3,942	1,643	1		
7179	30	73-52 193 St	3,942	1,208	1		
7179	32	73-56 193 St	3,942	1,728	1		
7179	34	73-60 193 St	3,942	1,418	1		
7179	47	73-55 192 St	4,000	1,200	1		
7179	49	73-51 192 St	4,000	1,872	1		
7179	51	73-47 192 St	4,300	1,560	1		
7179	53	73-43 192 St	4,000	1,623	1		
7179	55	73-39 192 St	4,000	1,688	1		
7179	57	73-35 192 St	4,000	1,196	1		
7179	59	73-31 192 St	4,000	1,208	1		
7179	61	73-27 192 St	4,000	1,648	1		
7179	63	73-23 192 St	4,000	1,460	1		
7179	65	73-19 192 St	4,500	2,106	1		
7179	67	73-15 192 St	4,100	1,600	1		
7179	69	73-11 192 St	4,200	1,658	1		
7179	71	73-07 192 St	4,000	2,520	1		
7178	1	73-03 190 St	4,300	2,316	1		
7178	7	73-02 192 St	4,300	2,500	1		
7178	9	73-06 192 St	4,000	1,568	1		
7178	11	73-10 192 St	4,000	1,724	1		
7178	13	73-14 192 St	4,000	1,540	1		
7178	15	73-18 192 St	4,000	1,920	1		
7178	17	73-22 192 St	4,000	2,012	1		
7178	19	73-26 192 St	4,000	1,611	1		
7178	21	73-30 192 St	4,000	1,392	1		
7178	23	73-34 192 St	4,000	1,772	1		
7178	25	73-38 192 St	4,400	2,164	1		
7178	61	73-27 190 St	4,000	1,800	1		

Block	Lot #	Address	Lot Area	Bldg Area	Units	Mixed Resid	Mixed Comm
7178	63	73-23 190 St	4,000	1,560	1		
7178	65	73-19 190 St	4,000	2,016	1		
7178	67	73-15 190 St	4,000	2,366	1		
7178	69	73-11 190 St	4,000	1,560	1		
7178	71	73-07 190 St	4,000	1,144	1		
7212	1	75-03 196 St	4,000	1,912	1		
7212	6	75-04 196 Pl	5,667	1,392	1		
7212	76	75-07 196 St	4,500	1,945	1		
7211	1	75-03 195 St	5,000	1,924	1		
7211	6	75-02 196 St	4,000	1,680	1		
7211	8	75-06 196 St	4,000	1,476	1		
7211	73	75-07 195 St	4,000	1,600	1		
7210	1	75-03 194 St	4,000	1,998	1		
7210	6	75-04 195 St	4,000	1,864	1		
			5,767,542	3,399,828	3,171	3,735	3,735
		Resid-Only	5,656,748	3,366,524			
		Mixed	10,844	7,469			
		Commercial	99,950	25,835			

L1.4R – DIVERSE USES

NYC Green Schools Rating System

DIVERSE USES

CREDIT FORM

Credit L1.4R

SCA School Construction Authority

RESPONSIBLE PARTY:

INITIAL SUBMISSION PHASE: SD | DD | 60% | 100% | Design | CA

Project:	PS 123A	Submission Phase:	Schematic Design
Address:	345 Example St	Architect:	MGA Architect
LLW #:	123456	Preparer:	
Design #:	123456	Form Revision Date:	

INSTRUCTIONS:
Step 1) Complete the table below with Diverse Uses within 1/2 mile (2,640 feet) walking distance and accessible by pedestrian access.
Step 2) Fill in eight or more uses. **Ten services are required to attain Credit L.2.2.**
Step 3) No more than one use in each Use Type may be counted toward compliance (except restaurants which may be listed up to twice).
Step 4) Services must be from at least three of the five Category Types.
Step 5) Submit site plan with basic service locations matching the numbering in the table below.

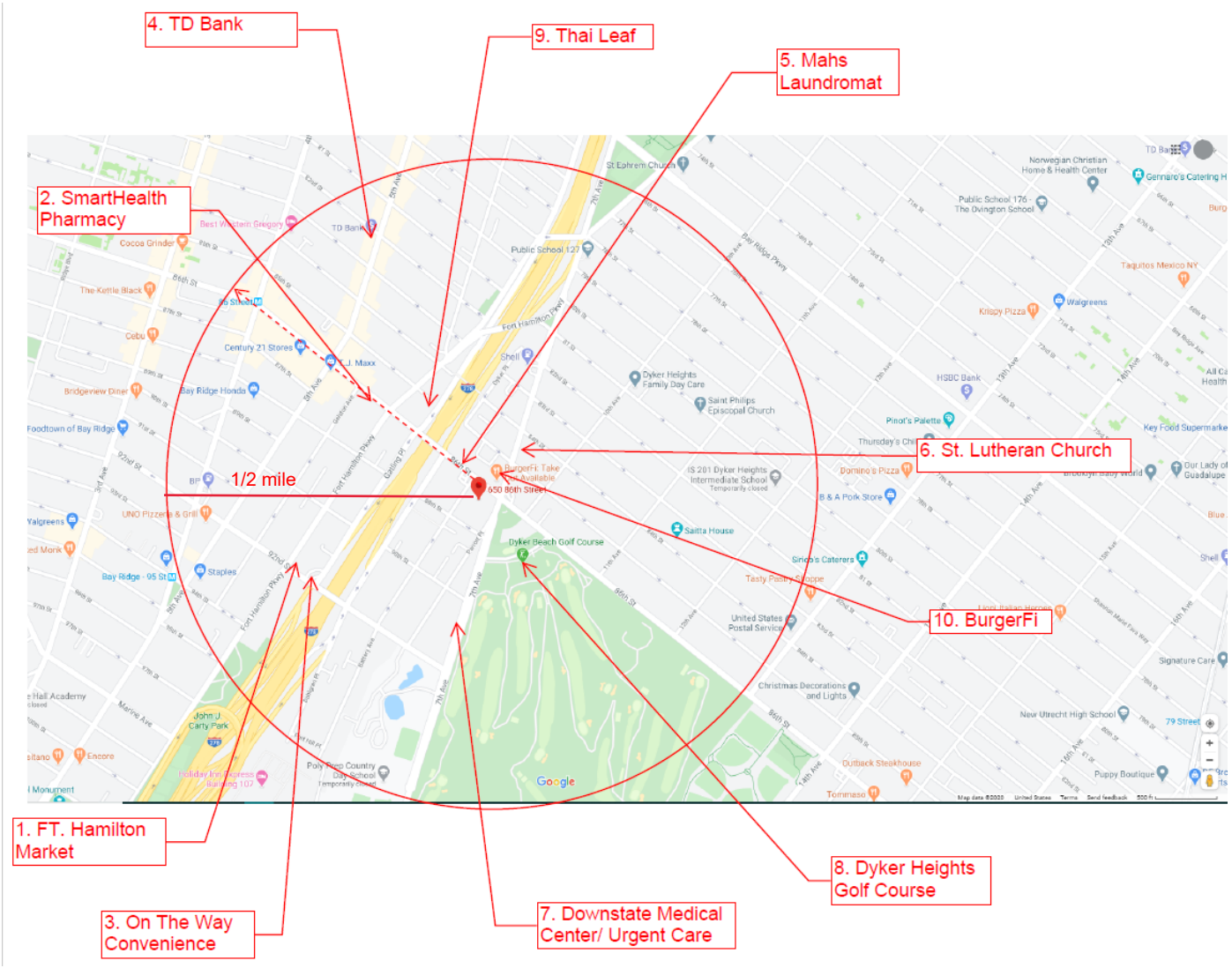
Step 1: Input business name and type

Plan Key	Business Name	Category Type	Use Type
1	US Post Service	Civic_Community_Facilities	Post office
2	Queens Public Library at Fresh Meadows	Civic_Community_Facilities	Library
3	AMC Cinema	Services	Theater
4	CITI Bank	Services	Bank
5	Fresh MeadoVII"S Community Center	Civic_Community_Facilities	Community center
6	Walgreens Pharmacy	Community_Service_Retail	Pharmacy
7	Public School 0040	Civic_Community_Facilities	Another School or University
8	IOG Supermarket	Food_Retail	Supermarket
9	Kowloon Café	Services	Restaurant
10	Cunningham Park	Civic_Community_Facilities	Park
TOTALS	10	4	
	# of unique businesses	# of category types	

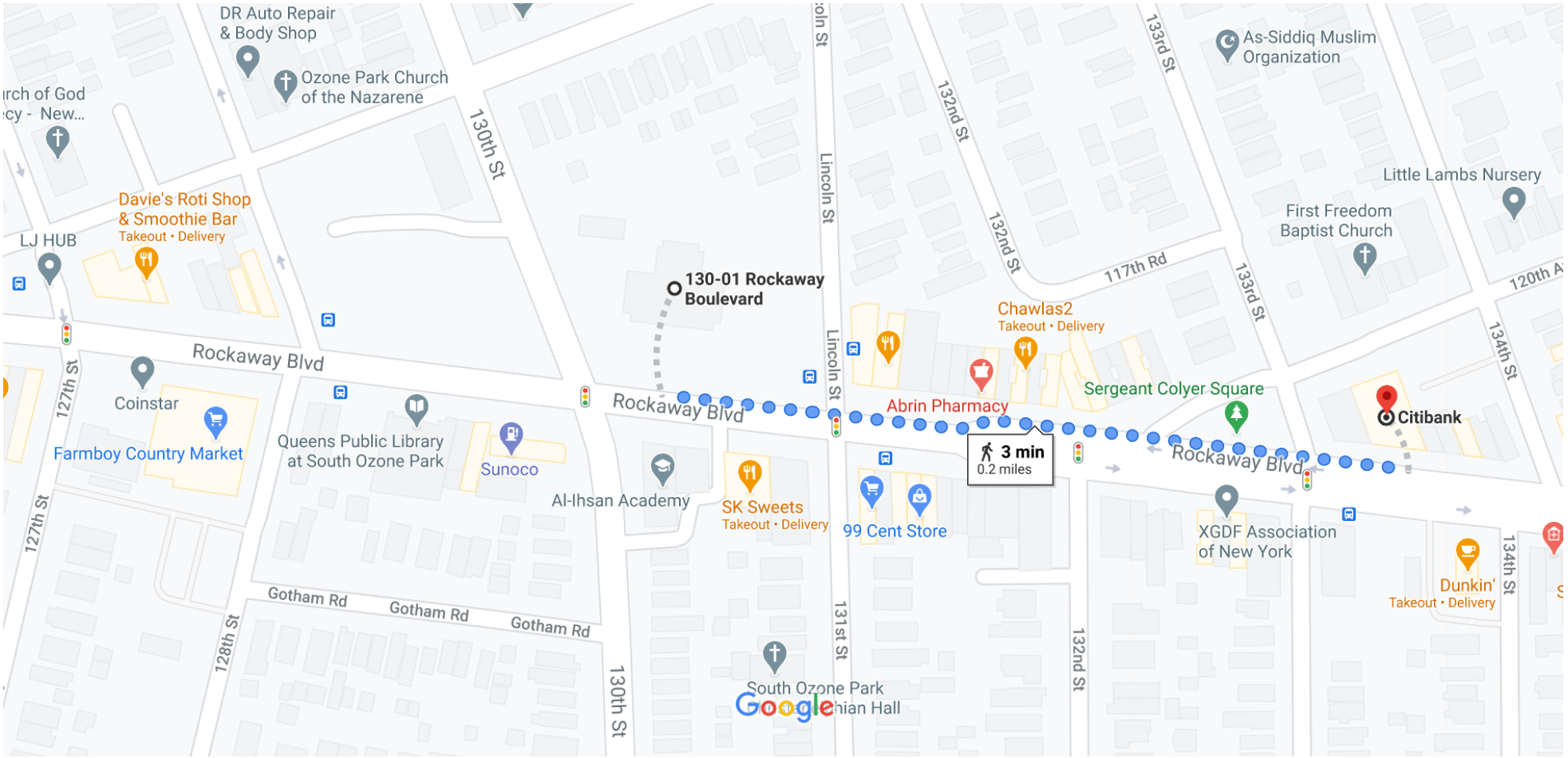
Points: **2**

Table 1: Use Types and Categories

Category	Food Retail	Community Service Retail	Services	Civic & Community Facilities	Community Anchor
Use Type	Supermarket	Convenience store	Bank	Senior care facility	Commercial office
	Grocery with produce	Hardware store	Theater	Day care	
		Pharmacy	Fitness center	Community center	
			Hair care	Place of worship	
			Laundry	Another school or university	
			Restaurant	Medical/Dental	
			Entertainment venue	Cultural arts facility	
			Sports	Fire station	
				Library	
				Post office	
				Park	


4. TD Bank
9. Thai Leaf
5. Mahs Laundromat
2. SmartHealth Pharmacy
6. St. Lutheran Church
1/2 mile
650 86th Street
10. BurgerFi
1. FT. Hamilton Market
3. On The Way Convenience
7. Downstate Medical Center/ Urgent Care
8. Dyker Heights Golf Course

Google Maps 130-01 Rockaway Boulevard, Queens, NY to Citibank Walk 0.2 mile, 3 min

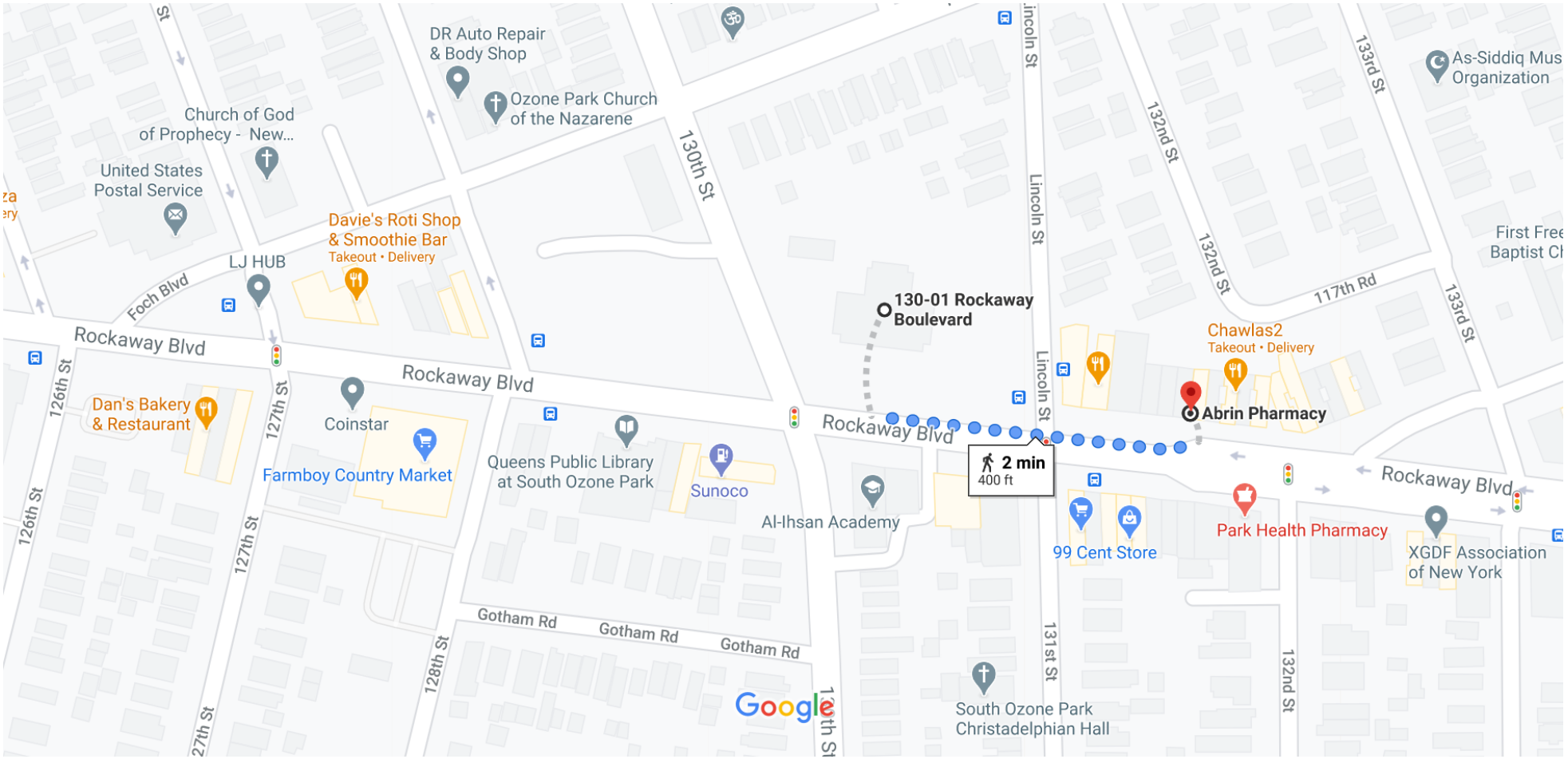


via Rockaway Blvd 3 min

0.2 mile

Mostly flat

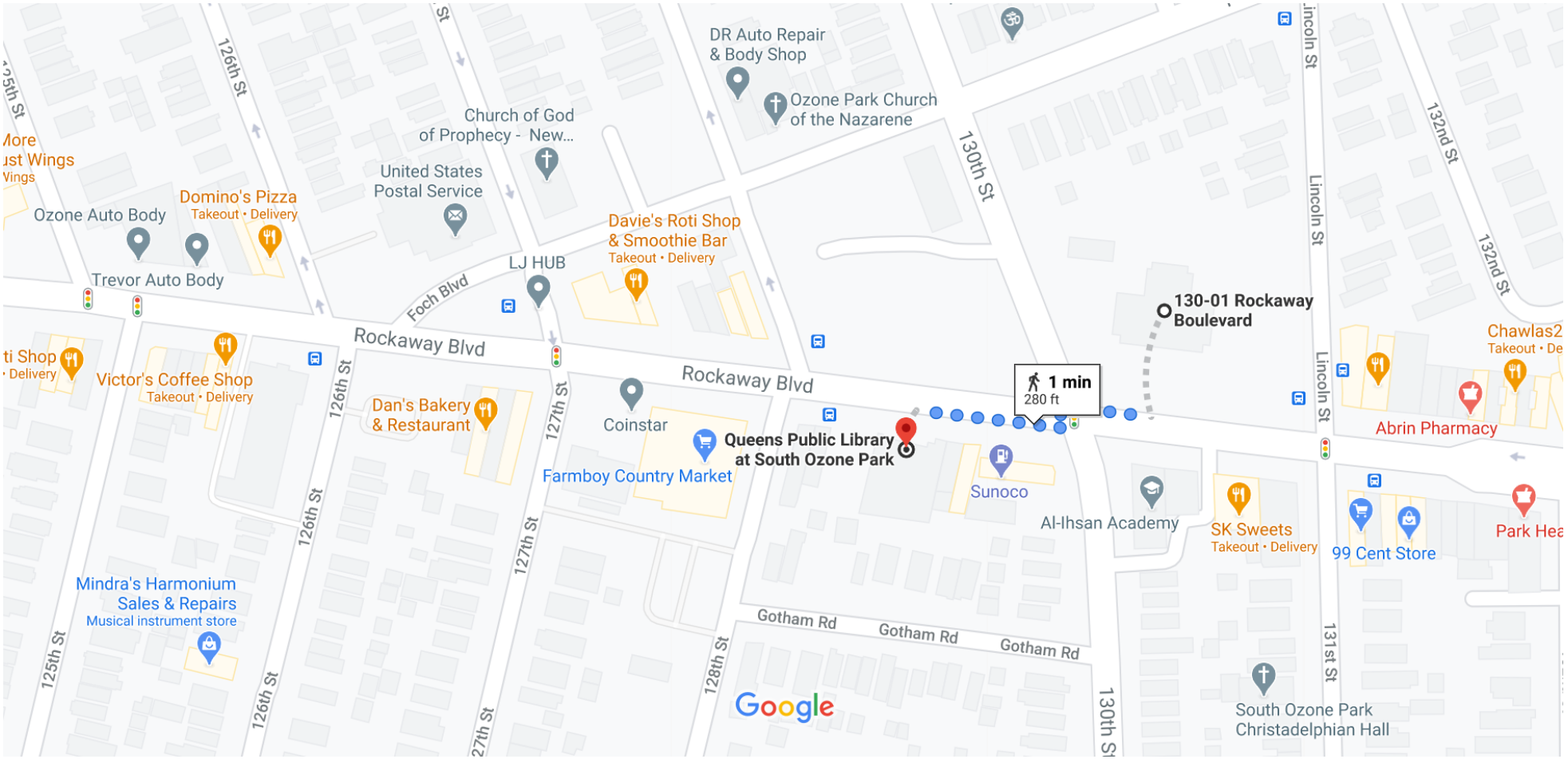
Google Maps 130-01 Rockaway Boulevard, Queens, NY to Abrin Pharmacy Walk 404 ft, 2 min



via Rockaway Blvd 2 min
404 ft

Mostly flat

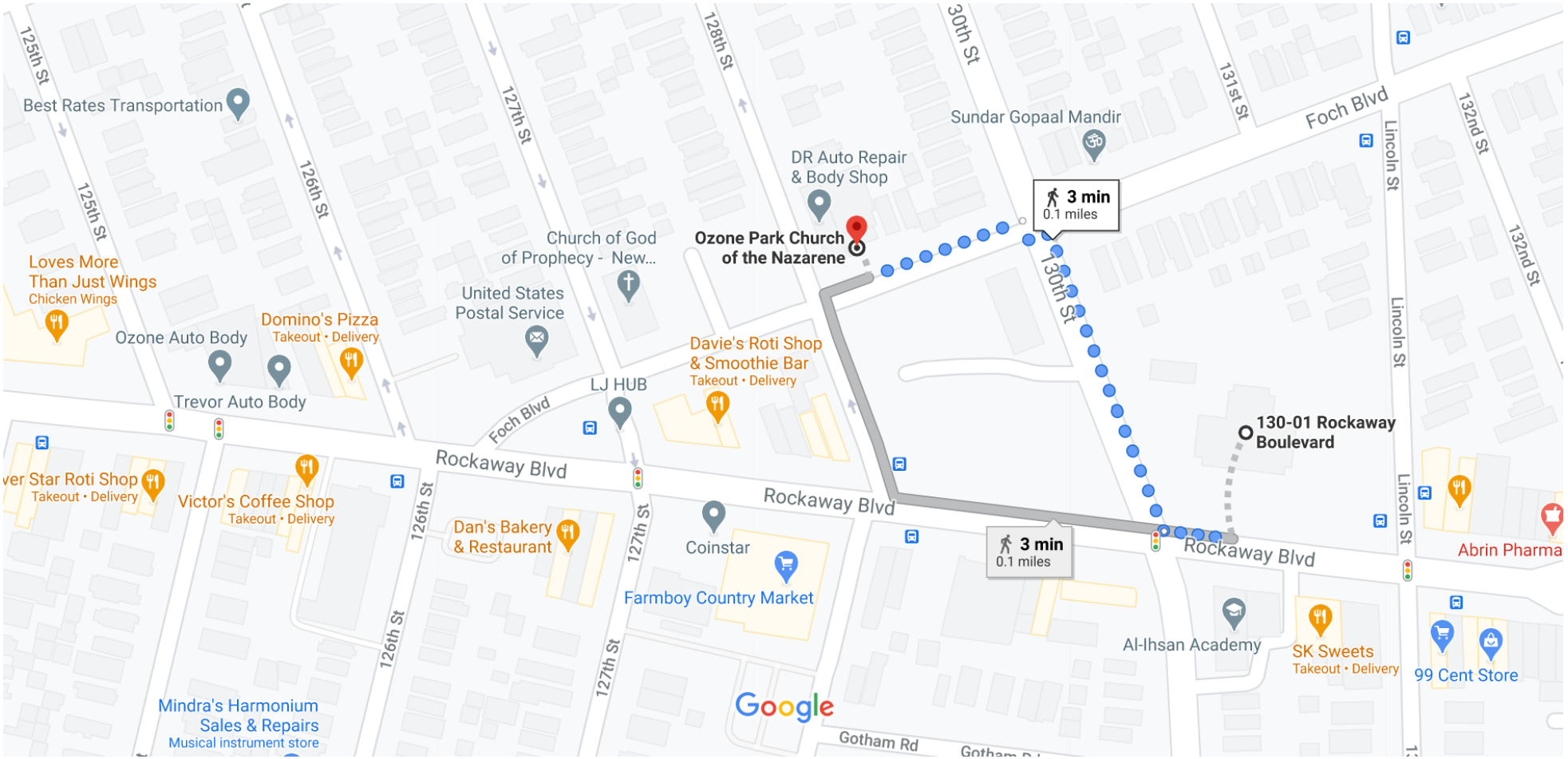
Google Maps 130-01 Rockaway Boulevard, Queens, NY to Queens Public Library at South Ozone Park Walk 282 ft, 1 min



via Rockaway Blvd 1 min
282 ft

Mostly flat

Google Maps 130-01 Rockaway Boulevard, Queens, NY to Ozone Park Church of the Nazarene Walk 0.1 mile, 3 min

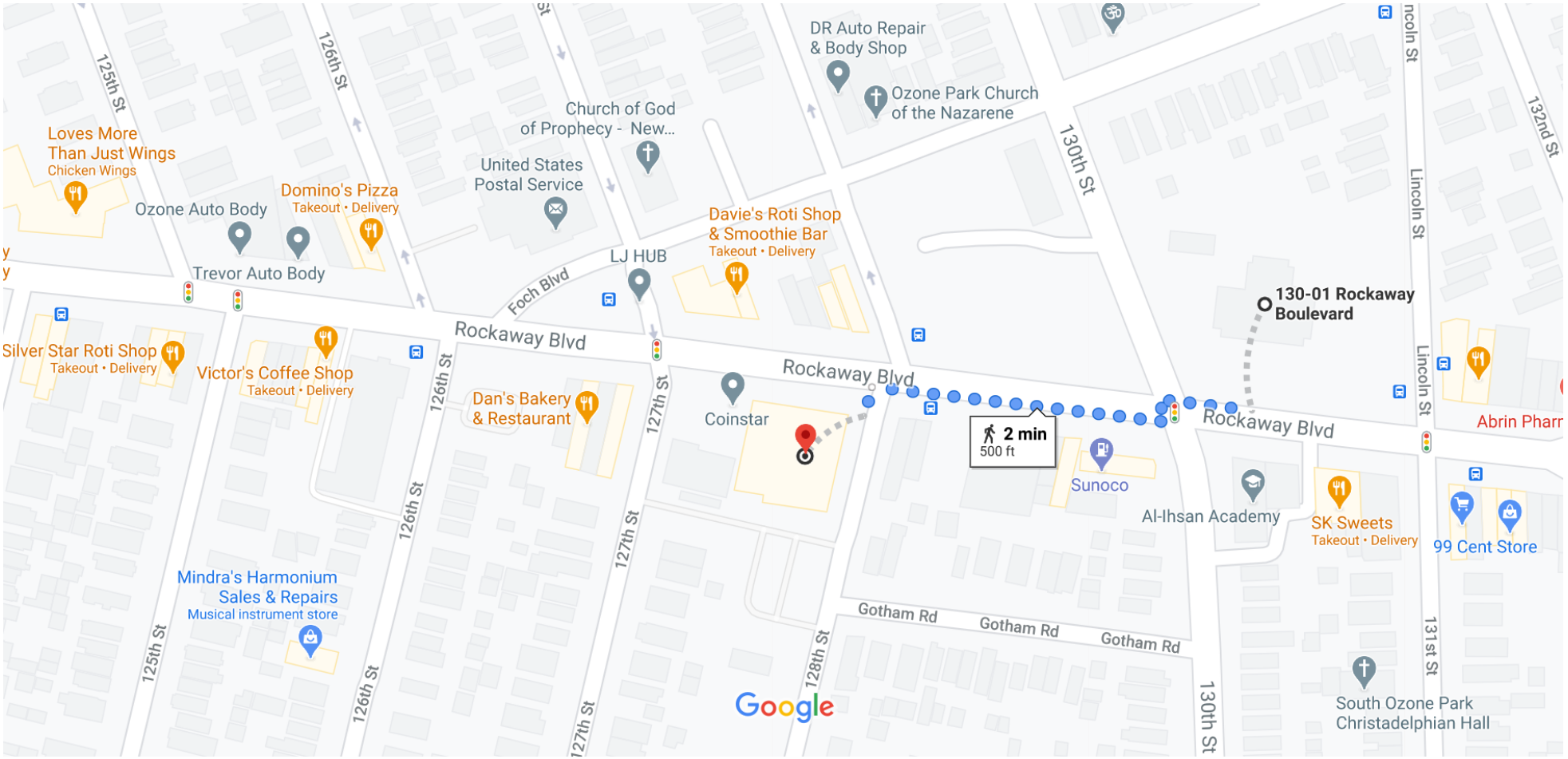


Map data ©2020 Google 100 ft

via 130th St and Foch Blvd 3 min
0.1 mile

via Rockaway Blvd and 128th St 3 min
0.1 mile

Google Maps 130-01 Rockaway Boulevard, Queens, NY to Farmboy Country Market Walk 495 ft, 2 min

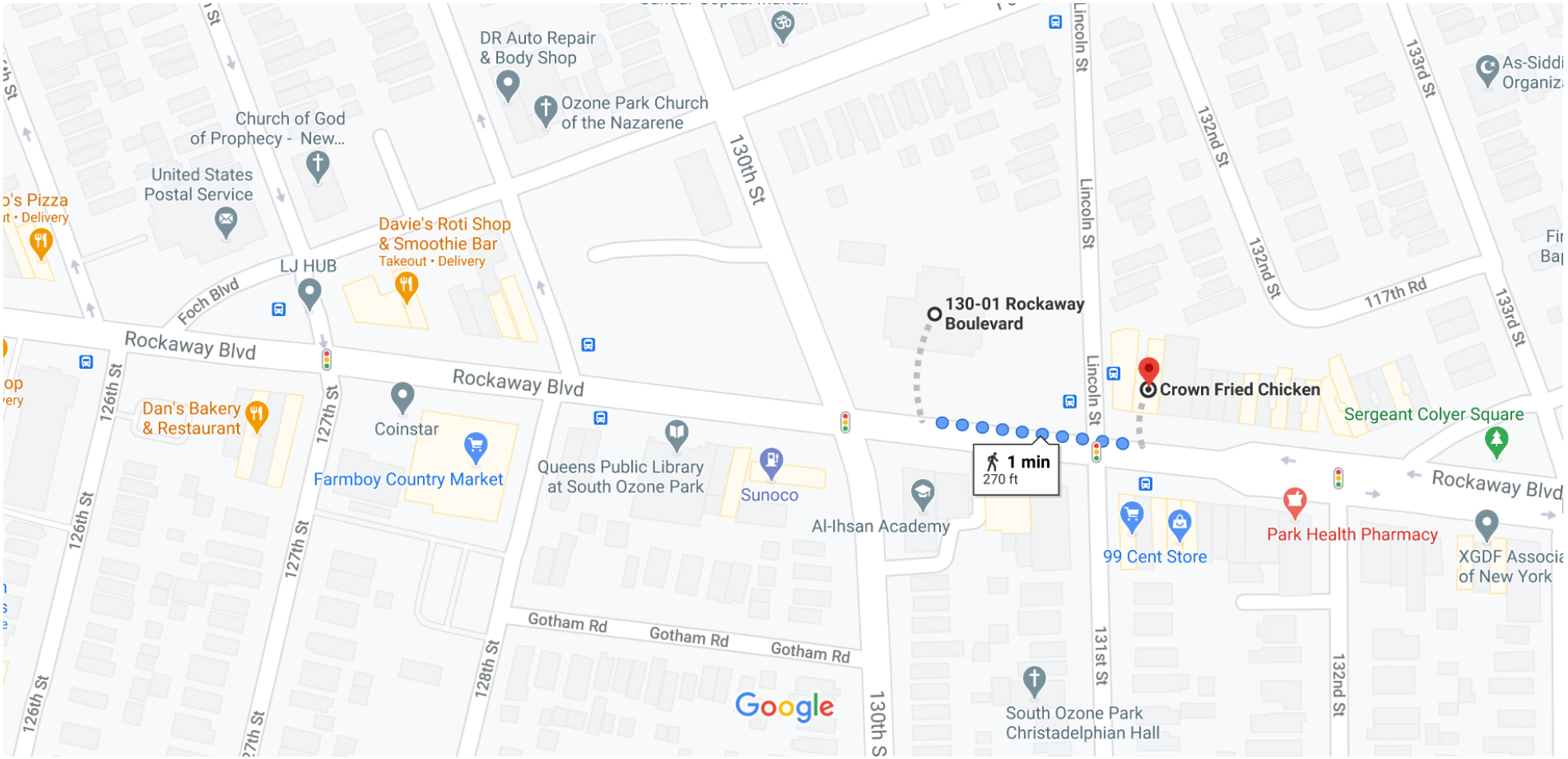


Map data ©2020 Google 100 ft

via Rockaway Blvd 2 min
495 ft

Mostly flat

Google Maps 130-01 Rockaway Boulevard, Queens, NY to Crown Fried Chicken Walk 266 ft, 1 min

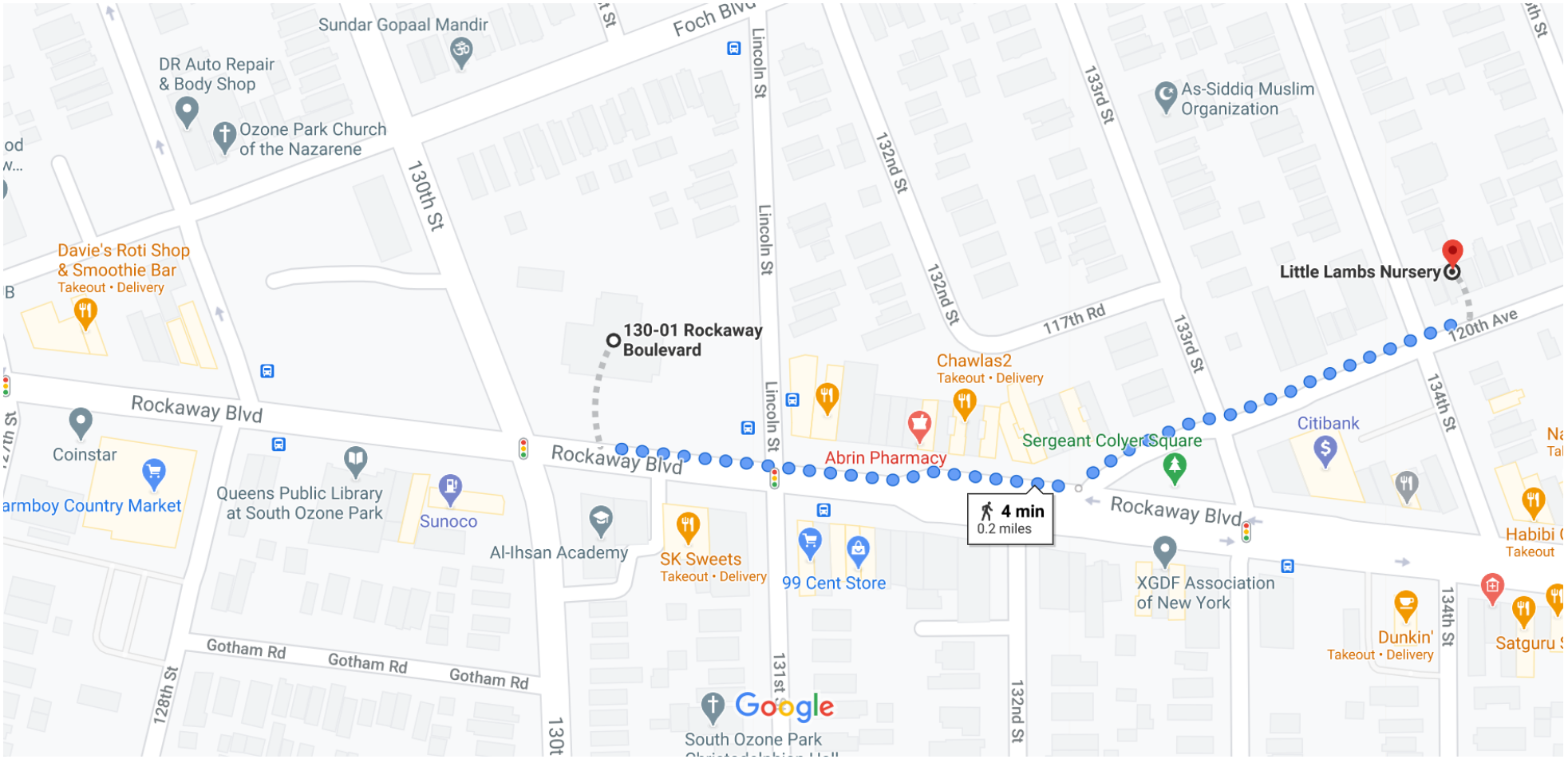


Map data ©2020 Google 100 ft

via Rockaway Blvd 1 min
266 ft

Mostly flat

Google Maps 130-01 Rockaway Boulevard, Queens, NY to Little Lambs Nursery Walk 0.2 mile, 4 min



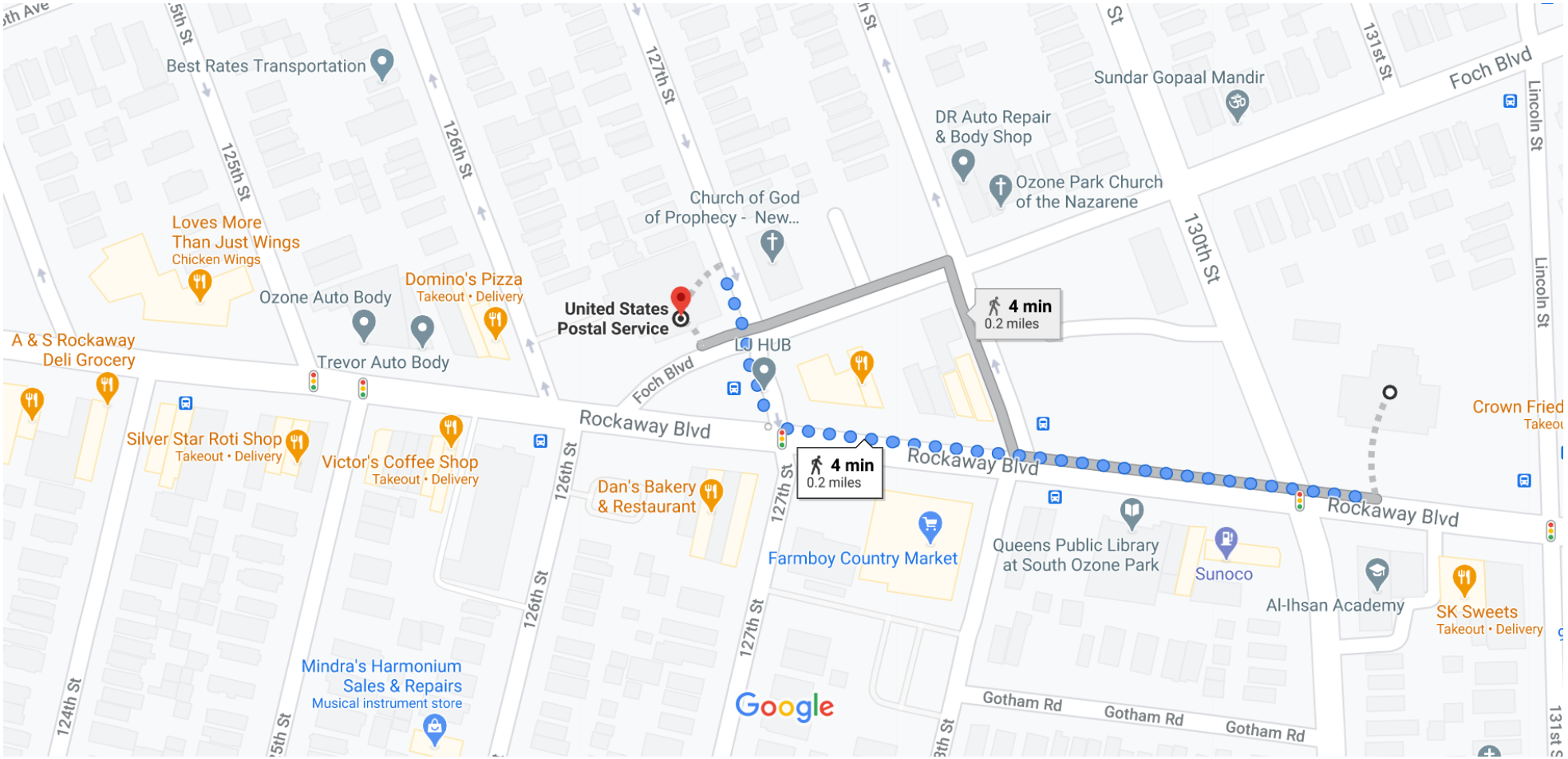
Map data ©2020 Google 100 ft

via Rockaway Blvd and 120th Ave 4 min

0.2 mile

Mostly flat

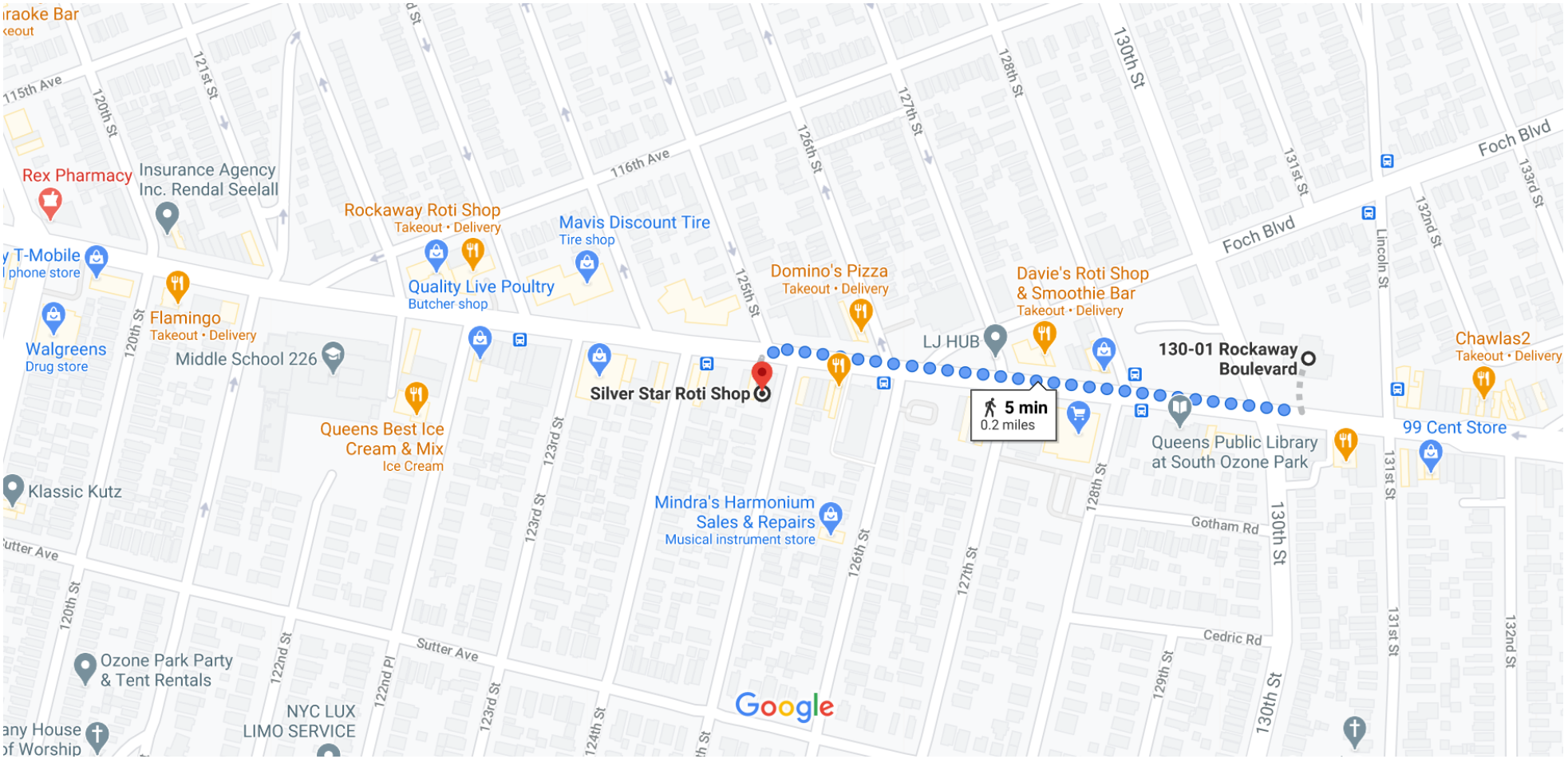
Google Maps 130-01 Rockaway Boulevard, Queens, NY to United States Postal Service Walk 0.2 mile, 4 min



Map data ©2020 Google 100 ft

via Rockaway Blvd	4 min	0.2 mile
via Rockaway Blvd, 128th St and Foch Blvd	4 min	0.2 mile

Google Maps 130-01 Rockaway Boulevard, Queens, NY to Silver Star Roti Shop Walk 0.2 mile, 5 min



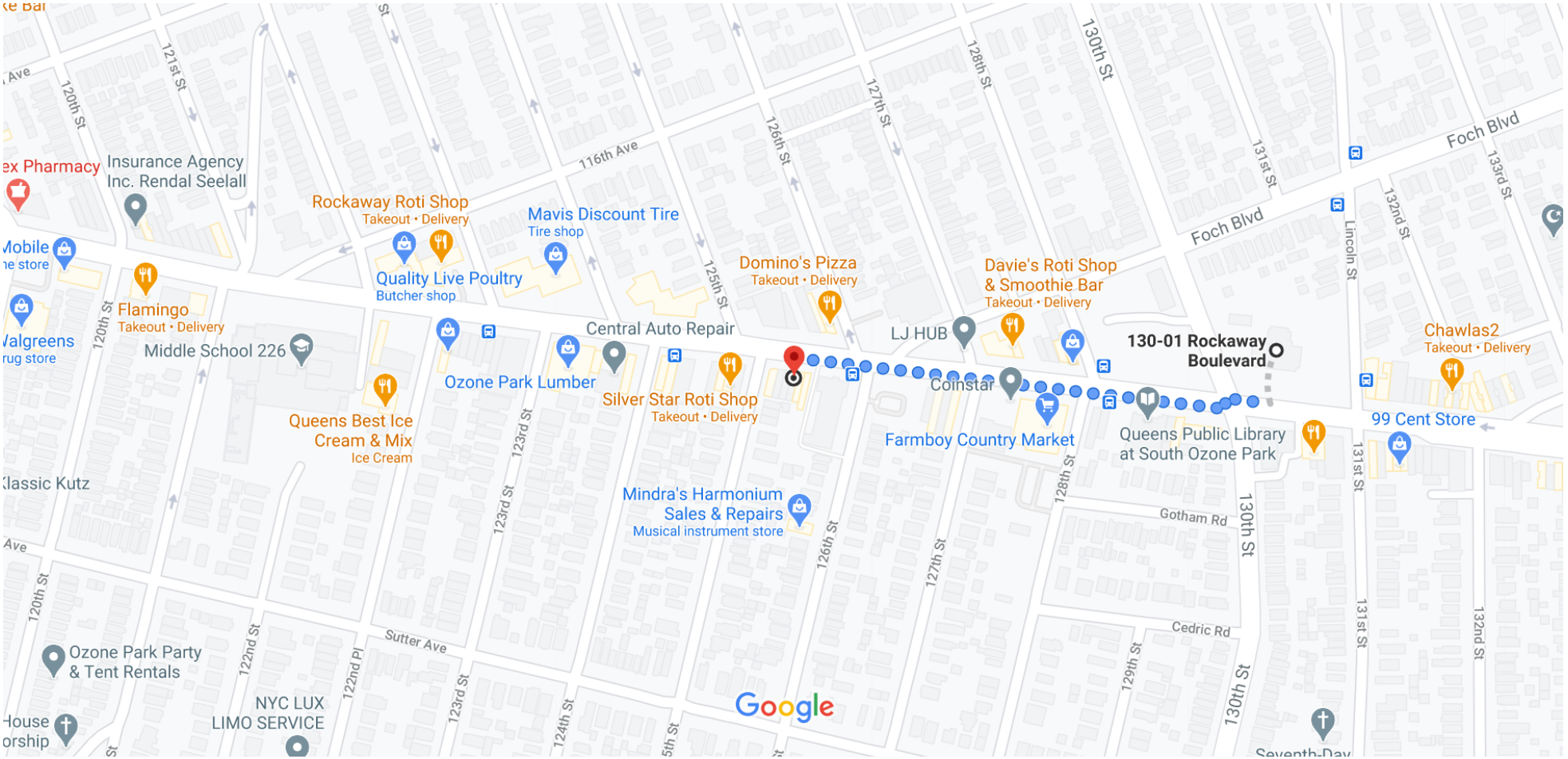
via Rockaway Blvd 5 min

0.2 mile

Mostly flat

Google Maps 130-01 Rockaway Boulevard, Queens, NY to J & D Laundromat

Walk 0.2 mile, 5 min



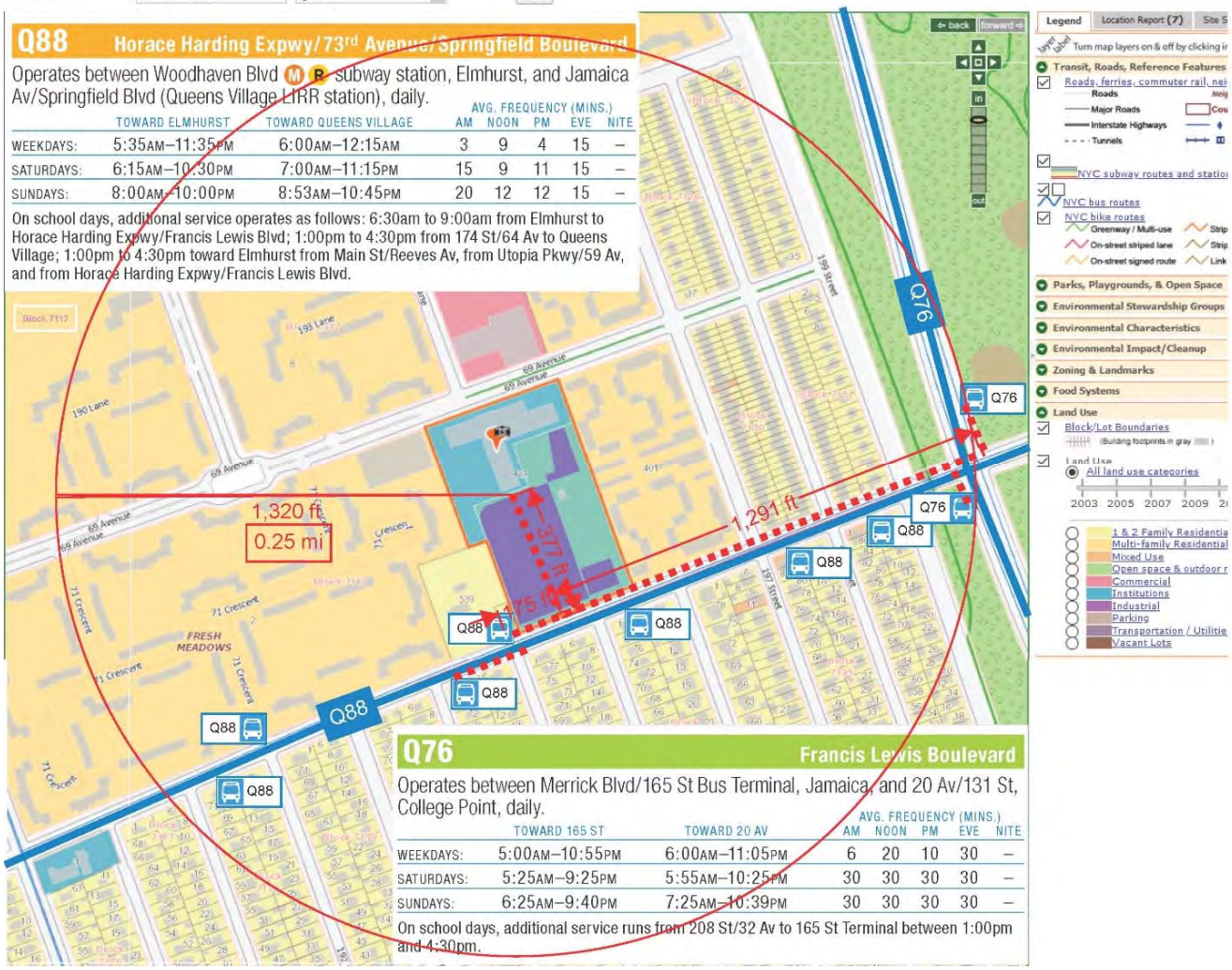
Map data ©2020 Google 200 ft

via Rockaway Blvd 5 min

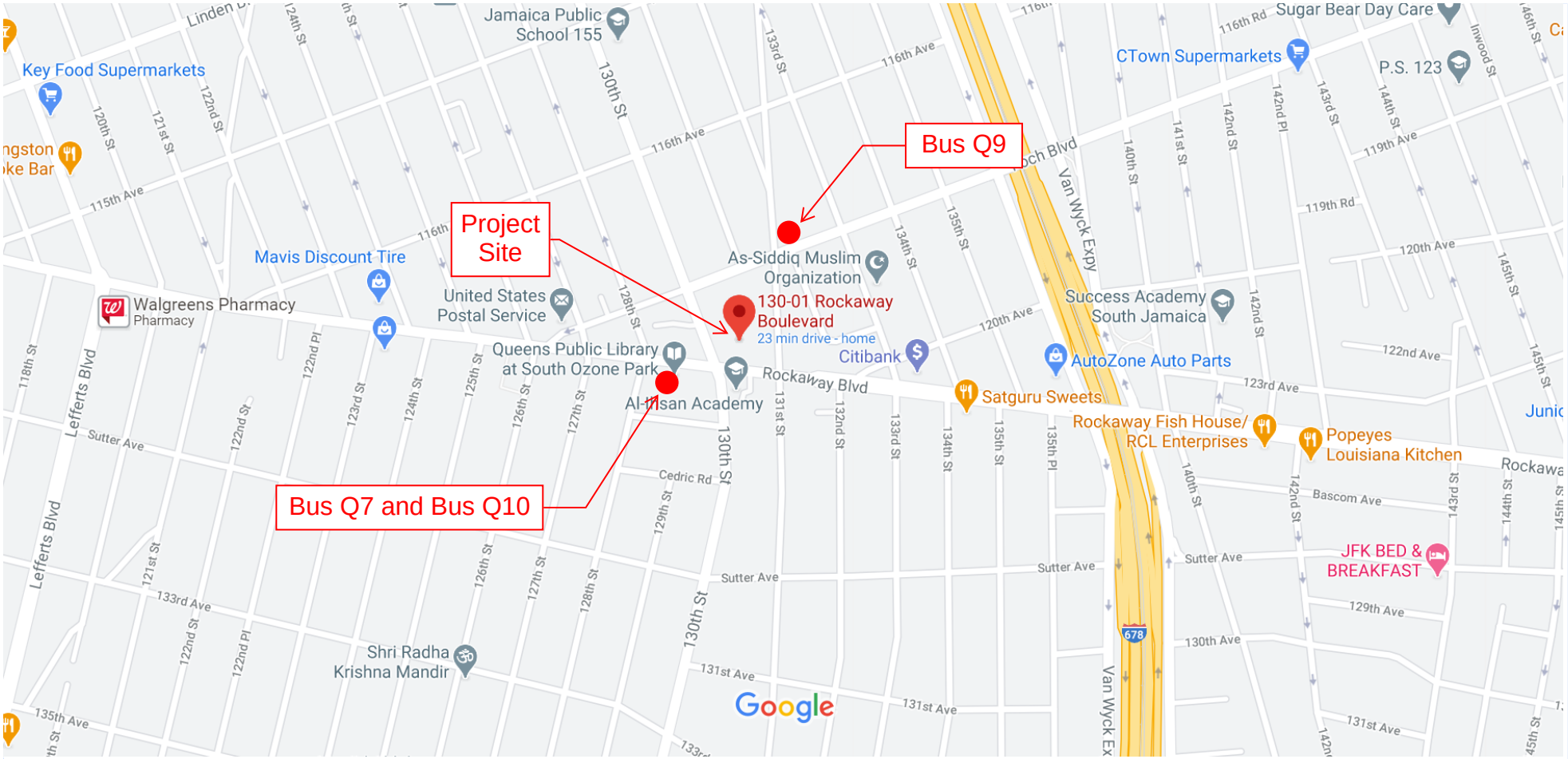
0.2 mile

Mostly flat

L2.1R – ACCESS TO QUALITY TRANSIT


nyc oasis
Address
Block & Lot
ZIP Code
Neighborhood
Community District
County/Borough
195-02 69th ave
Queens
Search
Q88 Horace Harding Expwy/73rd Avenue/Springfield Boulevard
Operates between Woodhaven Blvd M R subway station, Elmhurst, and Jamaica Av/Springfield Blvd (Queens Village LIRR station), daily.
AVG. FREQUENCY (MINS.)
TOWARD ELMHURST
TOWARD QUEENS VILLAGE
AM NOON PM EVE NITE
WEEKDAYS: 5:35AM–11:35PM 6:00AM–12:15AM 3 9 4 15 –
SATURDAYS: 6:15AM–10:30PM 7:00AM–11:15PM 15 9 11 15 –
SUNDAYS: 8:00AM–10:00PM 8:53AM–10:45PM 20 12 12 15 –
On school days, additional service operates as follows: 6:30am to 9:00am from Elmhurst to Horace Harding Expwy/Francis Lewis Blvd; 1:00pm to 4:30pm from 174 St/64 Av to Queens Village; 1:00pm to 4:30pm toward Elmhurst from Main St/Reeves Av, from Utopia Pkwy/59 Av, and from Horace Harding Expwy/Francis Lewis Blvd.
1,320 ft
0.25 mi
1,291 ft
477 ft
475 ft
FRESH MEADOWS
Q88
Q76
Q76 Francis Lewis Boulevard
Operates between Merrick Blvd/165 St Bus Terminal, Jamaica, and 20 Av/131 St, College Point, daily.
AVG. FREQUENCY (MINS.)
TOWARD 165 ST
TOWARD 20 AV
AM NOON PM EVE NITE
WEEKDAYS: 5:00AM–10:55PM 6:00AM–11:05PM 6 20 10 30 –
SATURDAYS: 5:25AM–9:25PM 5:55AM–10:25PM 30 30 30 30 –
SUNDAYS: 6:25AM–9:40PM 7:25AM–10:39PM 30 30 30 30 –
On school days, additional service runs from 208 St/32 Av to 165 St Terminal between 1:00pm and 4:30pm.
Legend
Location Report (7)
Transit, Roads, Reference Features
Roads, ferries, commuter rail, nei
Roads
Major Roads
Interstate Highways
Tunnels
NYC subway routes and statio
NYC bus routes
NYC bike routes
Greenway / Multi-use
On-street striped lane
On-street signed route
Parks, Playgrounds, & Open Space
Environmental Stewardship Groups
Environmental Characteristics
Environmental Impact/Cleanup
Zoning & Landmarks
Food Systems
Land Use
Block/Lot Boundaries
All land use categories
2003 2005 2007 2009
1 & 2 Family Residentia
Multi-family Residential
Mixed Use
Open space & outdoor r
Commercial
Institutions
Industrial
Parking
Transportation / Utilitie
Vacant Lots

Google Maps 130-01 Rockaway Blvd



Q7
Weekday Trips = 81
Q10
Weekday Trips = 198
Q9
Weekday Trips = 82

TOTAL TRIPS
Weekday = 361

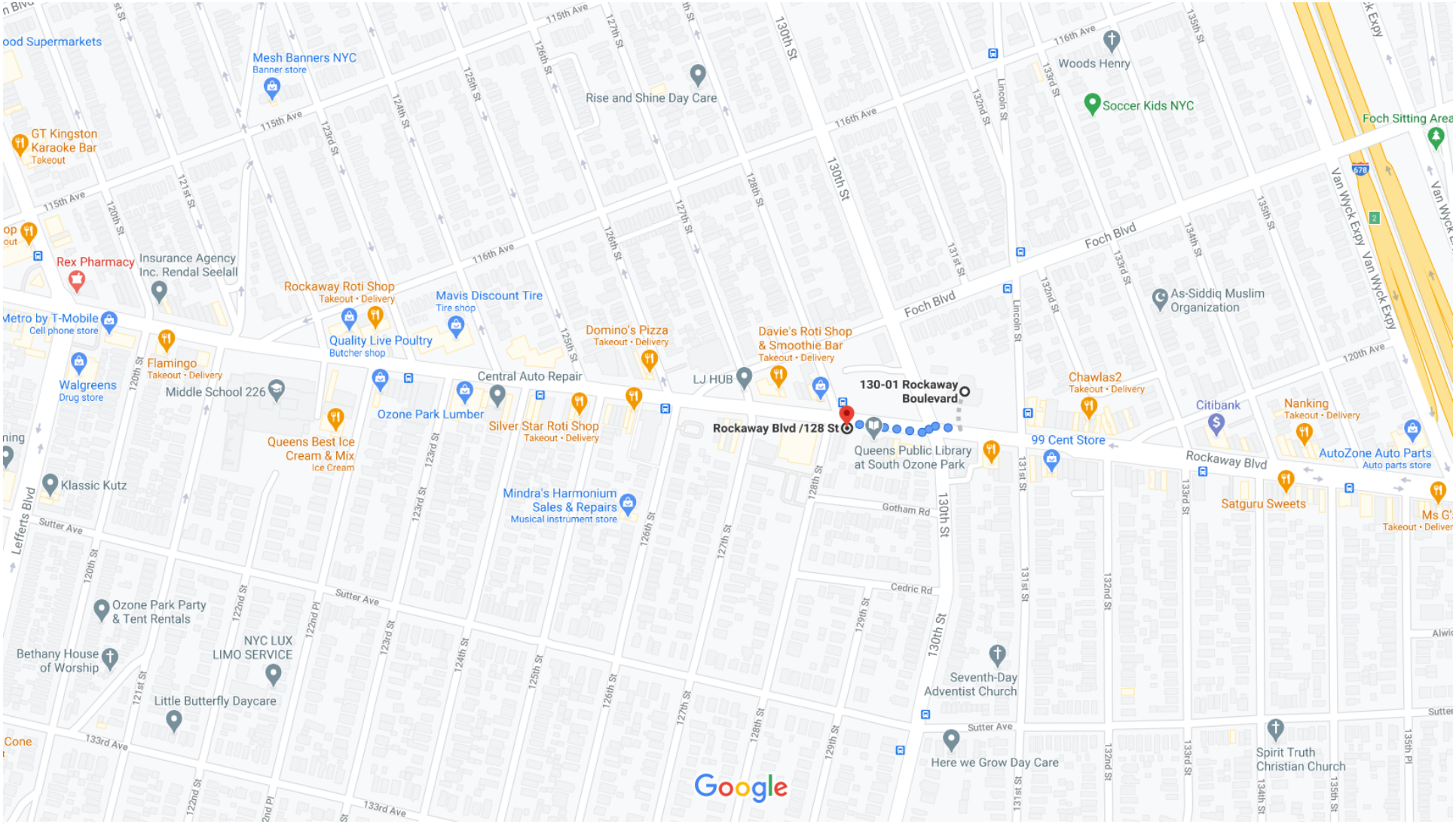
Note that this credit should take into account the operating schedule (inclusive of staff time before and after school hours).

Google Maps

130-01 Rockaway Boulevard, Queens, NY to Rockaway Blvd /128 St, Queens, NY 11420

Walk 384 ft, 2 min

Q7 & Q10



Map data ©2020 Google 200 ft

via Rockaway Blvd 2 min

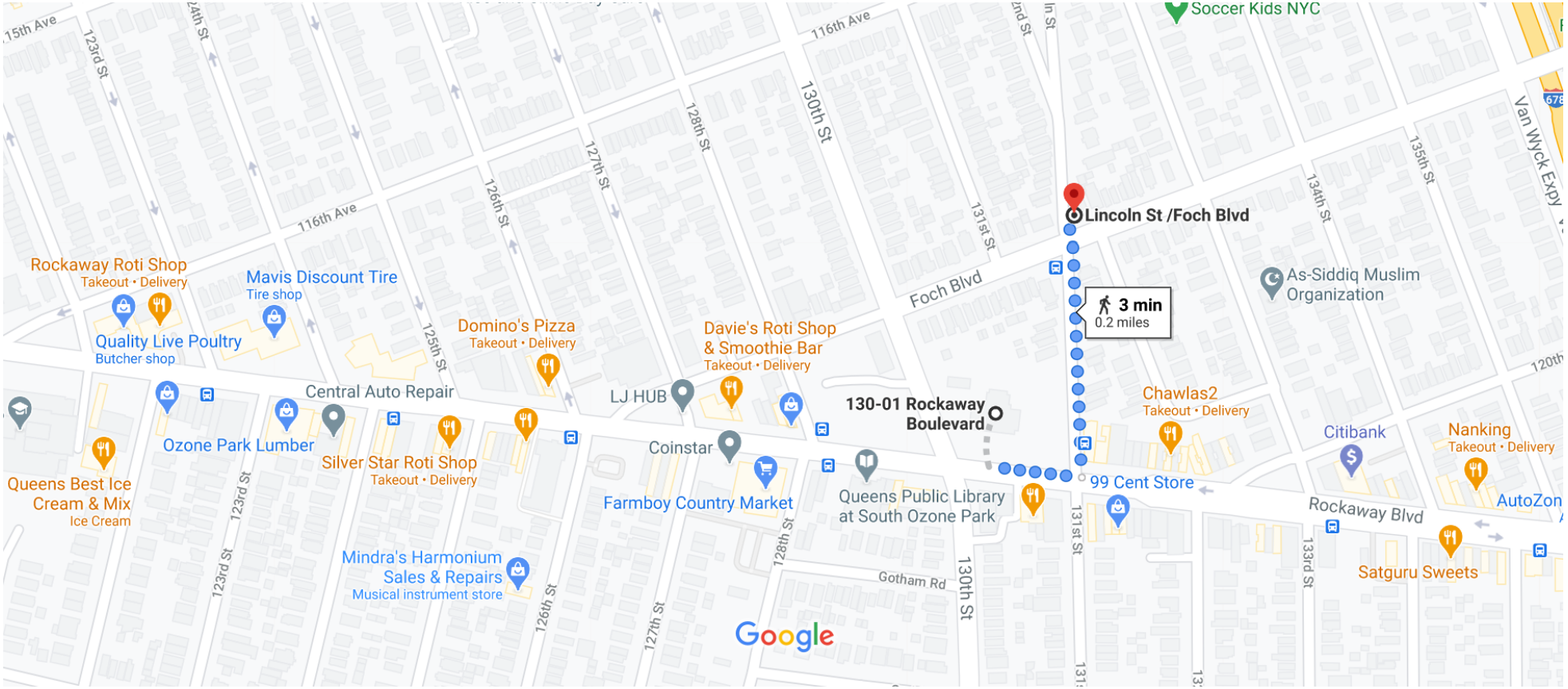
384 ft

Google Maps

130-01 Rockaway Boulevard, Queens, NY to Lincoln St /Foch Blvd, Queens, NY 11420

Walk 0.2 mile, 3 min

Q9

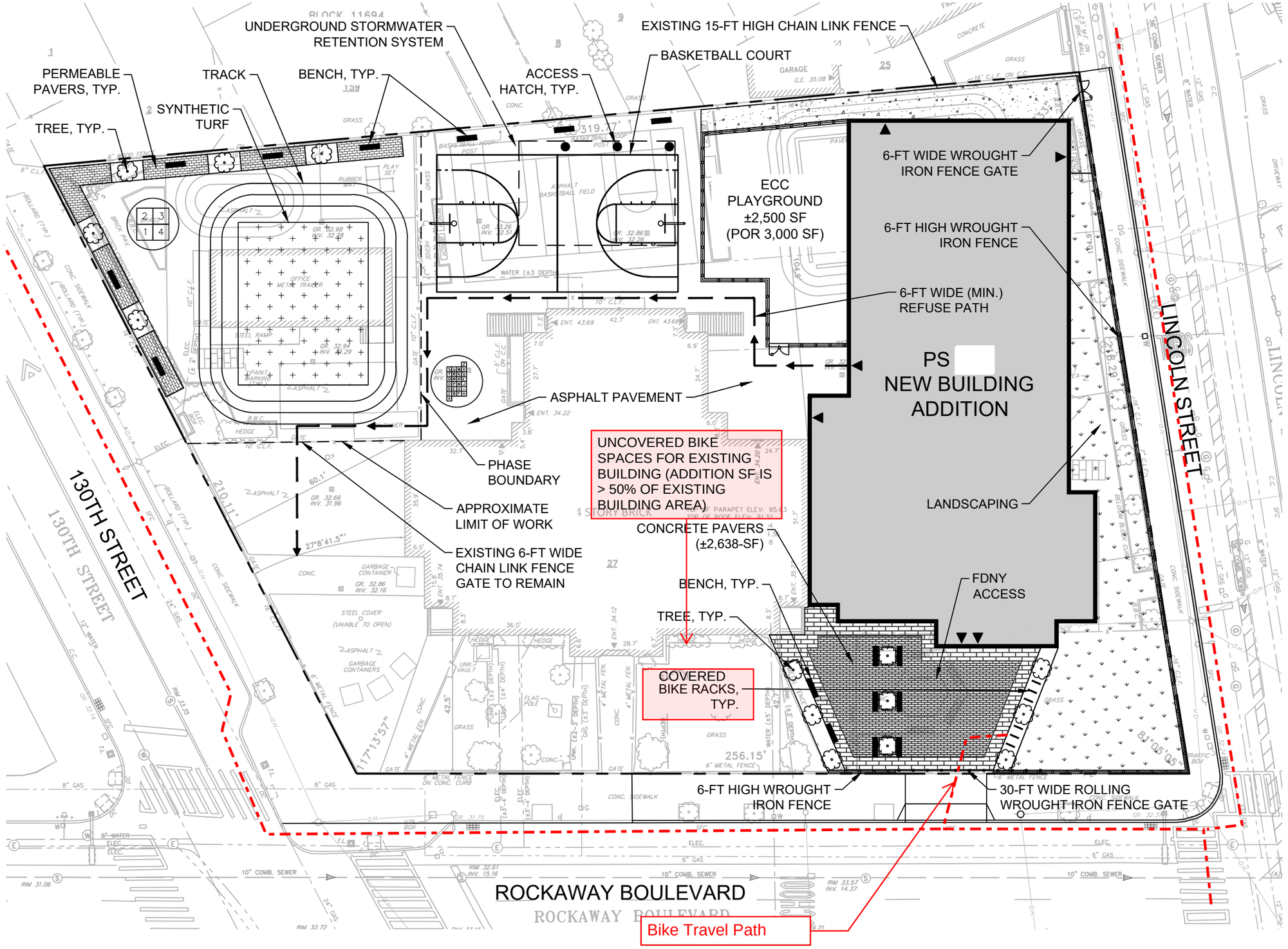


Map data ©2020 Google 200 ft

via Lincoln St	3 min	0.2 mile

Mostly flat

L2.2 – BICYCLE FACILITIES



DATE: 17 NOVEMBER 2020

DRAWN BY / CHECKED BY: NB/VS

SCALE:

30 0 15 30

SCALE IN FEET

PROJECT:

PS Q ADDITION

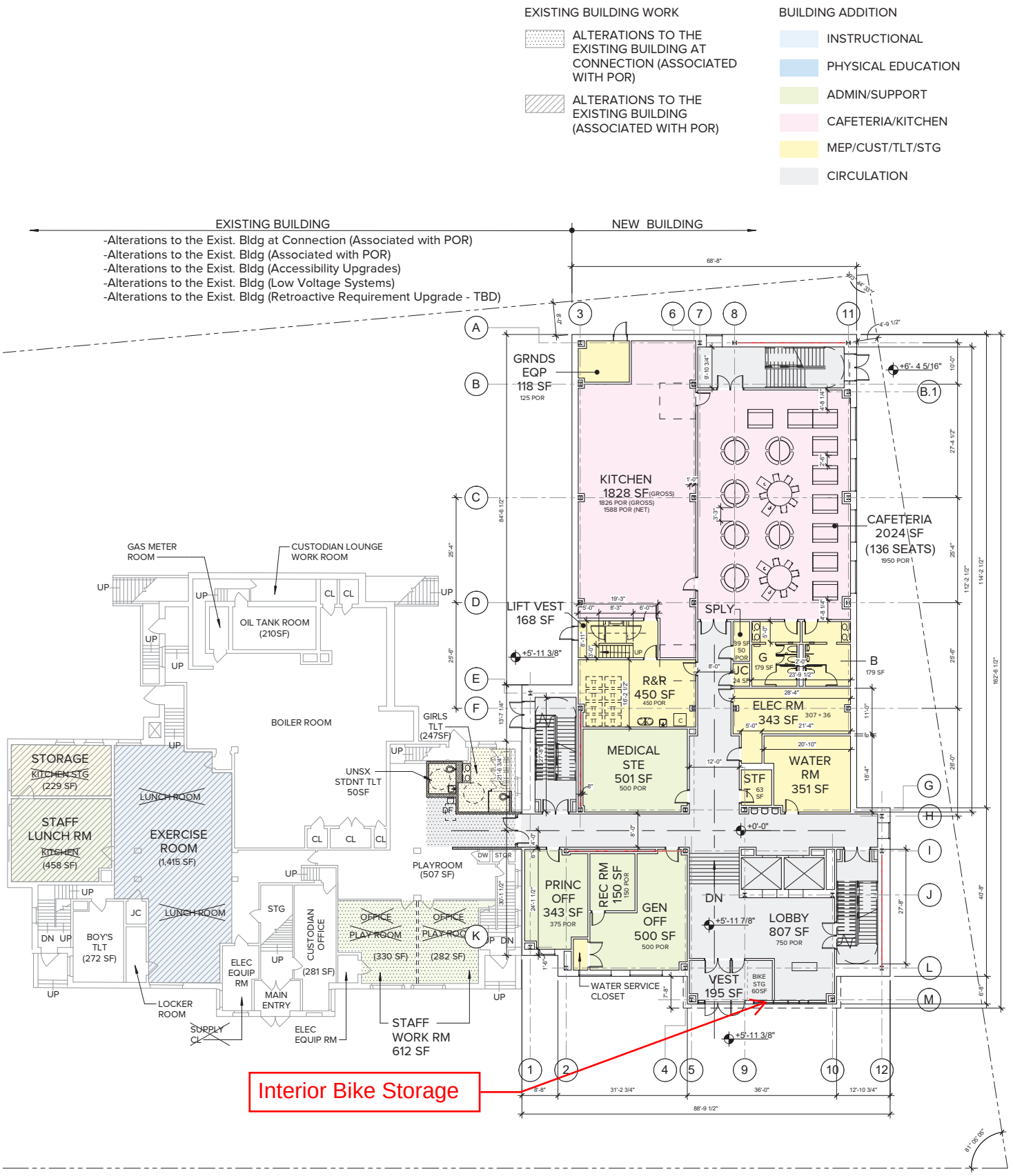
130-01 ROCKAWAY BLVD, QUEENS, NY 11420

PROJECT NUMBER:

TITLE:

SCHEMATIC SITE PLAN

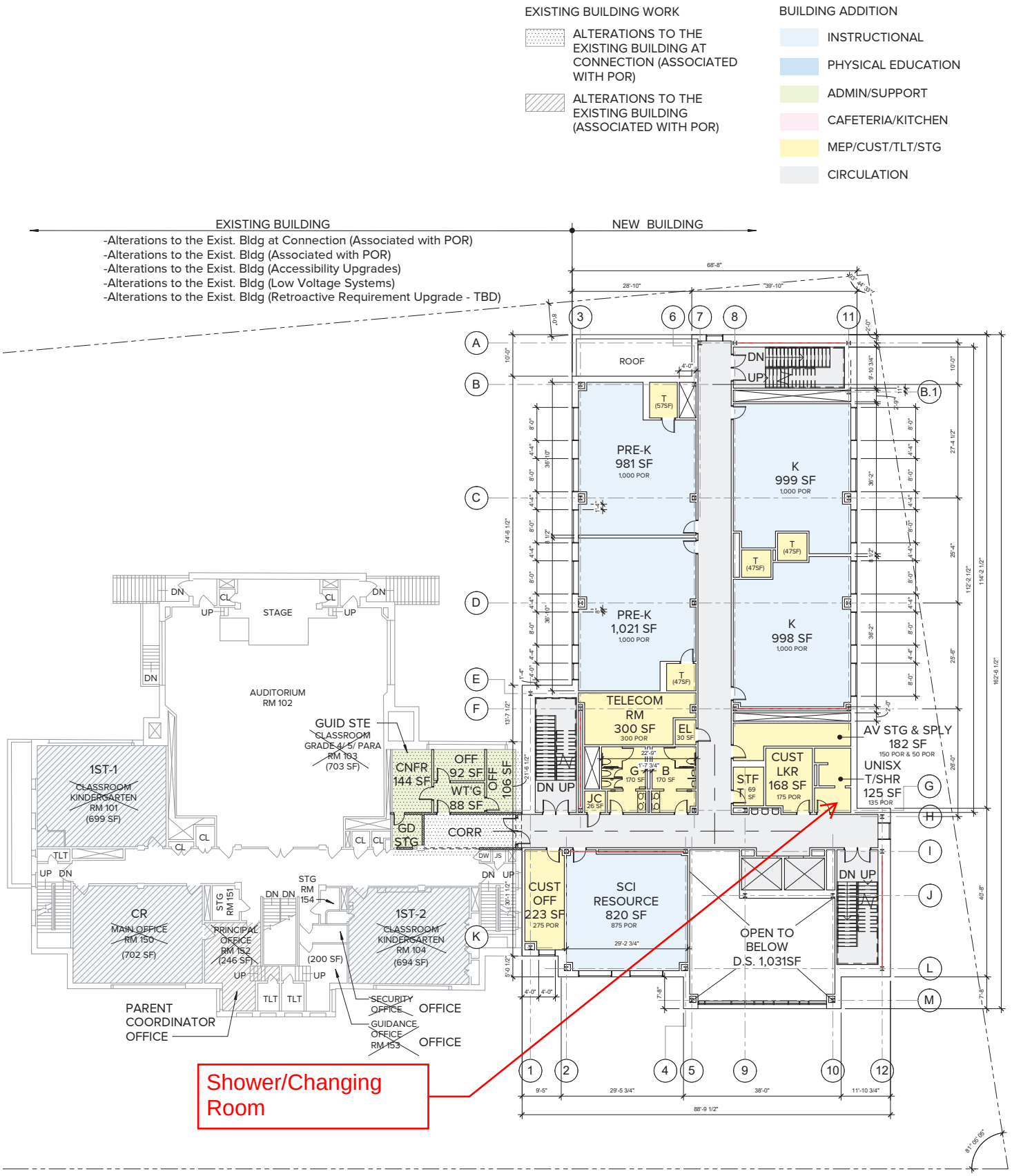
C001.00



1/32"=1'-0"

BASEMENT (12,059 SF)

SCHEME B.1



1/32"=1'-0"

FIRST FLOOR (10,769 SF)

S1.1P – ENVIRONMENTAL SITE ASSESSMENT

PHASE I ENVIRONMENTAL SITE ASSESSMENT UPDATE

OF

PROPOSED ADDITION TO PUBLIC SCHOOL (X)
BLOCK 4288, PORTION OF LOT 1
725 BRADY AVENUE
BRONX, NEW YORK 10462

SCA LLW NO.
SCA CONTRACT NO.

PROJECT NO.

JANUARY 3, 2020

Prepared by:

Engineering, Environmental, Surveying,
Landscape Architecture and Geology, D.P.C.

Prepared for:

NYCSCA

30-30 Thomson Avenue
Long Island City, NY 11101-3045
Phone: (718) 472-8502
Fax: (718) 472-8500
Attn: Ms. Lee Guterman

1.0 EXECUTIVE SUMMARY

At the request of the Industrial and Environmental Hygiene (IEH) Division of the New York City School Construction Authority (NYCSCA), Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (conducted a Phase I Environmental Site Assessment (ESA) Update for a portion of the property located at 725 Brady Avenue, Bronx, New York 10462 (hereafter referred to as the Site). The legal description for the Site is Block 4288, portion of Lot 1. The Site is located in an area primarily characterized by institutional, residential, and commercial properties, and public open space. understands that the New York City School Construction Authority (NYCSCA) is considering the construction of a building addition to the adjacent X105 school building. A Test Fit Study or conceptual design for the proposed building addition has not yet been provided.

The approximately 54,200 square foot (sf) Site is comprised of an exterior asphalt-paved recreational yard, two single-story temporary classroom unit (TCU) buildings, and peripheral landscaped areas. Primary access to the Site is via pedestrian gates in the perimeter fencing along Cruger and Holland Avenues (the eastern and western adjoining streets). The elevation of the Site is approximately 10 feet lower than the Holland Avenue right-of-way; and approximately 5 feet higher than the Cruger Avenue right-of-way. Concrete retaining walls are present at the eastern and western Site boundaries.

The Site is bounded to the north by two six-story multiple-family residential buildings; to the east by Holland Avenue followed by two six-story multiple-family residential buildings; to the south by the X105 school building followed by Brady Avenue and a six-story multiple-family residential building; and to the west by Cruger Avenue followed by three six-story multiple-family residential buildings.

Based on a review of environmental database records, historical Fire Insurance Maps, aerial photographs, and United States Geological Survey (USGS) topographic maps, the Site lot was initially developed in 1930 with the U-shaped four-story X105 school building, adjoining the Site to the south. The Site was paved circa 1950. By 2002, the two TCUs were placed on the Site, along with peripheral landscape areas and painted recreational play areas.

The main objective of the Phase I ESA Update is to identify recognized environmental conditions (RECs) and environmental concerns that may affect the suitability of the Site for use as an early childhood education facility. RECs are defined in ASTM International's (ASTM) Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or, (3) under conditions that pose a material threat of a future release to the environment. Note that controlled recognized environmental conditions (CRECs) are considered to be RECs and are listed in the Executive Summary and Conclusions of this Phase I ESA Update. Additionally, vapor encroachment conditions (VECs) were evaluated as per ASTM E 2600-10.

Other environmental concerns that, in the opinion of the *environmental professional* conducting the assessment, would not be considered RECs are identified in this assessment. These may include *historical RECs (HRECs)* and *de minimis* conditions. The Phase I ESA Update also includes a preliminary evaluation of specific potential environmental issues or conditions that are, according to ASTM E 1527-13, considered non-scope considerations. These issues include radon, asbestos-containing material (ACM), polychlorinated biphenyl (PCB)-containing light ballasts and caulking materials, exterior lead-based paint (LBP), chemical storage, wetlands, regulatory compliance issues, dry cleaner and other industrial emissions, mold, biological agents, electromagnetic fields, and methane. The Phase I

ESA Update included a review of federal, state, and local records, previous reports (if available) and historical documents; visual observation of the Site and adjoining properties; and interviews with selected Site representatives.

The assessment requested by the NYCSCA is intended to identify conditions that have the potential to impact the value of the Site or the development and use of the Site as a school facility. The assessment was also conducted for purposes of environmental due diligence to qualify for the innocent landowner, bona fide prospective purchaser or contiguous property owner defense under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Phase I ESA Update included evaluation of the following: current and historical Site usage; current and historical usage of adjoining properties; regulatory agency records review; on-site solid waste management and disposal practices; on-site hazardous materials and petroleum products management; chemical storage; ACM, PCBs and exterior LBP management; wetlands; regulatory compliance issues; dry cleaner and other industrial emissions; radon; mold and moisture intrusion; biological agents; electromagnetic fields; and potential for methane generating materials.

Summary of RECs, VECs and Environmental Concerns

A Phase I ESA was completed in March 2009 by). The Phase I ESA did not identify any on-site RECs. The following off-site RECs were identified in the March 2009 STV Phase I ESA and confirmed as part of this assessment:

- A gasoline service station, which formerly contained a greasing shed;
- A historical dress manufacturer (circa 1950); and
- Environmental regulatory database listings including two Resource Conservation Recovery Act (RCRA) generators, six New York Spills/ Leaking Tanks (NY Spills/LTANKs) listings, six Petroleum Bulk Storage (PBS) listings, and two registered drycleaners.

completed a Phase II Environmental Site Investigation (ESI) in June 2009 to investigate the findings of their March 2009 Phase I ESA.

This Phase I ESA Update, which included a review of the June 2009 Phase II ESI, revealed the following new RECs, VECs, and potential environmental concerns associated with the Site:

<u>On-site RECs/VECs:</u>

- Historic fill of unknown origin may have been imported to the Site during construction of PS 105 structures (circa 1930). Findings from the June 2000 Geotechnical Investigation and the June 2009 Phase II ESI confirm the presence of historical fill beneath the Site; and
- Presence of chromium and lead in soil above New York State Department of Environmental Conservation (NYSDEC) Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Unrestricted Use Soil Cleanup Objectives (SCOs) and petroleum-related volatile organic compounds (VOCs) and tetrachloroethene (PCE) in soil vapor.

<u>Off-site RECs/VECs:</u>

- A historical sign and printing shop (circa 1978 to 1983)
- Two additional RCRA generators, two additional NY Spills/LTANKs listings, two additional PBS listings, six historical dry cleaners, and one historical automotive facility

Potential Environmental Concerns:

- The potential presence of ACM, PCB, and LBP-containing material in existing structures and historic fill. ACM, PCB-, and LBP-containing material should be verified through visual inspection.

Recommendations

Based on the findings of the Phase I ESA Update, recommends that a Phase II Environmental Site Investigation (ESI) be performed, consisting of a geophysical survey, soil vapor, soil, and groundwater samples to determine whether the identified RECs and/or VECs have affected the suitability of the Site for use as a public school facility. also recommends an inspection of previously inaccessible areas on-site to determine if additional RECs/VECs or environmental concerns are present. also recommends that any suspect ACM, PCB, and LBP-containing material in existing structures and historic fill be identified and properly managed in accordance with all applicable regulations and NYCSCA policies and procedures.

PHASE II ENVIRONMENTAL SITE INVESTIGATION

OF

PROPOSED ADDITION TO PUBLIC SCHOOL ( )
BLOCK 4288, PORTION OF LOT 1
725 BRADY AVENUE
BRONX, NEW YORK 10462

SCA LLW NO.
SCA SERVICE ID NO.

May 20, 2020

Prepared by:

NYCSCA
IEH Division, HazMat Unit
30-30 Thomson Avenue
Long Island City, NY 11101-3045
Phone:

Attn: Ms.

Prepared for:

NYCSCA
Capital Planning Department
30-30 Thomson Avenue
Long Island City, NY 11101-3045
Phone:

Attn:

EXECUTIVE SUMMARY

At the request of the Capital Planning Department of the New York City School Construction Authority (NYCSCA), the Industrial & Environmental Hygiene Division (IEH) of NYCSCA conducted a Phase II Environmental Site Investigation (ESI) of the proposed new addition site located at PS 105, 725 Brady Avenue, Bronx, New York 10462 (hereafter referred to as the Site). The legal description for the Site is Block 4288, a portion of Lot 1. The Site is located in an area primarily characterized by institutional, residential, and commercial properties, and public open space. The NYCSCA is considering redevelopment of the Site with a building addition to the adjacent X105 school building. The December 30, 2019 Test Fit Study provided by NYCSCA Architecture & Engineering Division includes conceptual design plans for a 15,000-square-foot, four-story building addition with a partial cellar level, fronting Cruger Avenue.

The approximately 54,200 square foot (sf) Site is currently comprised of an exterior asphalt-paved recreational yard with two single-story temporary classroom unit (TCU) buildings and peripheral landscaped areas. Primary access to the Site is via pedestrian gates in the perimeter fencing along Cruger and Holland Avenues (the eastern and western adjoining streets). The elevation of the Site is approximately 10 feet lower than the Holland Avenue right-of-way; and approximately 5 feet higher than the Cruger Avenue right-of-way. Concrete retaining walls are present at the eastern and western Site boundaries.

The Site is bounded to the north by two six-story multiple-family residential buildings; to the east by Holland Avenue followed by two six-story multiple-family residential buildings; to the south by the X105 school building followed by Brady Avenue and a six-story multiple-family residential building; and to the west by Cruger Avenue followed by three six-story multiple-family residential buildings.

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) performed a Phase I Environmental Site Assessment (ESA) Update of the Site for the NYCSCA. The January 3, 2020 Phase I ESA Update identified on-site and off-site Recognized Environmental Conditions (RECs) and/or Vapor Encroachment Concerns (VECs). On-site RECs and VECs identified in the Phase I ESA Update: 1) historic fill of unknown origin may have been imported to the Site during the construction of X105 in 1930. Findings from the June 2000 Geotechnical Investigation Report (performed by Langan) and the June 2009 Phase II ESI (performed by STV Inc. [STV]) confirm the presence of historic fill on the Site. 2) Findings from the 2009 STV Phase II ESI identified the presence of chromium and lead in soil above New York State Department of Environmental Conservation (NYSDEC) Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Unrestricted Use Soil Cleanup Objectives (SCOs) and petroleum-related volatile organic compounds (VOCs) and tetrachloroethene (PCE) in soil vapor. Off-site RECs and VECs identified in historical records and database records included a historical dress manufacturer, a historical sign and printing shop, a gasoline service station that formerly contained a greasing shed, four hazardous waste generator listings, eight spill listings, eight Petroleum Bulk Storage (PBS) listings, six historical dry cleaner listings (two of which are also registered drycleaners), and one historical automotive station. Other environmental concerns associated with the Site include the potential presence of polychlorinated biphenyls (PCB), asbestos containing material (ACM), and lead based paint (LBP) in on-site structures and historic fill beneath the Site.

The purpose of the Phase II ESI was two-fold: 1) to determine if the RECs and VECs identified in the January 3, 2020 Phase I ESA Update require special consideration and/or affect the suitability of the Site for use as a public school facility, and 2) to preliminarily characterize the environmental condition of soil anticipated to be excavated for construction of a building addition to the adjacent X105 school building.

The Phase II ESI field activities were performed by Langan on March 7 and 8, 2020, which included performance of a geophysical survey to locate subsurface anomalies and clear proposed boring locations;

advancement of 5 soil borings to depths of 12 to 15 feet bgs and collection of 11 soil samples (including 1 duplicate); and the installation of 5 soil vapor probes to 5 feet bgs and collection of 5 soil vapor samples. The results of the Phase II ESI indicate the following:

- The geophysical survey did not identify any anomalies consistent with underground storage tanks (USTs) or subsurface structures. Several sewer and electrical utility lines were identified on the Site and marked in the field.

- Historic fill was identified in each soil boring from immediately below the surface cover to depths varying from approximately 2 to 9 feet bgs, and primarily consisted of brown fine-grained sand with varying amounts of coarse-grained sand, silt, asphalt, glass, concrete, wood, coal, and brick fragments. The historic fill was underlain by native material consisting of fine-grained sand with varying amounts of clay, silt, and fine gravel. No visual or olfactory evidence of contamination or photoionization detector (PID) readings indicating impacts were encountered while screening soil in any boring.

- Groundwater was not encountered during the ESI. Based on a review of previous reports (2009 Phase II ESI, performed by STV) and available published information, groundwater is assumed to be encountered at about 30 feet bgs and within the underlying bedrock.

- Five soil vapor samples were collected and analyzed for VOCs. Six petroleum-related VOCs (1,2,4-trimethylbenzene [TMB], 1,3,5-TMB, benzene, ethylbenzene, o-xylene, and p/m-xylene) were detected in soil vapor at concentrations that exceed the range of background levels in one or more soil vapor samples. Detected VOCs in soil vapor did not exceed the New York State Department of Health (NYSDOH) Air Guidance Values (AGVs) or Decision Matrix Values. The VOCs detected in soil vapor are attributed to off-site sources.

- A total of eleven soil samples (including one duplicate sample) were collected and analyzed for VOCs, semivolatile organic compounds (SVOCs), metals including hexavalent chromium and cyanide, pesticides, herbicides, and PCBs. A soil sample was collected from the historic fill layer in each boring; these samples were also analyzed for total petroleum hydrocarbons (TPH) gasoline and diesel range organics (GRO/DRO) and Resource Conservation and Recovery Act (RCRA) characteristics.

    - VOCs, Pesticides, PCBs, and herbicides were not detected above the NYSDEC General Fill Criteria (Table 2 of 6 NYCRR Part 360.13(f)) (GFC), and/or CP-51 Soil Cleanup Levels (SCLs).

    - Three SVOCs (benzo(a)anthracene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) were detected above their applicable GFC and/or SCLs in two soil samples collected. The detected SVOCs are attributed to the presence of historic fill.

    - One metal (chromium) was detected above its applicable GFC in one soil sample collected. In addition, lead was detected in one soil sample collected at a concentration that exceeds the 20 times rule, a benchmark for evaluating potential RCRA characteristic toxicity. The sample was submitted for additional toxicity characteristic leaching procedure (TCLP) analysis; results of which indicate that hazardous concentrations of lead was not detected. The detected metals in soil samples are attributed to the presence of historic fill at the Site.

- In support of pre-design waste characterization, the five soil samples of historic fill were analyzed for TPH-GRO, TPH-DRO, and RCRA Characteristics - ignitability, reactivity, and corrosivity. All soil samples were analyzed for cyanide and hexavalent chromium. Detections of TPH-GRO range from an estimated concentration of 0.64 milligrams per kilogram (mg/kg) to 1.6 mg/kg. Detections of TPH-DRO range from concentrations of 56 mg/kg to 1,300 mg/kg. There are no applicable regulatory comparison criteria for TPH. Results for RCRA characteristic testing in all samples were below criteria for ignitability, corrosivity, and reactivity. Hexavalent chromium was detected in 4 of the 11 soil samples at concentrations ranging from 0.178 mg/kg to 0.469 mg/kg, below its applicable GFC. Cyanide was not detected in soil samples. The detected concentrations of TPH and hexavalent chromium in soil samples are attributed to historic fill.

Based on the results of the Phase II ESI, the following remedial actions and/or engineering controls are recommended for the Site to be suitable for use as a public school facility:

- Based on historical evidence of elevated soil vapor impacts on-site, an active sub-slab depressurization system (SSDS) and a soil vapor barrier should be integrated into the new building design, including integration with any proposed damp-proofing or waterproofing components.

- All material excavated during construction activities should be properly characterized and disposed of off-site, if required, by the contractor-selected solid waste management facilities.

- Although not anticipated based on the inferred depth to groundwater and depth of proposed construction, any dewatering necessary during school construction activities must be performed in accordance with applicable local, state and federal regulations. Dewatering required during construction should be designed to minimize the influx of potentially contaminated water from off-site sources toward the Site.
- If landscaped areas are incorporated into the development of the Site, any exposed ground surfaces should be covered by a minimum two-foot thick layer of environmentally clean fill.
- Suspect ACM, LBP, PCB-containing materials that are disturbed by Site development should be properly managed during construction activities in accordance with applicable regulations and NYCSCA policies and procedures.

Based on the Phase II ESI results, additional investigation is not recommended for the Site.

S1.2R – ENHANCED SITE ASSESSMENT

S1.2R Enhanced Site Assessment

Narrative

Summaries have been provided below which cover all site features outlined in this credit. The provided credit form details how the assessment influenced project design.

For this project, it was noted that a Test Fit/Sketch Study was initiated and issued June 20, 2018 for the project in lieu of a Feasibility Study (SCA Design Requirements 1.1.3.1).

Topography

The topography of Staten Island ranges from steep hills to flat terrain. A hilly spine trends from about N60°E in the southwestern half of the Island to about N40°E in the northeastern part. The maximum land-surface altitude in the southwest part is about 150 ft above sea level; in the northeast part, where the slopes are steepest, it is about 405 ft. The 405-ft altitude is on Todt Hill, the highest spot on the eastern seaboard that is within 2.5 miles of the Atlantic Ocean. The hilly spine of the Island is flanked by a flat plain ranging from less than 0.1 miles wide at the Island's northern and southern ends to as much as about 2 miles wide in the northwestern part.

The immediate project site is fairly level. Based on the survey provided by the SCA, the high point occurs at the northeast corner of the lot and the low point is at the southwest corner, approximately a 2.79' delta over a distance of 575'.
See site surveys in supporting documentation.

Hydrology

The site is not within a NYS DEC regulated wetland area and is in an area of minimal flood hazard - "Zone X". Preliminary results indicated a high-water table and will require some additional observation wells to confirm. The elevation of the water table will determine the requirements for waterproofing and the feasibility of having a cellar level.

See DEC Determination Letter and Flood Maps in supporting documentation. Further details are also provided in credits S2.3P, S2.4 Green Infrastructure & Rainwater Management.

Climate

In Staten Island, the summers are warm and humid, the winters are very cold and windy, and it is wet and partly cloudy year-round. Over the course of the year, the temperature typically varies from 28°F to 86°F and is rarely below 14°F or above 94°F. The hot season lasts for 3.5 months, from May 31 to September 16, with an average daily high temperature above 77°F. The hottest day of the year is July 20, with an average high of 86°F and low of 71°F.

The cold season lasts for 3.3 months, from December 2 to March 11, with an average daily high temperature below 49°F. The coldest day of the year is January 30, with an average low of 28°F and high of 40°F. A wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Staten Island varies throughout the year. The wetter season lasts 4.8 months, from March 31 to August 25, with a greater than 29% chance of a given day being a wet day. The chance of a wet day peaks at 35% on July 31. The drier season lasts 7.2 months, from August 25 to March 31. The smallest chance of a wet day is 22% on October 27.

The most common form of precipitation throughout the year is rain alone, with a peak probability of 35% on July 31. Rain falls throughout the year in Staten Island. The most rain falls during the 31 days centered around July 29, with an average total accumulation of 3.8 inches. The least rain falls around February 7, with an average total accumulation of 2.3 inches.

The snowy period of the year lasts for 4.0 months, from November 26 to March 27, with a sliding 31-day liquid-equivalent snowfall of at least 0.1 inches. The most snow falls during the 31 days centered around January 23, with an average total liquid-equivalent accumulation of 0.5 inches.

The snow-less period of the year lasts for 8.0 months, from March 27 to November 26. The least snow falls around July 24, with an average total liquid-equivalent accumulation of 0.0 inches.

The average hourly wind speed in Staten Island experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 6.4 months, from October 12 to April 25, with average wind speeds of more than 8.4 miles per hour. The windiest day of the year is February 26, with an average hourly wind speed of 10.4 miles per hour. The calmer time of year lasts for 5.6 months, from April 25 to October 12. The calmest day of the year is July 31, with an average hourly wind speed of 6.3 miles per hour.

The predominant average hourly wind direction in Staten Island varies throughout the year. The wind is most often from the south for 5.0 days, from May 16 to May 21 and for 3.1 months, from June 24 to September 28, with a peak percentage of 38% on July 27. The wind is most often from the west for 1.1 months, from May 21 to June 24 and for 7.6 months, from September 28 to May 16, with a peak percentage of 35% on June 23.

Vegetation

The area of the site where the addition will be constructed is primarily pre-developed hardscape with small areas of grass covering and some existing trees lining Stecher Street. The existing trees include Norway Maple, Japanese Zelkova, White Oak, Swamp White Oak, Ash and Cherry Plum. The New York Natural Heritage Program indicates that the site does not contain any critical habitats. The site is not adjacent to a river or coastline.

Supporting documentation includes an except from the New York City Tree Map and the New York Natural Heritage Program.

Soils

Site soils as shown in the supporting documentation are listed as UGAI, Urban land-Greenbelt Complex, 0 to 3% slopes, low impervious surface and GUA – Greenbelt, Urban Land Complex 0 to 3% slopes. Most of the development will occur in the UGAI soil areas.

Urban soils typically exhibit a high rate of runoff due to development. No rating is listed for the UGAI soils. The Greenbelt soils, if undisturbed, are in Hydraulic Soil Group (HSG) B which have a lower rate of runoff. Soils in HSG B are suitable for infiltrative practices such as basins or dry wells. Specific to the GUA soil are listed significant amounts of fine particles which indicate possibly poor conditions for infiltration of stormwater and septic tank effluent.

Human Use

The site for the new addition is currently in the open area to the east of the existing three story 45,830 SF school being expanded, PS 005 Richmond. The location for the school addition currently contains a playground. The length of the proposed addition will most likely push the development into to open grass field previously use as a septic field. An existing ± 5,000 SF 1-story annex attached to the south west corner of the existing PS005R building, will remain in place. The existing ECC play area and general playground will be relocated and expanded into the existing grass field. The site of the new school addition is located within a residential neighborhood of predominately one to two story single family residences.

Residential buildings are across the street from the school along Kingdom Avenue to the West, Deisius Street to the North and Stecher Street to the East. Arbutus Woods Park is located adjacent to the school's grass covered field.

Human Health Effects

The project site is approximately 0.5 miles from Huguenot Beach and Wolfe's Pond Park Tennis Courts where healthy outdoor activities can be enjoyed. Immediately adjacent to the site is Arbutus Woods Park where visitors can take long strolls. Several other parks are also a short distance from the site. The site also contains a large field that creates opportunities for outdoor play. As this site was selected due to the project being an addition to the existing school building, the availability of this adjacent physical activity space was not a determining factor for the site selection, however, will become a benefit for the users of this new facility.

Any site-specific risks to human health have been assessed and addressed as outlined in the Phase I ESA, Phase I ESA and the Outdoor Air Assessment. Details can be found in the S1.1P Environmental Site Assessment and Q1.1P Min IAQ Performance sections of this submission.

SCA Standards Incorporated:

- None

Supporting Documentation

- S1.2R Enhanced Site Assessment credit form (Page 33)
- Maps/reports documenting features in topography, hydrology, climate, vegetation, soils, human use and human health effects categories (Pages 34-55)
- Shade Study (Appendix A)

NYC Green Schools Rating System

ENHANCED SITE ASSESSMENT

CREDIT FORM

Credit S1.2R

SCA School Construction Authority

RESPONSIBLE PARTY:

INITIAL SUBMISSION PHASE: SD | DD | 60% | 100% | Design | CA

Project:	PS 123A	Submission Phase:	Schematic Design
Address:	345 Example St	Architect:	MGA Architect
LLW #:	123456	Preparer:	
Design #:	123456	Form Revision Date:	3/30/2021

INSTRUCTIONS:
Step 1) Indicate that SCA Design Requirements have been fulfilled and ASHRAE Air Assessment has been received.
Step 2) Provide a narrative in the space provided describing how the site assessment influenced project design. If site assessment excludes parts of requested information, provide reasons why.
Step 3) List required and supporting documentation such as drawings, reports, or attachments to this form.

	Y	N
SCA Design Requirements 1.1.3.1 Feasibility Study performed	X	
SCA Design Requirements 1.1.3.2 Test Fit performed	X	
ASHRAE Outdoor Air Assessment Report received	X	

Required Documentation

Site Assessment includes the following information:

	Y	N
Topography	X	
Hydrology	X	
Climate	X	
Vegetation	X	
Soils	X	
Human Use	X	
Human Health Effects	X	

Provide a brief explanation of how the information gathered influenced the project design. If applicable, give reasons for not addressing these topics.

The site survey shows topographic information and the existing vegetation (street trees).
The site slopes from the northeast corner of the lot on 23rd Road to the southwestern corner of the lot at the intersection of 29th Street and 24th Avenue.
Hydrology is discussed in the civil engineer's geotechnical design narrative, included in the Pre-Schematic Design Report.
Site visits and aerial photos allowed the team to assess human use factors such as views, usage of adjacent properties, and public transportation access.
OAA report determined there is no proximity to major air pollution sources. Solar exposure, prevailing winds, and building massing were explored as part of the box modeling exercise for the IDP. Because this is an addition to an existing school building on a relatively small site, many of these factors were limited by existing conditions.

List required and supporting documentation included in the submission. (Provide required documentation such as drawings, reports, or attachments.)

Maps/reports documenting features in topography, hydrology, climate, vegetation, soils, human use and human health effects categories have been provided in the S1.2R Enhanced Site Assessment section of the GSG SD submission.

Revision I - September 2019
Revision II - February 1, 2021

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

ARTHUR KILL QUADRANGLE
NEW YORK - NEW JERSEY
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 18T
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, July 2015 - December 2017
Roads.....U.S. Census Bureau, 2016
Names.....GNIS, 1979 - 2019
Hydrography.....National Hydrography Dataset, 1899 - 2018
Contours.....National Elevation Dataset, 2013
Boundaries.....Multiple sources; see metadata file 2017 - 2018

Wetlands.....FWS National Wetlands Inventory 2007 - 2011

UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

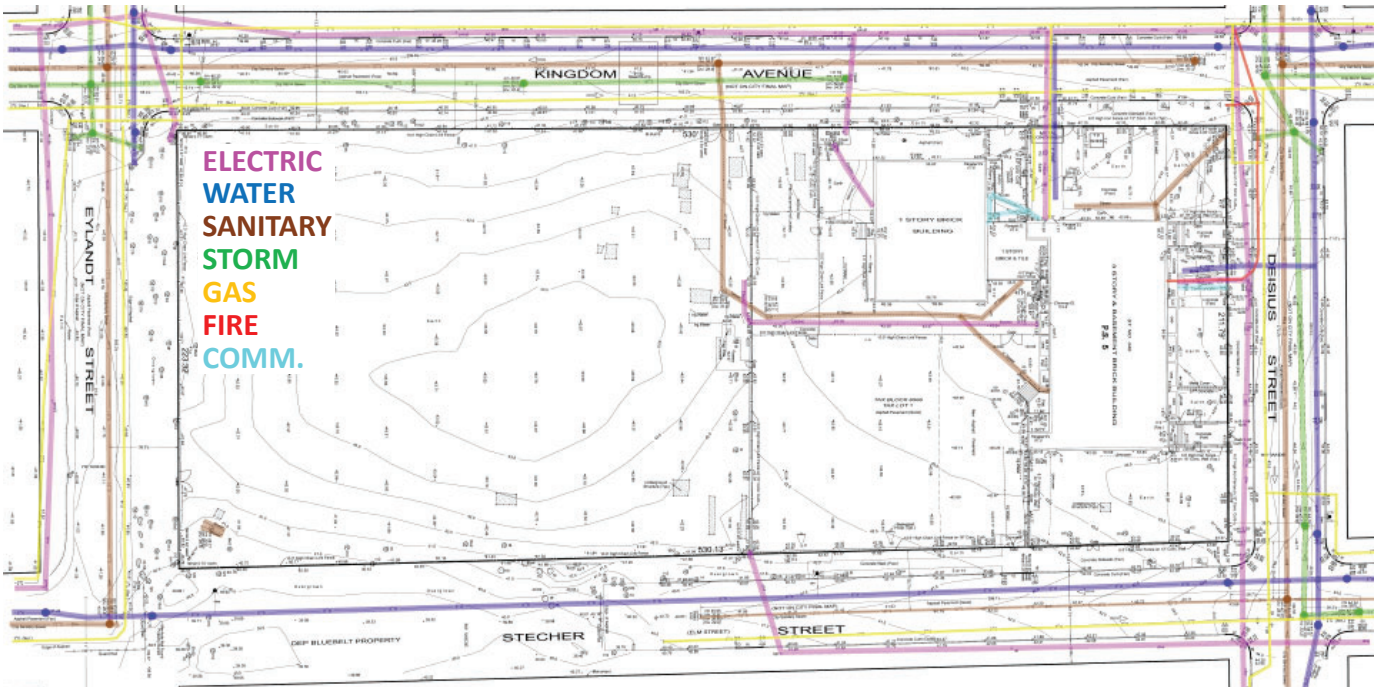
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

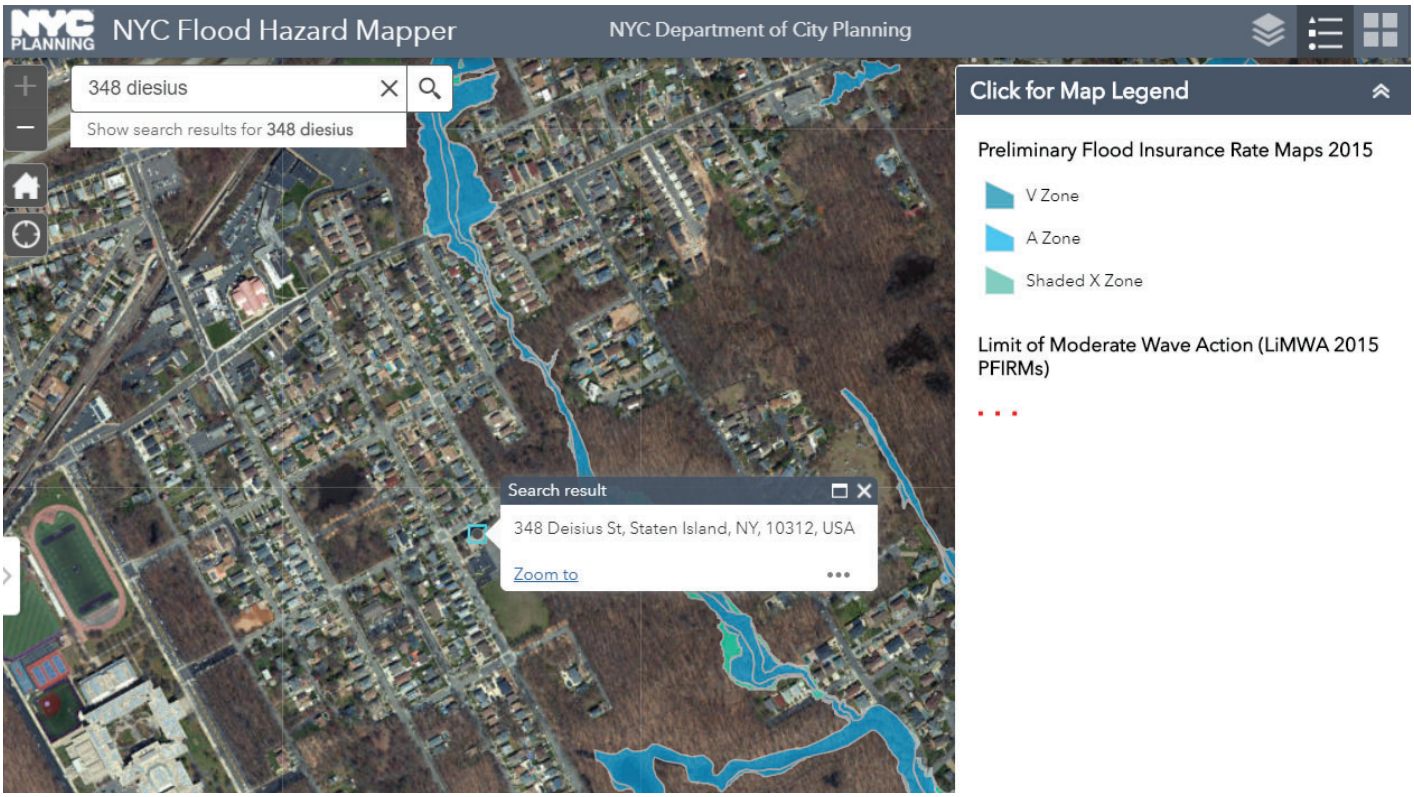
This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011. A metadata file associated with this product is draft version 0.6.18

ADJOINING QUADRANGLES
1 Roselle
2 Elizabeth
3 Jersey City
4 Perth Amboy
5 The Narrows
6 South Amboy
7 Keyport
8 Sandy Hook West

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

ARTHUR KILL, NY, NJ
2019


ELECTRIC
WATER
SANITARY
STORM
GAS
FIRE
COMM.
KINGDOM
AVENUE
EYLANDT
STREET
DEISIUS
STREET
STECHER
STREET


NYC PLANNING
NYC Flood Hazard Mapper
NYC Department of City Planning
348 diesius
Show search results for 348 diesius
Click for Map Legend
Preliminary Flood Insurance Rate Maps 2015
V Zone
A Zone
Shaded X Zone
Limit of Moderate Wave Action (LiMWA 2015 PFIRMs)
Search result
348 Deisius St, Staten Island, NY, 10312, USA
Zoom to

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits, Region 2
47-40 21st Street, Long Island City, NY 11101
P: (718) 482-4997 I F: (718) 482-4975
www.dec.ny.gov

March 3, 2020

12 West 37th St, 8th Floor
New York, NY 10018

Re: DEC Wetlands Jurisdictional Determination 64-10057
Block: 6566 Lot(s): 1
Staten Island, NY

Dear

The property referenced above is not within the jurisdiction of DEC under the Freshwater Wetlands Act (Article 24 of the Environmental Conservation Law), the Tidal Wetlands Act (Article 25 of the Environmental Conservation Law) or the Coastal Erosion Hazard Areas (Article 34 of the Environmental Conservation Law). Therefore, a DEC freshwater wetlands, tidal wetlands or coastal erosion hazard areas permit is not required to alter or develop this property.

If you have any further questions, please call this office at the above telephone number.

Very truly yours,

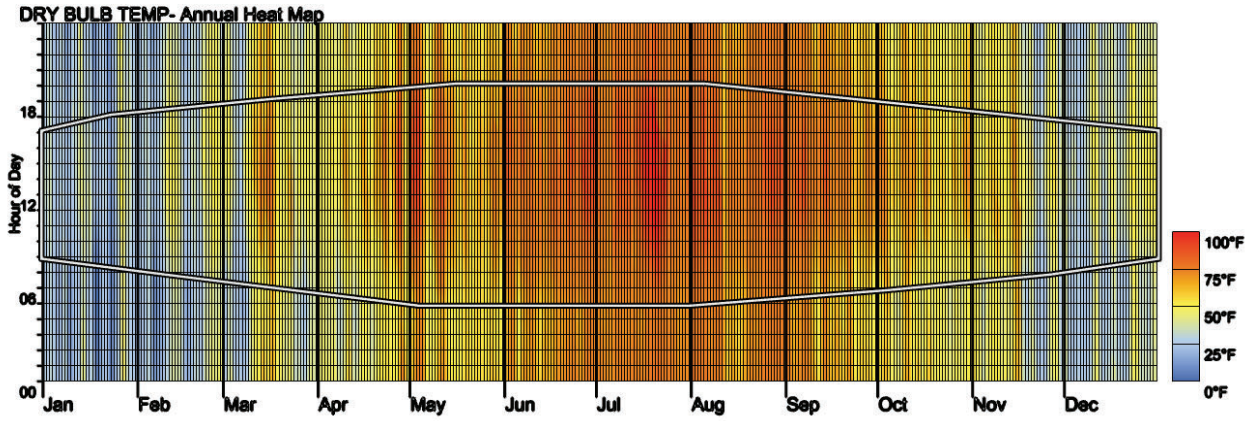
Regional Permit Administrator

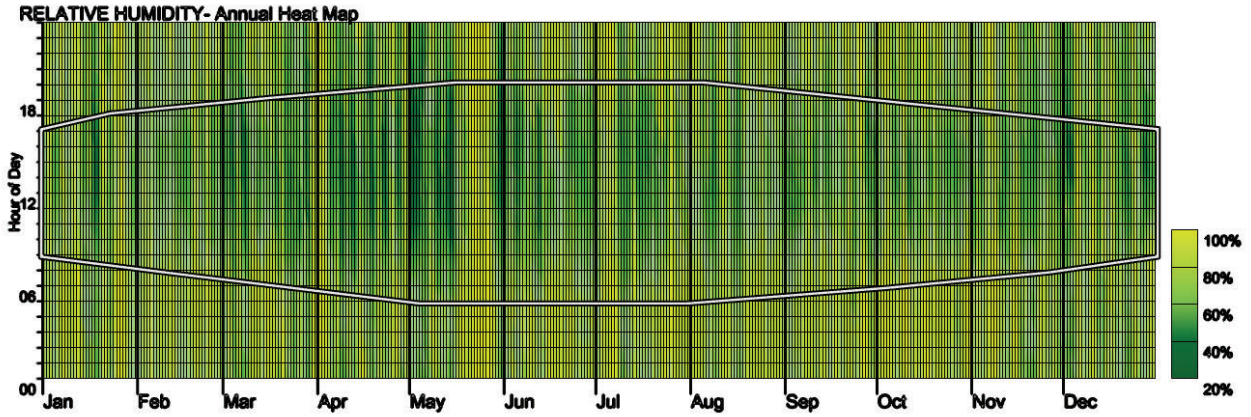
NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

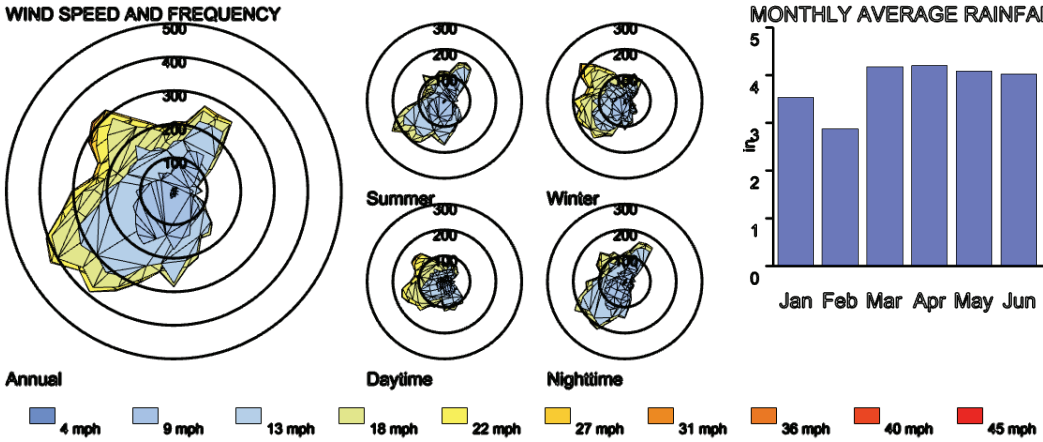
Climate Analysis

SD Scheme A

Weather Station: Newark Int'l AP
Source: EnergyPlus



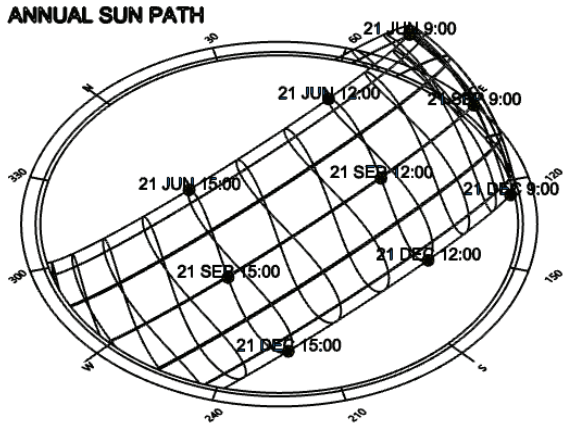


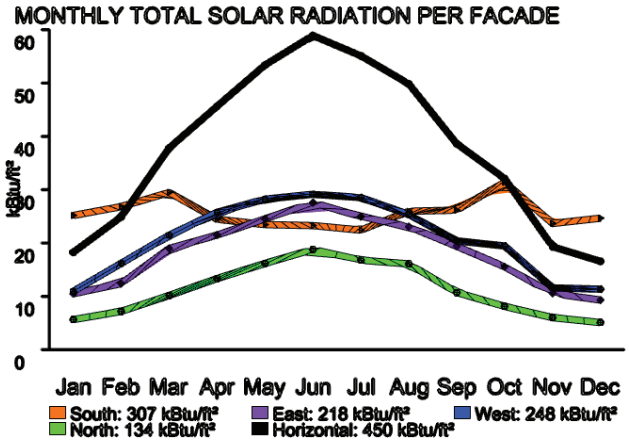


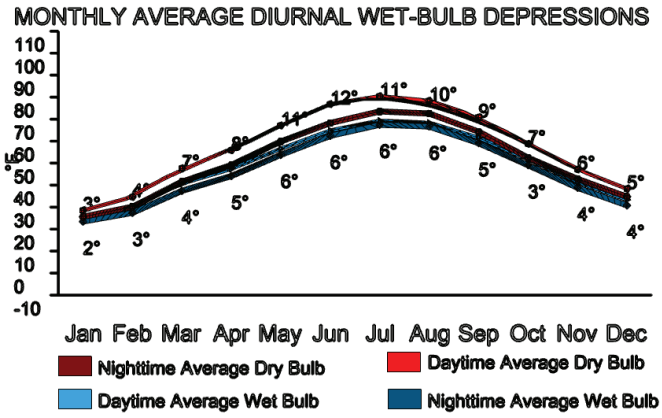
SD Scheme A

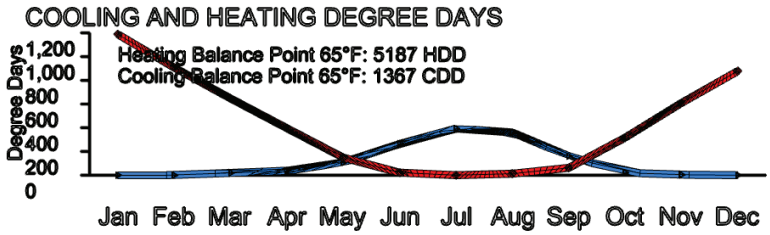
Weather Station: Newark Int'l AP
Source: EnergyPlus

Date and Time	Altitude	Azimuth	Altitude	Azimuth
21 JUN 9:00	49°	101°	49°	101°
21 JUN 12:00	73°	181°	73°	181°
21 JUN 15:00	48°	260°	48°	260°
21 SEP 9:00	34°	125°	34°	125°
21 SEP 12:00	50°	184°	50°	184°
21 SEP 15:00	31°	239°	31°	239°
21 DEC 9:00	14°	139°	14°	139°
21 DEC 12:00	26°	181°	26°	181°
21 DEC 15:00	13°	223°	13°	223°





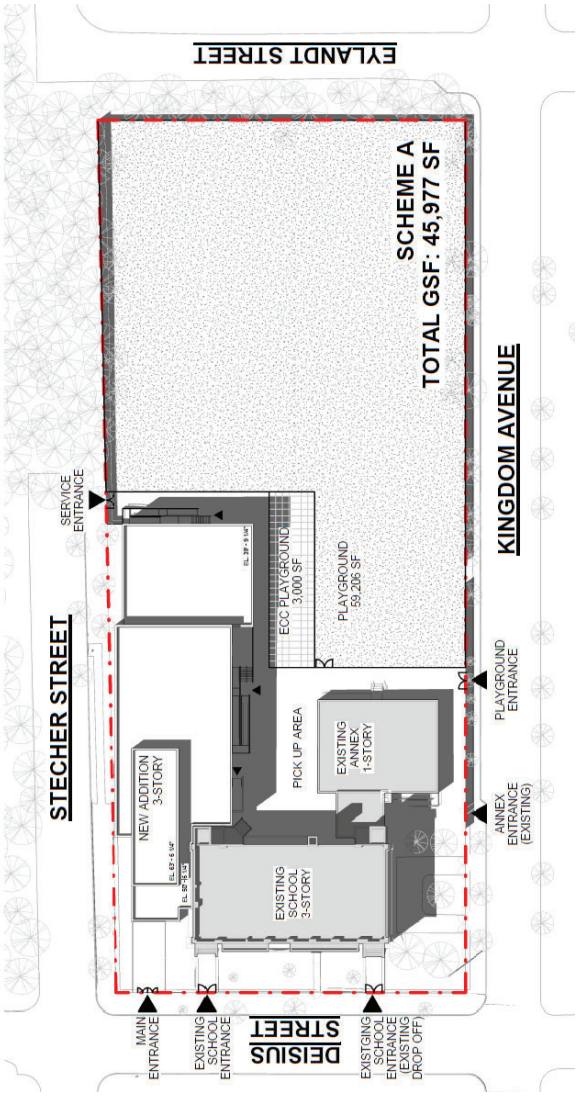




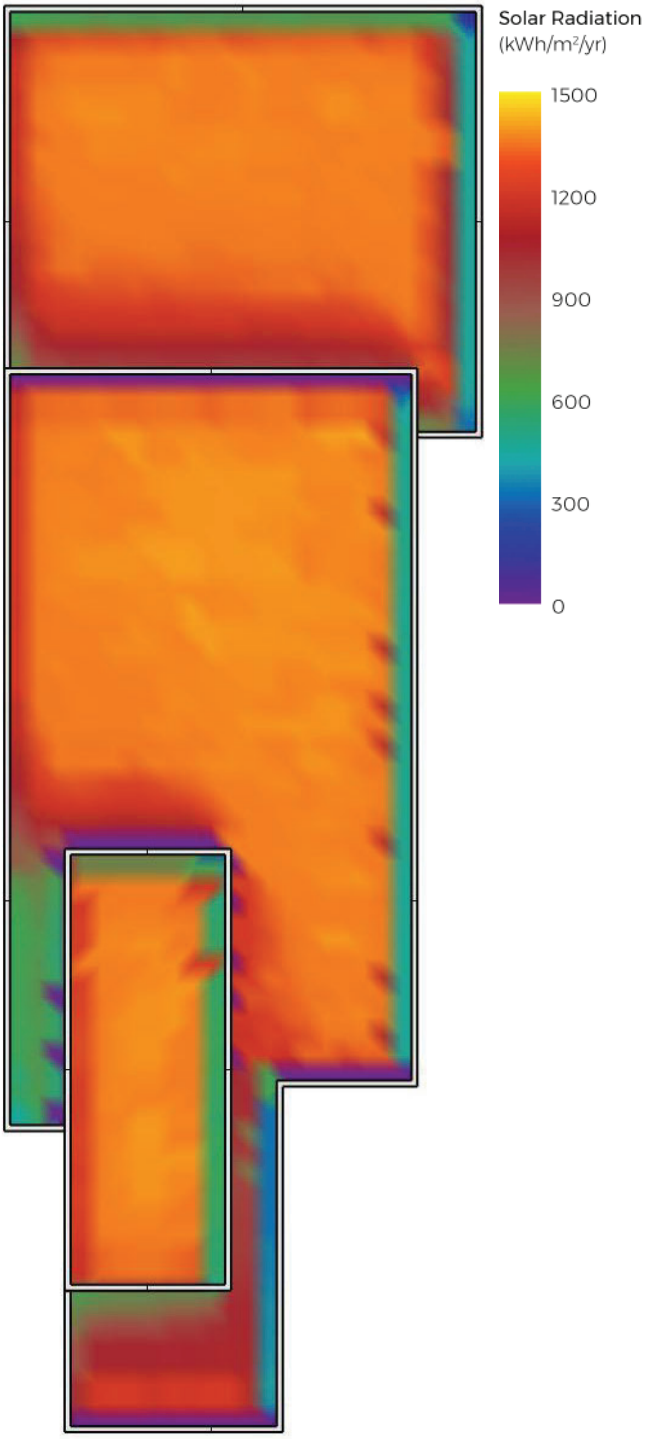
Climate Analysis

SD Scheme A

Solar Radiation Analysis



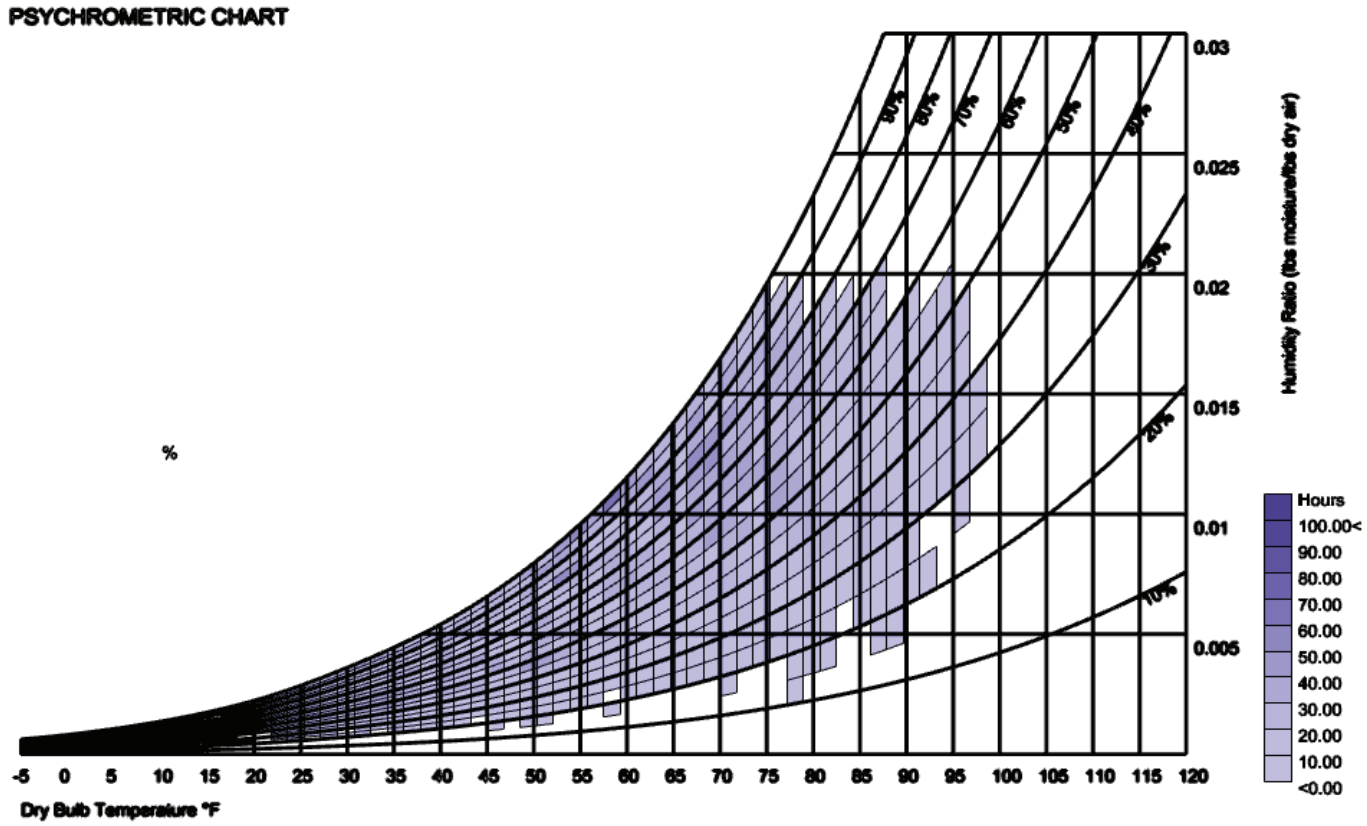
Site Plan, courtesy LHP Architects, 11/2/20

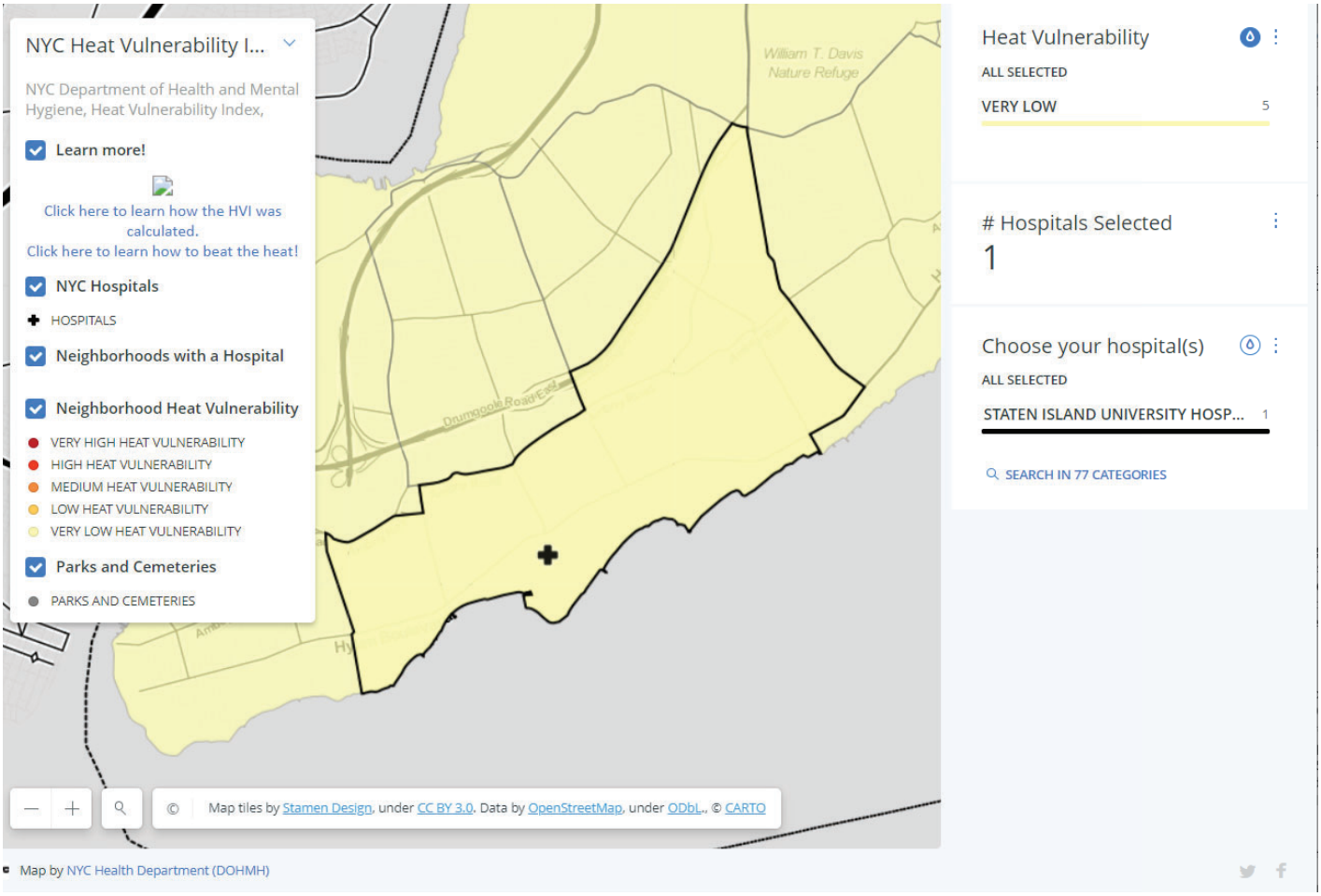


Climate Analysis

SD Scheme A

Weather Station: Newark Int'l AP
Source: EnergyPlus




NYC Heat Vulnerability I...
NYC Department of Health and Mental Hygiene, Heat Vulnerability Index,
Learn more!
Click here to learn how the HVI was calculated.
Click here to learn how to beat the heat!
NYC Hospitals
HOSPITALS
Neighborhoods with a Hospital
Neighborhood Heat Vulnerability
VERY HIGH HEAT VULNERABILITY
HIGH HEAT VULNERABILITY
MEDIUM HEAT VULNERABILITY
LOW HEAT VULNERABILITY
VERY LOW HEAT VULNERABILITY
Parks and Cemeteries
PARKS AND CEMETERIES
William T. Davis Nature Refuge
Drumgoole Road East
Map tiles by Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL., © CARTO
Heat Vulnerability
ALL SELECTED
VERY LOW 5
Hospitals Selected
1
Choose your hospital(s)
ALL SELECTED
STATEN ISLAND UNIVERSITY HOSP... 1
SEARCH IN 77 CATEGORIES
Map by NYC Health Department (DOHMH)

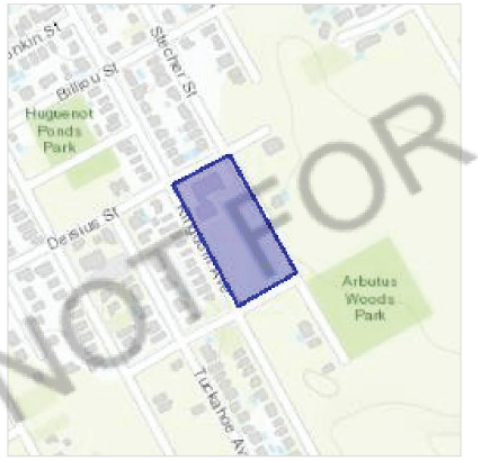
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Richmond County, New York



Local office

Long Island Ecological Services Field Office

(631) 286-0485
(631) 286-4003

340 Smith Road
Shirley, NY 11967-2258

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Roseate Tern Sterna dougallii dougallii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2083	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

New York Natural Heritage Program

Search...

Guide types: A Animals C Ecological Communities P Plants

Show 10 entries

Filter records:

Type	Common Name	Scientific Name
A	Eastern Mud Turtle	*Kinosternon subrubrum*
A	Fence Lizard	*Sceloporus undulatus*
A	Least Bittern	*Ixobrychus exilis*
A	Northern Harrier	*Circus hudsonius*
A	Northern Long-eared Bat	*Myotis septentrionalis*
A	Peregrine Falcon	*Falco peregrinus*
A	Pied-billed Grebe	*Podilymbus podiceps*
A	Short-eared Owl	*Asio flammeus*
A	Upland Sandpiper	*Bartramia longicauda*

Showing 1 to 9 of 9 entries

Previous 1 Next

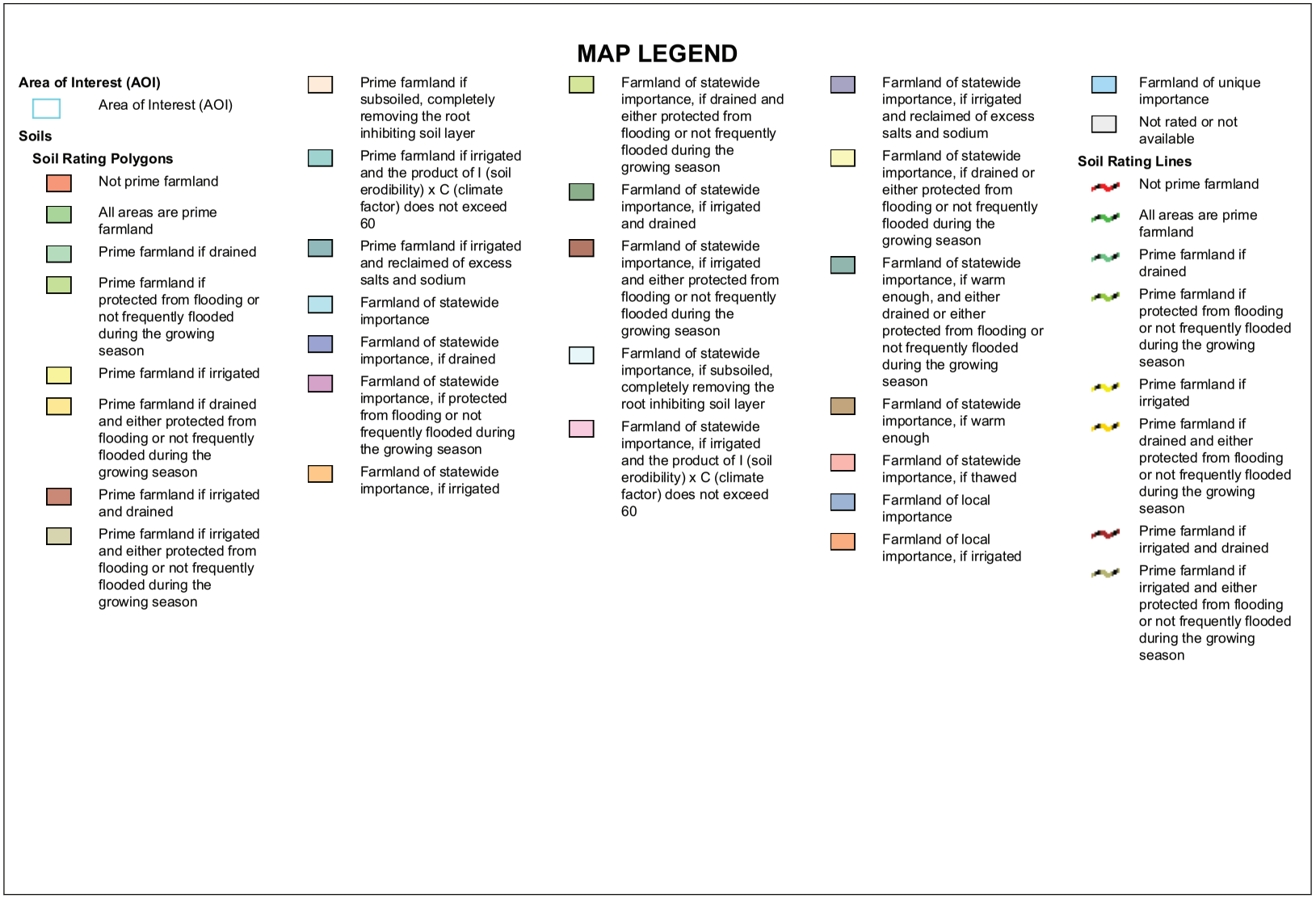
Map Scale: 1:7,130 if printed on A landscape (11" x 8.5") sheet.

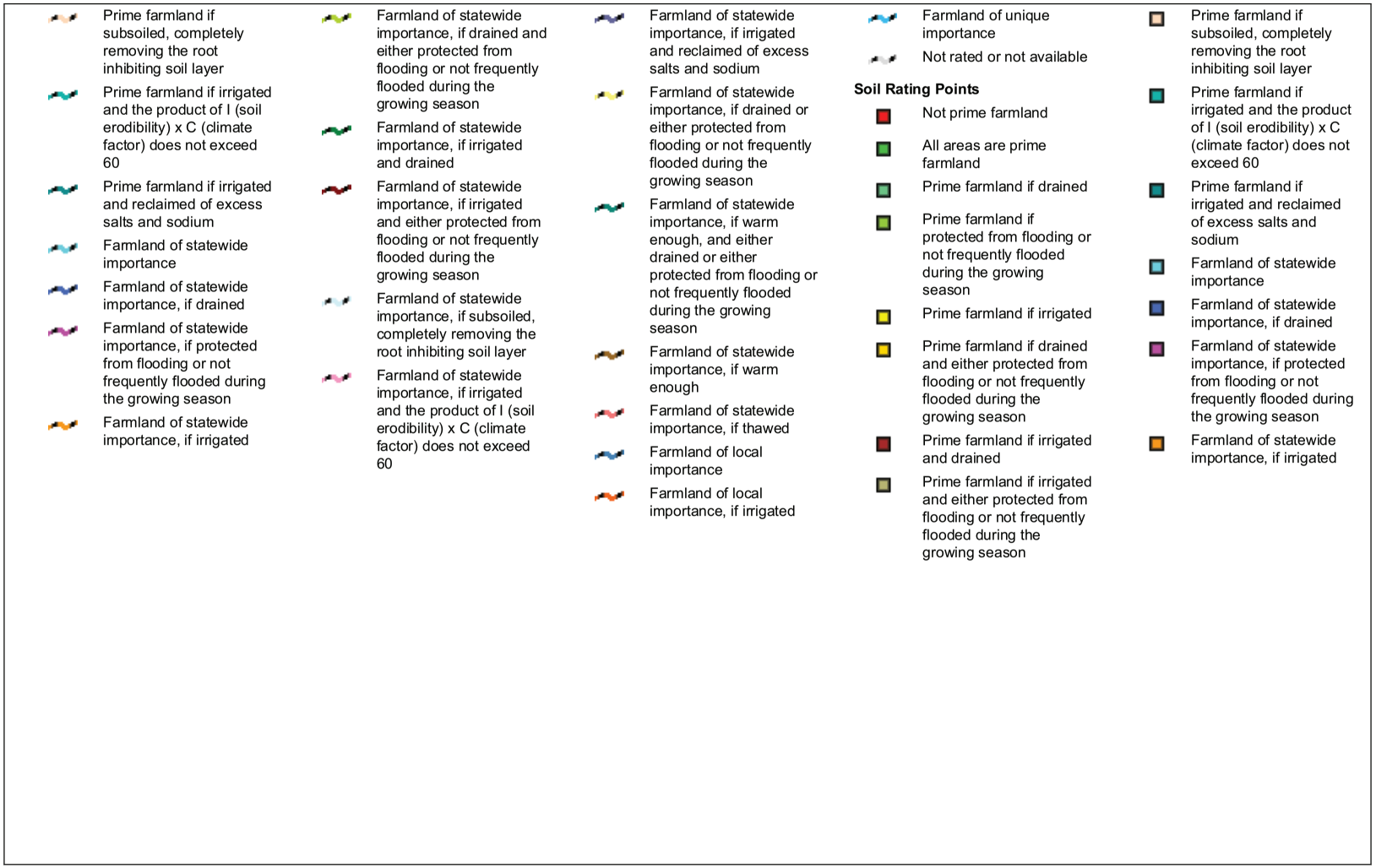
N

0 100 200 400 600 Meters

0 300 600 1200 1800 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84


MAP LEGEND
Area of Interest (AOI)
Area of Interest (AOI)
Soils
Soil Rating Polygons
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated
Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated and drained
Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough
Farmland of statewide importance, if thawed
Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Lines
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season


Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated
Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated and drained
Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if warm enough
Farmland of statewide importance, if thawed
Farmland of local importance
Farmland of local importance, if irrigated
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of statewide importance, if drained
Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
Farmland of statewide importance, if irrigated

- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Richmond County, New York
Survey Area Data: Version 11, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 25, 2019—Jul 30, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BHBu	Boonton-Haledon complex, 0 to 8 percent slopes	Farmland of statewide importance	13.7	7.1%
BmB	Boonton loam, moderately well drained, 3 to 8 percent slopes	All areas are prime farmland	9.4	4.8%
BtB	Boonton loam, 3 to 8 percent slopes	All areas are prime farmland	8.5	4.4%
BtC	Boonton loam, 8 to 15 percent slopes	Farmland of statewide importance	4.8	2.5%
GbB	Greenbelt loam, 3 to 8 percent slopes	Not prime farmland	0.1	0.0%
GUA	Greenbelt-Urban land complex, 0 to 3 percent slopes	Not prime farmland	5.3	2.7%
GUB	Greenbelt-Urban land complex, 3 to 8 percent slopes	Not prime farmland	1.1	0.6%
HaA	Hasbrouck silt loam, 0 to 3 percent slopes, frequently ponded	Not prime farmland	15.9	8.2%
HHA	Haledon-Hasbrouck complex, 0 to 3 percent slopes, frequently ponded	Not prime farmland	18.1	9.4%
NaA	Natchaug muck, 0 to 2 percent slopes	Not prime farmland	0.4	0.2%
NoA	North Meadow sandy loam, 0 to 3 percent slopes	Not prime farmland	5.7	2.9%
UGAl	Urban land-Greenbelt complex, 0 to 3 percent slopes, low impervious surface	Not prime farmland	64.7	33.5%
UGB	Urban land-Greenbelt complex, 3 to 8 percent slopes	Not prime farmland	2.3	1.2%
UGBl	Urban land-Greenbelt complex, 3 to 8 percent slopes, low impervious surface	Not prime farmland	37.1	19.2%
UtA	Urban land, till substratum, 0 to 3 percent slopes	Not prime farmland	4.0	2.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
UtB	Urban land, till substratum, 3 to 8 percent slopes	Not prime farmland	1.9	1.0%
Totals for Area of Interest			**193.1**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Zoning and Land Use

Tax Lots ☐

- One & Two Family Buildings
- Multi-Family Walk-Up Buildings
- Multi-Family Elevator Buildings
- Mixed Residential & Commercial Buildings
- Commercial & Office Buildings
- Industrial & Manufacturing
- Transportation & Utility
- Public Facilities & Institutions
- Open Space & Outdoor Recreation
- Parking Facilities
- Vacant Land
- Other

Basemaps

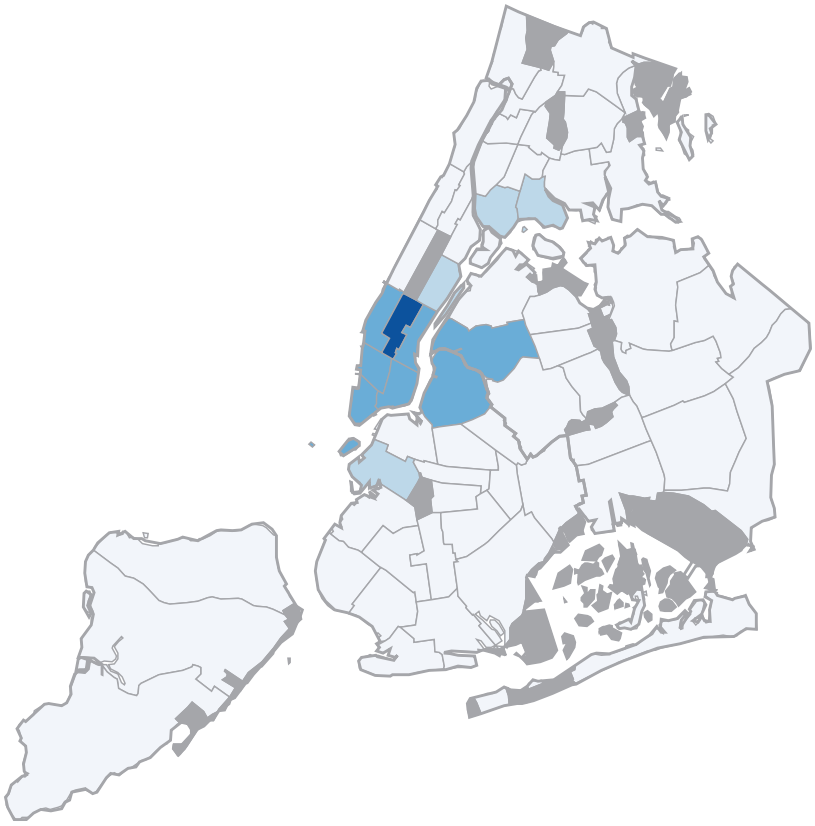
Subways

Building Footprints ☐

Aerial Imagery

◉ 2016	○ 2014	○ 2012
○ 2010	○ 2008	○ 2006
○ 2004	○ 2001-2	○ 1996
○ 1951	○ 1924	

Neighborhood Air Quality: Fine Particulate Matter ($PM_{2.5}$) - Mean (mcg per cubic meter), Annual Average 2019, Neighborhood (Community District)



Mean (mcg per cubic meter), Annual Average 2019

5.6	7.5	8.4	10	11	18.8

About the Indicators

Fine particles are emitted by vehicles, building boilers, and other combustion - and are a major form of air pollution that harms health.

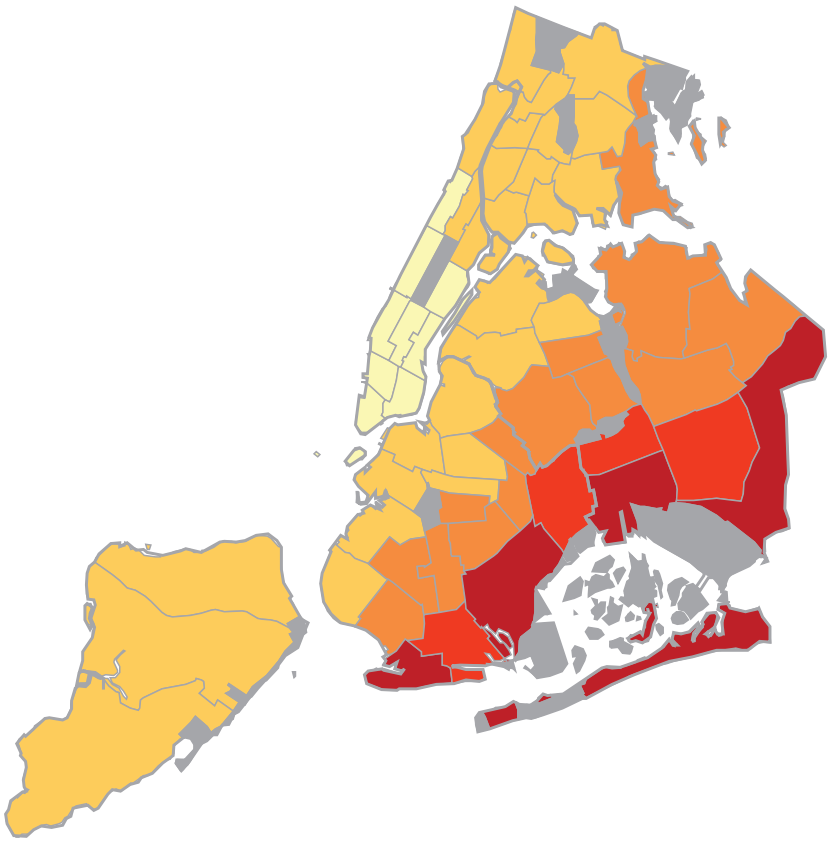
Name: Fine Particulate Matter (PM2.5) **Measure:** Mean **How Calculated:**
Air samples collected at specific NYCCAS monitoring sites along with information about emissions sources were incorporated into a statistical model that predicted pollutant concentrations at all locations in NYC for the specified time period. The results were then assigned to the appropriate NYC neighborhood and averaged. In NYC, fine particulate matter is measured in units of micrograms per cubic meter of air.

Source(s): New York City Community Air Survey

NYC Department of Health and Mental Hygiene
Environment & Health Data Portal
More information can be found at: *http://nyc.gov/health/tracking*
Accessed November 06, 2020

Environment & Health Data Portal

Neighborhood Air Quality: Ozone (O3) - Mean (ppb), Summer 2019, Neighborhood (Community District)



Mean (ppb), Summer 2019

About the Indicators

Ozone is a common air pollutant that can harm breathing and worsen asthma and other respiratory conditions.

Name: Ozone (O3) **Measure:** Mean **How Calculated:**
Air samples collected at specific NYCCAS monitoring sites along with information about emissions sources were incorporated into a statistical model that predicted pollutant concentrations at all locations in NYC for the specified time period. The results were then assigned to the appropriate NYC neighborhood and averaged. In NYC ozone is measured in units of parts per billion (ppb).

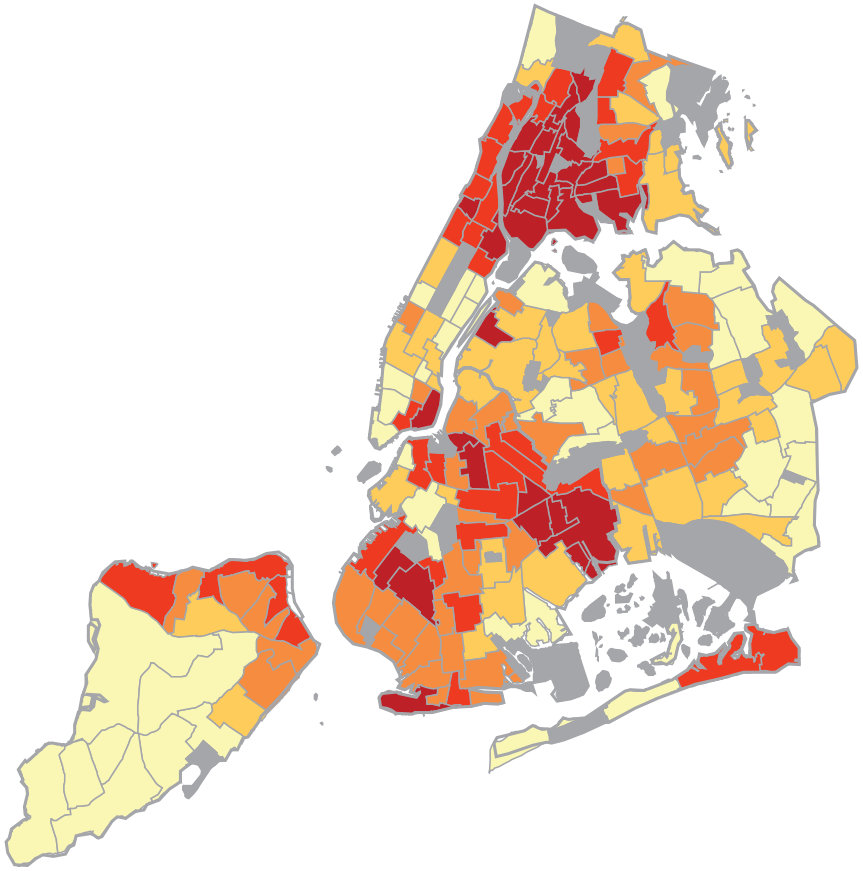
Source(s): New York City Community Air Survey

NYC Department of Health and Mental Hygiene
Environment & Health Data Portal
More information can be found at: *http://nyc.gov/health/tracking*
Accessed November 06, 2020

NYC Health

Environment & Health Data Portal

Poverty - Percent , 2013-17, Neighborhood (NTA)



Percent , 2013-17

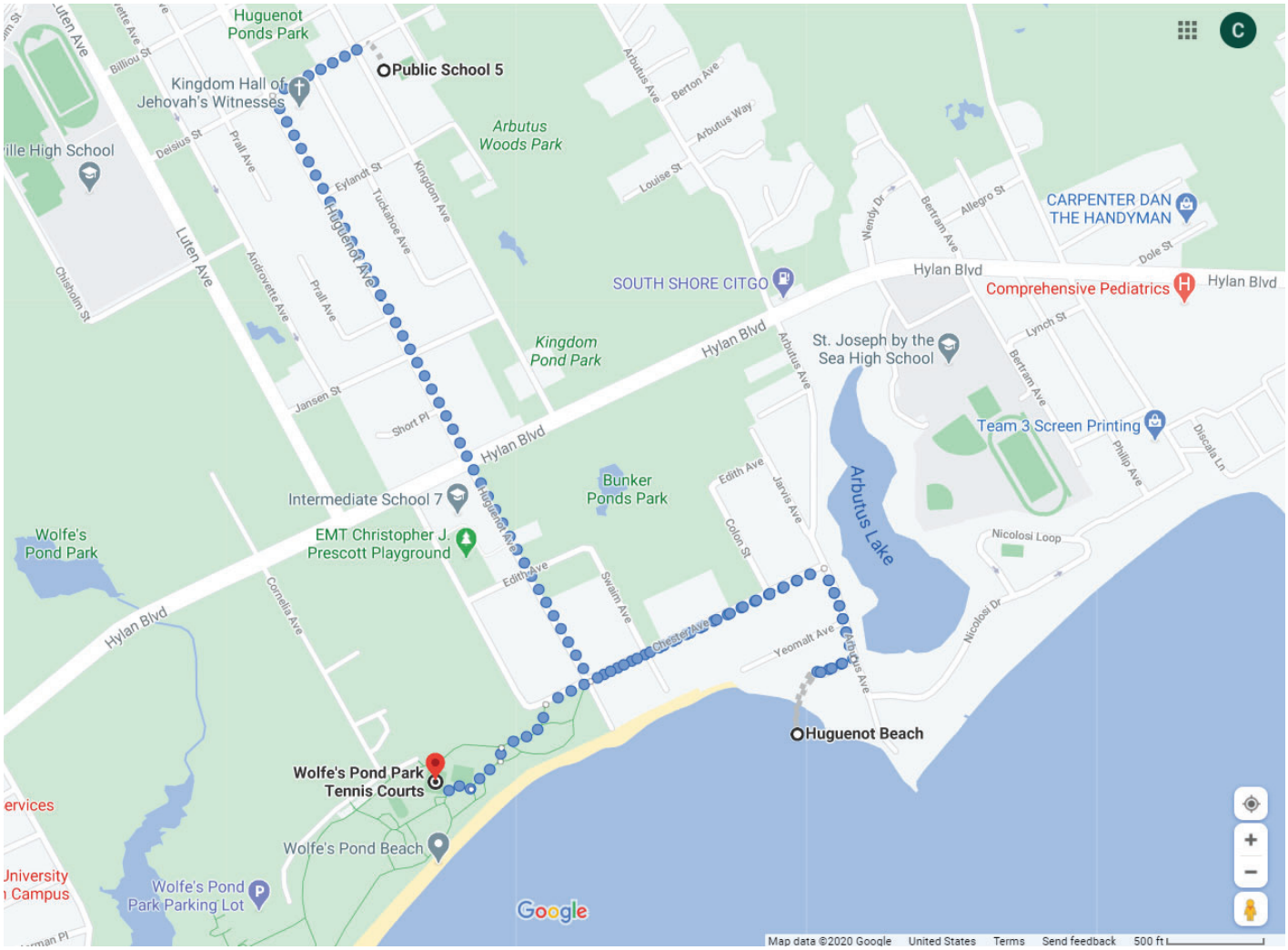
4.3%	9.9%	14.2%	20.6%	29%	57.8%

About the Indicators

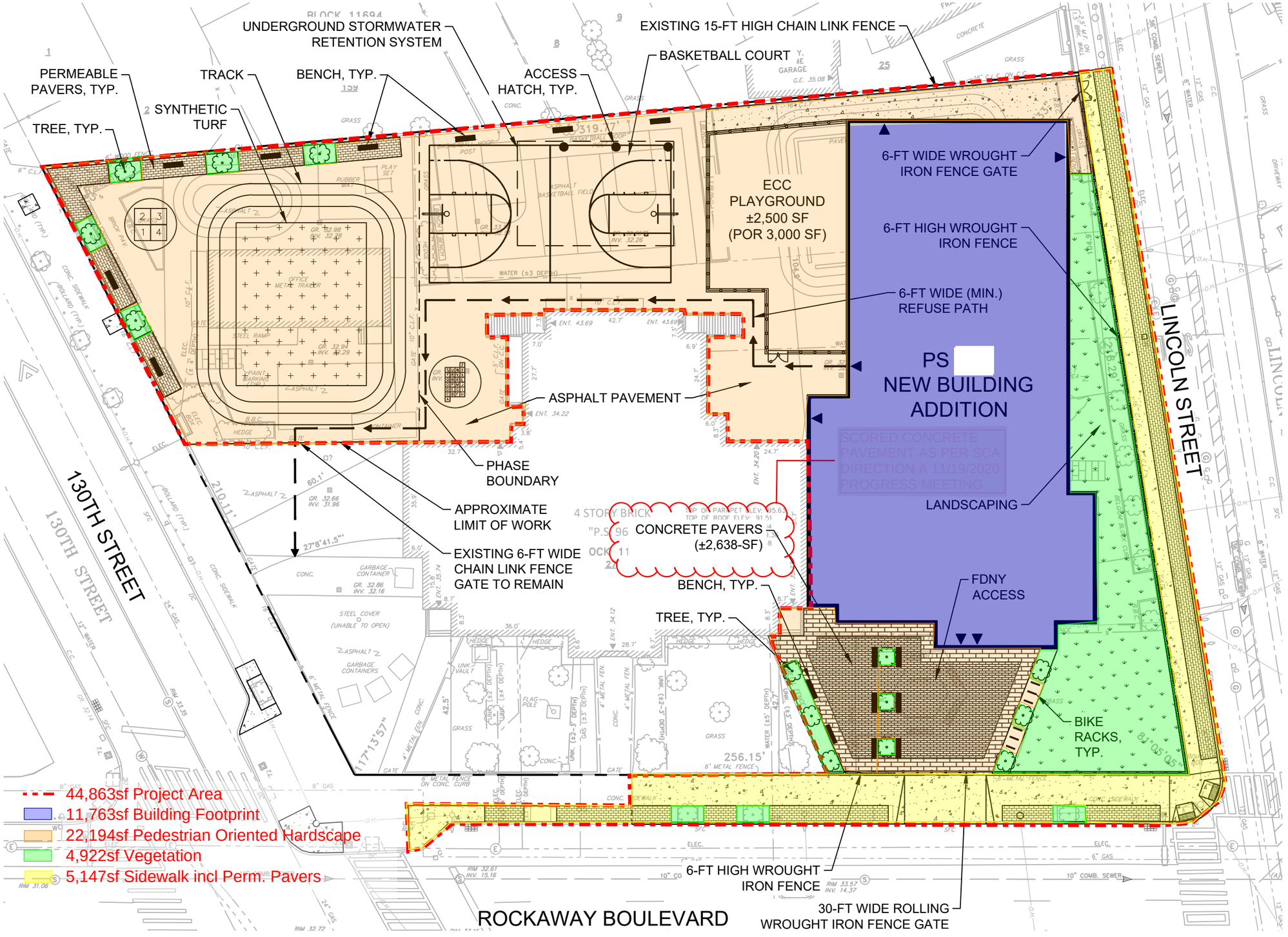
Neighborhood poverty is a major determinant of health, since poverty deprives people of access to health and safety resources.

Name: Poverty **Measure**: Percent **How Calculated**: Estimated number of people for whom poverty status is determined, whose annual income falls below 100% o federal poverty level, divided by the number of people for whom poverty status is determined; expressed as percent. **Source(s)**: American Community Survey

NYC Department of Health and Mental Hygiene
Environment & Health Data Portal
More information can be found at: *http://nyc.gov/health/tracking*
Accessed November 06, 2020


Huguenot Ponds Park
Public School 5
Kingdom Hall of Jehovah's Witnesses
Arbutus Woods Park
CARPENTER DAN THE HANDYMAN
SOUTH SHORE CITGO
Comprehensive Pediatrics
Hylan Blvd
Kingdom Pond Park
St. Joseph by the Sea High School
Team 3 Screen Printing
Intermediate School 7
Bunker Ponds Park
EMT Christopher J. Prescott Playground
Wolfe's Pond Park
Arbutus Lake
Nicolosi Loop
Huguenot Beach
Wolfe's Pond Park Tennis Courts
Wolfe's Pond Beach
Wolfe's Pond Park Parking Lot
Google
Map data ©2020 Google
United States
Terms
Send feedback
500 ft

S2.2 – OPEN SPACE



Hartland Engineering, DPC
152 Edgar Street, 2nd Floor
Weehawken, NJ 07086
347.899.4710

DATE: 17 NOVEMBER 2020

DRAWN BY / CHECKED BY: NB/VS

SCALE:

30 0 15 30

SCALE IN FEET

PROJECT:

PS ADDITION

130-01 ROCKAWAY BLVD, QUEENS, NY 11420

PROJECT NUMBER: 1

TITLE:

SCHEMATIC SITE PLAN

C001.00

S2.3P, S2.4 – GREEN INFRASTRUCTURE ASSESSMENT AND RAINWATER MANAGEMENT

RESPONSIBLE PARTY:

INITIAL SUBMISSION PHASE: SD | DD | 60% | #### | Design | CA

RAINWATER MANAGEMENT
CREDIT FORM
S2.4

Project:		Submission Phase:	DD Submission
Address:	130-17 Rockaway Blvd	Architect:	
LLW #:		Preparer:	
Design #:		Form Revision Date:	2/22/2021

INSTRUCTIONS:
Step 1) Select NOAA Weather File Site nearest to the project. Then select Percentile Rain Event the project is pursuing.
Step 2) List all low-impact development (LID) and green infrastructure (GI) strategies used to manage runoff on-site. The runoff volume must be calculated for the entire developed site. Include the amount of volume managed per strategy. The combination of strategies listed must meet or exceed the runoff volume required to be managed on site.
Step 3) Check compliance.

Step 1: Historical Data

Nearest NOAA Weather File Site	JFK	
Percentile Rainfall Event	95	th percentile

Step 2: List all low-impact development (LID) and green infrastructure (GI) strategies used to manage runoff on-site

LID or GI Strategy Description	Runoff Volume Managed (cu ft)	Percent Runoff Volume Managed (%)
Stormwater Retention System	*8,820*	100%

Step 3: Compliance

Site Area	58,754	SF
Percentile Rainfall Event	1.58	inches
Runoff volume required to be managed on site	7,736	cu ft
Runoff planned to be managed on site	**8,820**	cu ft

SCHEMATIC DESIGN

EXISTING SITE CHARACTERISTICS

TOPOGRAPHY/GEOLOGY/SOILS

Subsurface Conditions (based on historic borings & field data):

Based on the available geotechnical information, the subsurface materials at the site consists of medium dense sand, followed by very stiff Silt and dense sand.

The upper-medium dense sand layer is about 10-ft thick, consisting of red-brown, coarse to fine sand with varying amounts of gravel and Silt.

Very stiff Silt is present below the medium dense sand layer. The thickness of this layer is about 35 feet. This layer consists of red-brown Silt with varying amounts of gravel and Silt.

Below the silt layer at about 45-ft from the ground surface, a dense layer of sand is present. This layer consists of red-brown, coarse to fine sand with varying amounts of gravel and Silt.

Below dense sand layer at about 72-ft from the ground surface, a hard layer of clayey Silt and silty clay with pockets of fine sand is present. This layer consists of yellow-white to gray clayey Silt and silty clay with varying amounts of fine sand.

Based on the existing borings, groundwater is likely to occur at about 12-ft below ground surface, or approximately at elevation 29.0. (*The Elevations refer to Richmond High Water Datum, which is 3.19 feet above United States Coast and Geodetic Survey Datum at Sandy Hook.)*

Topography

The topography of Staten Island ranges from steep hills to flat terrain. A hilly spine trends from about N60°E in the southwestern half of the Island to about N40°E in the northeastern part. The maximum land-surface altitude in the southwest part is about 150 ft above sea level; in the northeast part, where the slopes are steepest, it is about 405 ft. The 405-ft altitude is on Todt Hill, the highest spot on the eastern seaboard that is within 2.5 miles of the Atlantic Ocean. The hilly spine of the Island is flanked by a flat plain ranging from less than 0.1 miles wide at the Island's northern and southern ends to as much as about 2 miles wide in the northwestern part.

Geology

Staten Island is underlain by consolidated rocks (bedrock) and unconsolidated deposits. The bedrock structure is complex, and rock types differ significantly within the Island's 60 square mile area. The Island is underlain by igneous, metamorphic, and sedimentary rocks that range from Upper Proterozoic to Lower Jurassic age. These bedrock units are the Manhattan Schist, serpentine; the Newark Supergroup, undivided; and the Palisade Diabase.

The rocks are directly overlain by unconsolidated deposits of the Upper Cretaceous Raritan Formation, undivided, or by upper Pleistocene deposits of Wisconsinan glacial drift, except in several bedrock-outcrop areas.

Soil

Site soils as shown in Figure 1 below are listed as UGAI, Urban Land-Greenbelt Complex, 0 to 3% slopes, low impervious surface and GUA – Greenbelt, Urban Land Complex 0 to 3% slopes. Most of the development will occur in the UGAI soil areas.

Urban soils typically exhibit a high rate of runoff due to development. No rating is listed for the UGAI soils. The Greenbelt soils, if undisturbed, are in Hydraulic Soil Group (HSG) B which have a lower rate of runoff. Soils in HSG B are suitable for infiltrative practices such as basins or dry wells. Specific to the GUA soil are listed significant amounts of fine particles which indicate possibly poor conditions for infiltration of stormwater and septic tank effluent. However, the location of existing septic systems on the site indicate the soils may be acceptable for these purposes. Soil testing will be required to determine the permeability rate for the site soils to verify that these practices are viable on site provided that no such practice is within setbacks required by the city code. The USDA shows the depth to groundwater is >200 cm. The seasonal high water table would have to be verified by monitoring wells with readings from January through March.

Note that SCA historic soil borings provided indicate the B soils are present in this zone with some areas of silt prevalent.

Seismic Design Parameters

Based on the available SPT data (blow counts), the site falls within a **Site Class D** – soil profile. Seismic Design Category and Peak Ground Acceleration (PGA) for this site is B and 0.156, respectively, based on the International Building Code (IBC) – 2015.

Figure 1 - Soils

BORING ANALYSIS RESULTS

Six (6) borings, designated B-1(OW) to B-6, in the vicinity of the proposed addition, and Three (3) borings, designated SB-1 to SB-3, for pavement design, were drilled at the site between October 10, 2020 and October 18, 2020. The borings were advanced to depths varying between 22 feet and 102 feet below the existing ground surface. Three (3) observation wells were installed within the test borings B-1(OW), B-3, and B-5 to obtain direct measurements of groundwater levels.

A summary of the results of the boring analysis is as follows:

Surface Layer

An approximately 4-inch thick layer of topsoil was encountered in the Borings B-1(OW) and B-2. These borings are located on the northeast corner of the site. An about 4 to 6-inch thick asphalt layer was encountered in the Borings B-3(OW), B-4, and B-5(OW). These borings are located in the playground area on the south side of the existing school building.

Miscellaneous Fill Layer

An approximately 2 to 7 feet thick layer of loose to medium dense miscellaneous fill material was encountered in all the borings. The fill generally consists of brown Silt and coarse to fine Sand with various amounts of Silt and miscellaneous construction debris such as brick. SPT N-values ranged from 3 to 91 with average N-values 26 within this layer. The fill layer is classified as NYCBC Class 7 Material – Uncontrolled Fill.

Loose to Medium Dense Sand Layer

This layer consists of loose to medium dense, coarse to fine Sand with various amounts of Gravel and silt, extending to depths ranging from about 15 feet to 70 feet below the ground surface. SPT N-values ranged from 2 to 30 with average N-values 16 within this layer. The looser sands are classified as NYCBC Class 6 Material- Nominally Unsatisfactory Bearing Material, and the denser sands are classified as NYCBC Class 3b Material – Granular Soils.

Dense Sand Layer

Dense to very dense silty sand was encountered beneath the loose to medium dense sand layer, at depth of about 2 feet to 70 below the existing ground surface. SPT N-values ranged from 31 to 89 with average N-values 44 within this layer. The dense sands are classified as NYCBC Class 3a Material - Granular Soils.

Groundwater Measurements

The static groundwater (GW) levels measured at the time of drilling in the test borings were between about 5 ft and 12 ft below ground surface. Groundwater readings are also measured in the three monitoring wells installed and the table below summarizes the groundwater elevations as measured in these monitoring wells:

Date Measured	Time Measured	Depth to GW (ft +/-)	GW Elevation (ft +/-)	Depth to GW (ft +/-)	GW Elevation	Depth to GW (ft +/-)	GW Elevation

		B-1(OW)	B-1 (OW)	B-3(OW)	(ft +/-) B-3(OW)	B-5(OW)	(ft +/-) B-5(OW)
10/17/20	1:00 PM	14.2	26.8	17.5	22.5	-	-
10/18/20	8:30 AM	14.2	26.8	17.5	22.5	-	-
10/18/20	11:00 AM	14.2	26.8	17.5	22.5	-	-

Foundation Support

Based on the recent investigation performed by KSE, a layer of existing fill is present at the surface throughout the site, underlain by loose to medium dense sand material. Based on the Standard Penetration Test (SPT) "N-Value" results, the compactness of the fill and natural sand material varied from medium to dense and medium to very dense for fill and natural sand, respectively.

The recommended basic allowable bearing pressure on the natural material below the fill is up to 4,000 psf (2 tsf) and the recommended minimum footing width is 3 ft. We recommend that the footings be supported on natural material at a minimum embedment depth of 3.5 ft below the adjoining ground or pavement surface for protection from frost heave. Footing bearing surfaces should be level and clear of debris, standing or frozen water, and other deleterious materials. It is anticipated that total settlements of properly designed and constructed foundations should be less than 1- inch, and differential settlements would be about ½-inch.

After excavating to footing base elevation, the resulting subgrades should be compacted with a large (10-Ton) vibratory roller. Any soft or otherwise unsuitable subgrade soils revealed by the proof rolling should be removed and replaced with controlled compacted fill or clean crushed stone. Controlled-fill if used should be placed in 10-inch maximum thick layers to the design foundation bottom elevation. Each layer of controlled fill should be compacted to at least 95% of Maximum Modified Proctor density.

Slabs on Grade and Pavements

Slabs on grade and pavements can be supported on the existing fill materials, after proof rolling subgrades and removing and replacing any soft spots with controlled fill, as previously described. It is recommended that concrete slabs be directly underlain by at least six inches of compacted, ¾-inch size clean crushed stone or as otherwise required by the design structural engineer. A modulus of subgrade reaction equal to 100 PCI may be used to design slabs-on-grade supported by properly prepared subgrades.

Controlled Fill and Backfill

Controlled compacted fill and backfill material should consist of environmentally clean, well-graded sand and gravel, with a maximum particle size of 2 inches, and less than 12% (by weight) of non-plastic fines (material passing the No. 200 sieve). The fill material should not contain unsuitable matter, such as organic or other deleterious matter, frozen clods, construction debris, etc. The fill should be placed in even horizontal lifts, not exceeding 10

inches loose thickness before compaction. It may be necessary to utilize thinner lifts at locations where compaction is performed using hand-operated equipment. Each lift should be compacted to at least 95% of Maximum Modified Proctor density (ASTM D1557) below foundations or concrete slabs, and 92% of Maximum Modified Proctor density in non-structural areas. The moisture content of the fill material should be uniform and should be in a range of plus/minus two percent of optimum. Existing on-site fill materials can be used as controlled fill, provided that they conform to the above gradation requirements, and can be properly compacted.

EXISTING UTILITIES

Kingdom Avenue (reporting from west to east running longitudinally along roadway)

- 2" gas is reported to be found in the westerly sidewalk
- Electric primary and secondary lines and street lights are on a pole line along the westerly sidewalk,
- Communications and CTV line are found on this same pole line
- Secondary lines cross the roadway feeding an above ground transformer on school property
- 8" DIP water main found in the street near the west curb line
- 10" sanitary sewer line west of center line, with an exsting school building connection mid-block into an existing manhole
- 18" storm sewer beginning at a manhole mid-block and traveling southerly towards Eylandt Street, right of center line of the roadway, with catch basins found in Kingdom Avenue and at the corners of Eylandt street and Deisius Street
- 2" retired gas line is reported near the easterly curb line in the street

Deisius Street (reporting from north to south running longitudinally along the roadway)

- 8" DIP water main found in the street near the northerly curb line
- 30" Storm Sewer north of center line of the roadway, with catch basins found at the corner of Stecher Street and Deisius Street
- 10" sanitary sewer found near the centerline of the roadway
- 2" gas main running near the southerly curb line
- Fire Communications lines run from the school underground in the street and into a manhole at the corner of Kingdom and Deisius. A pull box also feeds in the manhole and runs up a pole on the south west corner of the intersection of Kingdom and Deisius
- Electric primary and secondary lines and street lights are on a pole line along the southerly sidewalk. Service wires were found to run down the pole and to a property box at the property line of the school
- Communications and CTV line are found on this same pole line
- Found in our walk-through the existing school collects some of its site storm water run-off, directs it to the basement and a sump pump discharges to a catch basin at the south east corner of Deisius Street and Kingdom Avenue.

Stecher Street (reporting from east to west running longitudinally along roadway)

- Stecher Street road improvements end approximately ¾ way down the street. It is reported that the remainder is DEP Blue Belt Property
- Electric secondary lines and street lights are on a pole line along the easterly sidewalk

- Communications and CTV line are found on this same pole line
- 2" gas main running near the easterly curb line which ends at the Blue Belt Property
- 10" sanitary sewer line running at the center line of the street, ending at a manhole near the dead end of the street
- 8" DIP water main found in the street near the westerly curb line. Past the street limit the 8" pipe is reported to be cast iron.

PERMITS:

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NYCDEP):

Connection permits will be required for water and fire protection services. A connection permit for the sanitary sewers will be required. A storm water permit will be required for conection to the separete storm sewer system or for on site retention using infitratration pracitices.

NYCDEP has separate departments for Blue Belt, MS 4 (Figures 3 & 4) and Stormwater connections. Submittals may be required to all three or may be waived to a submittal to the connection permits department if the on-site retention of stormwater is available through infiltration. NYCDEP usually requires the retention of the volume for the 5-year storm with a duration of 60 minutes and a Time of concentration. Tc = 6 minutes, rainfall intensity, I = 5.95 inches per hour.

The site is located in the Staten Island Blue Belt Region. (Figure 2)

Figure 2. Staten Island Blue Belt

The project is located in either the Wolfe's Pond basin or Artibus Creek basin of the Staten Island Bluebelt.

NYCDEP states "The Staten Island Bluebelt is an award winning, ecologically sound and cost-effective stormwater management system for approximately one third of Staten Island's land area. The program preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas. Preservation of these wetland systems allows them to perform their functions of conveying, storing, and filtering stormwater. In addition, the Bluebelts provide important community open spaces and diverse wildlife habitats. The Bluebelt program saves tens of millions of dollars in

infrastructure costs when compared to providing conventional storm sewers for the same land area. This program demonstrates how wetland preservation can be economically prudent and environmentally responsible.

The current Bluebelt system drains 15 watersheds clustered at the southern end of the Island, plus the Richmond Creek watershed. The combined area of these 16 watersheds totals approximately 10,000 acres.

This system of strategically placed wetlands over 14,000 acres temporarily stores and filters 350,000 gallons of stormwater—up to 1.75 inches of rain per hour. By protecting and beefing up natural drainage corridors, such as streams and ponds, Staten Island is saving more than $80 million in sewer costs.

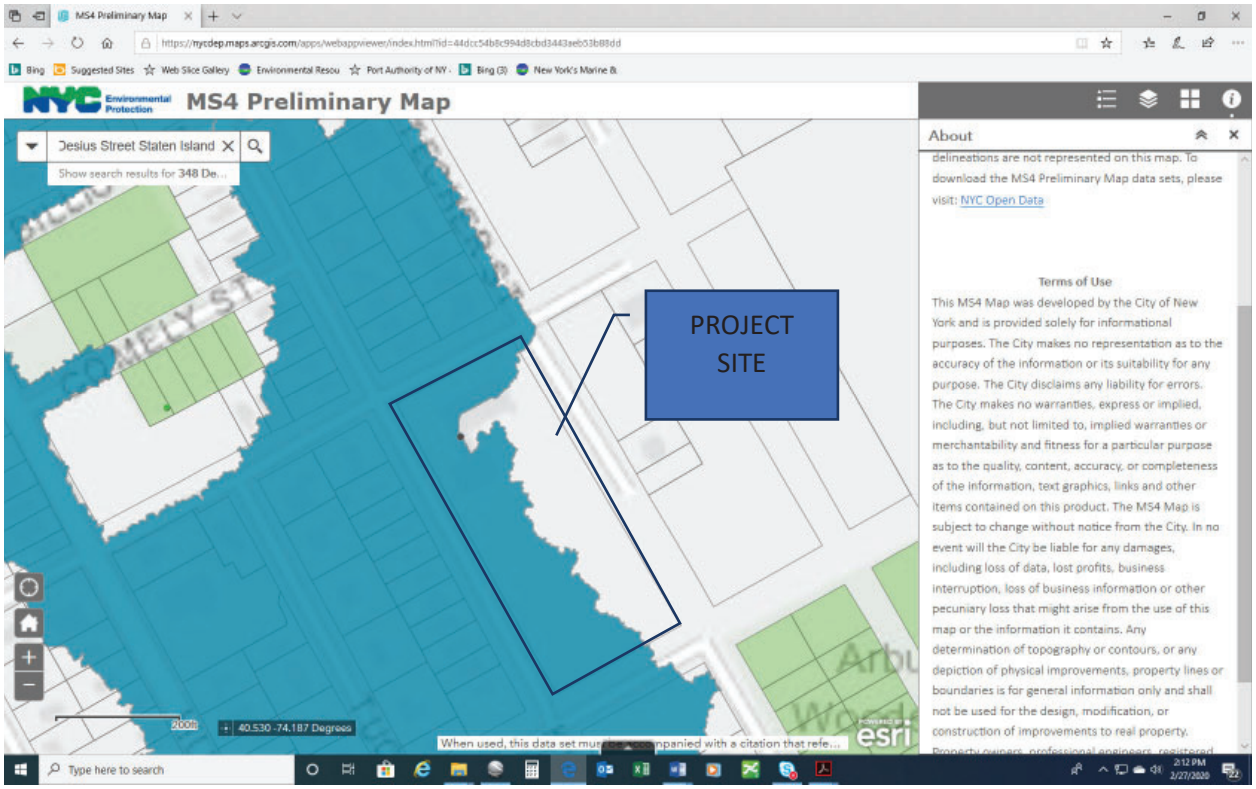


Figure 3 – MS4 Zone

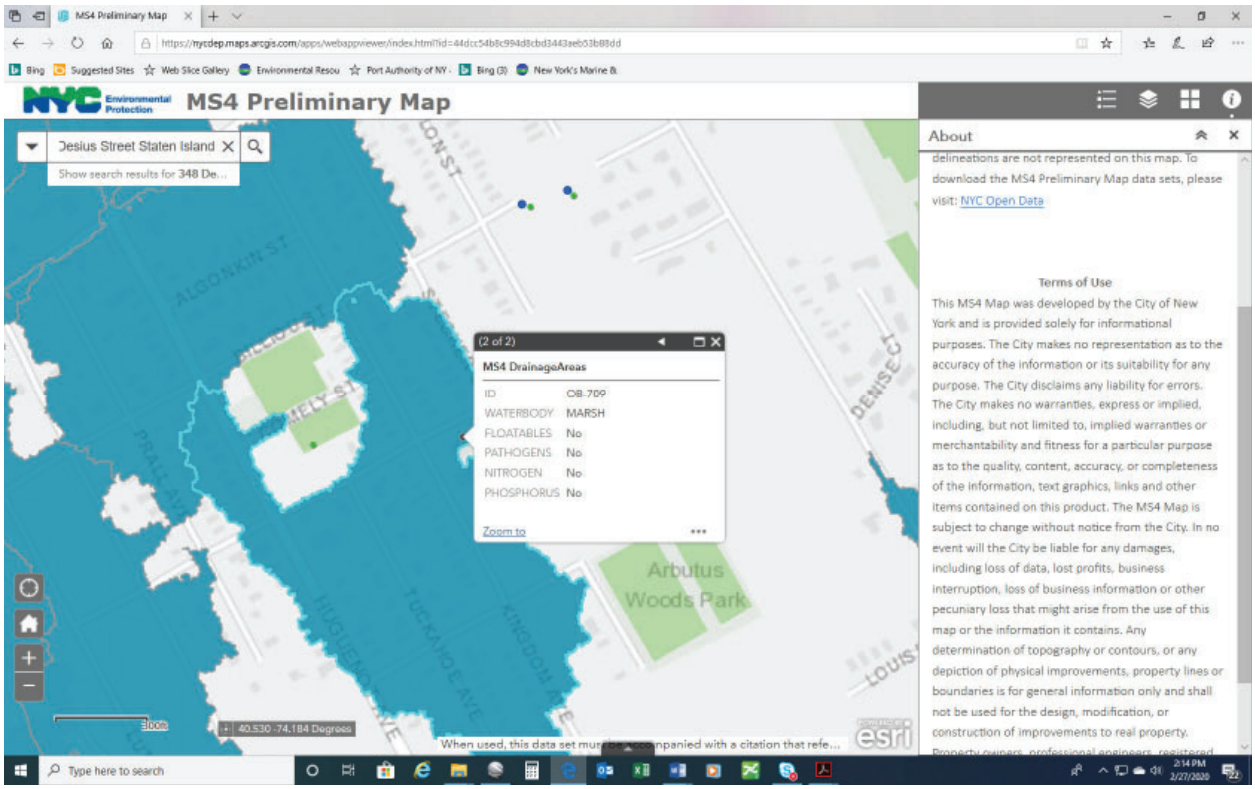


Figure 4 – MS4 Zone

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC).

Construction Activity Permit GP-0-15-002

Site disturbances of one or more acres of land with no impervious cover, 40,000 square feet (0.918 acres) or more require the submittal of a Storm Water Pollution Prevention Plan (SWPPP). Note that the disturbance is on a cumulative basis from existing conditions at the site for any currently proposed and future work. NYSDEC requires a more detailed stormwater analysis for a variety of storms (90th Percentile water quality,

The location of the site in the Richmond County areas discharging to Grassmere, Arbitus and Wolfe Lakes requires design in accordance with the New York State Strom Water Management Design manual as per Appendix E of GP-0-15-002.

A Notice of Intent (NOI) must be filed electronically with the SWPPP to be kept on site during and after construction with the required reporting. Confirmation of filing is required.

PROPOSED SCHOOL AND SITE PLAN

The proposal is to a new five story addition (including basement) on the east side of the school. A new Early Childhood Center (ECC) playground will be constructed directly behind the new building. The existing grass field to the south of the school will be converted into a multi-use playground. The playground area will include new basketball courts, individual games centers, and a track with a grass infield. A new 12-foot chain link fence will be installed around the playground from the end of Stecher Street south to Eylandt Street continuing west to Kingdom Avenue and then north on Kingdom Avenue ending at the entrance to the playground. The balance of the school will be

protected by a six-foot high iron picket fence. A new four-foot high chain link fence will be constructed to separate the school from the playground area.

New utility connections will be required the school addition. The following utilities are located on Stecher Street:

- Stecher Street road improvements end approximately ¾ way down the street. It is reported that the remainder is DEP Blue Belt Property
- Electric secondary lines and street lights are on a pole line along the easterly sidewalk
- Communications and CTV line are found on this same pole line
- 2" gas main running near the easterly curb line which ends at the Blue Belt Property
- 10" sanitary sewer line running at the center line of the street, ending at a manhole near the dead end of the street
- 8" DIP water main found in the street near the westerly curb line. Past the street limit the 8" pipe is reported to be cast iron.

Water, sanitary, gas, and electric service connections will be from Stecher Street.

Sidewalk/Roadway Design

The existing grass area adjacent to the sidewalk along Stecher Street will be replaced with permeable pavers and trees. A new sidewalk meeting the current ADA standards will be constructed with a new handicap ramp located in the southwest corner of Stecher Street/Deisius Street. A new sidewalk will also be constructed on Kingdom Avenue from the entrance to the playground south to Eylandt Street with a new handicap ramp located in the northeast corner of Kingdom Avenue/Eylandt Street. The existing remaining sidewalk and trees will remain in their current condition.

Landscaping

The playground area and the area inside the track will be grass and landscaped. The landscape band will be approximately 15 feet wide beginning at the ECC Playground's chain link fence and then continuing clockwise around the perimeter of the site up. Area drain inlets will be placed within the landscaped area connecting to the detention basin. The number of drain inlets will be determined during the preparation of Design Development documents.

Stormwater Runoff Design

Borings that have been taken showing that the existing soils do not allow water to percolate down through the soils. Therefore, the initial design option to construct a series of infiltration basins to manage stormwater runoff will not be feasible. Therefore, a new detention basin will be located under the play area and designed in accordance with NYCDEP/MS4 and Blue Belt regulations. There is an existing 18-inch storm sewer located in the Kingdom Avenue. The new detention basin comprised on HDPE piping, a water quality structure, and control structure will be connected to the existing storm sewer in Kingdom Avenue. The amount of flow that will be permitted to leave the site and connection point to the existing storm sewer on Kingdom Avenue will be determined after we meet with NYCDEP in accordance with the Blue Belt regulations.

E6.1P – RENEWABLE ENERGY FEASIBILITY

(Net Zero Energy Building Feasibility, no more than 3 stories above grade)

This reporting template is to be utilized for projects that are 3 stories or less

School Construction Authority
Architecture & Engineering

LOCAL LAW 31/16 RENEWABLE ENERGY PRODUCTION REPORT

☒ NET ZERO ENERGY BUILDING FEASIBILITY

[Local Law 31/16 compliant projects that are three stories above grade or less must complete a net zero energy building feasibility study. This form is to be included in the Green Schools Guide Schematic Design submission for E6.1P requirements and for Local Law 31 reporting purposes.]

School Name/Building ID: PS

LLW No. : 112019

Project Description: Addition

Prepared For:

NYC School Construction Authority

3030 Thomson Avenue

Long Island City, NY 11101

Prepared By:

December 18th, 2020

TABLE OF CONTENTS

1.0 OVERVIEW

Project Type *[Indicate per the following categories: Capacity: New Construction- New Building, Addition, Annex* *Substantial Reconstruction of Existing Building including Substantial Work on Building Envelope]*	Addition
Site Area (SF)	115,306
Building Area (SF)	Floor area: 48,965 Footprint: 15,618
Potential Available Roof Space for Renewable Energy System (SF)	6,331
Potential Available Site Space for Renewable Energy System (SF)	10,000

2.0 RENEWABLE ENERGY SOURCES

Strategy	Feasible	Non-Feasible	Ranking	Magnitude of Cost
Solar energy	x		1	$
Wind		x		
Closed-loop biomass*		x		
Open-loop biomass*		x		
Geothermal energy**		x		
Small irrigation power*		x		
Municipal solid waste*		x		
Qualified hydropower production*		x		

**These renewable energy strategies are not typically implemented for SCA projects. These measures will be evaluated on a project by project basis. Investigate the applicability of these strategies to the project.*

***Ground source heat pumps do not qualify as a geothermal energy strategy.*

[Rank the feasibility (from most technically feasible to least technically feasible) of the above qualified energy resources, as defined in section 45 of title 26 of the United States code. Denote NA in spaces that were not investigated for the project as not appropriate to the type of project. Provide a magnitude of cost for each of the items based on typical construction values.]

3.0 NET ZERO ENERGY BUILDING LOAD MANAGEMENT STRATEGIES

ENERGY CONSERVATION MEASURES

Include any ECMs that are not part of the SCA Standard Design Requirements and that can be considered to offset energy consumption.

ECM	EUI REDUCTION
Gearless Elevators with Regenerative Drives	0.6
Wall Thermal Upgrades (R-30)	2.65
Foundation Additional Insulation	0.01
Window and Storefront Lower U-Value (0.18)	2.02
Insulated Infill Panel Upgrade	0.09
Thermal Bridging Mitigation	2.39
Insulated Light Dispersion Panels (R-13)	0.43
Oversized Ductwork & Piping	2.1
Overvoltage Control Device	1.1
Ground Source Heat Pump	*NYC Geothermal Pre-Feasibility Tool results are included in SD GSG submission.*
TOTAL EUI REDUCTION	11.39

4.0 RENEWABLE ENERGY ASSESSMENT

4.1 GENERATION TARGETS

Low Energy Intensity Building Target	65 kBTU/SF/yr (Source EUI)
Projected Annual Energy Usage	873,004 kWh/yr

Net Zero Energy Building Energy Feasibility Study Target Production (Equal to Energy Usage)	873,004 kWh/yr
Onsite Energy Generating Building Energy Feasibility Study Target Production (10% of Energy Usage)*	87,300 kWh/yr

**Each project subject to Local Law 31 of 2016 shall consider the feasibility of designing and constructing such project as an onsite energy generating building.*

4.2 COST ANALYSIS

[Provide construction costs attributable to complying with the net zero energy building requirements. Provide a magnitude of cost for renewable energy costs and load reduction costs based on typical construction values.]

RENEWABLE ENERGY AND LOAD REDUCTION COSTS

ITEM DESCRIPTION	ORDER OF MAGNITUDE COST
RENEWABLE ENERGY COSTS	$ (roof mount) $ (canopy/ground mount)
LOAD REDUCTION COSTS	-
TOTAL COST	$

LIFECYCLE COST ANALYSIS

Parameter	Cost
Annual Cost Savings with Renewable Energy System ($/year)	$
Payback Period for Renewable Energy System (years)	12.36
Annual Cost of Carbon ($/year)	*The project will fall under the LL97 CO2 emissions limits until 2030. Without the solar PV system, the project will pay $ /year in fines between 2030 and 2034. Emissions limits beyond 2034 are not set, however, assuming a steady CO2 limit reduction, fines could increase to $9,162/year between 2035 and 2040.*

4.3 BENEFITS OF RENEWABLE ENERGY PRODUCTION

The project has many opportunities for both roof-mounted and ground-mounted solar PV systems due to its large site area. The south-west orientation or the new building will maximize solar exposure for rooftop mounted systems, while the low-rise surrounding buildings will limit shading of canopy/ground-mounted systems. Solar PV is very suitable for use in a school building because the peak generation and peak electricity demand coincide, meaning the project can directly consume its generated electricity before selling it to the grid. Additionally, a canopy mounted PV system can act as a shading device for walkways, improving thermal comfort during summer.

Solar PV systems result in reduced environmental impacts through the following:

- *Zero operational emissions of greenhouse gases which cause global warming*
- *Zero particulate emissions (unlike energy generated via combustion)*
- *Reduced noise pollution (also evident with energy generated via combustion)*
- *Reduced urban heat island effect via shading of roof surfaces and hardscape*

Economic benefits of solar PV include a return on investment, low operation and maintenance costs due to fewer moving parts and long lifespan of equipment and components, avoiding fluctuating utility prices, as well as net metering benefits.

Energy benefits of solar PV include a potential for surplus electricity production that can be used to charge on-site batteries (for use overnight) or produce ice for cooling air in HVAC systems. Solar PV is also a stable and reliable source of energy that lowers the strain on the city's power grid.

The solar PV system proposed in this feasibility report has been sized to cover the estimated annual electricity demand for the building (323,781 kWh/year) and contains a 119 kW(DC) rooftop mounted array and 150kW(DC) canopy/ground mounted array.. The combined generation potential for the two systems is 330,159 kWh/year. Further generation details can be found in Appendix B. A solar PV system capable of generating enough electricity to cover the equivalent amount of natural gas energy would require a significantly larger canopy or ground mounted system.

Installation of a solar PV system will result in immediate carbon footprint reductions (as shown below) and potentially maintain the building's compliance with Local Law 97 of 2019 (LL97/2019) until the mid-2040s. At some point before 2050, the project may need to consider carbon offsets, increased solar PV capacity and/or electrification to mitigate fines due to LL97/2019.

Parameter	Savings
Annual Carbon Footprint Reduction (MTCO2e)	47

Project teams are to multiply projected annual energy usage (kWh/yr) by the DCAS factor of .000288962 to determine the annual carbon footprint reduction.

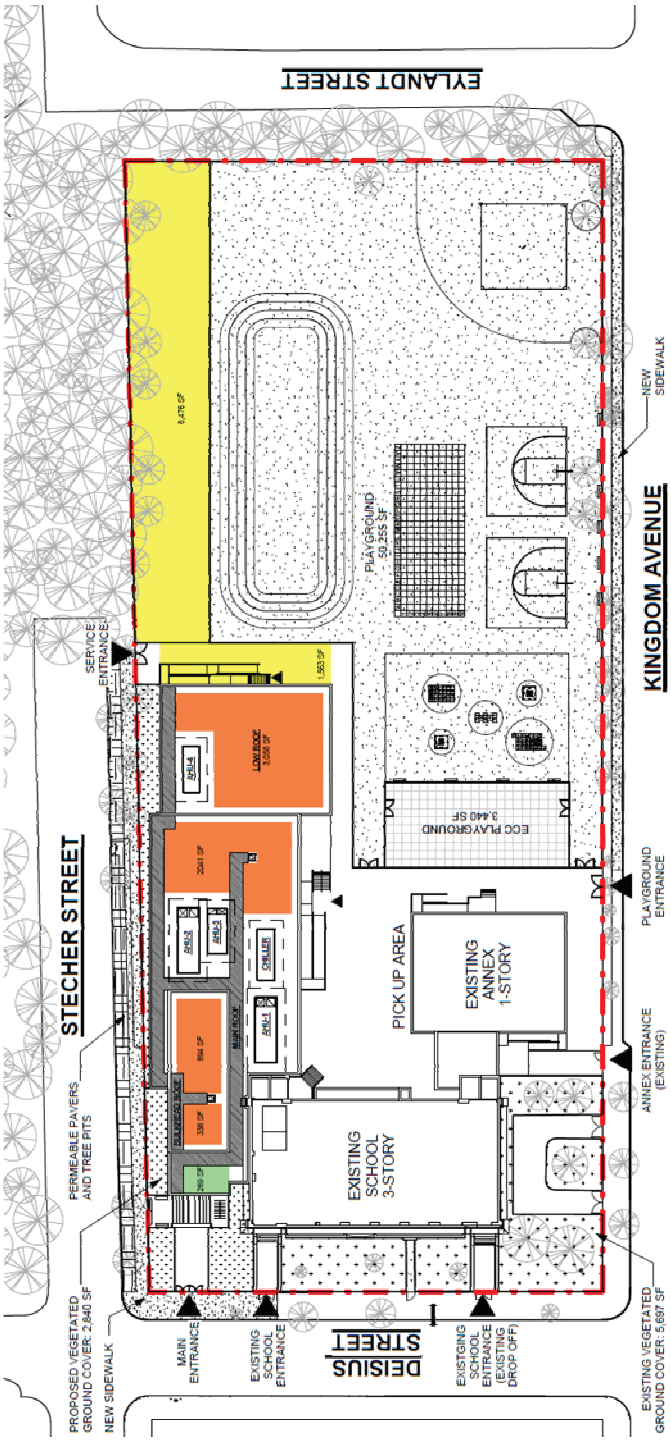
5.0 APPENDICES

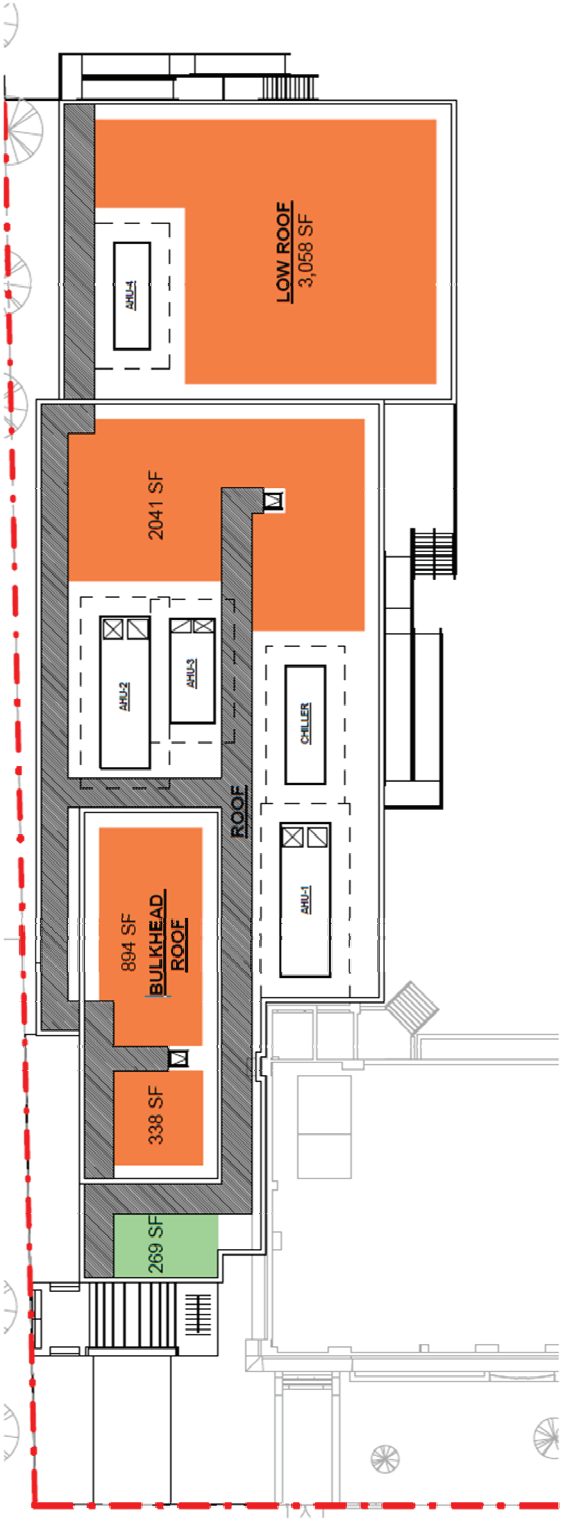
APPENDIX A – SITE AND ROOF PLAN

[Provide a site and/or roof plan to denote location of feasible renewable energy strategies.]

Roof mount

Canopy/ground mount




LOW ROOF
3,058 SF
AHU-4
2041 SF
AHU-2
AHU-3
CHILLER
ROOF
894 SF
BULKHEAD
ROOF
AHU-1
338 SF
269 SF

APPENDIX B – PRODUCTION RESULTS

Please find NREL PVWatts Calculator output data on the following pages.

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at https://sam.nrel.gov) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

141,423 kWh/Year*

System output may range from 136,035 to 148,141 kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	2.24	6,811	787
February	3.20	8,706	1,006
March	4.15	12,379	1,430
April	5.11	14,093	1,628
May	5.82	16,237	1,875
June	6.06	16,189	1,870
July	6.31	17,138	1,979
August	5.59	15,126	1,747
September	4.75	12,673	1,464
October	3.26	9,287	1,073
November	2.44	6,860	792
December	2.00	5,923	684
Annual	**4.24**	**141,422**	**$ 16,335**

Location and Station Identification

Requested Location	348 Deisius St, Staten Island, NY 10312
Weather Data Source	Lat, Lon: 40.53, -74.18 0.4 mi
Latitude	40.53° N
Longitude	74.18° W

PV System Specifications *(Commercial)*

DC System Size	119 kW
Module Type	Premium
Array Type	Fixed (roof mount)
Array Tilt	10°
Array Azimuth	240°
System Losses	14.08%
Inverter Efficiency	96%
DC to AC Size Ratio	1.2

Economics

Average Retail Electricity Rate	0.116 $/kWh

Performance Metrics

Capacity Factor	13.6%

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at https://sam.nrel.gov) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

188,736 kWh/Year*

System output may range from 181,545 to 197,701 kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	2.47	9,616	1,111
February	3.47	12,039	1,390
March	4.39	16,661	1,924
April	5.26	18,496	2,136
May	5.89	20,962	2,421
June	6.17	20,976	2,423
July	6.38	22,082	2,550
August	5.75	19,833	2,291
September	4.99	16,933	1,956
October	3.52	12,768	1,475
November	2.70	9,720	1,123
December	2.28	8,649	999
Annual	4.44	188,735	$ 21,799

Location and Station Identification

Requested Location	348 Deisius St, Staten Island, NY 10312
Weather Data Source	Lat, Lon: 40.53, -74.18 0.4 mi
Latitude	40.53° N
Longitude	74.18° W

PV System Specifications *(Commercial)*

DC System Size	150 kW
Module Type	Premium
Array Type	Fixed (open rack)
Array Tilt	10°
Array Azimuth	180°
System Losses	14.08%
Inverter Efficiency	96%
DC to AC Size Ratio	1.2

Economics

Average Retail Electricity Rate	0.116 $/kWh

Performance Metrics

Capacity Factor	14.4%

E6.1P – RENEWABLE ENERGY FEASIBILITY

(ONSITE ENERGY GENERATING BUILDING FEASIBILITY, more than 3 stories above grade)

This reporting template is to be utilized for projects that are more than 3 stories

School Construction Authority
Architecture & Engineering

LOCAL LAW 31/16 RENEWABLE ENERGY PRODUCTION REPORT

☒ ONSITE ENERGY GENERATING BUILDING FEASIBILITY

School Name/Building ID:

PS Queens /

LLW No. :

Project Description:

PSQ Addition

Prepared For:

NYC School Construction Authority

3030 Thomson Avenue

Long Island City, NY 11101

Prepared By:

, Inc.

December 18, 2020

TABLE OF CONTENTS

1.0 OVERVIEW

Project Type	New Construction- Addition
Site Area (SF)	39,363sf (Project Boundary)
Building Area (SF)	38,268sf
Potential Available Roof Space for Renewable Energy System (SF)	3,340sf
Potential Available Site Space for Renewable Energy System (SF)	0 sf

2.0 RENEWABLE ENERGY SOURCES

Strategy	Feasible	Non-Feasible	Ranking	Magnitude of Cost
Solar energy	X		1	$
Wind		X		
Closed-loop biomass*		X		
Open-loop biomass*		X		
Geothermal energy**		X		
Small irrigation power*		X		
Municipal solid waste*		X		
Qualified hydropower production*		X		

3.0 RENEWABLE ENERGY ASSESSMENT

3.1 GENERATION TARGETS

Low Energy Intensity Building Target	**70 kBTU/SF/yr** (Source EUI)
Projected Annual Energy Usage	**208,780 kWh/yr**

Onsite Energy Generating Building Energy Feasibility Study Target Production (10% of Energy Usage)	**20,878 kWh/yr**

3.2 COST ANALYSIS

RENEWABLE ENERGY COSTS

ITEM DESCRIPTION	ORDER OF MAGNITUDE COST
RENEWABLE ENERGY COSTS	$ (per RS Means)
TOTAL COST	$ (per RS Means)

LIFECYCLE COST ANALYSIS

Parameter	Cost
Annual Cost Savings with Renewable Energy System ($/year)	$ (PV Watts Value)
Payback Period for Renewable Energy System (years)	14.4
Annual Cost of Carbon ($/year)	

3.3 BENEFITS OF RENEWABLE ENERGY PRODUCTION

Due to its location in a neighborhood with low-rise buildings to prevent shading and availability of building SF for rooftop installations, the project is able to benefit from onsite rooftop PV array. A shading study was prepared by the architect to determine the best location of the array.

Environmental impacts include less pollution emitted to the environment due to the use of a natural and clean source of energy and less reliance on fossil fuels that generate harmful emissions, less noise pollution, and the offset of carbon emissions produced by a non-renewable energy sources.

Economic benefits include a return on investment, low operation and maintenance costs, less dependency on fluctuating utility costs, and net metering benefits. Additionally, an alternate source of electricity during peak demand will drive the project away from higher energy costs at this time.

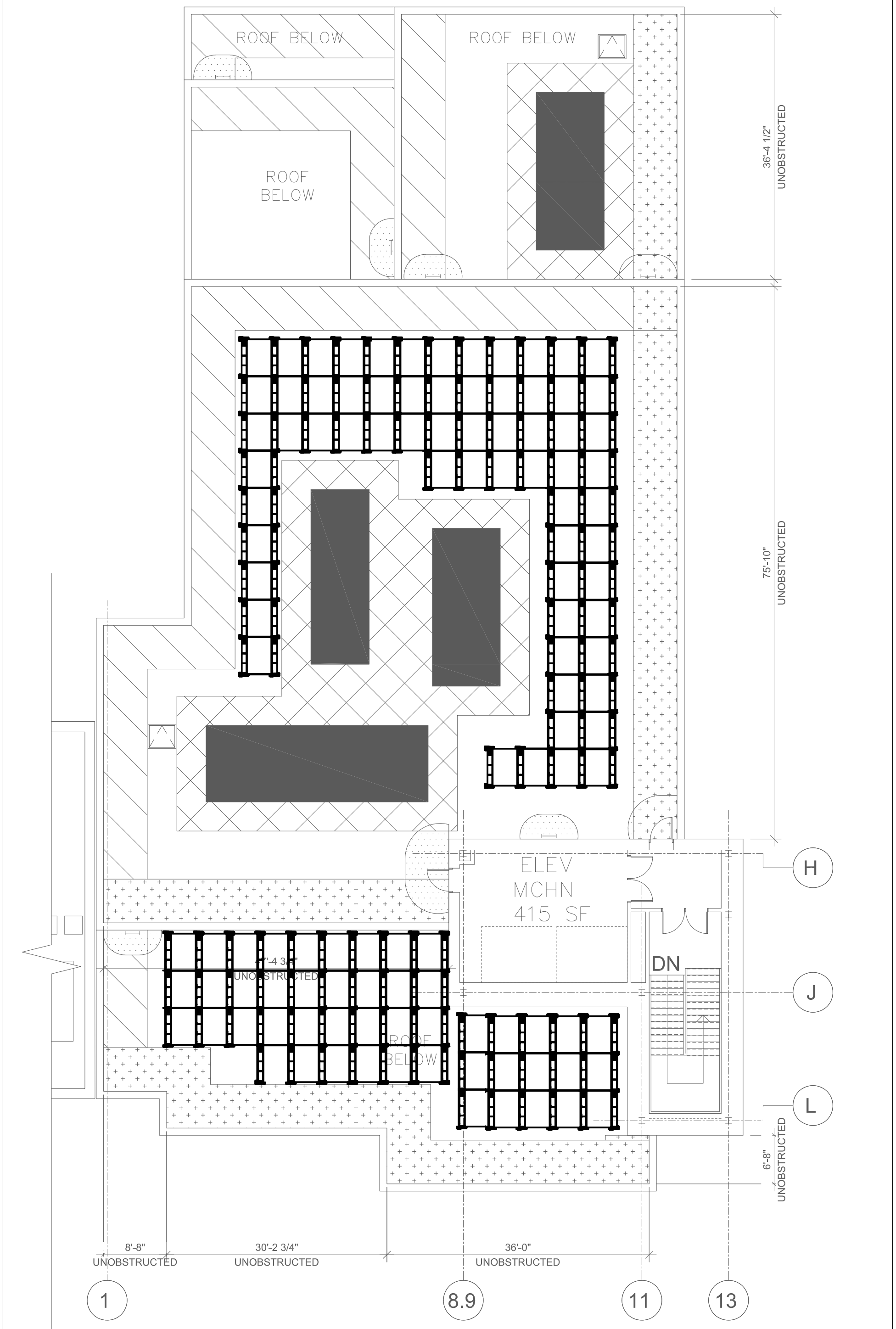
Energy benefits include a potential for surplus production of energy that is used to meet electricity demand, high efficiency system, a reliable source of energy, and less strain on the city's power grid thereby avoiding blackouts.

By installing a rooftop PV array, the project assists in compliance with Local Law 97/2019 due to annual reductions in greenhouse gas emissions and will support New York City's goals of installing 100 MW of solar capacity. The installation will also assist in compliance with Local Law 94/2019 to maximize sustainable roofing.

Parameter	**Savings**
Annual Carbon Footprint Reduction (MTCO2e)	38.4 metric tons (per EPA GGE calculator)

Project teams are to multiply projected annual energy usage (kWh/yr) by the DCAS factor of .000288962 to determine the annual carbon footprint reduction.

4.0 APPENDICES



PROPOSED ROOF PV SYSTEM LAYOUT

SCALE: 1/8"=1'-0"

0 4' 28'

' 12'

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at https://sam.nrel.gov) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

54,336 kWh/Year*

System output may range from 52,157 to 56,157 kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	2.57	2,761	319
February	3.52	3,366	389
March	4.28	4,486	518
April	5.38	5,291	611
May	6.22	6,202	716
June	6.52	6,171	713
July	6.59	6,352	734
August	6.06	5,873	678
September	5.23	5,016	579
October	3.69	3,698	427
November	2.77	2,772	320
December	2.26	2,349	271
Annual	**4.59**	**54,337**	**$ 6,275**

User Comments

PS96Q

Location and Station Identification

Requested Location	130-01 Rockaway Blvd Queens, NY 11430
Weather Data Source	Lat, Lon: 40.69, -73.82 1.2 mi
Latitude	40.69° N
Longitude	73.82° W

PV System Specifications *(Commercial)*

DC System Size	41 kW
Module Type	Premium
Array Type	Fixed (open rack)
Array Tilt	10°
Array Azimuth	180°
System Losses	14.08%
Inverter Efficiency	96%
DC to AC Size Ratio	1.2

Economics

Average Retail Electricity Rate	0.116 $/kWh

Performance Metrics

Capacity Factor	15.1%

The following 2 examples indicate applicability or non-applicability of CFD modeling.
Only 1 report will be required for the GSG-SD submission.

Q1.1P – MINIMUM IAQ PERFORMANCE

November 28, 2018

Mr.
Industrial Hygienist C, IEH Division
New York City School Construction Authority
30-30 Thomson Avenue
Long Island City, NY 11101-3045

Re: ASHRAE Outdoor Air Assessment
Proposed Addition to Public School Facility l
348 Deisius Street, Staten Island, New York
Block 6566, Portion of Lot 1
LLW # 112019
D&B No. 3834-BU2

Dear

At the request of the New York City School Construction Authority (NYCSCA), Engineers and Architects, P.C. (I conducted an American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Outdoor Air Assessment for the Proposed Addition to Public School Facility R005 located at 348 Deisius Street, Staten Island, New York (hereafter referred to as the "Site"). The assessment was conducted in accordance with the ASHRAE Standard 62.1-2016 (Standard) Section 4.0 ("Outdoor Air Quality"). The assessment was conducted to satisfy the New York City Department of Education/NYCSCA Green Schools Guide Credit Q1.1 R: Minimum IAQ Performance/Increased Ventilation. The assessment consisted of a qualitative evaluation of regional and local air quality, but did not include air sampling, modeling or other detailed analysis.

Regional Air Quality Compliance Status

Criteria Air Pollutants are those substances for which a National Ambient Air Quality Standard (NAAQS) has been established, as specified in the Clean Air Act. The following table contains a summary of criteria pollutant information for Richmond County provided by the United States Environmental Protection Agency's (USEPA) Green Book Non-attainment Areas for Criteria Pollutants website.

Regional Outdoor Air Quality Pollutants							
	Particulates (PM2.5)	**Particulates (PM10)**	**Carbon Monoxide – 1 hour/8 hour**	**Ozone 8 hour**	**Nitrogen Dioxide**	**Lead**	**Sulfur Dioxide**
Attainment Status	Attainment	Attainment	Maintenance	**Non-attainment**	Attainment	Attainment	Attainment

In April 2016, as requested by New York State, USEPA reclassified New York City as a moderate nonattainment area for ozone. Areas classified as moderate nonattainment have 8-hour ozone design value concentrations ranging from 0.086 to 0.100 parts per million (ppm).

Local Survey

Date and Time of Observation

A survey of the Site and surrounding areas was conducted on November 6, 2018 at 11:00 a.m. by Ms. Environmental Scientist of

Site Description

The Site consists of the asphalt play area located on the southern side of the existing I school building and the grass area located on the eastern side of the school building. The Site is located at 348 Deisius Street in Staten Island, New York. At the time of the inspection, the weather was overcast with a temperature of 60 degrees Fahrenheit and 7 mile per hour winds out of the southeast. Limiting conditions affecting observation of air quality were not encountered during the survey. In addition to the Site, the surrounding properties within a 400-foot radius were surveyed for potential point sources of air emissions.

Description of Nearby Facilities

The surrounding area is primarily characterized by residential and institutional uses. The Site is bounded to the north by the P.S. : school building and Deisius Street followed by residential properties; to the east by Stecher Street followed by residential properties; to the south by the P.S. : field; and to the west by the P.S. : school building and mini-building.

Observation of Odors, Irritants, Visible Plumes or Air Contaminants

No odors, irritants, visible plumes or air contaminants were observed during the Site visit.

Description of Nearby Sources of Vehicle Exhaust

Light traffic flow was observed adjoining the Site to the north on Deisius Street, to the east on Stecher Street and to the west on Kingdom Avenue.

Description of Nearby Point Sources

Based on a review of USEPA Envirofacts Air Facility System (AFS) database (https://www.epa.gov/enviro/icis-air-search), no listed facilities are located within approximately 1,000 feet of the Site.

Discussion and Conclusions

In order to determine the acceptability of outdoor air, the nearby facilities identified during the assessment were evaluated against the following screening criteria[1]:

- Large parking facilities or parking garage exhaust vents adjacent to the Site;

[1] Based on guidance for evaluation of air quality in the *City Environmental Quality Review Technical Manual* (New York City Mayor's Office of Environmental Coordination, March 2014).

- An atypical (e.g., not at-grade) source of vehicular pollutants, such as a highway or bridge, within 200 feet of the Site;
- A major or large emission source within 1,000 feet of the Site;
- A medical, chemical or research laboratory within 400 feet of the Site;
- Manufacturing or processing facilities within 400 feet of the Site;
- A facility with a New York State Department of Environmental Conservation (NYSDEC) air facility registration within 200 feet the site.

No CFD modeling needed

Based on this evaluation and the findings of the local survey, no facilities were identified with the potential to affect the acceptability of the outdoor air quality at the Site.

If you have any questions and/or comments, please do not hesitate to contact me at (516) 364-9890, Ext. 3006.

Sincerely,

Senior Vice President

RMW\MHt\nc
•3834\RMW112718SK_ltr

February 11, 2020

Ms.
Industrial Hygienist
Industrial & Environmental Hygiene Division
New York City School Construction Authority
30-30 Thomson Avenue, Long Island City, NY 11101

Re: ASHRAE Outdoor Air Assessment
Public School (P.S.) – Proposed Building Addition
130-01 Rockaway Boulevard, South Ozone Park, New York 11420
Block 11694, Lot 27
NYCSCA LLW No. 116480

Dear Ms.

At the request of the New York City School Construction Authority (NYCSCA), AECOM Technical Services, Inc. (conducted an American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Outdoor Air Assessment in support of the proposed building addition at Public School (P.S.) (, located at 130-01 Rockaway Boulevard, South Ozone Park, New York 11420 (the "Site"). While the exact layout of the proposed building addition has not been finalized, the proposed building addition will occupy the eastern portion of the property.

The assessment was conducted in accordance with the ASHRAE Standard 62.1-2016 (Standard) Section 4.0: Outdoor Air Quality. The assessment was conducted to satisfy the New York City Department of Education/NYCSCA Green Schools Guide Credit Q1.1R: Minimum IAQ Performance/Increased Ventilation. The assessment consisted of a qualitative evaluation of regional and local air quality, and did not include air sampling, modeling, or other detailed analysis.

Regional Air Quality Compliance Status

Criteria Air Pollutants are those substances for which a National Ambient Air Quality Standard (NAAQS) has been established, as provided in the Clean Air Act. The following table contains a summary of criteria pollutant information for Queens County provided by the U.S. Environmental Protection Agency's (USEPA) Green Book Nonattainment Areas for Criteria Pollutants website.

	Regional Outdoor Air Quality Pollutants						
	Particulates (PM2.5)	**Particulates (PM10)**	**Carbon Monoxide – 1 hour/8 hours**	**Ozone 8-hour**	**Nitrogen Dioxide**	**Lead**	**Sulfur Dioxide**
Attainment Status	Attainment	Attainment	Attainment	**Non-attainment**	Attainment	Attainment	Attainment

In August 2019 (effective September 23, 2019), USEPA reclassified New York City as a serious nonattainment area for the 2008 8-hour Ozone Standard.

Local Survey

Date and Time of Observation
Visual inspection of the Site and adjacent areas was performed on December 22, 2019 at approximately 2:00 PM by Stephen Libert of

Site Description
The approximately 55,910 square foot (sf) lot is improved with an approximately 32,000 sf three-story inverted T-shaped brick school building with a basement. The southern portion of the building includes a basement and three stories. The northern part of the building includes a basement and first floor only. At the time of the inspection, weather conditions were cloudy with a temperature of approximately 32º Fahrenheit, and a breeze with winds traveling 5 miles per hour from the north-northeast. No limiting conditions associated with the weather were encountered. The surrounding properties within a 500-foot radius of the perimeter of the Site were surveyed for potential point sources of air emissions.

Description of Nearby Facilities
The Site is bounded to the north by residential properties followed by Foch Boulevard and low-rise residential properties further to the north; to the east by Lincoln Street, followed by low rise residential and retail properties; to the south by Rockaway Boulevard, with a Sunoco Service Station, private school ("Al-Ihsan Academy"), and commercial properties located on the south side of Rockaway Boulevard; and, to the west by 130th Street followed by a lumber yard ("South Ozone Lumber"). Two vehicle repair shops ("DR Auto Body" and "Continental Lift Trucks") were also identified further to the northwest and west during the Site reconnaissance.

Observation of Odors, Irritants, Visible Plumes or Air Contaminants
No odors, irritants, visible plumes or air contaminants were noted during the survey.

Description of Nearby Sources of Vehicle Exhaust
The nearest roadway with heavy traffic flow is Rockaway Boulevard which adjoins the Site building to the south. Lincoln Street adjoins the Site to the east and 130th Street adjoins the Site to the west. Both roadways as well as Foch Boulevard located further to the north are used for local traffic.

Description of Nearby Point Sources
Based on a review of USEPA Envirofacts Air Facility System (AFS) database (https://www.epa.gov/enviro/icis-air-search), the following facilities, located within approximately 1,000 feet of the Site, are potential point sources or air emissions:

Site Name	Address	Distance from Site	Air Program Information[1]	Notes
128 Rockaway Motors (Sunoco Service Station)	128-24 Rockaway Boulevard, South Ozone Park, NY 11420	<200 feet	SIP (Operating)	Gasoline Service Station, Minor Emissions
DR Auto Repair and Body Shop	116-51 128th Street, South Ozone Park, NY 11420	~400 feet	SIP (Operating)	Minor Emissions
Ann's Cleaners (Dry Cleaner)	133-02 Rockaway Boulevard, South Ozone Park, NY 11420	~650 feet	MACT, SIP (Operating)	MACT 63 NESHAPS-Subpart M Dry Cleaners Perchloroethylene
Ozone Auto Body	125-07 Rockaway Boulevard, South Ozone Park, NY 11420	~1000 feet	MACT, SIP (Operating)	MACT 63 NESHAPS-Subpart 6H Paint Strip & Misc. Surface Coating Operations Area Source

1 MACT = Maximum Achievable Control Technology (MACT) Standards (40 CFR Part 63); NESHAP = National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61);
2 SIP = Clean Air Act State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards

Discussion and Conclusions

In order to determine the acceptability of outdoor air, the nearby facilities identified during the assessment were evaluated against the following screening criteria[3]:

- Large parking facilities or parking garage exhaust vents adjacent to the Site;
- An atypical (e.g., not at-grade) source of vehicular pollutants, such as a highway or bridge, within 200 feet of the Site;
- A major or large emission source within 1,000 feet of the Site;
- A medical, chemical, or research lab within 400 feet of the Site;
- Manufacturing or processing facilities within 400 feet of the Site; and
- A facility with a New York State Department of Environmental Conservation (NYSDEC) air facility registration within 200 feet the site.

CFD modeling will be required. SCA will request it.

Based on this evaluation and the findings of the local survey, the following source may affect the acceptability of the outdoor air quality at the Site:

1. 128 Rockaway Motors (Sunoco Service Station), located approximately 200 feet southwest from the Site, across Rockaway Boulevard. This gas station facility is listed as Minor Emission with no specific pollutant description.

Therefore, recommends conducting further evaluation of emissions from surrounding sources to determine whether additional design measures beyond the standard NYCSCA requirements should be incorporated into the building's heating, ventilation, and air conditioning (HVAC) system.

Please do not hesitate to contact either myself at or on my cell phone at or at s or via cell phone at at if you have any questions or concerns.

Sincerely,

Project Manager

cc:

[3] Based on guidance for evaluation of air quality in the *City Environmental Quality Review Technical Manual* (New York City Mayor's Office of Environmental Coordination, March 2014).

I1.1R – LEED® ACCREDITED PROFESSIONAL

-AP-BD+C

CREDENTIAL ID

12 MAR 2010

ISSUED

10 MAR 2022

VALID THROUGH

GREEN BUSINESS CERTIFICATION INC. CERTIFIES THAT

LEED AP BD+C is required.

HAS ATTAINED THE DESIGNATION OF

LEED AP® Building Design + Construction

by demonstrating the knowledge and understanding of green building practices and principles needed to support the use of the LEED® green building program.

MAHESH RAMANUJAN
PRESIDENT & CEO, U.S. GREEN BUILDING COUNCIL
PRESIDENT & CEO, GREEN BUSINESS CERTIFICATION INC.

REVISED IDP REPORT COVER PAGE

This Workshop Report is intended to be used as a reference only. Please refer to the requirements outlined in the IDP Facilitator Guide and the Green Schools Guide for a complete list of requirements.

TABLE OF CONTENTS

Integrative Design Report and Recommendations

Design Phase/	Turnover date	Occupancy Year
Pre schematic	10/25/21	2024

Capacity Project GSG IDP Workshop Meeting Minutes

Date: 12/15/2020
Re: Project Design Kick-off Meeting

List of Attendees				
Initial	Name (SCA/DOE/DSF/Consultant)	Company /Department:	Telephone	Email Address
X				
X				
X				
X				
X				
X				
X				
X				
X				
X				

PS96Q IDP Workshop meeting minutes
Revised 3/18/2020

The PS [redacted] Integrative Design Process workshop was held on 3/16/20 at SCA and remotely via Skype. Attendees are listed on the sign in sheet, provided separately. All documents reviewed during the workshop are included in Integrative Design Process Workshop report dated March 12, 2020, issued by [redacted] Architects and the team.

Summary of Discussion:

Introduction
After introductions, [redacted] provided overview of the IDP process and discoveries conducted by the design team. The IDP discussion is intended to address GSG 2019 standards, relevant local laws, and also ideas beyond the standards and credits. [redacted] reviews the three schemes (A,B,C formerly 7,8a,8b) that have been developed. [redacted] indicates plans for each scheme are to be included in final IDP report.

Discovery #1 Energy
[redacted] presented results of box energy model for the three schemes and reviewed the Box Model Summary form inputs. [redacted] discussed differences in building massing, Window to Wall ratio, and how these differences effect the Box Model results. SCA to provide team with list of EEMs to meet LL31 for reference. Per discussion, a net-zero analysis will not be required as the design is more than 3 stories.

Geothermal tool was reviewed, note that printout in report includes incorrect building and site area. This will be revised for the final report. Geothermal is shown to be a feasible option for this site. A feasibility analysis will need to be conducted by the team for the DD submission, in accordance with the SCA report templates. Geothermal is not typically SCA standard and will not be part of this project unless team is directed by SCA to include.

[redacted] presented the LL94 roof plans, based on FDNY access paths and proposed location of mechanical units for each scheme. The FDNY access is significant due to the number of small roof areas. Location of mechanical units to be considered to maximize clear roof area. The amount of sustainable roofing area varies by scheme in area and also in how fragmented the spaces are, which will affect ability to install a PV array system. Per LL94, all sustainable roofing areas are required to be either PV array or green roof unless they meet one of the exceptions noted in the LL. SCA has advised that green roof will not be pursued on this project. [redacted] Architects notes that some of the spaces may be exempt as they are setback areas less than 25% of the largest floor plate. [redacted] to verify exemption and revise diagrams to include a more limited and feasible area for PV array. Any remaining sustainable roofing zone areas will need to be addressed as project is developed.

Per Building Bulletin 2019-10, II,C, 4 - Building setbacks less than 25% of the area of the largest floor plan in the building shall be exempt from sustainable roof zone requirements. Using Scheme C, the largest floor area of the addition is 11,510 SF. Therefore, any roof area less than 2,877 SF in area is not required to be a sustainable roof zone requiring PV system or green roof system.

Per Building Bulletin 2019-10, II, D, 1 – Sustainable roofing zones shall include a PV system that exceeds a capacity of 4kW, or a green roof system, or a combination of both. Vidaris to provide analysis including shading to confirm that the PV system exceeds 4kW.

The following item was not discussed during the workshop, however is included as follow-up is required. SCA to provide information/details on the ballast PV system per conference call minutes dated 1/30/2020 to go over 2019 GSG requirements for this project.

Discovery #2 Water

[redacted] presented water discoveries including rainwater as a non-potable supply source. Amount of monthly and annual rainfall available was presented for each scheme. Team discussed testing, sanitation requirements for water reuse. Interior water use is the same for all schemes as it is dependent upon the number of building users. Results indicate a reduction of 33% from baseline. Potential exterior water uses include irrigation and maintenance. Rainwater reuse does not appear likely as plantings are expected to be native/adaptive and there is only a limited need for water for exterior maintenance. Amount of rainwater would allow use for fixture flushing but may be cost prohibitive.

Discovery #3 Life-cycle Impacts Assessment

[redacted] presented the LCA analysis generated with the Athena Impact Estimator, and reviewed the six environmental measurement criteria. The comparison reports for two wall assemblies and two roof assemblies were discussed. Assemblies with less concrete (cement) tend to have better results when assessed by these measures. [redacted] Architects noted some errors in the roof assembly; the insulation should be changed to 8" and the thickness of concrete pavers may require revision. SCA to confirm if additional concrete pavers will be required. [redacted] to revise for final report.

Discovery #4 Active Design

[redacted] and [redacted] presented active design measures that can be incorporated into design. There are some differences noted between Scheme A, B, and C. [redacted] noted that some recent changes will also allow Scheme C to achieve measures 4 and 5. [redacted] notes that measure 9 will not be achieved using SCA standards. [redacted] architects to revise checklist.

Discovery #5 Acoustics

[redacted] from [redacted] presented the acoustic analysis. The report indicates that criteria for both prerequisite Q8.1P and credit Q8.2 can be met by design but it can be difficult to meet the criteria Q8.2 HVAC background noise criteria with typical mechanical equipment. The gym location in all schemes is above classroom space. The slab will need to be designed to meet the acoustical separation requirements. The windows may also need to be upgraded from SCA standard to mitigate site noise. A survey will be conducted to determine if traffic or airplane noise will require mitigation. [redacted] notes that if it is airplane noise, it is likely to affect all facades.

Discovery #6 Climate Resiliency

[redacted] from [redacted] presented the summary report, CRDG exposure screening tool and design strategies checklist. Bioswales are not typical but may be an option for the site. SCA noted that there is a new Exposure Screening Tool that should be used. The new tool requires any result of Medium or High to create list

of recommendations for mitigation. [redacted] to revise tool and generate list for final report. A green infrastructure assessment will be conducted considering other elements to manage stormwater onsite through infiltration and/or detainment per SCA report template at SD.

[redacted] reviewed GSG 2019 checklist, noting required GSG submissions at SD, DD, 60%, 100%, Design will be required from team.

Conclusions and Next Steps

The IDP report will be revised to incorporate items noted above. The design team is to develop a list of design impacts of topics discussed at the IDP workshop to be included in the DD GSG report. [redacted] and team to deliver final IDP report to SCA by 3/31/20.

PS 96Q IDP Design Impacts Narrative

12/18/20

Energy Discovery

- Among the three evaluated in the IDP energy model, Scheme B showed the highest energy consumptions, along with highest heating and cooling loads. However, this appears to be due to the increased area presented with the scheme. Once the value based on the areas of the project were normalized, Scheme B projected the best performance as far as EUI and loads per square foot. While the performance advantages were marginal, it did show that the design does not sacrifice the building performance for the increased usable areas.

Water Discovery

- Rainwater as a non-potable source has not been incorporated into the design as no cost-effective use for collected water has been found (i.e. irrigation is not required). The landscaping proposed at the site will include low maintenance trees, shrubs, groundcover, etc. that will not require irrigation.

Life Cycle Analysis

- SCA has determined that the exterior envelope of the addition be precast, insulated concrete panels. The precast panels will be utilized to their full potential allowing the envelope to become a self-supported skin that does not bear on the steel frame of the building. Precast panels do not require scaffolding and require less time for installation than masonry.

Active Design Discovery

- Assessment indicates all required strategies and 7 of the main staircase items are achievable with the design.

Acoustics Discovery

- Because the gym is located above classroom space, the design is to include appropriate acoustical separation requirements at the slab.

Climate Resiliency Discovery

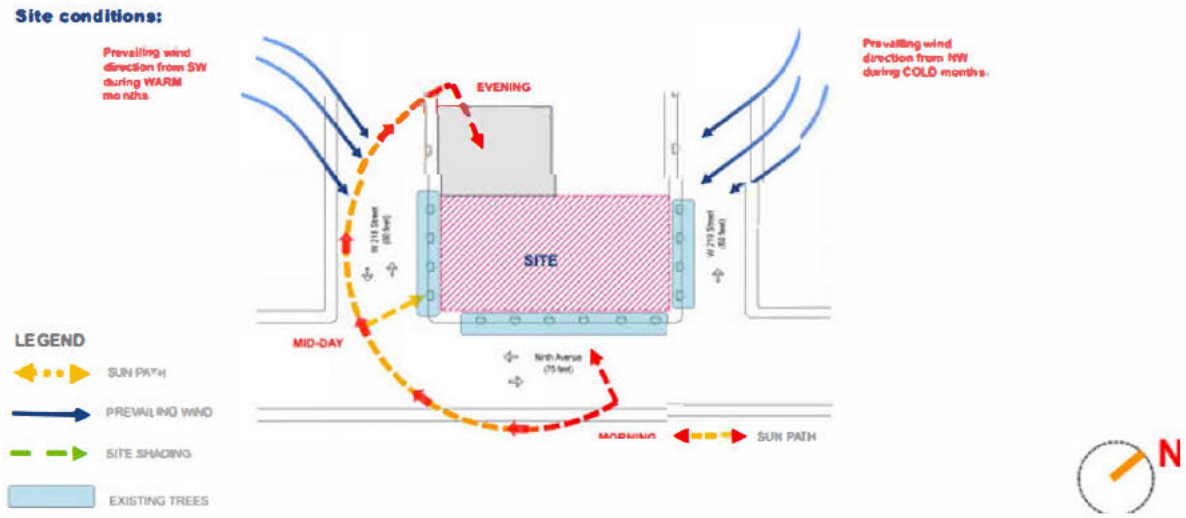
- Based on the subsurface investigation performed at the site, the percolation tests concluded that the permeability of the soil meets the NYC DEP and DOB standards for infiltration practices. As part of the design, the stormwater for the entire site will be collected and conveyed to a stormwater retention system located at the north side of the existing building. Heat mitigation measures including permeable paver strips will be installed at the north west limits of the site and landscaping is proposed along the eastern and southern portions of the new building addition.

Integrative Design Report and Recommendations

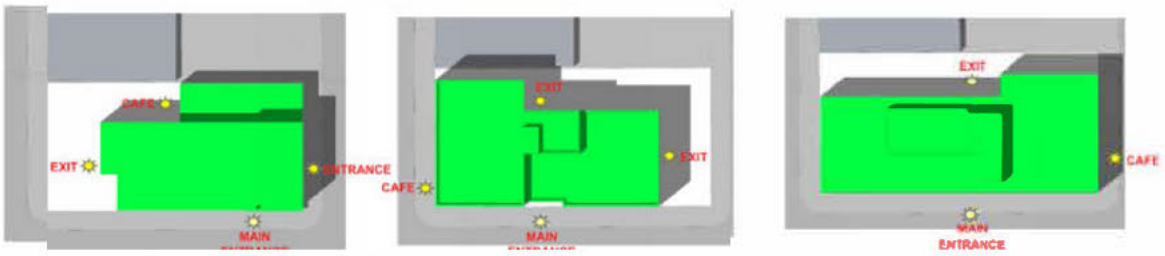
2.0 Discovery # 1 Energy and Daylight Related Systems\

2.1 Energy and Daylight Systems

Site conditions:



Site conditions: Exterior lighting at exit and entrance



SCHEME A SCHEME B SCHEME C

Integrative Design Report and Recommendations

Discovery #1 Scheme A

Energy and Daylight Related System

Site conditions: Summer & winter solstice shadows

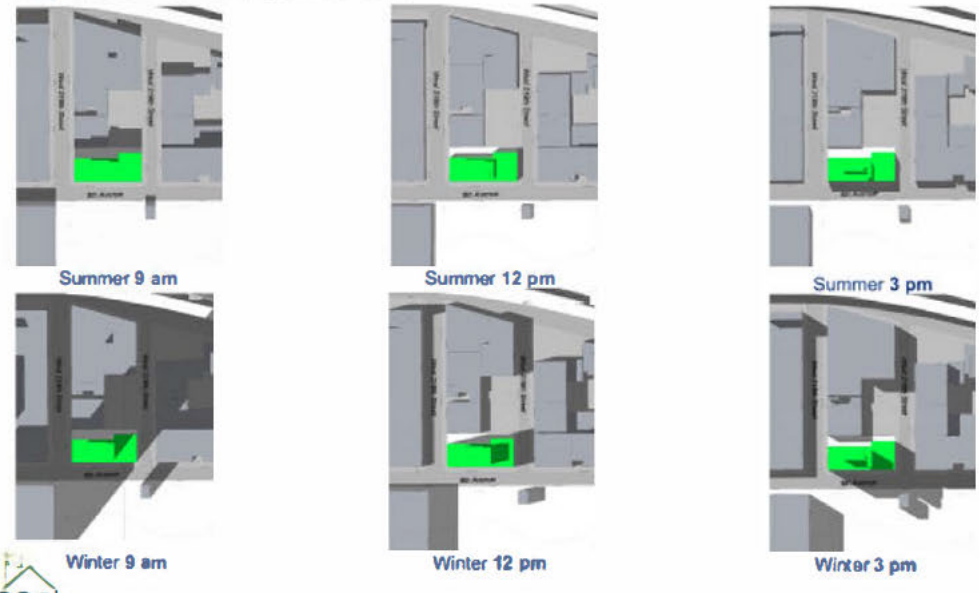
Discovery #1 Scheme B

Energy and Daylight Related System

Site conditions: Summer & winter solstice shadows

Integrative Design Report and Recommendations

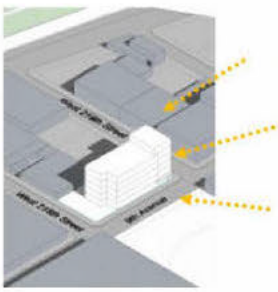
Discovery #1 Scheme C
Energy and Daylight Related System
Site conditions: Summer & winter solstice shadows



Discovery #1 Scheme A, B, & C
Energy and Daylight Related System
Gymatorium Daylight

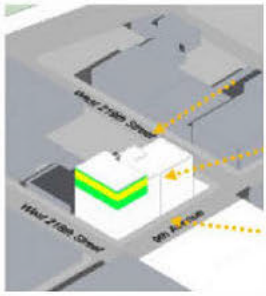
Integrative Design Report and Recommendations

Discovery #1 Scheme A, B, & C
Energy and Daylight Related System
Gymatorium Daylight



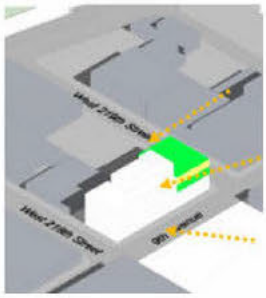
SCHEME A

- Minimum exposure to daylight
- Gymatorium is facing West
- Minimal building obstruction



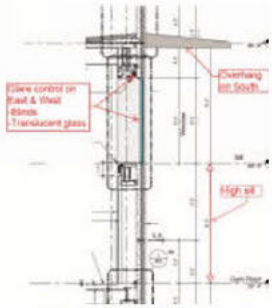
SCHEME B

- High exposure to daylight, volume is more exposed
- Part of Gymatorium is facing South and East
- Minimal building obstruction



SCHEME C

- Medium exposure to daylight
- Gymatorium is facing North
- No building obstructions



Window Example detail

2.2 Scheme 1 Energy box model

IDP Box Model Summary

School Name	
How many schemes were explored?	3
If less than 3 schemes, explain	
Warnings	No Warnings

Basic Attributes

Description	Scheme 1	Scheme 2	Scheme 3
Building Area (ft2)	63,909	63,991	63,548
Wall Area (ft2)	30,335	34,086	30,747
Window Area	7,555	8,537	7,711
% Window Area	20%	20%	20%
Roof Area (ft2)	13,593	12,543	14,990

Integrative Design Report and Recommendations

Comparison to Scheme 1 (% increase/decrease)

Description	Scheme 1	Scheme 2	Scheme 3
Source EUI (2.55 elec)	0%	0%	-1%
Carbon Emissions (tons)	0%	1%	-1%
PV installation (kW)	0%	-8%	10%
PV Energy Production (kWh/yr)	0%	-8%	10%
Peak kW	0%	1%	-3%
Max Heating Demand (kBtu/hr)	0%	-4%	-5%
Max Cooling Demand (kBtu/hr)	0%	4%	-3%
Annual Daylighting Reduction	0%	3%	-3%

Effects of Window Area- Scheme 1

All Results are compared to Scheme 1 with 20% glazing on all facades

Description	**Whole Building**		
Window-Wall Ratio (%)	15%	20%	25%
Source EUI (2.55 elec)	0%	0%	1%
Carbon Emissions (tons)	0%	0%	1%
Peak kW	-1%	0%	1%
Max Heating Demand (kBtu/hr)	1%	0%	-1%
Max Cooling Demand (kBtu/hr)	-1%	0%	0%
Annual Daylighting Reduction	-5%	0%	3%

Effects of Window Area- Scheme 2

All Results are compared to Scheme 2 with 20% glazing on all facades

Description	**Whole Building**		
Other Façade Window %	15%	20%	25%
Source EUI (2.55 elec)	0%	0%	1%
Carbon Emissions (tons)	0%	0%	1%
Peak kW	-1%	0%	1%
Max Heating Demand (kBtu/hr)	-1%	0%	1%
Max Cooling Demand (kBtu/hr)	-8%	0%	-2%
Annual Daylighting Reduction	-3%	0%	3%

Effects of Window Area- Scheme 3

All Results are compared to Scheme 3 with 20% glazing on all facades

Description	**Whole Building**

Integrative Design Report and Recommendations

Other Façade Window %	15%	20%	25%
Source EUI (2.55 elec)	0%	0%	0%
Carbon Emissions (tons)	0%	0%	0%
Peak kW	0%	0%	1%
Max Heating Demand (kBtu/hr)	1%	0%	-7%
Max Cooling Demand (kBtu/hr)	0%	0%	0%
Annual Daylighting Reduction	-3%	0%	3%

Scheme A

Information from LS-I

Case	Annual Reduction by Daylight %
Building Orientation_ 0	37%
Building Orientation_90	37%
Building Orientation_180	37%
Building Orientation_270	37%

Information from SS-D

Case	Maximum Heating Load (kBtu/hr)	Maximum Cooling Load (kBtu/hr)
Building Orientation_ 0	1,258	1,726
Building Orientation_90	1,252	1,728
Building Orientation_180	1,231	1,728
Building Orientation_270	1,247	1,728

Information from PS-E

Case	Electric Use (kWh)	Fuel Use (MBTU)	Peak Demand (kW)
Building Orientation_ 0	348,617	876	222
Building Orientation_90	348,894	895	222
Building Orientation_180	347,793	890	222
Building Orientation_270	347,634	886	222

Integrative Design Report and Recommendations

2.3 IDP *Energy Summary*

Site Conditions

Site Shading

Review the IDP Shading Study. **Rank the favorability of each scheme.**
Shading Table

Scheme A	Very Unfavorable	Somewhat Unfavorable	Neutral	Somewhat Favorable	Very Favorable	Not Feasible
Scheme B	Very Unfavorable	Somewhat Unfavorable	Neutral	Somewhat Favorable	Very Favorable	Not Feasible
Scheme C	Very Unfavorable	Somewhat Unfavorable	Neutral	Somewhat Favorable	Very Favorable	Not Feasible

Site conditions does not provide a very favorable shading. Scheme C could improve favorability if the playground could be relocated.

Exterior Lighting

Describe any features that may have special lighting requirements. Describe opportunities to have single fixtures meet multiple lighting needs.

Wall pack lighting will be provided no special requirement.

Landscaping

Describe opportunities for deciduous shade plants/trees on the south side of the building, and evergreen trees on the north/west sides.

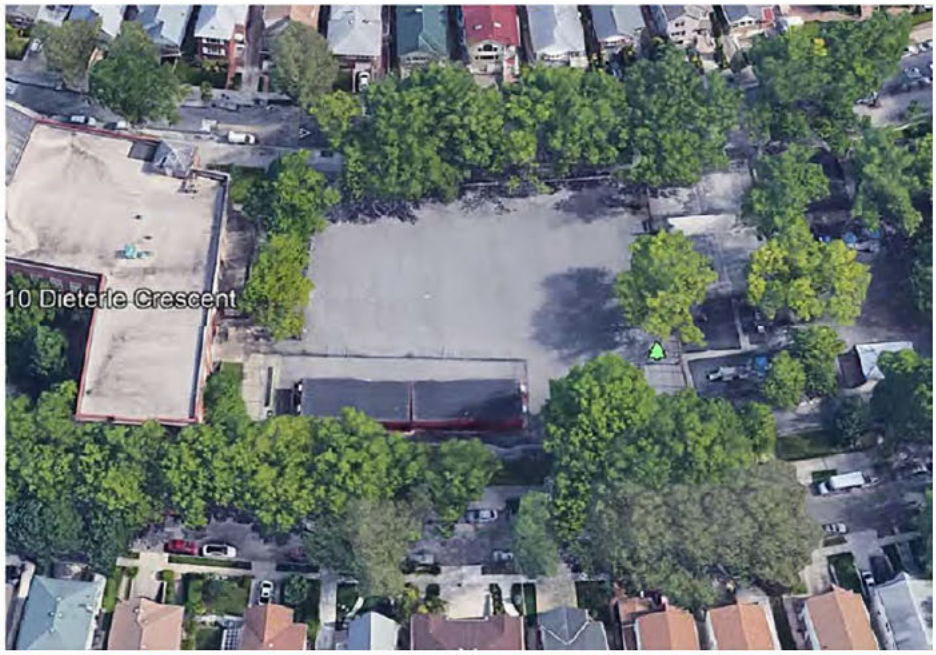
Trees may be implemented on the design where it doesn't obstruct any entrances or exits. There will be more trees in the sidewalk to comply with the park department requirement. The goal is to maintain the existing nine trees on the sidewalk.

Adjacent Site Conditions

Describe any existing built environment conditions and vegetation that can provide shelter from extreme weather or to deflect unwanted noise, if any.

There is no protection from existing structures. The lot is located in a manufacture zone, the existing landscape responds to that use.

Landscaping



Existing Site Plan

Possible Landscaping with Deciduous Shade Trees

Integrative Design Report and Recommendations

Massing, Envelope and Façade Elements

Review the Shading Study and Box Model Information Summary. When determining the most favorable scheme, reduction in boiler capacity is preferable to reduction in chiller capacity. The box model only includes daylighting controls in a specific run, and higher chiller capacity indicates greater daylighting potential.

1.0 **List the preferred Scheme based on box model. More than one may be considered if results are similar. Options that are not feasible due to site constraints may be eliminated. Briefly describe the decision making process:**

Based on the results of the box model, the programmatic needs should be used to select the preferred scheme, not the energy use.

The box model shows that the overall energy use between the three options are similar:

Scheme	Energy (MBTU)
A	4,445.9
B	4,415.9
C	4,373.0

The overall energy use is similar in all three schemes, with Scheme C having lowest energy consumption and scheme B best daylighting opportunity. The main difference in the massing options is the locations of the kitchen/cafeteria and the gymatorium. The box model was developed and analyzed using eQuest

2.0 **Scheme for Design:**

To be determined as design is developed.

3.0 **If the Scheme selected for the design is not among the preferred options from the box model**

a) **Explain why the preferred box model scheme is not suitable**

NA- the site is constrained and both massing options are equally preferable

b) **Describe how the findings from the box model will influence the design.**

We learn a few energy saving items and less carbon emission from box model. We will consider to improve those items during the design development, such as install as many PV panel as possible, reduce wall openings, and reduce overall building envelop.

4.0 **Describe the strategies for limiting the vision glazing while maximizing daylighting. Provide proposed window wall ratio.**

- External shades should be considered on south facing windows.
- Framing should be minimized to the extent possible (fewer large windows preferred over more smaller windows)
- 20% WWR was modeled in the box model analysis
- The window head height should be as high as possible to maximize daylighting while maintaining views.
- The window-to-wall (WWR) ratio favored the north facing walls to maximize the daylight savings possible. The WWR of each orientation is as follows:

	Scheme A	Scheme B	Scheme C
NE	17.8%	21.5%	16.5%
SE	29.0%	25.1%	27.3%
SW	14.7%	13.6%	12.7%
NW	38.5%	39.8%	43.5%

5.0 **Describe the consideration of thermal breaks in the envelope assembly and the integration of details in the design process.**

Envelope Recommendations below are based on studies that were performed on prototypical buildings. The studies can be applied to all SCA buildings.

- The insulation values of the walls and roof should be maximized to the extent practical.
- Recommended Roof insulation is R-40 or greater
- Recommended effective wall U-value is R-15 or greater

Integrative Design Report and Recommendations

MEP Layout Optimization

6.0 **Do special circumstances advocate for consideration of HVAC alternates to the standard design?**

a) If yes, describe the HVAC system(s) under consideration
No alternate to standard design. HVAC design will follow agency standard SCA Design Requirements Section 6.2.

7.0 **Describe how the following will be addressed in the design. Both architectural and HVAC disciplines should be considered:**

1. **Reducing cooling loads**
   - For building envelope load reduction, HVAC Engineer will account for load reductions as a result of any additional insulation and better building envelope components (windows etc.) the Architect will provide.
   - For infiltration load reduction, HVAC Engineer will slightly pressurize interior spaces to reduce infiltration. In addition, the Architect will design air barriers and/or vapor barriers for the building envelope.
   - For outside air load reduction, HVAC Engineer will provide Enthalpy Heat Recovery wheels on Rooftop Units serving classrooms and the gymnasium. CO2 based demand control ventilation to reduce outside air in response to space vacancies will also be provided for Rooftop Units serving classrooms and the gymnasium.
   - For internal load reduction, HVAC Engineer will take into consideration the energy efficient lighting as designed.
   - For air leakage load reduction, HVAC Engineer will provide air curtains at the main building entrances and provide Energy Code required Class 1 low leakage dampers integral to the building envelope.

2. **Reducing heating loads**
   The same methodology which reduces cooling loads described above will also be utilized for heating load reductions.

3. **Limiting air duct pressure drop**
   Air ducts will be designed according to acoustical guidelines which limits air duct velocities. Limiting air duct velocities automatically limits air duct pressure drop. In addition, a variable air volume (VAV) system will be designed. The VAV system reduces airflow during non-peak heating and cooling space load conditions. The reduction of airflow reduces air duct velocities in mild weathers, therefore also reduces air duct pressure drop in mild weathers.

4. **Limiting envelope penetrations**
   Envelope penetrations by HVAC equipment (ductwork and piping through roof, louvers through walls) will be limited to necessary ones according to required equipment for the project, as well as code required shaft smoke vents as per 2014 NYCBC 708.12.1. Envelope penetrations by HVAC equipment and shaft smoke vents will be caulked and sealed per SCA specifications.

5. **Limiting piping pressure drop**
   Engineer will limit piping pressure drop according to 2020 NYC ECC Appendix CA (aka, ASHRAE 90.1-2016 with NYC amendments) Section 6.5.4.6 Pipe Sizing Requirements with Table 6.5.4.6.

6. **Other**
   N/A.

2.4 NYC Geothermal Screening Tool selection

NYC Geothermal Webtool selection

This document contains the geothermal feasibility estimation, retrieved at:
Wed May 20 2020 15:07:47 GMT-0400 (Eastern Daylight Time)

Selection			
Address	400 WEST 219 STREET		
Borough	Manhattan		
Block	2214		
Lot(s)	24		
BBL(s)	1022140024		
Building			***Overrides**
Lot Area (SqFt)	20,000		20000
Building Area (SqFt)	63,909		63909
Building Footprint (SqFt)	13,593		13593
Building Type	Other: W3		
Calculation			
Depth To Bedrock (Ft +-25 Ft)	0		
Depth To Water (Ft +-25 Ft)	Data Not Available		
Lloyd Aquifer (Present/Not Present)	Not Present		
Geothermal System	**Standing Column Well**	**Closed Loop**	**Open Loop****
Geological and Technical Suitability (Yes/No)	Yes	Yes	No
Potential Capacity (Tons)	105	49	
Full System Feasible (Yes/No)	Yes	Yes	Yes
Hybrid System Feasible (Yes/No)	No	No	No
Carbon Footprint Reduction (Tons CO2e)			
Annual Cost of Carbon ($)	0	0	0
Annual Potential Savings with Geothermal System ($)	0	0	0
Projected Incremental Payback with Carbon Credit (Years)			
Projected Incremental Payback without Carbon Credit (Years)			

NOTE: The City's critical infrastructure, such as water tunnels, shafts, or appurtenant facilities are regulated by the New York City Department of Environmental Protection ("DEP"). DEP is in the process of promulgating rules to require that any boring, drilling or excavation to a depth of 50 feet in the borough of the Bronx or north of 135th Street in the borough of Manhattan or to a depth of 100 feet in any other location / borough in New York City first be reported to DEP. Please send written notification of intention to drill or excavate to: Chief of Site Connection and Plan Review, Bureau of Water and Sewer Operations, 9605 Horace Harding Expy, 3rd Floor, Flushing, NY 11368-4100

The geothermal feasibility tool indicates that geothermal systems are feasible for full systems.

The Geothermal Feasibility Tool indicates that closed loop, open loop and standing column well are feasible for a Full system.

The SCA Geothermal Feasibility Report is required to be completed if either a standing column, closed loop or open loop system indicates "Yes" for full system feasibility.

Therefore,
the SCA Geothermal Feasibility Report will need to be completed for a later phase.

Integrative Design Report and Recommendations

Furthermore, sites that have contaminated land, are archeologically significant, and/or are located in protected marshland should not move forward with a full feasibility study due to an increased cost.

*. The override calculation assumes new construction with optimal building location to maximize geothermal capacity. In cases of renovation or re-purposing of an existing building, the calculation may over-estimate capacity.

**: For Open Loop systems in the Bronx and Manhattan, the information available from USGS is insufficient.

Integrative Design Report and Recommendations

2.6 Renewable Energy

Summary

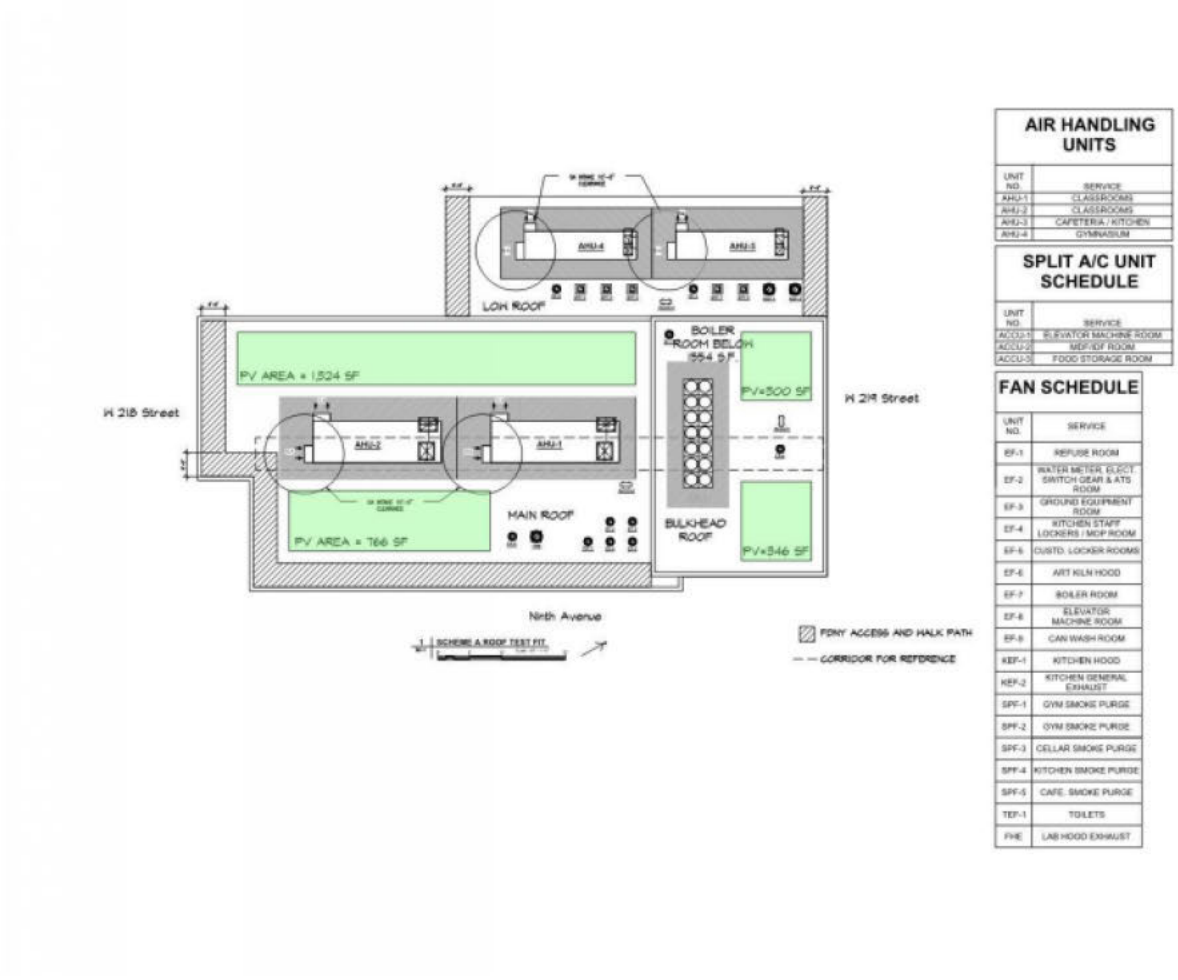
Each scheme was evaluated for photovoltaic (PV) capacity and generation. Scheme A has the most potential for PV capacity and energy generation. Scheme C has comparable capacity and generation if the area dedicated for the playground can be used for PV instead. Scheme B does not have a favorable building orientation to the southern sun exposure. The schemes have system capacities ranging from 26 kW to 53 kW, and energy generations ranging from 33,000 to 68,000 kWh annually depending on which scheme is chosen. Certain schemes have recommendations in the analysis below, based on shading and rooftop equipment design flexibility. The analysis is based on ballasted PV racking. This allows for the PV modules (weighed down by ballast, usually CMUs), to avoid roof penetrations and allow for flexible system layouts.

Building Scheme	Scheme A	Scheme B	Scheme C
PV System Capacity	52.9 kW	41.7 kW	25.9 kW
Annual Energy Generation	68,319 kWh	46,343 kWh	33,437 kWh

Integrative Design Report and Recommendations

Scheme A

TOTAL SOLAR AREA= 1,324+766+346+300 = 2,736 SQFT
TOTAL DC SYSTEM SIZE KW= 2736/80= 34.20 KW
TOTAL GENERATED AMPs= 34,200/(1.73*208*0.8)=118.80A
TOTAL NUMBER OF PANEL= 34,200/372 = 91 PANELS



AIR HANDLING UNITS

UNIT NO.	SERVICE
AHU-1	CLASSROOMS
AHU-2	CLASSROOMS
AHU-3	CAFETERIA / KITCHEN
AHU-4	GYMNASIUM

SPLIT A/C UNIT SCHEDULE

UNIT NO.	SERVICE
ACCU-1	ELEVATOR MACHINE ROOM
ACCU-2	MEP/IDF ROOM
ACCU-3	FOOD STORAGE ROOM

FAN SCHEDULE

UNIT NO.	SERVICE
EF-1	REFUSE ROOM
EF-2	WATER METER, ELECT. SWITCH GEAR & ATS ROOM
EF-3	GROUND EQUIPMENT ROOM
EF-4	KITCHEN STAFF LOCKERS / MCP ROOM
EF-5	CUSTD. LOCKER ROOMS
EF-6	ART KILN HOOD
EF-7	BOILER ROOM
EF-8	ELEVATOR MACHINE ROOM
EF-9	CAN WASH ROOM
KEF-1	KITCHEN HOOD
KEF-2	KITCHEN GENERAL EXHAUST
SPF-1	GYM SMOKE PURGE
SPF-2	GYM SMOKE PURGE
SPF-3	CELLAR SMOKE PURGE
SPF-4	KITCHEN SMOKE PURGE
SPF-5	CAFE. SMOKE PURGE
TEF-1	TOILETS
FHE	LAB HOOD EXHAUST

Solar PV systems generation potential is to be evaluated for each scheme, the below tool is a sample reference.

PVWatts Calculator

RESULTS

226,976 kWh/Year*

System output may range from 217,874 to 234,580 kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	3.76	15,916	1,448
February	4.51	17,055	1,552
March	4.80	19,642	1,787
April	5.46	20,822	1,895
May	5.32	20,509	1,866
June	5.77	21,030	1,914
July	5.87	21,706	1,975
August	5.80	21,489	1,955
September	5.58	20,668	1,881
October	4.43	17,704	1,611
November	3.95	15,782	1,436
December	3.42	14,653	1,333
Annual	4.89	226,976	$ 20,653

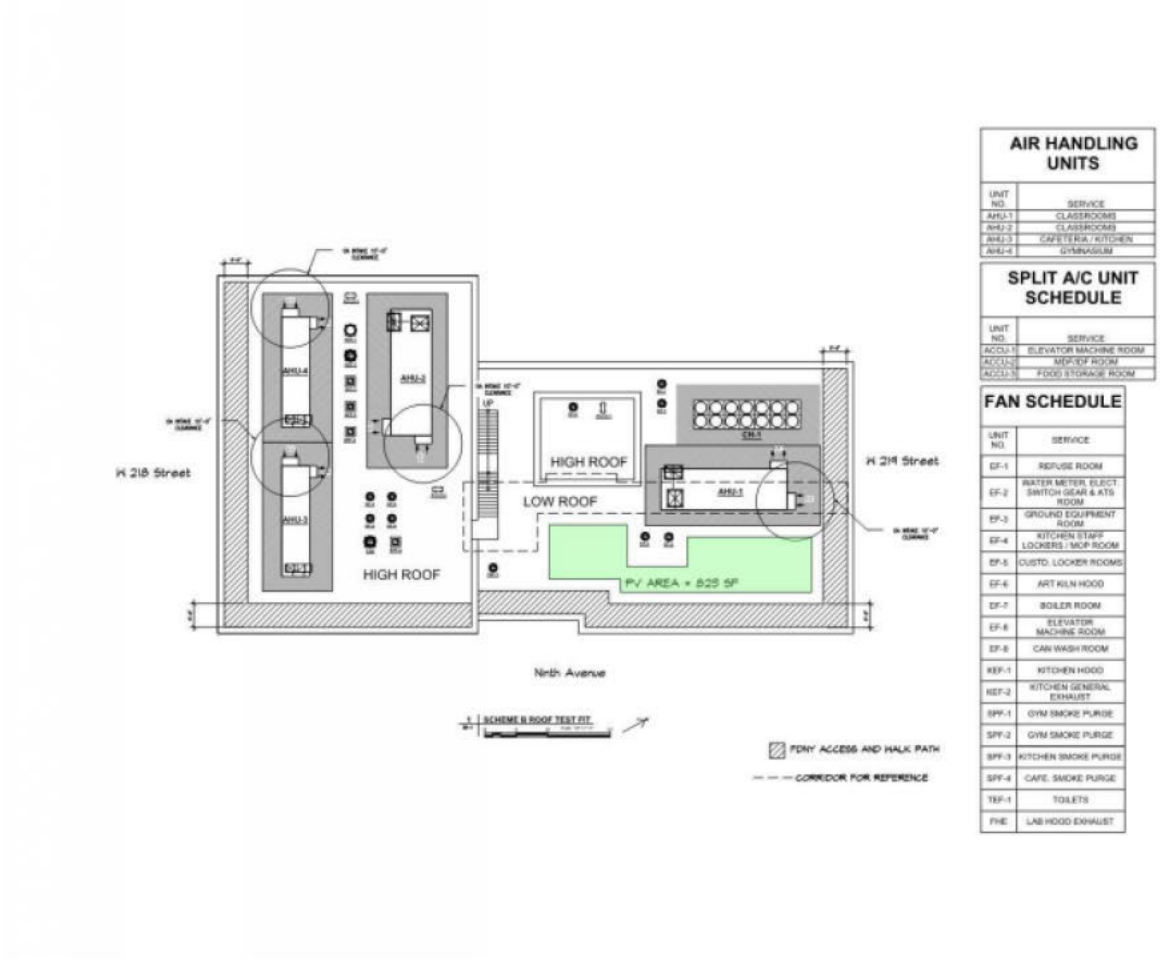
We evaluated the pre-schematic design schemes for solar PV potential. The following drawings consider HVAC equipment clearances (shown as dashed lines) and FDNY for rooftop access requirements for buildings less than 100 feet in height with roof slopes less than 20 degrees from horizontal. Mechanical equipment and solar PV panels are treated as obstructions per the Fire Code. All four exposures of each scheme are assumed to be accessible to fire apparatus. Requirements include:

- For each 12 linear feet of accessible perimeter, a minimum 6 foot by 6 foot landing clearance area. Such areas may be combined into areas up to 12 feet long, separated by no less than 12 feet.
- For each 100 linear feet of rooftop width and each 100 linear feet of length, a minimum 6 foot wide clear path from side to side or from front to back, providing reasonable access to all bulkhead doors.
- For each rooftop stairway or bulkhead access door, a minimum 6 foot clear area in all directions.

Integrative Design Report and Recommendations

Scheme B

TOTAL SOLAR AREA = 823 SF
TOTAL DC SYSTEM SIZE KW=823/80=10.28 KW
TOTAL GENERATED AMPs= 10,280/(1.73*208*0.8)=35.71A
TOTAL NUMBER OF PANEL= 10,280/372 = 27 PANELS



AIR HANDLING UNITS

UNIT NO.	SERVICE
AHU-1	CLASSROOMS
AHU-2	CLASSROOMS
AHU-3	CAFETERIA / KITCHEN
AHU-4	GYMNASIUM

SPLIT A/C UNIT SCHEDULE

UNIT NO.	SERVICE
ACCU-1	ELEVATOR MACHINE ROOM
ACCU-2	MEP/FP ROOM
ACCU-3	FOOD STORAGE ROOM

FAN SCHEDULE

UNIT NO.	SERVICE
EF-1	REFUSE ROOM
EF-2	WATER METER, ELECT. SWITCH GEAR & ATS ROOM
EF-3	GROUND EQUIPMENT ROOM
EF-4	KITCHEN STAFF LOCKERS / MOP ROOM
EF-5	CUSTO. LOCKER ROOMS
EF-6	ART KILN HOOD
EF-7	BOILER ROOM
EF-8	ELEVATOR MACHINE ROOM
EF-9	CAN WASH ROOM
KEF-1	KITCHEN HOOD
KEF-2	KITCHEN GENERAL EXHAUST
SPF-1	GYM SMOKE PURGE
SPF-2	GYM SMOKE PURGE
SPF-3	KITCHEN SMOKE PURGE
SPF-4	CAFE. SMOKE PURGE
TEF-1	TOILETS
FHE	LAB HOOD EXHAUST

RESULTS

105,642 kWh/Year*

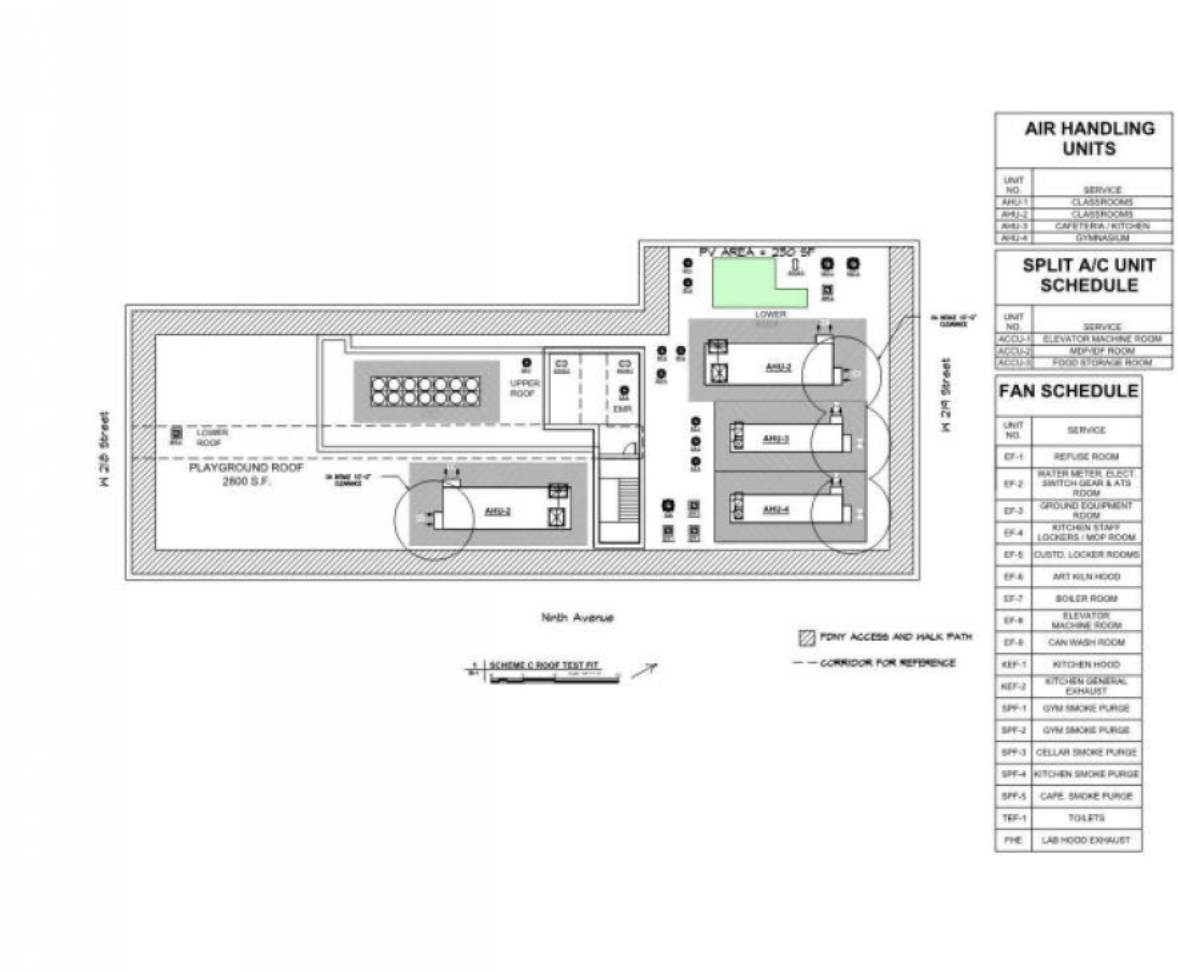
System output may range from 101,406 to 109,181 kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	3.76	7,408	674
February	4.51	7,938	722
March	4.80	9,142	832
April	5.46	9,691	882
May	5.32	9,546	869
June	5.77	9,788	891
July	5.87	10,103	919
August	5.80	10,002	910
September	5.58	9,620	875
October	4.43	8,240	750
November	3.95	7,345	668
December	3.42	6,820	621
Annual	**4.89**	**105,643**	**$ 9,613**

Integrative Design Report and Recommendations

Scheme C

TOTAL SOLAR AREA= 230 SF
TOTAL DC SYSTEM SIZE KW=230/80 = 7.6 KW
TOTAL GENERATED AMPs=7,666/(1.73*208*0.8)= 26.6A
TOTAL NUMBER OF PANEL= 7,666/372 = 20 PANEL



AIR HANDLING UNITS

UNIT NO.	SERVICE
AHU-1	CLASSROOMS
AHU-2	CLASSROOMS
AHU-3	CAFETERIA / KITCHEN
AHU-4	GYMNASIUM

SPLIT A/C UNIT SCHEDULE

UNIT NO.	SERVICE
ACCU-1	ELEVATOR MACHINE ROOM
ACCU-2	MEP/ROF ROOM
ACCU-3	FOOD STORAGE ROOM

FAN SCHEDULE

UNIT NO.	SERVICE
EF-1	REFUSE ROOM
EF-2	WATER METER, ELECT. SWITCH GEAR & ATS ROOM
EF-3	GROUND EQUIPMENT ROOM
EF-4	KITCHEN STAFF LOCKERS / MOP ROOM
EF-5	CUSTD. LOCKER ROOMS
EF-6	ART KILN HOOD
EF-7	BOILER ROOM
EF-8	ELEVATOR MACHINE ROOM
EF-9	CAN WASH ROOM
KEF-1	KITCHEN HOOD
KEF-2	KITCHEN GENERAL EXHAUST
SPF-1	GYM SMOKE PURGE
SPF-2	GYM SMOKE PURGE
SPF-3	CELLAR SMOKE PURGE
SPF-4	KITCHEN SMOKE PURGE
SPF-5	CAFE. SMOKE PURGE
TEF-1	TOILETS
FHE	LAB HOOD EXHAUST

RESULTS

132,963 kWh/Year*

System output may range from 127,631 to 137,417 kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	3.76	9,324	2,164
February	4.51	9,991	2,319
March	4.80	11,507	2,671
April	5.46	12,198	2,831
May	5.32	12,014	2,788
June	5.77	12,320	2,859
July	5.87	12,715	2,951
August	5.80	12,588	2,922
September	5.58	12,107	2,810
October	4.43	10,371	2,407
November	3.95	9,245	2,146
December	3.42	8,584	1,992
Annual	4.89	132,964	$ 30,860

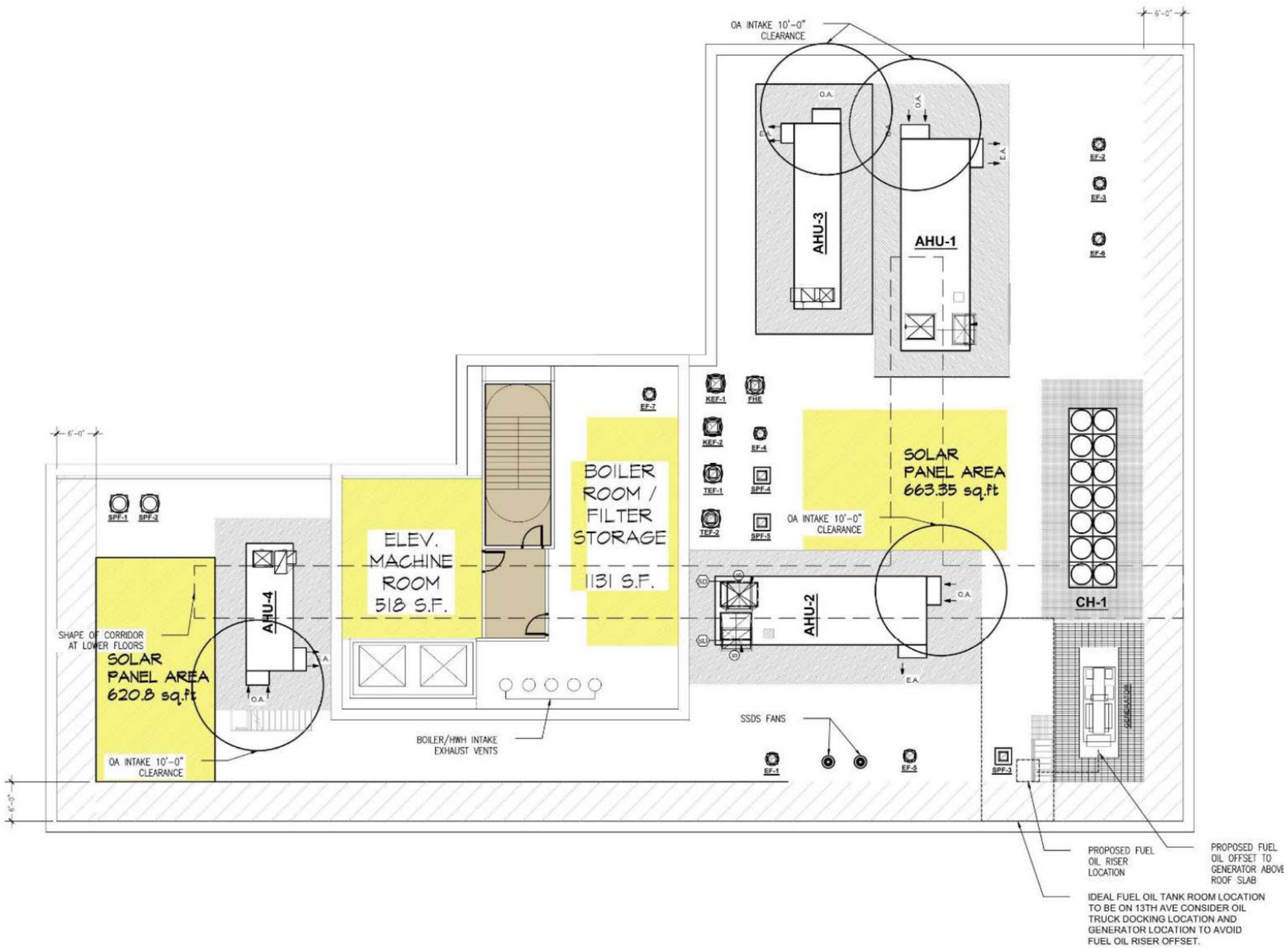
Local Law 94 of 2019 – Sustainable Roofing Zone

Refer to Sustainable Roofing Zone Diagrams below

Discovery #1 Scheme A

Energy and Daylight Related Systems

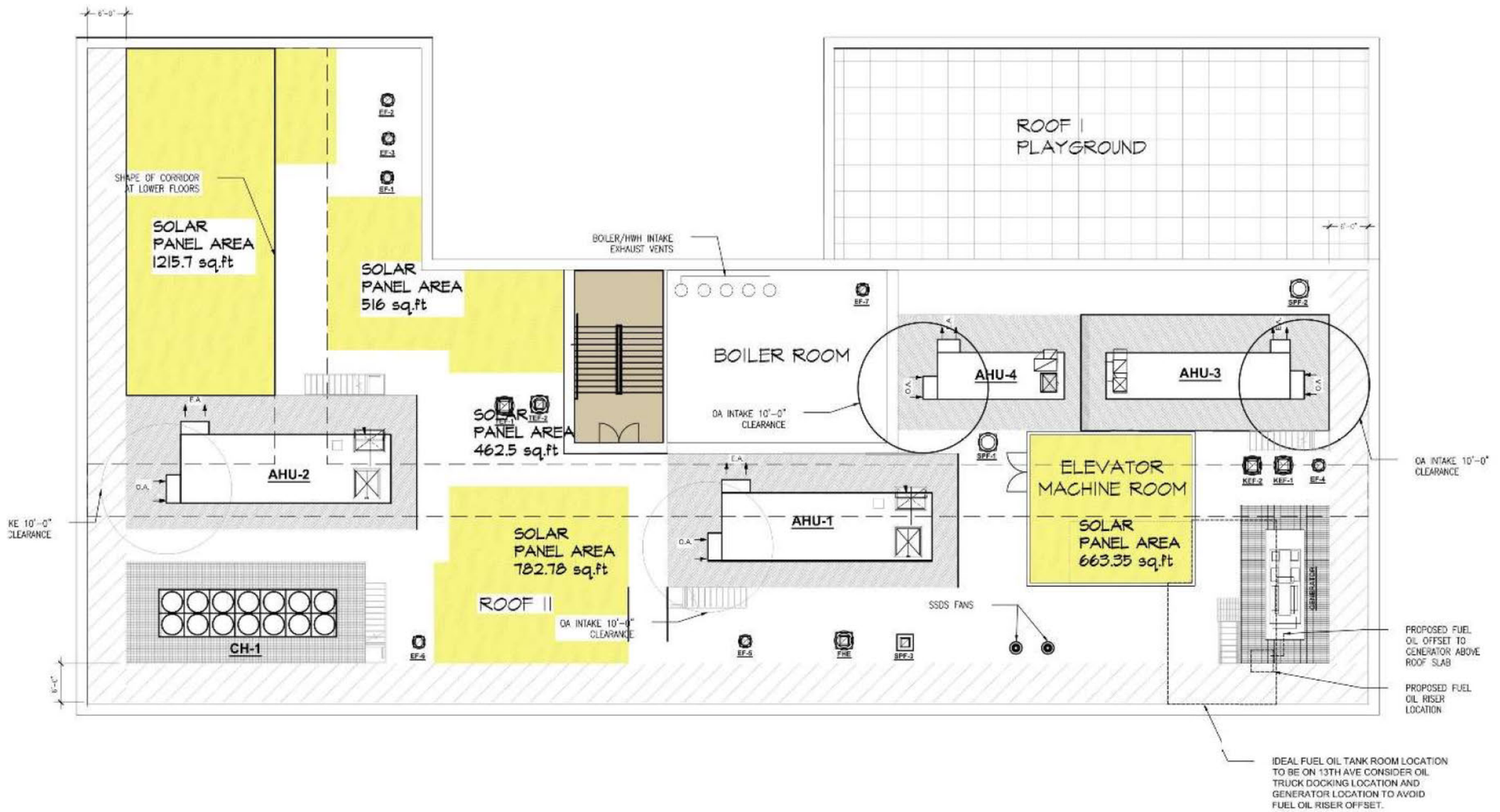
Renewable Energy Analysis



Discovery #1 Scheme B

Energy and Daylight Related Systems

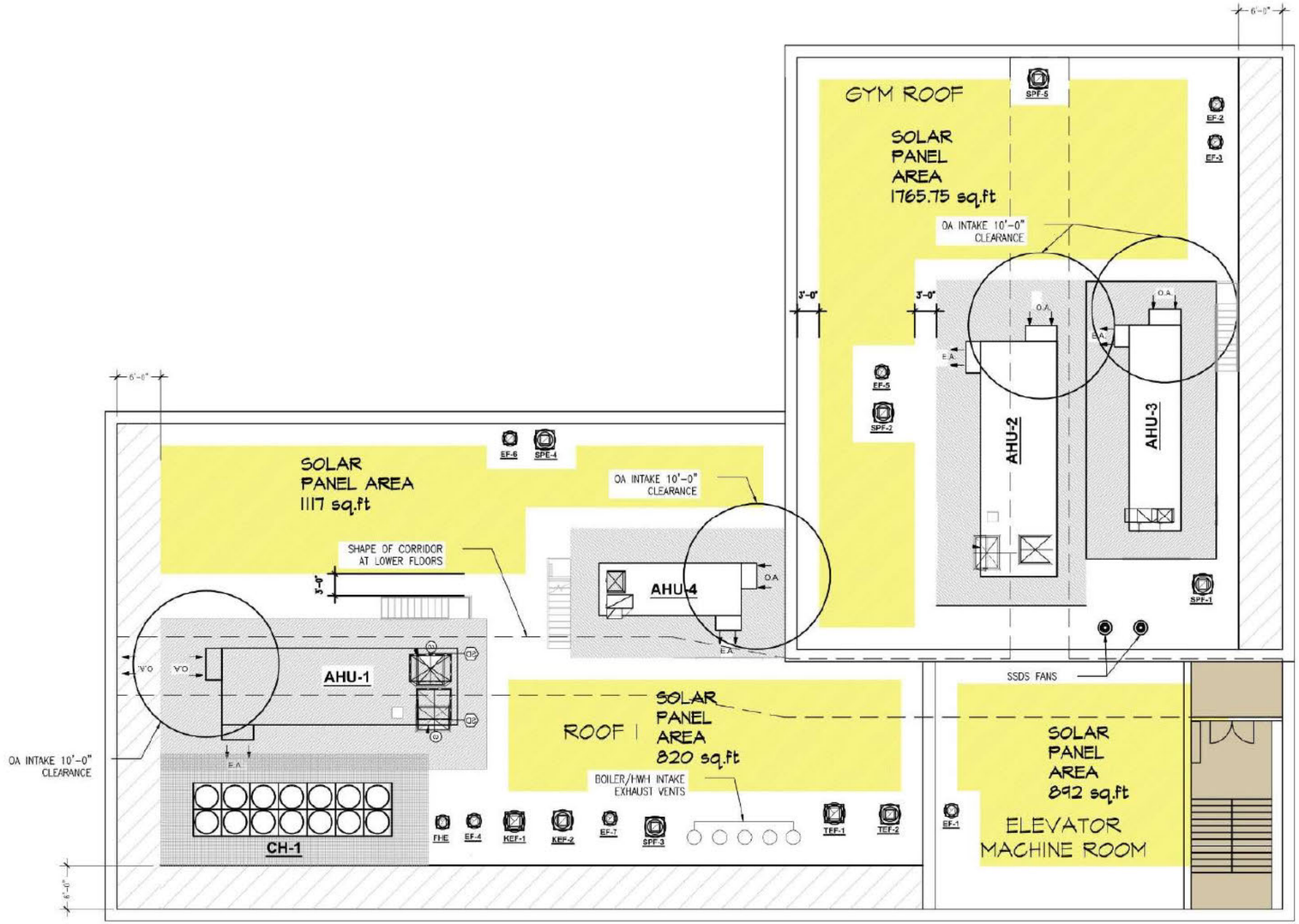
Renewable Energy Analysis



Discovery #1 Scheme C

Energy and Daylight Related Systems

Renewable Energy Analysis



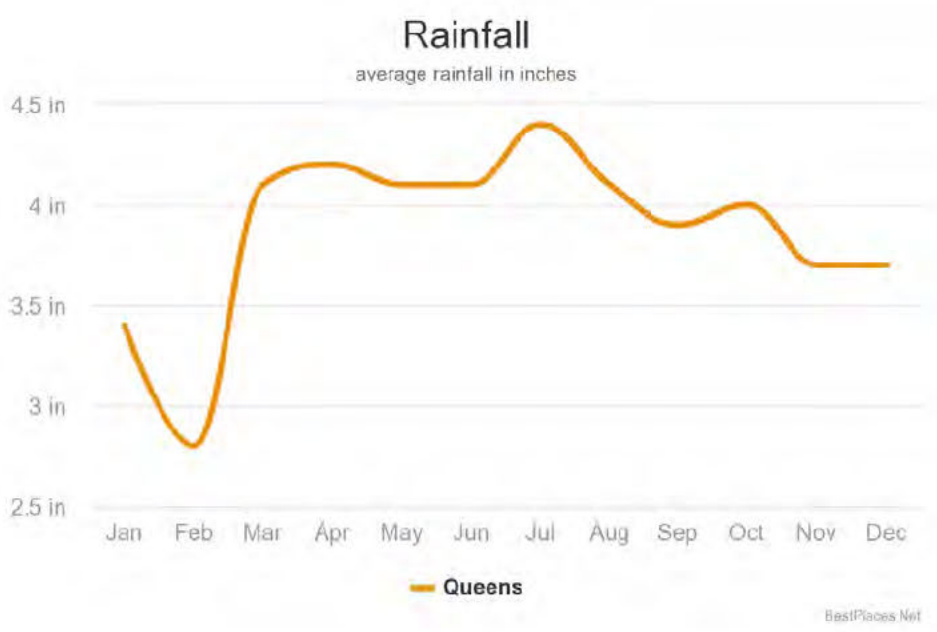
Discovery #2 - Water-Related Systems

Supply Sources

Test-Fit / Sketch Study report indicates groundwater was encountered at 30 feet based on 1944 borings. Groundwater cannot be used as a source of potable water.

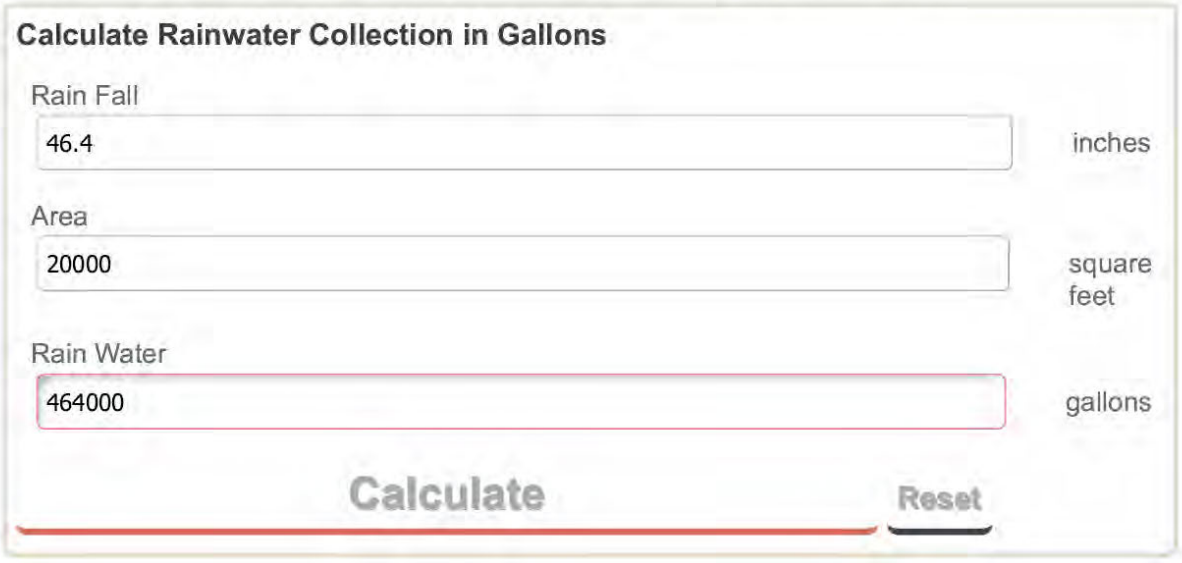
Existing 8" lined cast iron pipe water supply lines are below Ellwell Crescent and Dieterle Crescent.

	Queens, New York	United States
Annual Rainfall	46.4 in.	38.1 in.



Rainwater Collection Calculator in Gallons

Rainwater can be collected from the roofs using the rain water harvesting method. The collectable rainwater from the roof can be calculated in gallons using this calculator based on the rainfall and area.



Formula:

r = 0.5 * f * a

Where,

r = Rainwater Collection in Gallons

f = Rain Fall

a = Area

The 20,000sf area considered for rainwater collection includes the entire area carved out of Lot 1 for the new addition, not just the roof of the new building itself.

Average annual rainfall collected from this area can supply roughly 100% of the plumbing fixture use.

Cost Impact

Rainwater collection: extensive filtering required by NYC DEP for use for irrigation and/or flushing toilets. Queens groundwater is not used as a source of potable water.

Graywater re-use: large increase in piping needed and extensive filtering required by NYC DEP for use for irrigation and/or flushing toilets.

HVAC equipment condensate (e.g. boilers, split heat pumps, kitchen equipment) re-use: extensive filtering required by NYC DEP.

Cooling tower condensate re-use: Standard SCA cooling system does not include cooling towers so condensate re-use in cooling towers is not available.

Annual Water Demand Analysis

NYC Green Schools Rating System
INDOOR WATER USE REDUCTION
CREDIT FORM
Credit W2.1P, W2.2R

SCA School Construction Authority
RESPONSIBLE PARTY:
INITIAL SUBMISSION PHASE:

Project:		Submission Phase:	IDP
Address:	65-10 Dieterle Crescent	Architect:	
LLW #:		Preparer:	
Design #:	0	Form Revision Date:	11-Dec-20

INSTRUCTIONS:
Step 1) Insert Occupancy Info:
Insert number of students in summer, number of staff in summer, number of D75 students with toilets in regular school year and number of D75 students with toilets in summer.
Step 2) Check compliance at bottom of form.
W2.2R is feasible if reduction from baseline is equal to or greater than 30%.
W2.3 is feasible if reduction from baseline is equal to or greater than 35%.
W2.3 is feasible if reduction from baseline is equal to or greater than 40%.

Step 1: Insert Occupancy Info

	Regular	Summer
Total number students	460	138
Total number of staff	73	22
Number of D75 students in classrooms with toilets	0	0
Total students PK to K	152	46
Conventional Water Closet (male 1-12)	154	46
Conventional Urinal (male 1-12)	154	46
Conventional Water Closet (female 1-12)	154	46

Reference Table 1: Instructional Days

Annual Instruction Days School is in Full Operation	180
Annual Instructional Days School is in Summer Operation	30

Reference Table 2: Daily Sewage Volumes (gallons)

		Base Case					Design Case				
		Daily Uses	Flowrate (gpm or gpc)	Duration (Flush)	Regular Sewage Generated	Summer Sewage Generated	Daily Uses	Flowrate (gpm or gpc)	Duration (Flush)	Regular Sewage Generated	Summer Sewage Generated
Flow Fixtures	Conventional Lavatory (Student) (cycle)	3.0	0.25	1	345	104	3.0	0.125	1	173	52
	Conventional Lavatory (Adult) (cycle)	3.0	0.25	1	55	17	3.0	0.125	1	27	8
	Shower (gpm, seconds)	0.1	2.50	1	18	18	0.1	1.80	1	13	13
	Hand Sink (cycle)	4.0	0.25	1	533	160	4.0	0.125	1	267	80
Flush Fixtures	Conventional Water Closet (male 1-12)	1.0	1.60	1	246	74	1.0	1.28	1	197	59
	Conventional Urinal (male 1-12)	2.0	1.00	1	308	92	2.0	0.125	1	39	12
	Conventional Water Closet (female 1-12)	3.0	1.60	1	739	221	3.0	1.28	1	591	177
	Conventional Water Closet (PK, K classrm w/ toilet)	3.0	1.60	1	730	221	3.0	1.28	1	584	177
	Conventional Water Closet (D75 classrm w/ toilet)	3.0	1.60	1	-	-	3.0	1.28	1	-	-
	Conventional Water Closet (adult)	3.0	1.60	1	350	106	3.0	1.28	1	280	84
			BASE CASE TOTALS		3,325	1,011		DESIGN CASE TOTALS		2,170	661

Regular Operation + Summer Operation Summary

	Base Case	Design Case
Total "Regular Operation" + Summer Operation" Annual Volume	628,760	410,528
Total: Water Use Reduction for "Regular Operation" + "Summer Operation"		35%

Notes

1. Figures in shaded boxes are based on EPA 1992 as amended in 2005 with revisions as per LEED 2009 (base case), SCA standards (design case) or are calculated by this spreadsheet. No design team revision required.
2. Spreadsheet will calculate occupant users for water closets and urinals for design and base cases based on figures entered by Design Team for "Occupant Users" for "Conventional Lavatory" for students and adults, along with "% of Student Population by Grade". Distribution of male and female "Occupant Users" are based on assumption of 50-50 ratio of male and
3. Methodology to determine student population: Use unadjusted capacity from POR
Methodology to determine adult population: Follow DR 2.3.3-Bicycle Racks
4. Figure entered by Design Team for occupant users for showers should include all physical edication staff, potent al adult bike users (GGG credit S 2.2) and for high schools with showers in the student locker rooms, all students.
5. Figure entered by Design Team to determine occupant users for "Food Service Hand Sinks" is based on 1 staff for each 100 students. Student population based on unadjusted capacity from POR is to be entered. (Minimum of 2 kitchen staff is required)
6. For "Summer Operation", occupant users is anticipated to be 30% of "Full Operation Population". If program is known to be different, actual summer population should be entered.
7. For "Annual Days of Summer Operation", revise anticipated number of days for regular summer operation, excluding weekends and days when school is closed, if program is known to be different than the default value of 30.
8. Modernization projects should include the actual fixture flow rate of fixtures to remain in the design case calculations and indicate assumptions about percentage of occupant users who will use those existing fixtures to remain.
9. Percentage of Student Population by Grade should be based on number of students in classrooms with toilets located within the classrooms. Dedicated classroom toilets would be applicable to PK and K and to first and second grade classrooms as indicated in the POR. Single user toilets are typically provided for staff use. If first and second grade don't have
10. For typical IS and HS, percentage of occupant users in the PK-K row should be equal to zero.
11. For typical PS and PS/IS, percentage of occupant users in the PK-K row should be based on occupants users in PK-K grade classrooms that have dedicated toilets.

Green Infrastructure

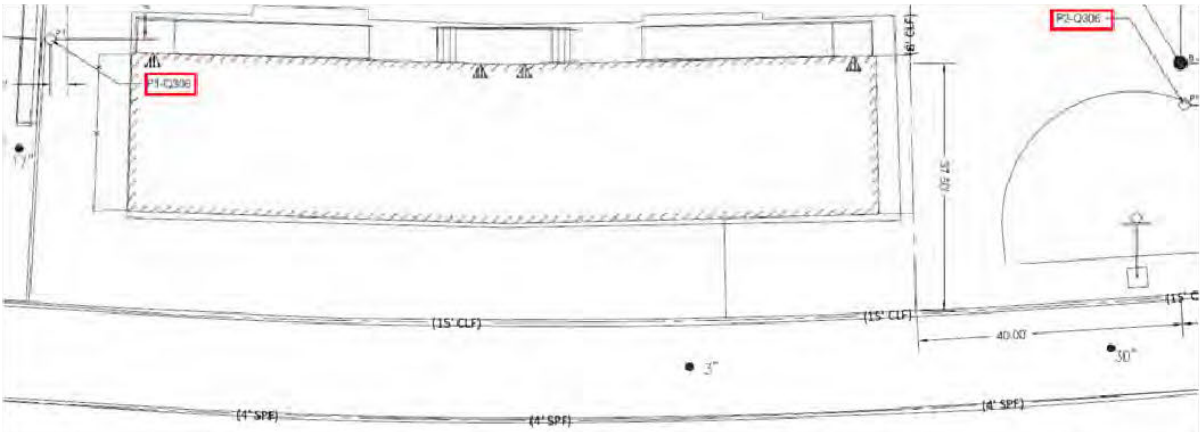
Test Fit / Sketch Study:

- Site slopes down from Northeast to Southwest, approximate 1.6% slope.
- Bedrock is approximately 434 feet below grade.
- Ground water level is below 30 feet below grade from borings of 1944.
- Not within a flood zone.
- Most of proposed site currently covered in asphalt.

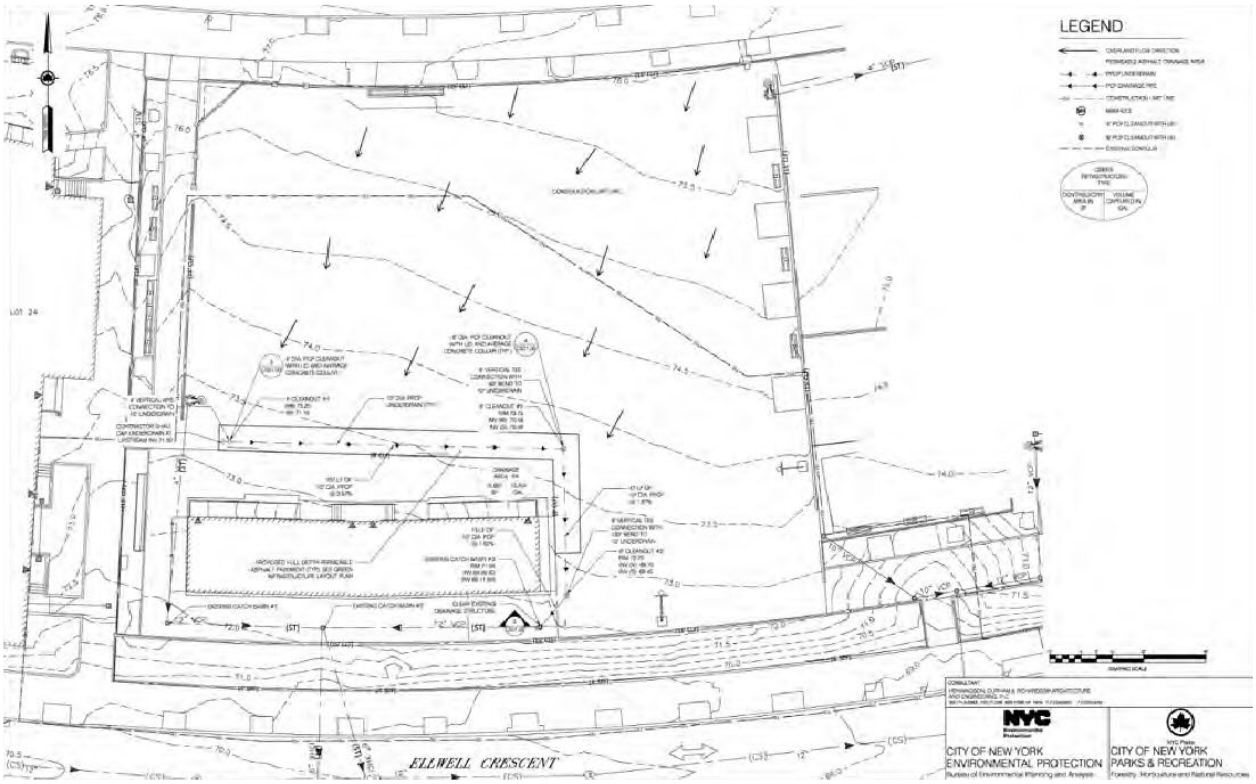
Documentation from DEP Green Infrastructure project Q306-2, previously planned for Painters Playground, is shown below.

- Borings found dry loose light brown f sand, trace silt, and trace f gravel (SP) to 15 feet below grade
- Borings found maximum soil permeability of 19.51 in/hr = 0.0138 cm/sec
- Per the SCA Green Infrastructure Assessment flow chart, soil type and soil permeability are not suitable for green infrastructure

Following the DEP documentation is a preliminary analysis of stormwater management options for the PS174Q addition by the project's civil engineer.



No.	Nearest Boring ID No.	Laboratory Testing Data / Historical Boring Soil Description			Permeability Analysis			Groundwater Table Depth(ft)
		Depth (ft)	USCS Symbol	% Passing No 200 Sieve	Nearest Permeability Test ID No.	Permeability Test Depth (ft)	Average Permeability Coef. (in/hr)	
6-1	B1-Q306	3 - 5	SM	22.1%	P1-Q306	3	1.59	
C)		5 - 7	SM	13.2%		6	0.40	
		7 - 9	SM	12.4%		10	0.52	N/A
		9 - 11	SW-SM	10.7%				
		11 - 13	SM	16.7%				
6-2	B2-Q306	3 - 5	SM	12.7%	P2-Q306	3	19.51	
C)		5 - 7	SW-SM	10.8%		6	0.13	
		7 - 9	SP-SM	5.4%		10	2.70	N/A



From:
Sent: Tuesday, November 10, 2020 11:17 AM
To:
Cc:
Subject: Stormwater summary

Please see our outline for your schematic considerations.
The two concepts you are advancing (2 story v. 3 story) have little bearing on the rough sizing, so please consider this information universal.
SCA support with DEP and Parks to obtain information not available through record retrieval channels would be advantageous to stay on schedule.
For comparative purposes, we sized the stormwater mitigation as a pipe in a stone envelope.
You will see the inclusion of the JOP in the project introduces a multiplier of ~5 on the stormwater requirement.
Building design, survey, and geotechnical will be required to remove variables and allow us to refine the design.
Please let us know what level of additional information/documentation you would like us to prepare at this early juncture.

1. Point of discharge
    a. Ellwell Crescent
    b. Combined sewer
    c. Sewer ~11' below grade
    d. Survey to confirm elevations
2. Location of system
    a. Grade falls from Dieterle to Ellwell
    b. Subsurface system would lie generally below footprint of TCB to be removed
    c. Infiltration and borings required to confirm separation from rock/groundwater and infiltration rate
    d. Record drawings required from Parks. SCA should provide contact or request/circulate plans.
    e. DEP has a green infrastructure project (Q306-2) under design(OGI-DESIGN-2-OS14) in the Painter's Playground (permeable pavement)
        i. The location of the project is unknown and requires coordination design drawings required from DEP. SCA should request and circulate.
3. Approach to filing
    a. 2 theoretical possibilities:
        i. JOP = Site
            1. typical approach that requires stormwater mitigation be installed for the entire lot (SCA and Parks improvements)
            2. Existence of DEP green infrastructure project (Q306-2) may complicate the application
        ii. 20,000 SF "lease" = Site
            1. Deputy Chief, Site Connection & Application Review was hesitant, but did not rule out. Pre-application conference would be required to discuss any potential.
            2. Existence of DEP green infrastructure project (Q306-2) may complicate the discussion design drawings should be obtained before a meeting

3. Direction required to proceed to Pre-application conference.

4. Schematic solutions
    a. Working assumptions:
        i. 15,000 SF building (max)
        ii. 5,000 SF exterior hardscape (walks, courtyards, plazas, ramps, and similar)
        iii. Painter's Playground improvements are unchanged under this project
        iv. <10,000 SF available for blue roof
        v. Structural verification of load-carrying capacity for blue roof will be provided
        vi. SCP application cannot be made without final design of roof
        vii. SWPPP will be provided on the detailed erosion and sediment control plans.
        viii. Green infrastructure feasibility will require subsurface investigation results.
    b. 20,000 SF "lease" = Site
        i. 1 perforated pipe in stone pack
        ii. 4' diameter
        iii. infiltration rate conservatively assumed
        iv. 121' of pipe required
        v. Rectangular footprint (ft) = 5x121, plus inlet & outlet structures
    c. JOP = Site
        i. 5 perforated pipes in stone pack
        ii. 4' diameter
        iii. infiltration rate conservatively assumed
        iv. 137' of pipe required in each row – 685' total
        v. Rectangular footprint (ft) = 25x137, plus inlet & outlet structures
        vi. The tributary area to the DEP green infrastructure project (Q306-2) can potentially offset a portion of this system size.
        vii. feasibility of capture of the eastern portion of the park is unknown until survey is completed, Parks record plans are reviewed, and DEP GI project Q306-2 is reviewed.
    d. Blue roof
        i. cannot mitigate stormwater alone
        ii. can be implemented in series before subsurface system
        iii. will provide a small but limited volume mitigation benefit – can be disregarded for schematic planning purposes
        iv. benefit is constrained by DEP limitations on depth, flow rate, roof slope, and percentage contribution to regulatory release rate

3.3 Detention Facility Design

CRITERIA FOR DETENTION FACILITY DESIGN
SD-1/SD-2 CALCULATION - MANHATTAN

SCHEME A

PREPARED BY: NYAN WIN AUNG, P.E. DATE: 5/21/2020

PROJECT NAME:			
PROJECT ADDRESS:			
BOROUGH:	MANHATTAN		
BLOCK:	2214		
LOT:	24		
ZONE	M1-1	MAP:	3a

STORM FLOW CALCULATION

	AREA	RUNOFF COEFFICIENT	
	SQ.FT	C	AREA X C
LOT SIZE	20,000.00		20,000.00
ROOF	13,610.00	0.95	12,929.50
SYNTHETIC TURF		0.70	0.00
PAVED	6,390.00	0.85	5,431.50
GRASS	0.00	0.20	0.00

As = THE SITE AREA IN ft^2	
ASxCw	18,361.0

Cwt = THE WEIGHTED RUNOFF COEFFICIENT FOR THE SITE AREA	
Cwt	0.918

Qall = THE ALLOWABLE FLOW RATE IN cfs A Site in the Brooklyn			
Qall	Site Area		Factor
1.64	20,000.00		12,200.00

Qdev = THE DEVELOPED FLOW RATE IN cfs			
Qdev	AS	Factor	
2.51	18,361.00	7,320.00	

Qdrr= THE DETENTION FACILITY MAXIMUM RELEASE RATE IN cfs	
Qdrr	0.25

Qall	<	Qdev	Detention tank is required

Integrative Design Report and Recommendations

OUTFLOW WILL BE CONTROLLED BY AN ORIFICE TUBE AND WILL VARY WITH THE DEPTH OF STORAGE.

tv = 0.27(Cwt At/Qdrr)^0.5-15

Tv = THE DURATION OF THE STORM IN min WITH A 10YR. RETURN FREQUENCY REQUIRING THE MAXIMUM DETENTION VOLUME WITH A VARIABLE OUTFLOW

Cwt= THE WEIGHTED RNOFF COEFFICIENT FOR THE AREA TRIBUTARY TO THE DETENTION FACILITY

At= THE ARE TRIBUTARY TO THE DETENTION FACIUTY IN ft2

Tv (min)	Factor	Cwt	At	Qdrr
58.17	0.27	0.92	20,000.00	0.25

Vv = THE MAXIMUM REQUIRED DETENTION VOLUME IN ft^3 WITH A VARIABLE OUTFLOW

Vv = [0.19CwtAt/(tv+15)-40Qdrr]tv

Vv (cu.ft.)	Factor	Cwt	At	Qdrr
2,191.72	0.19	0 92	20,000.00	0.25

TO MAXIMUMIZE THE STORAGE DEPTH, USE A 2.0 in Dia. WITH FLUSH ORIFICE TUBE OUTLET.

Sdf = THE MAXIMUM STORAGE DEPTH IN FT. FOR FLUSH ORIFIC TU BE OUTLET

Sdf = 1400 (Qdrr)^2/(do)^4 + do/ 24

Sdf (ft)	Factor	Qdrr	do	
5.55	1400	0.25	2	

TO MAXIMUMIZE THE STORAGE DEPTH, USE A 2.0 in Dia. WITH RE-ENTRANT ORIFICE TUBE OUTLET

Sdr = THE MAXIMUM STORAGE DEPTH IN FT. FOR RE-ENTRANT ORIFICE TUBE OUTLET

Sdr = 1930 (Qdrr)^2/(do)^4 + do/24

Sdr (ft)	Factor	Qdrr	dc	
7.62	1930	0.25	2	

USE FLUSH ORIFICE	ONE MODULE CAPACITY			
NO. OF MODULES REQUIREMENT	DEPTH (ft.)	WIDTH (ft.)	LENGTH (ft.)	VOLUME (cu.ft.) PER MODULE
4	5.55	15.0	7.0	583.0

TOTAL STORAGE VOLUME (cu.ft.)	>	REQUIRED VOLUME (cu.ft.)	SATISFY
2,331.88		2,191.72	

SANITARY FLOW CALCULATION (Zone: M1-1)

10,000 (gal./acre/day) x total site area (sq.ft/43,560) Acre x factor x peak flow factor

Sanitary Flow (cfs)	Population Density per Acre	Site Area (sq ft.)	Gallons Per Person Per Day	Peak
0.0142	10,000	20,000.00	1	2

Integrative Design Report and Recommendations

CRITERIA FOR DETENTION FACILITY DESIGN

SD-1/SD-2 CALCULATION - MANHATTAN

SCHEME B

PREPARED BY: NYAN WIN AUNG, P.E. DATE: 5/21/2020

PROJECT NAME:			
PROJECT ADDRESS:			
BOROUGH:	MANHATTAN		
BLOCK:	2214		
LOT:	24		
ZONE	M1-1	MAP:	3a

STORM FLOW CALCULATION

	AREA	RUNOFF COEFFICIENT	
	SQ.FT	C	AREA X C
LOT SIZE	20,000.00		20,000.00
ROOF	12,872.00	0.95	12,228.40
SYNTHETIC TURF		0.70	0.00
PAVED	7,128.00	0.85	6,058.80
GRASS	0.00	0.20	0.00

As = THE SITE AREA IN ft^2	
ASxCw	18,287.2

Cwt = THE WEIGHTED RUNOFF COEFFICIENT FOR THE SITE AREA	
Cwt	0.914

Qall = THE ALLOWABLE FLOW RATE IN cfs

A Site in the Brooklyn

Qall	Site Area		Factor
1.64	20,000.00		12,200.00

Qdev = THE DEVELOPED FLOW RATE IN cfs			
Qdev	AS	Factor	
2.50	18,287.20	7,320.00	

Qdrr= THE DETENTION FACILITY MAXIMUM RELEASE RATE IN cfs	
Qdrr	0.25

Qall	<	Qdev	Detention tank is required

Integrative Design Report and Recommendations

OUTFLOW WILL BE CONTROLLED BY AN ORIFICE TUBE AND WILL VARY WITH THE DEPTH OF STORAGE.

tv = 0.27(Cwt At/Qdrr)^0.5-15

Tv = THE DURATION OF THE STORM IN min WITH A 10YR. RETURN FREQUENCY REQUIRING THE MAXIMUM DETENTION VOLUME WITH A VARIABLE OUTFLOW

Cwt= THE WEIGHTED RNOFF COEFFICIENT FOR THE AREA TRIBUTARY TO THE DETENTION FACILITY

At= THE ARE TRIBUTARY TO THE DETENTION FACILITY IN ft2

Tv (min)	Factor	Cwt	At	Qdrr
58.02	0.27	0.91	20,000.00	0.25

Vv = THE MAXIMUM REQUIRED DETENTION VOLUME IN ft^3 WITH A VARIABLE OUTFLOW

Vv = [0.19CwtAt/(tv+15)-40Qdrr]tv

Vv (cu.ft.)	Factor	Cwt	At	Qdrr
2,180.61	0.19	0.91	20,000.00	0.25

TO MAXIMUMIZE THE STORAGE DEPTH, USE A 2.0 in Dia. WITH FLUSH ORIFICE TUBE OUTLET.

Sdf = THE MAXIMUM STORAGE DEPTH IN FT. FOR FLUSH ORIFIC TUBE OUTLET

Sdf = 1400 (Qdrr)^2/(do)^4 + do/24

Sdf (ft)	Factor	Qdrr	do	
5.55	1400	0.25	2	

TO MAXIMUMIZE THE STORAGE DEPTH, USE A 2.0 in Dia. WITH RE-ENTRANT ORIFICE TUBE OUTLET

Sdr = THE MAXIMUM STORAGE DEPTH IN FT. FOR RE-ENTRANT ORIFICE TUBE OUTLET

Sdr = 1930 (Qdrr)^2/(do)^4 + do/24

Sdr (ft)	Factor	Qdrr	do	
7.62	1930	0.25	2	

USE FLUSH ORIFICE	ONE MODULE CAPACITY			
NO. OF MODULES REQUIREMENT	DEPTH (ft.)	WIDTH (ft.)	LENGTH (ft.)	VOLUME (cu.ft.) PER MODULE
4	5.55	15.0	7.0	583.0

TOTAL STORAGE VOLUME (cu.ft.)	>	REQUIRED VOLUME (cu.ft.)	SATISFY
2,331.88		2,180.61	

SANITARY FLOW CALCULATION (Zone: M1-1)

10,000 (gal./acre/day) x total site area (sq.ft/43,560) Acre x factor x peak flow factor

Sanitary Flow (cfs)	Population Density per Acre	Site Area (sq.ft.)	Gallons Per Person Per Day	Peak
0.0142	10,000	20,000.00	1	2

Integrative Design Report and Recommendations

CRITERIA FOR DETENTION FACILITY DESIGN

SD-1/SD-2 CALCULATION - MANHATTAN

SCHEME C

PREPARED BY: NYAN WIN AUNG, P.E. DATE: 5/21/2020

PROJECT NAME:			
PROJECT ADDRESS:			
BOROUGH:	MANHATTAN		
BLOCK:	2214		
LOT:	24		
ZONE	M1-1	MAP:	3a

STORM FLOW CALCULATION

	AREA	RUNOFF COEFFICIENT	
	SQ.FT	C	AREA X C
LOT SIZE	20,000.00		20,000.00
ROOF	15,027.00	0.95	14,275.65
SYNTHETIC TURF		0.70	0.00
PAVED	4,973.00	0.85	4,227.05
GRASS	0.00	0.20	0.00

As = THE SITE AREA IN ft^2	
ASxCw	18,502.7

Cwt = THE WEIGHTED RUNOFF COEFFICIENT FOR THE SITE AREA	
Cwt	0.925

Qall = THE ALLOWABLE FLOW RATE IN cfs
A Site in the Brooklyn

Qall	Site Area		Factor
1.64	20,000.00		12,200.00

Qdev = THE DEVELOPED FLOW RATE IN cfs			
Qdev	AS	Factor	
2.53	18,502.70	7,320.00	

Qdrr= THE DETENTION FACILITY MAXIMUM RELEASE RATE IN cfs	
Qdrr	0.25

Qall	<	Qdev	Detention tank is required

Integrative Design Report and Recommendations

OUTFLOW WILL BE CONTROLLED BY AN ORIFICE TUBE AND WILL VARY WITH THE DEPTH OF STORAGE.

tv = 0.27(Cwt At/Qdrr)^0.5-15

Tv = THE DURATION OF THE STORM IN min WITH A 10YR. RETURN FREQUENCY REQUIRING THE MAXIMUM DETENTION VOLUME WITH A VARIABLE OUTFLOW

Cwt= THE WEIGHTED RNOFF COEFFICIENT FOR THE AREA TRIBUTARY TO THE DETENTION FACILITY

At= THE ARE TRIBUTARY TO THE DETENTION FACILITY IN ft2

Tv (min)	Factor	Cwt	At	Qdrr
58.45	0.27	0.93	20,000.00	0.25

Vv = THE MAXIMUM REQUIRED DETENTION VOLUME IN ft^3 WITH A VARIABLE OUTFLOW

Vv = [0.19CwtAt/(tv+15)-40Qdrr]tv

Vv (cu. ft.)	Factor	Cwt	At	Qdrr
2,213.07	0.19	0.93	20,000.00	0.25

TO MAXIMUMIZE THE STORAGE DEPTH, USE A 2.0 in Dia. WITH FLUSH ORIFICE TUBE OUTLET.

Sdf = THE MAXIMUM STORAGE DEPTH IN FT. FOR FLUSH ORIFIC TUBE OUTLET

Sdf = 1400 (Qdrr)^2/(do)^4 + do/24

Sdf (ft)	Factor	Qdrr	do	
5.55	1400	0.25	2	

TO MAXIMUMIZE THE STORAGE DEPTH, USE A 2.0 In Dia. WITH RE-ENTRANT ORIFICE TUBE OUTLET

Sdr = THE MAXIMUM STORAGE DEPTH IN FT. FOR RE ENTRANT ORIFICE TUBE OUTLET

Sdr = 1930 (Qdrr)^2/(do)^4 + do/24

Sdr (ft)	Factor	Qdrr	do	
7.62	1930	0.25	2	

USE FLUSH ORIFICE	ONE MODULE CAPACITY			
NO. OF MODULES REQUIREMENT	DEPTH (ft.)	WIDTH (ft.)	LENGTH (ft.)	VOLUME (cu.ft.) PER MODULE
4	5.55	15.0	7.0	583.0

TOTAL STORAGE VOLUME (cu.ft.)	>	REQUIRED VOLUME (cu.ft.)	SATISFY
2,331.88		**2,213.07**	

SANITARY FLOW CALCULATION (Zone: M1 1)

10,000 (gal./acre/day) x total site area (sq.ft/43,560) Acre x factor x peak flow factor

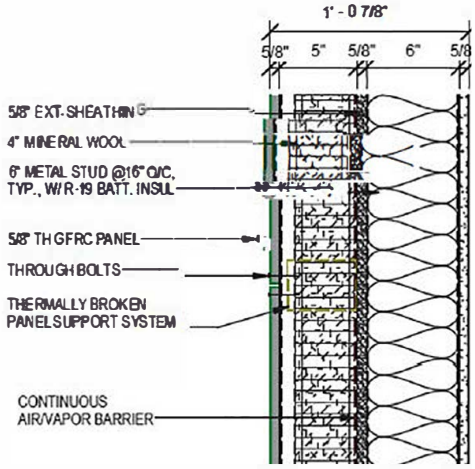
Sanitary Flow (cfs)	Population Density per Acre	Site Area (sq.ft.)	Gallons Per Person Per Day	Peak
0.0142	10,000	20,000.00	1	2

DISCOVERY #3 PRELIMINARY LIFE-CYCLE IMPACTS

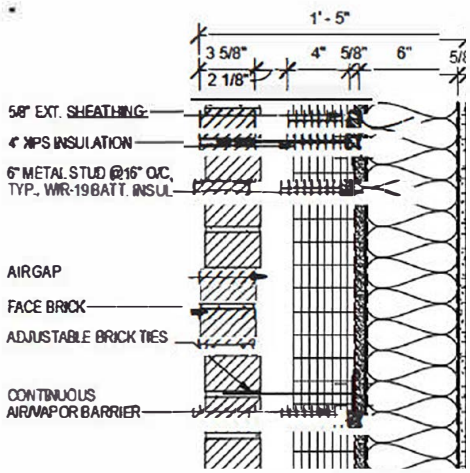
Comparative life-cycle assessment of potential wall systems was investigated in the Athena software.

The LCA comparison is between:

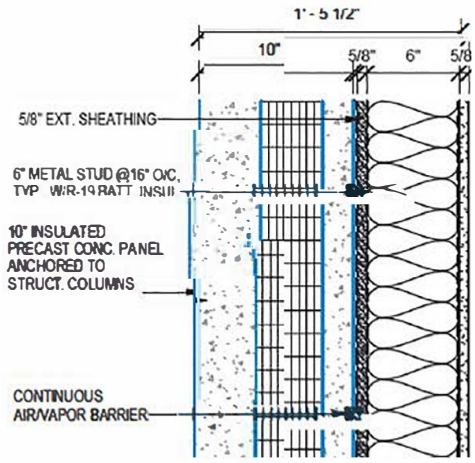
- BASE: Brick/CMU Cavity wall
- OPTION #1: Fiber Cement Panel On Metal Stud
- OPTION #2: Modular Brick On Metal Stud
- OPTION #3: Precast Concrete Panels On Metal Stud



OPTION 1
Fiber Cement Panel On Mtl Stud

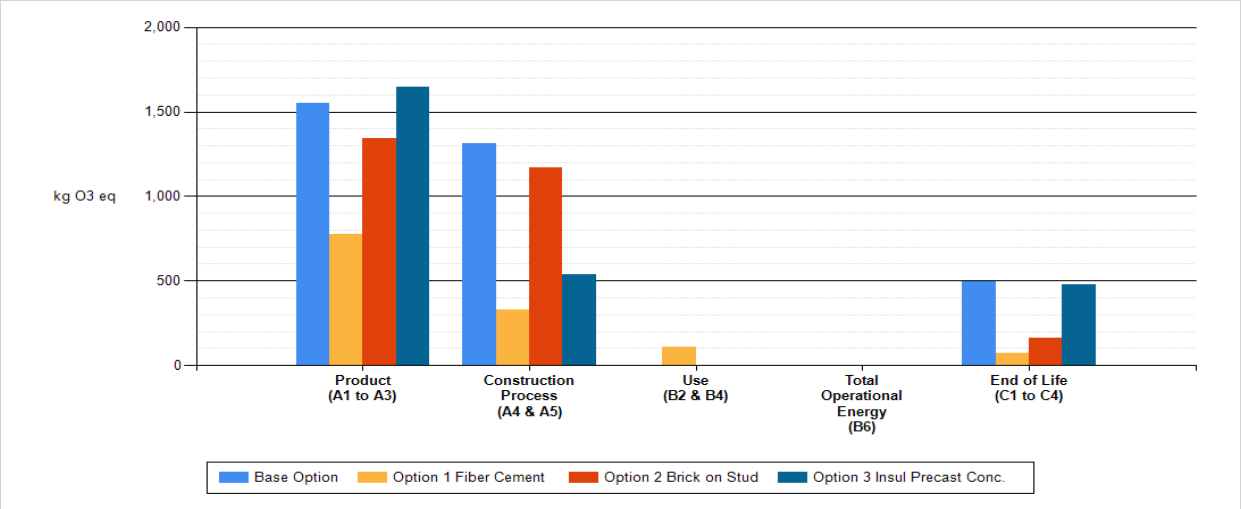


OPTION 2
Modular Brick On Mtl Stud



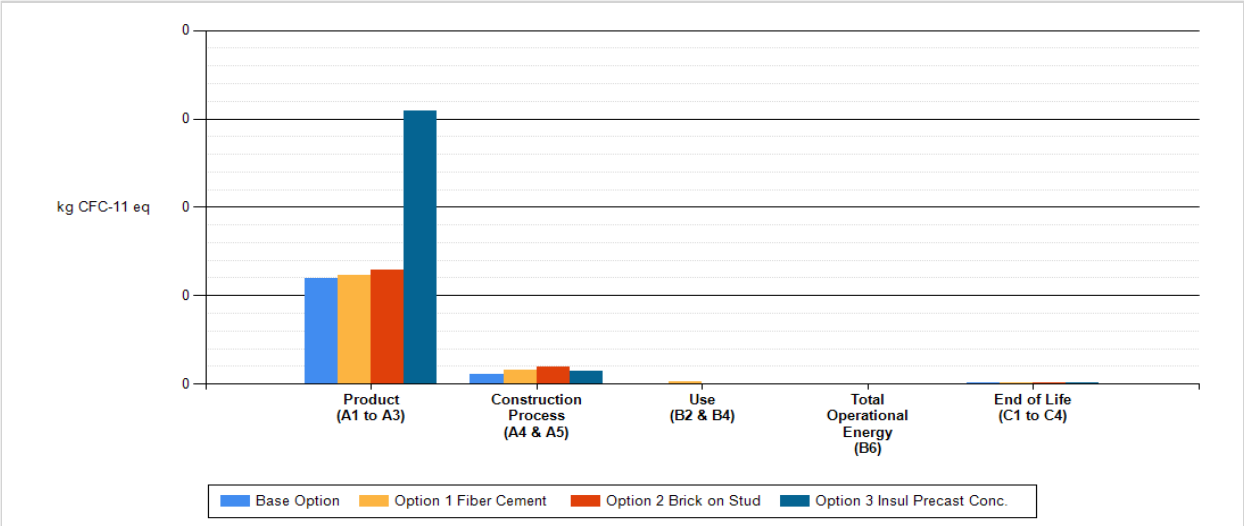
OPTION 3
Precast Concrete Panels On Mtl Stud

Comparison of Smog Potential By Life Cycle Stage



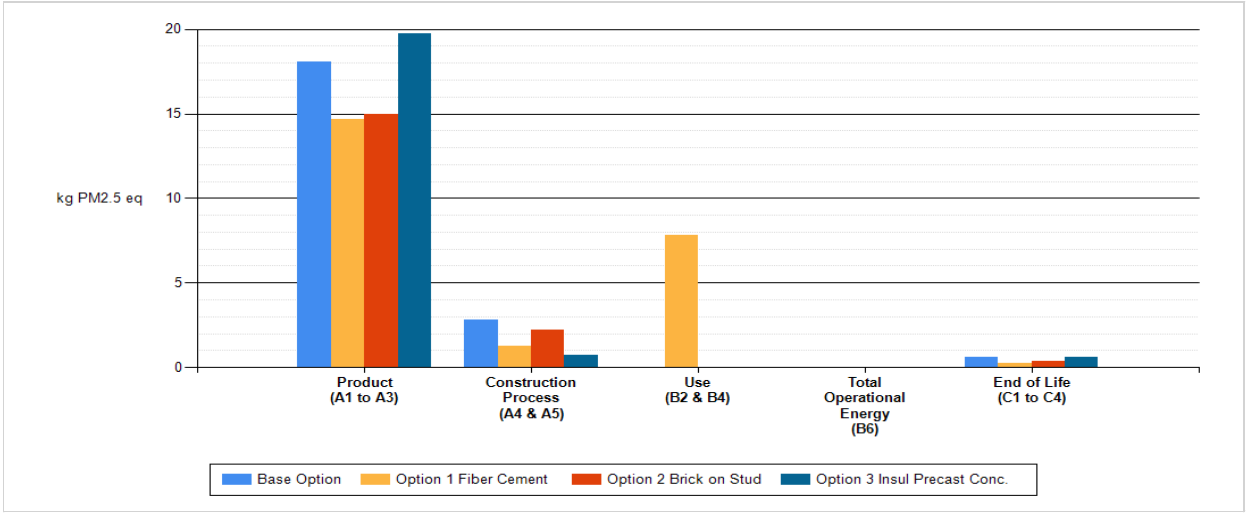
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg O3 eq	1.55E+03	1.31E+03	0.00E+00	0.00E+00	4.94E+02	**3.35E+03**
Option 1 Fiber Cement	kg O3 eq	7.75E+02	3.30E+02	1.05E+02	0.00E+00	7.44E+01	**1.28E+03**
Option 2 Brick on Stud	kg O3 eq	1.34E+03	1.17E+03	0.00E+00	0.00E+00	1.60E+02	**2.67E+03**
Option 3 Insul Precast Conc.	kg O3 eq	1.65E+03	5.37E+02	0.00E+00	0.00E+00	4.75E+02	**2.66E+03**
Total	**kg O3 eq**	**5.31E+03**	**3.35E+03**	**1.05E+02**	**0.00E+00**	**1.20E+03**	**9.97E+03**

Comparison of Ozone Depletion Potential By Life Cycle Stage



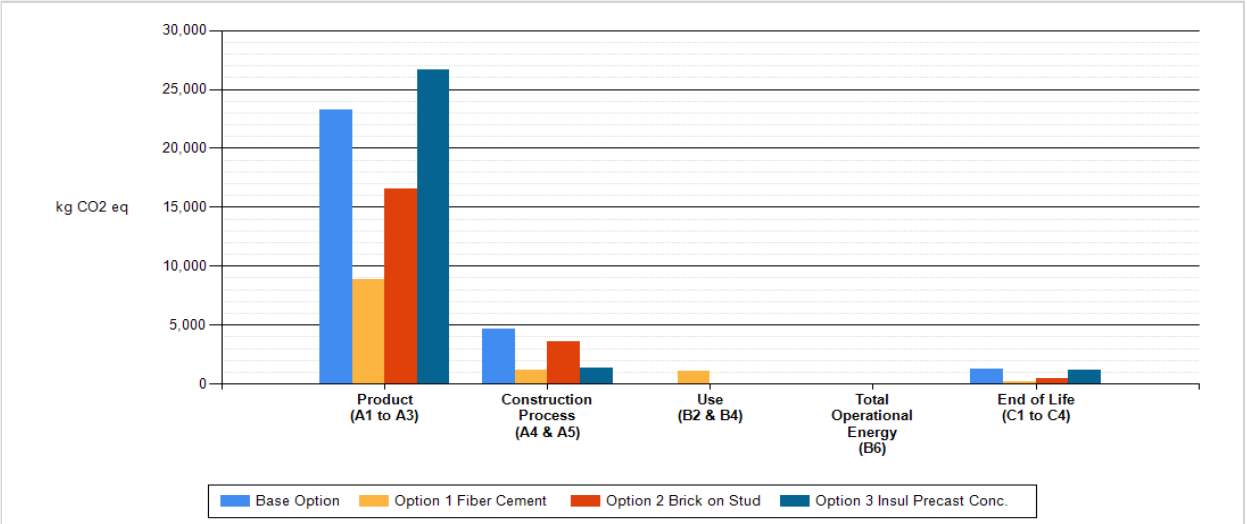
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg CFC-11 eq	2.40E-04	2.28E-05	0.00E+00	0.00E+00	4.94E-08	**2.63E-04**
Option 1 Fiber Cement	kg CFC-11 eq	2.45E-04	3.20E-05	4.50E-06	0.00E+00	8.28E-09	**2.82E-04**
Option 2 Brick on Stud	kg CFC-11 eq	2.58E-04	3.78E-05	0.00E+00	0.00E+00	1.76E-08	**2.96E-04**
Option 3 Insul Precast Conc.	kg CFC-11 eq	6.18E-04	2.88E-05	0.00E+00	0.00E+00	4.68E-08	**6.47E-04**
Total	**kg CFC-11 eq**	**1.36E-03**	**1.21E-04**	**4.50E-06**	**0.00E+00**	**1.22E-07**	**1.49E-03**

Comparison of HH Particulate By Life Cycle Stage



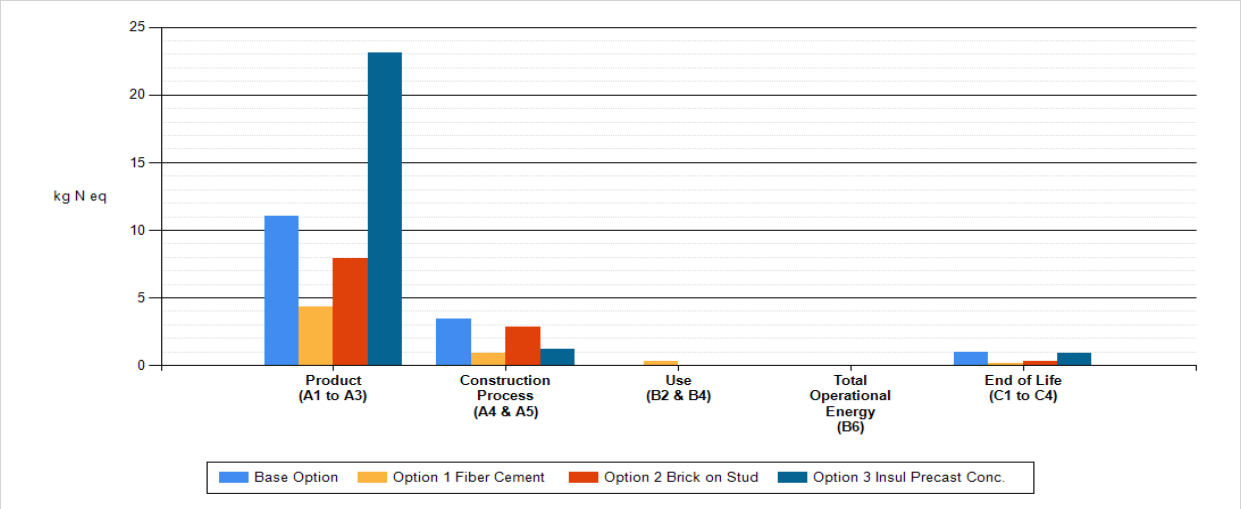
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg PM2.5 eq	1.81E+01	2.82E+00	0.00E+00	0.00E+00	5.78E-01	**2.15E+01**
Option 1 Fiber Cement	kg PM2.5 eq	1.47E+01	1.28E+00	7.84E+00	0.00E+00	2.48E-01	**2.40E+01**
Option 2 Brick on Stud	kg PM2.5 eq	1.50E+01	2.20E+00	0.00E+00	0.00E+00	3.77E-01	**1.75E+01**
Option 3 Insul Precast Conc.	kg PM2.5 eq	1.97E+01	7.04E-01	0.00E+00	0.00E+00	6.17E-01	**2.10E+01**
Total	**kg PM2.5 eq**	**6.74E+01**	**7.01E+00**	**7.84E+00**	**0.00E+00**	**1.82E+00**	**8.41E+01**

Comparison of Global Warming Potential By Life Cycle Stage



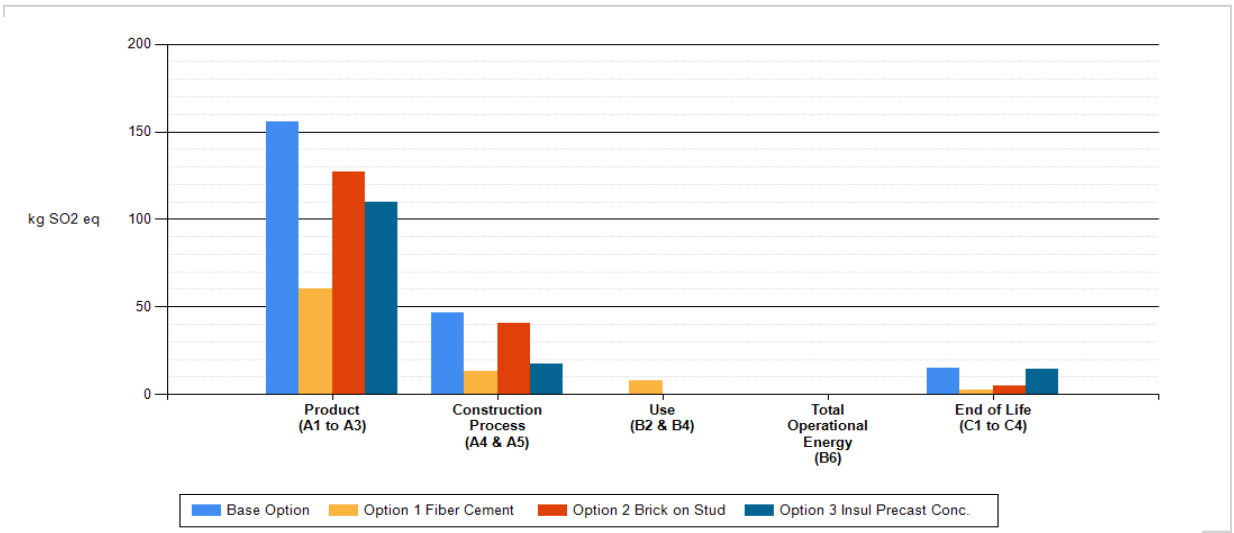
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg CO2 eq	2.32E+04	4.67E+03	0.00E+00	0.00E+00	1.24E+03	**2.91E+04**
Option 1 Fiber Cement	kg CO2 eq	8.88E+03	1.22E+03	1.04E+03	0.00E+00	2.08E+02	**1.13E+04**
Option 2 Brick on Stud	kg CO2 eq	1.65E+04	3.57E+03	0.00E+00	0.00E+00	4.60E+02	**2.06E+04**
Option 3 Insul Precast Conc.	kg CO2 eq	2.66E+04	1.39E+03	0.00E+00	0.00E+00	1.14E+03	**2.92E+04**
Total	**kg CO2 eq**	**7.53E+04**	**1.08E+04**	**1.04E+03**	**0.00E+00**	**3.04E+03**	**9.02E+04**

Comparison of Eutrophication Potential By Life Cycle Stage



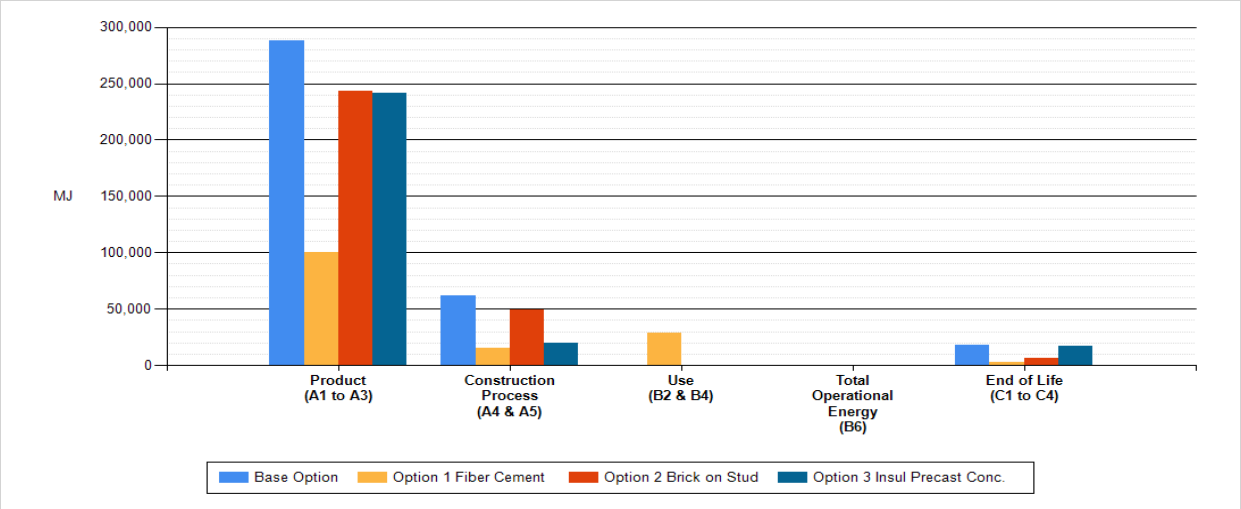
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg N eq	1.10E+01	3.41E+00	0.00E+00	0.00E+00	9.44E-01	**1.54E+01**
Option 1 Fiber Cement	kg N eq	4.36E+00	8.73E-01	3.00E-01	0.00E+00	1.43E-01	**5.68E+00**
Option 2 Brick on Stud	kg N eq	7.92E+00	2.86E+00	0.00E+00	0.00E+00	3.10E-01	**1.11E+01**
Option 3 Insul Precast Conc.	kg N eq	2.31E+01	1.21E+00	0.00E+00	0.00E+00	9.02E-01	**2.52E+01**
Total	**kg N eq**	**4.64E+01**	**8.35E+00**	**3.00E-01**	**0.00E+00**	**2.30E+00**	**5.73E+01**

Comparison of Acidification Potential By Life Cycle Stage



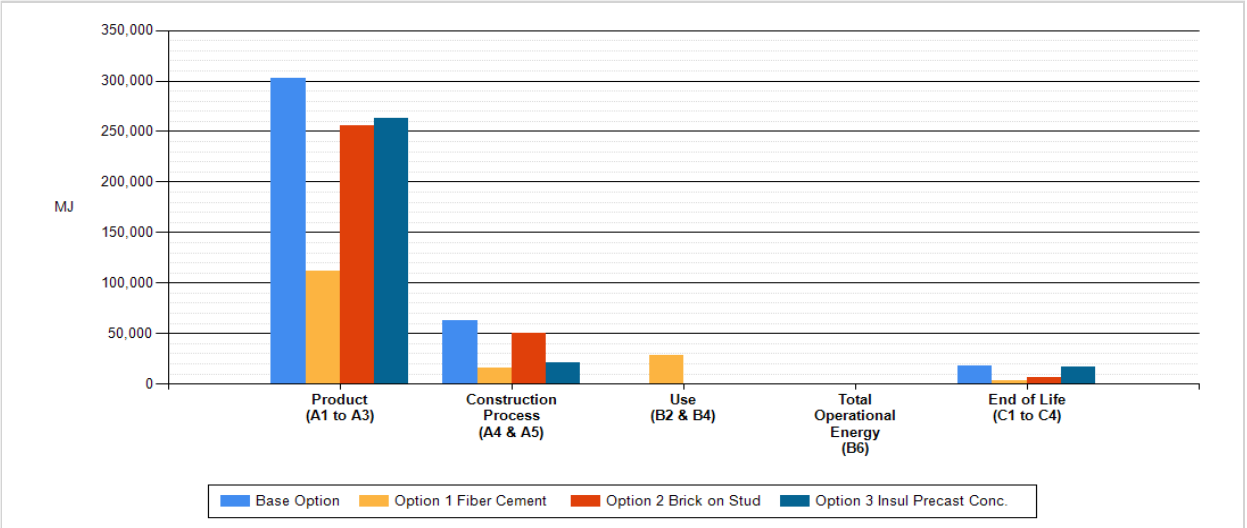
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg SO2 eq	1.56E+02	4.64E+01	0.00E+00	0.00E+00	1.51E+01	**2.17E+02**
Option 1 Fiber Cement	kg SO2 eq	6.01E+01	1.29E+01	7.89E+00	0.00E+00	2.30E+00	**8.32E+01**
Option 2 Brick on Stud	kg SO2 eq	1.27E+02	4.09E+01	0.00E+00	0.00E+00	4.98E+00	**1.73E+02**
Option 3 Insul Precast Conc.	kg SO2 eq	1.10E+02	1.75E+01	0.00E+00	0.00E+00	1.45E+01	**1.42E+02**
Total	**kg SO2 eq**	**4.53E+02**	**1.18E+02**	**7.89E+00**	**0.00E+00**	**3.69E+01**	**6.15E+02**

Comparison of Fossil Fuel Consumption By Life Cycle Stage



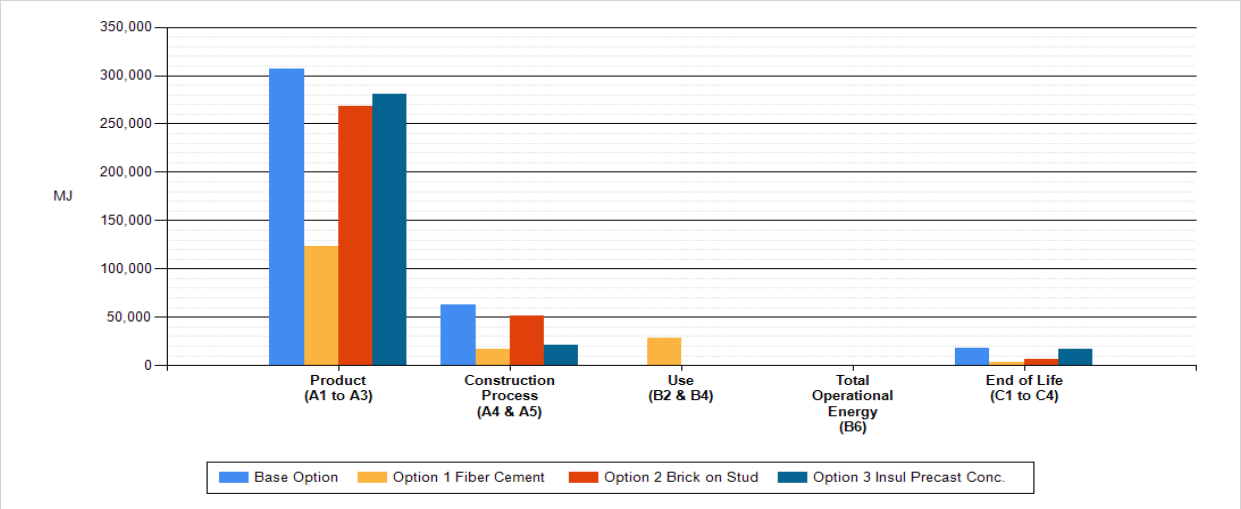
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	MJ	2.88E+05	6.17E+04	0.00E+00	0.00E+00	1.82E+04	**3.68E+05**
Option 1 Fiber Cement	MJ	9.99E+04	1.52E+04	2.83E+04	0.00E+00	3.04E+03	**1.46E+05**
Option 2 Brick on Stud	MJ	2.43E+05	4.95E+04	0.00E+00	0.00E+00	6.73E+03	**2.99E+05**
Option 3 Insul Precast Conc.	MJ	2.42E+05	1.98E+04	0.00E+00	0.00E+00	1.68E+04	**2.78E+05**
Total	**MJ**	**8.73E+05**	**1.46E+05**	**2.83E+04**	**0.00E+00**	**4.48E+04**	**1.09E+06**

Comparison of Non-Renewable Energy By Life Cycle Stage



Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	MJ	3.02E+05	6.25E+04	0.00E+00	0.00E+00	1.82E+04	**3.83E+05**
Option 1 Fiber Cement	MJ	1.12E+05	1.61E+04	2.83E+04	0.00E+00	3.05E+03	**1.59E+05**
Option 2 Brick on Stud	MJ	2.56E+05	5.07E+04	0.00E+00	0.00E+00	6.74E+03	**3.14E+05**
Option 3 Insul Precast Conc.	MJ	2.63E+05	2.08E+04	0.00E+00	0.00E+00	1.68E+04	**3.01E+05**
Total	**MJ**	**9.34E+05**	**1.50E+05**	**2.83E+04**	**0.00E+00**	**4.48E+04**	**1.16E+06**

Comparison of Total Primary Energy By Life Cycle Stage



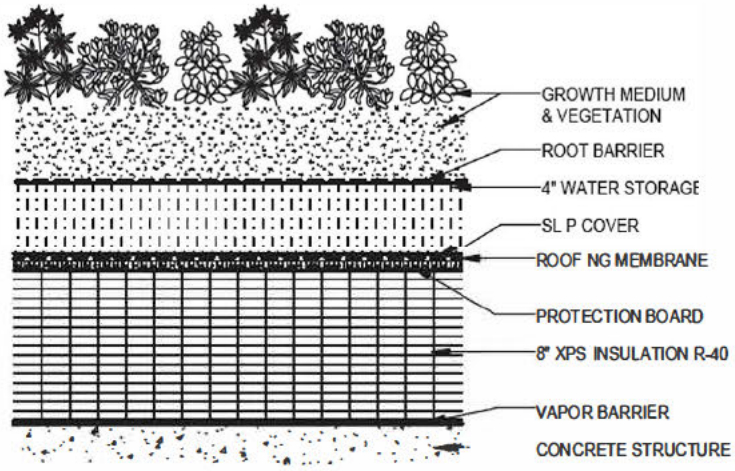
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	MJ	3.07E+05	6.30E+04	0.00E+00	0.00E+00	1.82E+04	**3.88E+05**
Option 1 Fiber Cement	MJ	1.23E+05	1.69E+04	2.83E+04	0.00E+00	3.05E+03	**1.71E+05**
Option 2 Brick on Stud	MJ	2.68E+05	5.16E+04	0.00E+00	0.00E+00	6.74E+03	**3.27E+05**
Option 3 Insul Precast Conc.	MJ	2.80E+05	2.15E+04	0.00E+00	0.00E+00	1.68E+04	**3.19E+05**
Total	**MJ**	**9.79E+05**	**1.53E+05**	**2.83E+04**	**0.00E+00**	**4.49E+04**	**1.20E+06**

DISCOVERY #3 PRELIMINARY LIFE-CYCLE IMPACTS

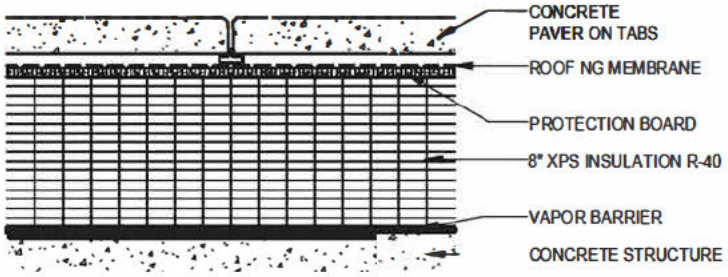
Comparative life-cycle assessment of potential roof systems was investigated in the Athena software.

The LCA comparison is between:

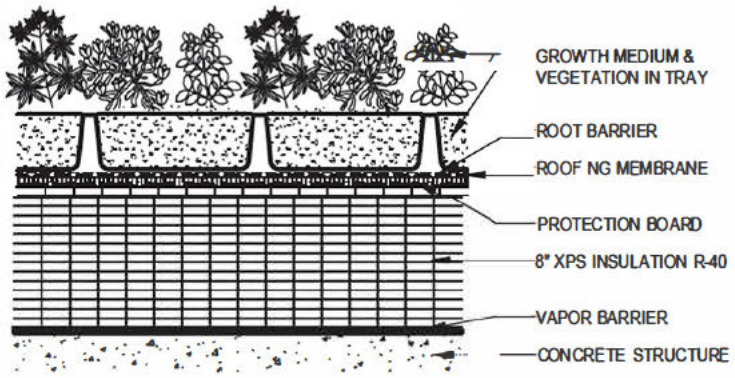
BASE Roof Option
OPTION #1: Blue Roof Seedums
OPTION #2: Green Roof Paver Area
OPTION #3: Green Roof Seedums



Blue Roof Seedums **OPTION 1**

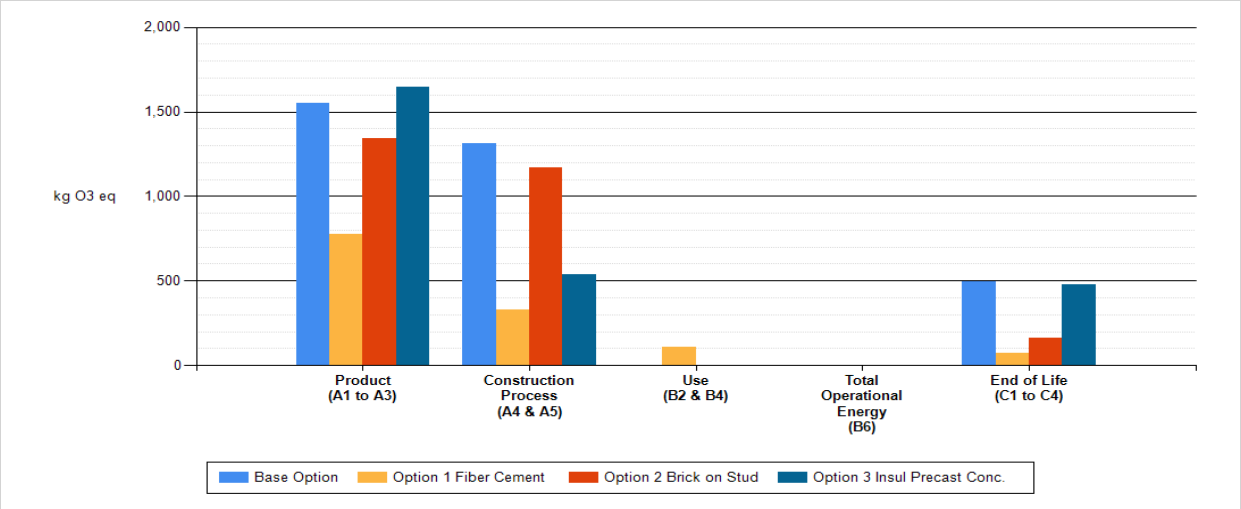


SCA Standard Roof **OPTION 2**



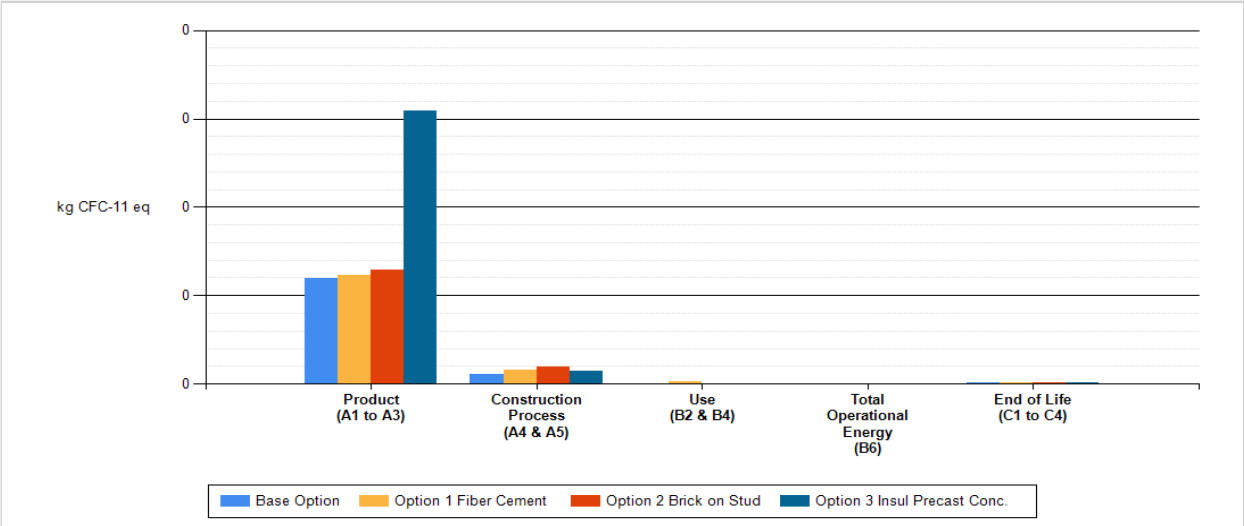
Green Roof Seedums **OPTION 3**

Comparison of Smog Potential By Life Cycle Stage



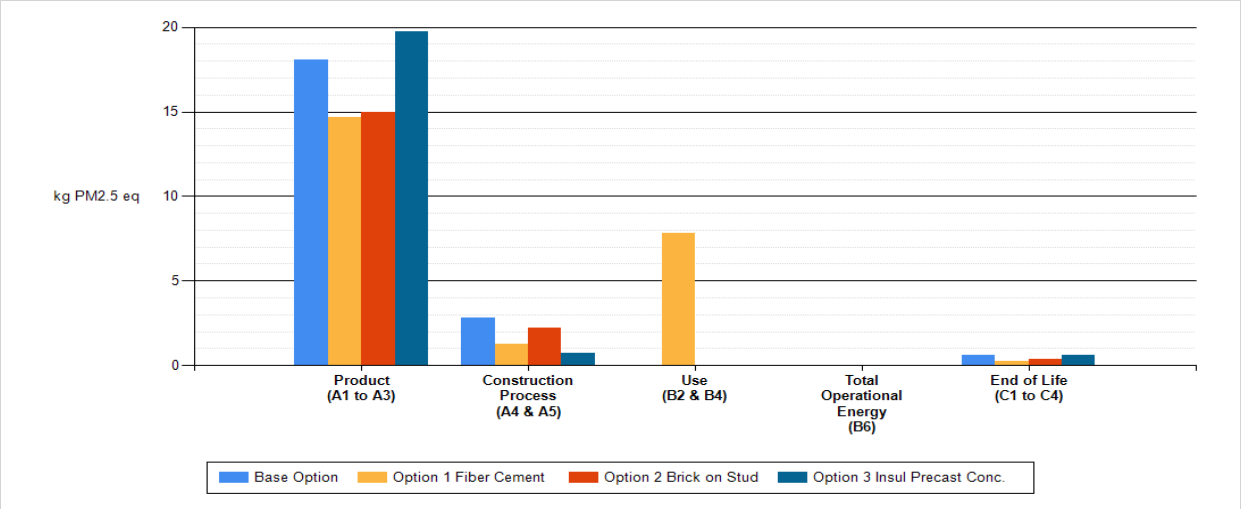
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg O3 eq	1.55E+03	1.31E+03	0.00E+00	0.00E+00	4.94E+02	**3.35E+03**
Option 1 Fiber Cement	kg O3 eq	7.75E+02	3.30E+02	1.05E+02	0.00E+00	7.44E+01	**1.28E+03**
Option 2 Brick on Stud	kg O3 eq	1.34E+03	1.17E+03	0.00E+00	0.00E+00	1.60E+02	**2.67E+03**
Option 3 Insul Precast Conc.	kg O3 eq	1.65E+03	5.37E+02	0.00E+00	0.00E+00	4.75E+02	**2.66E+03**
Total	**kg O3 eq**	**5.31E+03**	**3.35E+03**	**1.05E+02**	**0.00E+00**	**1.20E+03**	**9.97E+03**

Comparison of Ozone Depletion Potential By Life Cycle Stage



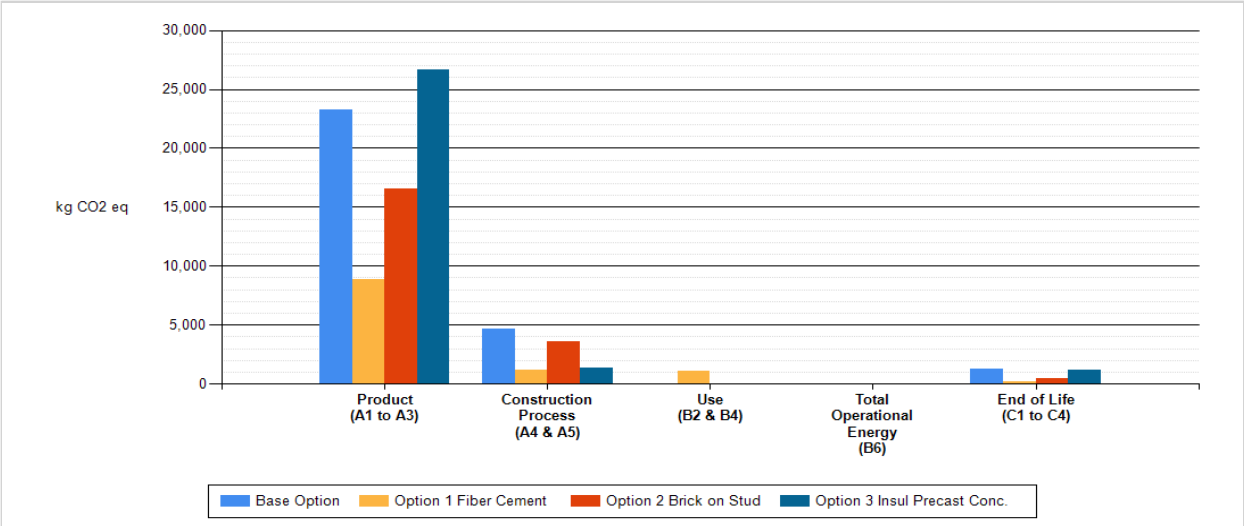
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg CFC-11 eq	2.40E-04	2.28E-05	0.00E+00	0.00E+00	4.94E-08	**2.63E-04**
Option 1 Fiber Cement	kg CFC-11 eq	2.45E-04	3.20E-05	4.50E-06	0.00E+00	8.28E-09	**2.82E-04**
Option 2 Brick on Stud	kg CFC-11 eq	2.58E-04	3.78E-05	0.00E+00	0.00E+00	1.76E-08	**2.96E-04**
Option 3 Insul Precast Conc.	kg CFC-11 eq	6.18E-04	2.88E-05	0.00E+00	0.00E+00	4.68E-08	**6.47E-04**
Total	**kg CFC-11 eq**	**1.36E-03**	**1.21E-04**	**4.50E-06**	**0.00E+00**	**1.22E-07**	**1.49E-03**

Comparison of HH Particulate By Life Cycle Stage



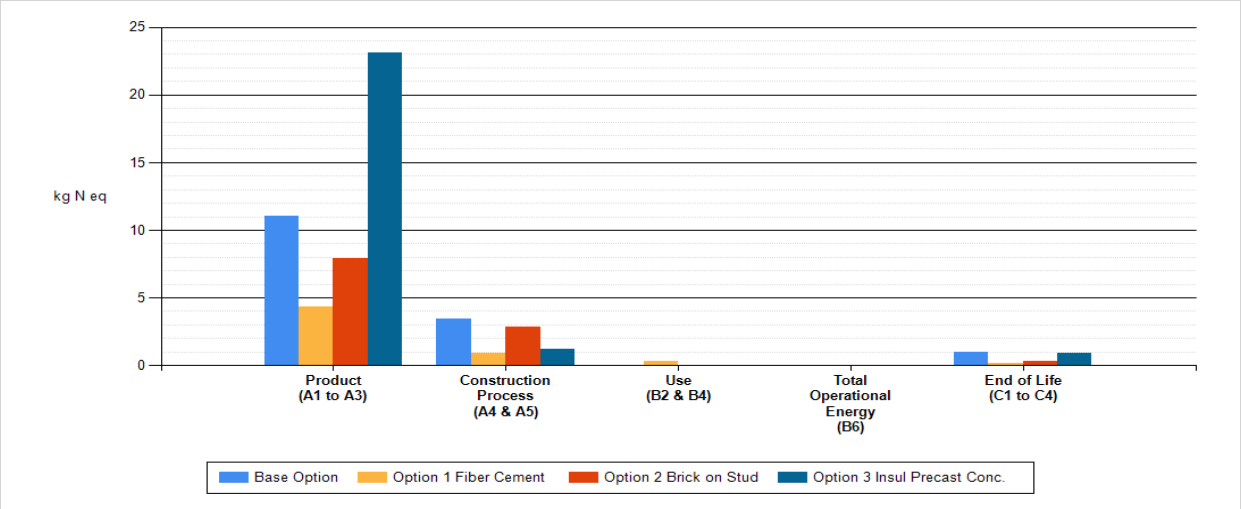
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg PM2.5 eq	1.81E+01	2.82E+00	0.00E+00	0.00E+00	5.78E-01	**2.15E+01**
Option 1 Fiber Cement	kg PM2.5 eq	1.47E+01	1.28E+00	7.84E+00	0.00E+00	2.48E-01	**2.40E+01**
Option 2 Brick on Stud	kg PM2.5 eq	1.50E+01	2.20E+00	0.00E+00	0.00E+00	3.77E-01	**1.75E+01**
Option 3 Insul Precast Conc.	kg PM2.5 eq	1.97E+01	7.04E-01	0.00E+00	0.00E+00	6.17E-01	**2.10E+01**
Total	**kg PM2.5 eq**	**6.74E+01**	**7.01E+00**	**7.84E+00**	**0.00E+00**	**1.82E+00**	**8.41E+01**

Comparison of Global Warming Potential By Life Cycle Stage



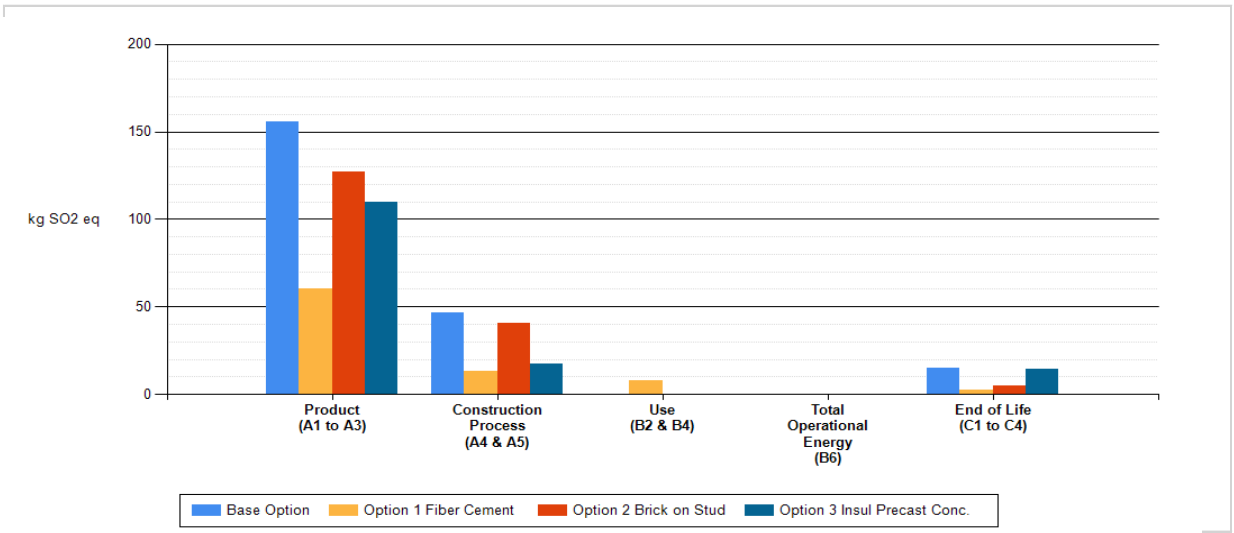
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg CO2 eq	2.32E+04	4.67E+03	0.00E+00	0.00E+00	1.24E+03	**2.91E+04**
Option 1 Fiber Cement	kg CO2 eq	8.88E+03	1.22E+03	1.04E+03	0.00E+00	2.08E+02	**1.13E+04**
Option 2 Brick on Stud	kg CO2 eq	1.65E+04	3.57E+03	0.00E+00	0.00E+00	4.60E+02	**2.06E+04**
Option 3 Insul Precast Conc.	kg CO2 eq	2.66E+04	1.39E+03	0.00E+00	0.00E+00	1.14E+03	**2.92E+04**
Total	**kg CO2 eq**	**7.53E+04**	**1.08E+04**	**1.04E+03**	**0.00E+00**	**3.04E+03**	**9.02E+04**

Comparison of Eutrophication Potential By Life Cycle Stage



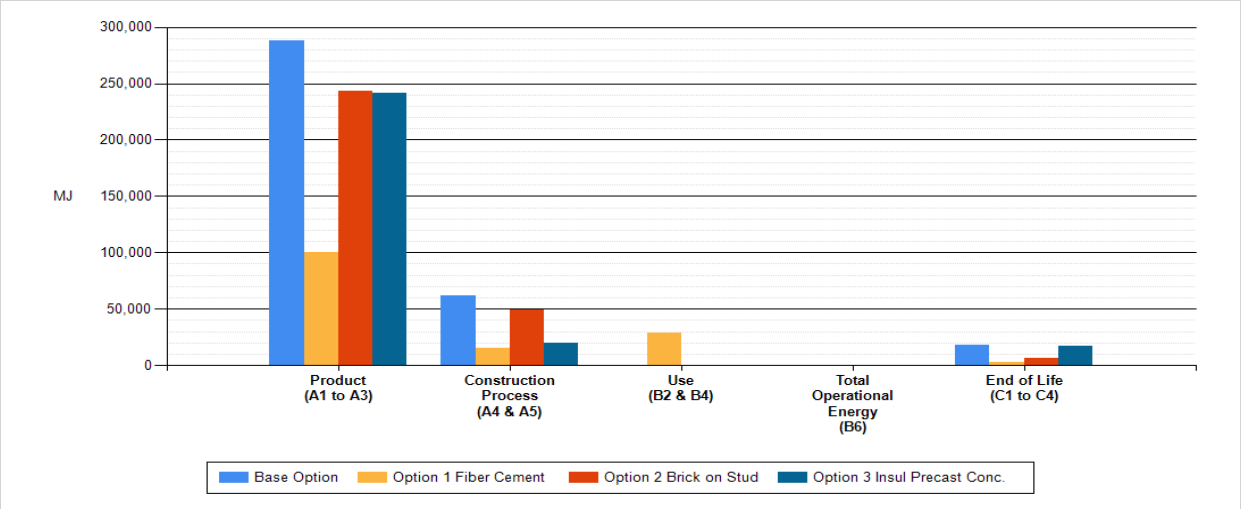
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg N eq	1.10E+01	3.41E+00	0.00E+00	0.00E+00	9.44E-01	**1.54E+01**
Option 1 Fiber Cement	kg N eq	4.36E+00	8.73E-01	3.00E-01	0.00E+00	1.43E-01	**5.68E+00**
Option 2 Brick on Stud	kg N eq	7.92E+00	2.86E+00	0.00E+00	0.00E+00	3.10E-01	**1.11E+01**
Option 3 Insul Precast Conc.	kg N eq	2.31E+01	1.21E+00	0.00E+00	0.00E+00	9.02E-01	**2.52E+01**
Total	**kg N eq**	**4.64E+01**	**8.35E+00**	**3.00E-01**	**0.00E+00**	**2.30E+00**	**5.73E+01**

Comparison of Acidification Potential By Life Cycle Stage



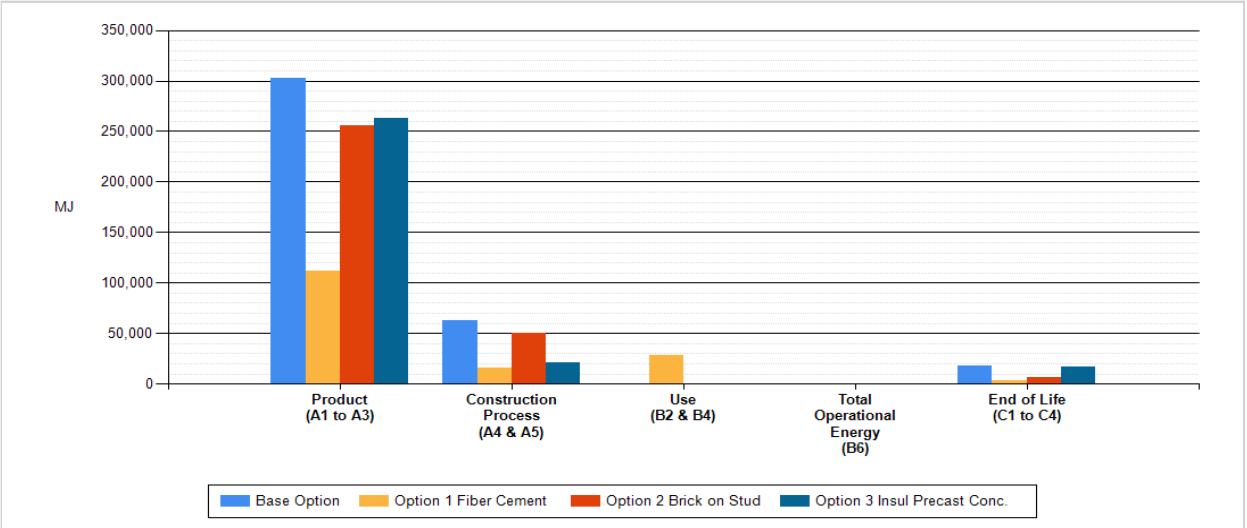
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	kg SO2 eq	1.56E+02	4.64E+01	0.00E+00	0.00E+00	1.51E+01	**2.17E+02**
Option 1 Fiber Cement	kg SO2 eq	6.01E+01	1.29E+01	7.89E+00	0.00E+00	2.30E+00	**8.32E+01**
Option 2 Brick on Stud	kg SO2 eq	1.27E+02	4.09E+01	0.00E+00	0.00E+00	4.98E+00	**1.73E+02**
Option 3 Insul Precast Conc.	kg SO2 eq	1.10E+02	1.75E+01	0.00E+00	0.00E+00	1.45E+01	**1.42E+02**
Total	**kg SO2 eq**	**4.53E+02**	**1.18E+02**	**7.89E+00**	**0.00E+00**	**3.69E+01**	**6.15E+02**

Comparison of Fossil Fuel Consumption By Life Cycle Stage



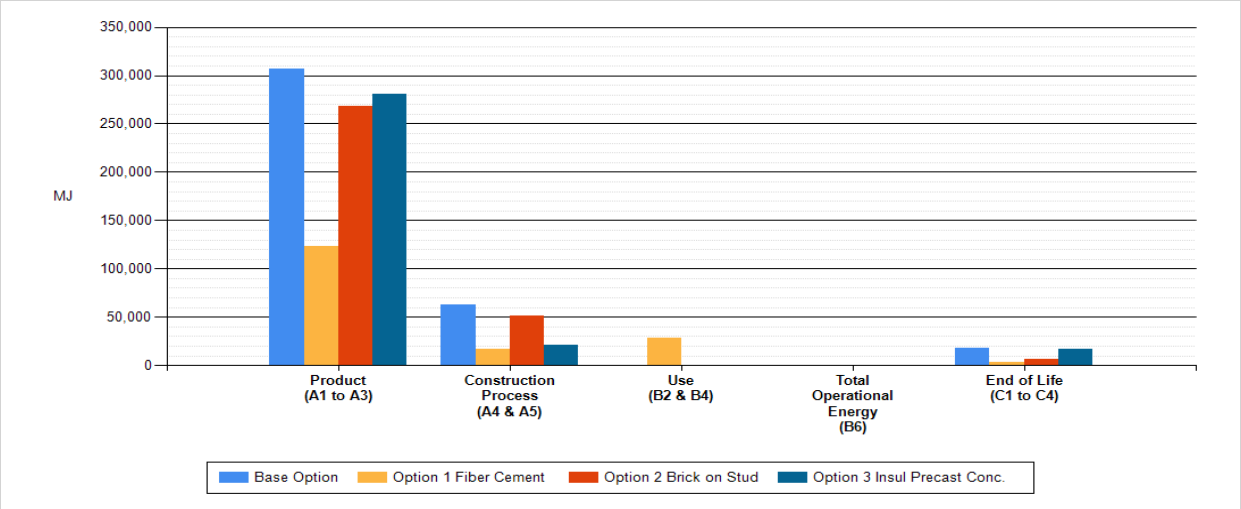
Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	MJ	2.88E+05	6.17E+04	0.00E+00	0.00E+00	1.82E+04	**3.68E+05**
Option 1 Fiber Cement	MJ	9.99E+04	1.52E+04	2.83E+04	0.00E+00	3.04E+03	**1.46E+05**
Option 2 Brick on Stud	MJ	2.43E+05	4.95E+04	0.00E+00	0.00E+00	6.73E+03	**2.99E+05**
Option 3 Insul Precast Conc.	MJ	2.42E+05	1.98E+04	0.00E+00	0.00E+00	1.68E+04	**2.78E+05**
Total	**MJ**	**8.73E+05**	**1.46E+05**	**2.83E+04**	**0.00E+00**	**4.48E+04**	**1.09E+06**

Comparison of Non-Renewable Energy By Life Cycle Stage



Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	MJ	3.02E+05	6.25E+04	0.00E+00	0.00E+00	1.82E+04	**3.83E+05**
Option 1 Fiber Cement	MJ	1.12E+05	1.61E+04	2.83E+04	0.00E+00	3.05E+03	**1.59E+05**
Option 2 Brick on Stud	MJ	2.56E+05	5.07E+04	0.00E+00	0.00E+00	6.74E+03	**3.14E+05**
Option 3 Insul Precast Conc.	MJ	2.63E+05	2.08E+04	0.00E+00	0.00E+00	1.68E+04	**3.01E+05**
Total	**MJ**	**9.34E+05**	**1.50E+05**	**2.83E+04**	**0.00E+00**	**4.48E+04**	**1.16E+06**

Comparison of Total Primary Energy By Life Cycle Stage

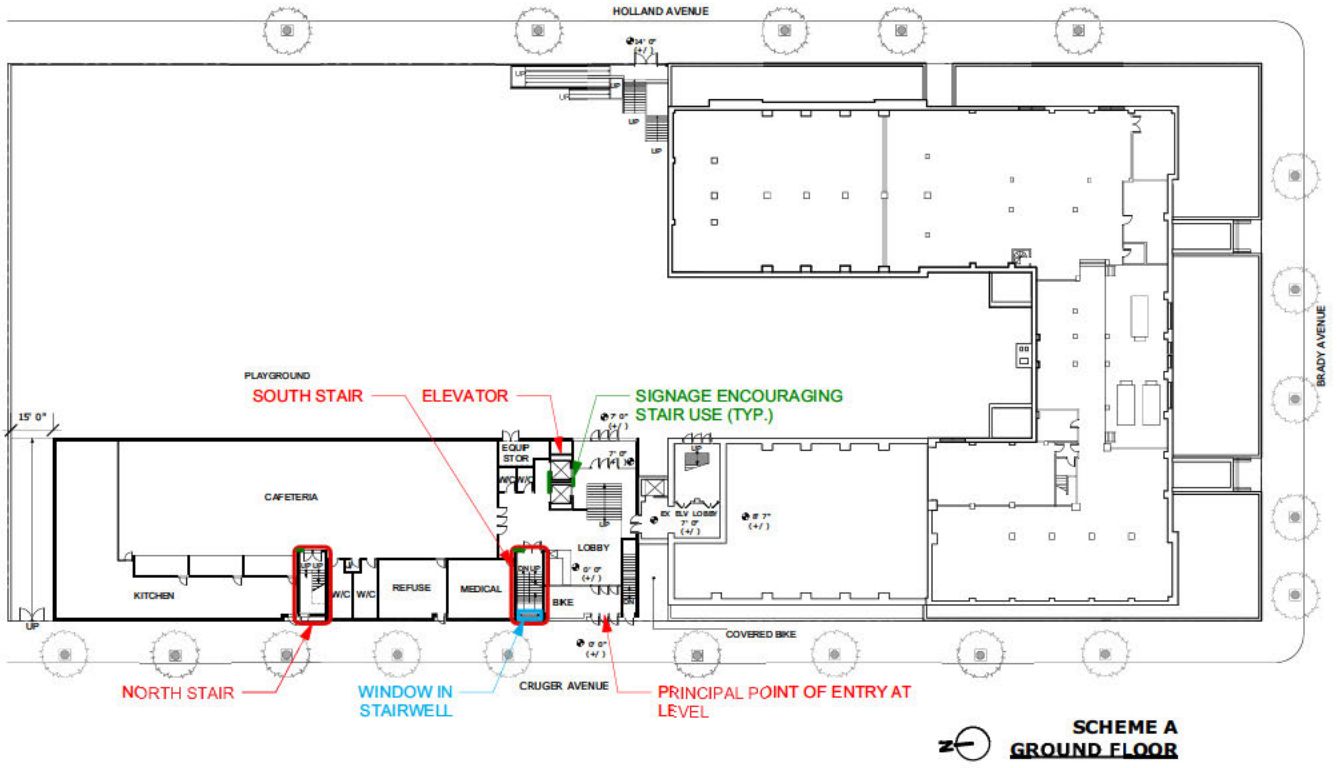


Project Name	Unit	Product (A1 to A3)	Construction Process (A4 & A5)	Use (B2 & B4)	Total Operational Energy (B6)	End of Life (C1 to C4)	Total
Base Option	MJ	3.07E+05	6.30E+04	0.00E+00	0.00E+00	1.82E+04	**3.88E+05**
Option 1 Fiber Cement	MJ	1.23E+05	1.69E+04	2.83E+04	0.00E+00	3.05E+03	**1.71E+05**
Option 2 Brick on Stud	MJ	2.68E+05	5.16E+04	0.00E+00	0.00E+00	6.74E+03	**3.27E+05**
Option 3 Insul Precast Conc.	MJ	2.80E+05	2.15E+04	0.00E+00	0.00E+00	1.68E+04	**3.19E+05**
Total	**MJ**	**9.79E+05**	**1.53E+05**	**2.83E+04**	**0.00E+00**	**4.49E+04**	**1.20E+06**

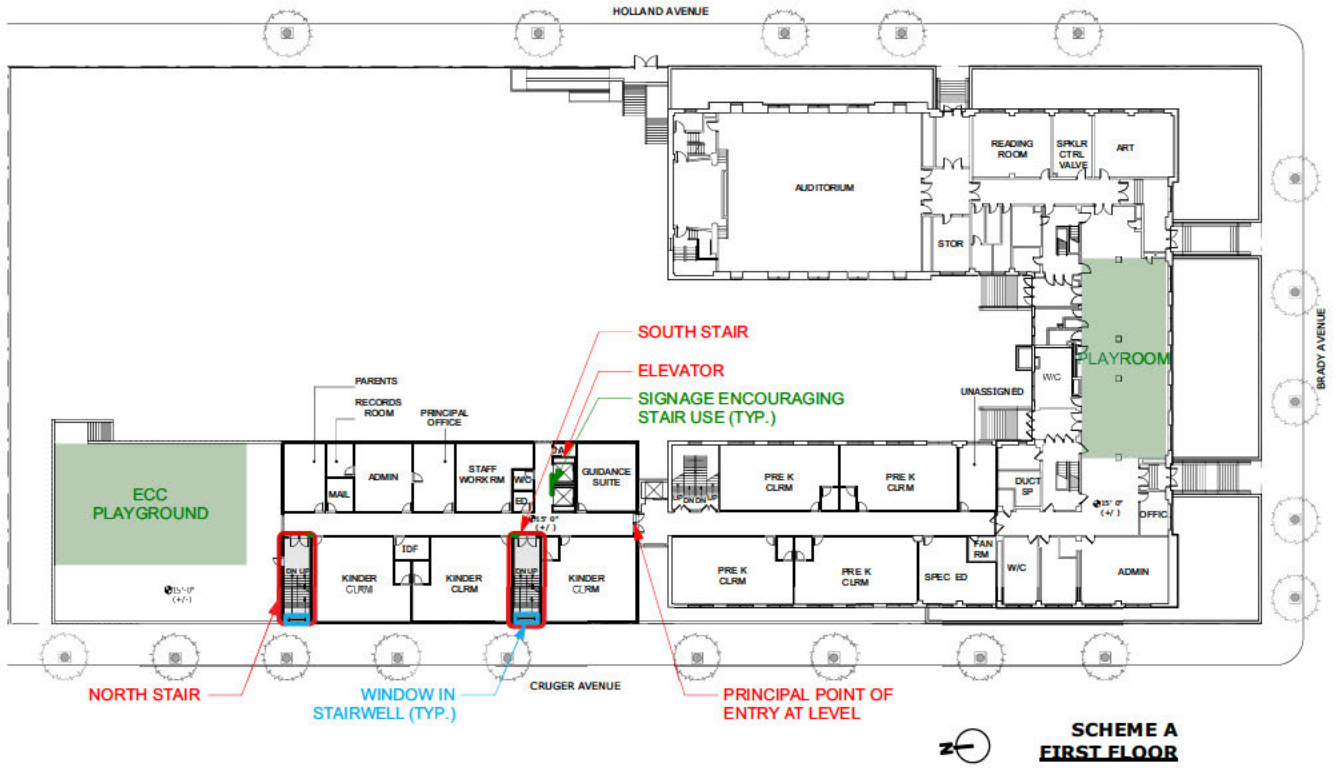
DISCOVERY #4

ACTIVE DESIGN

SCHEME A DIAGRAMS

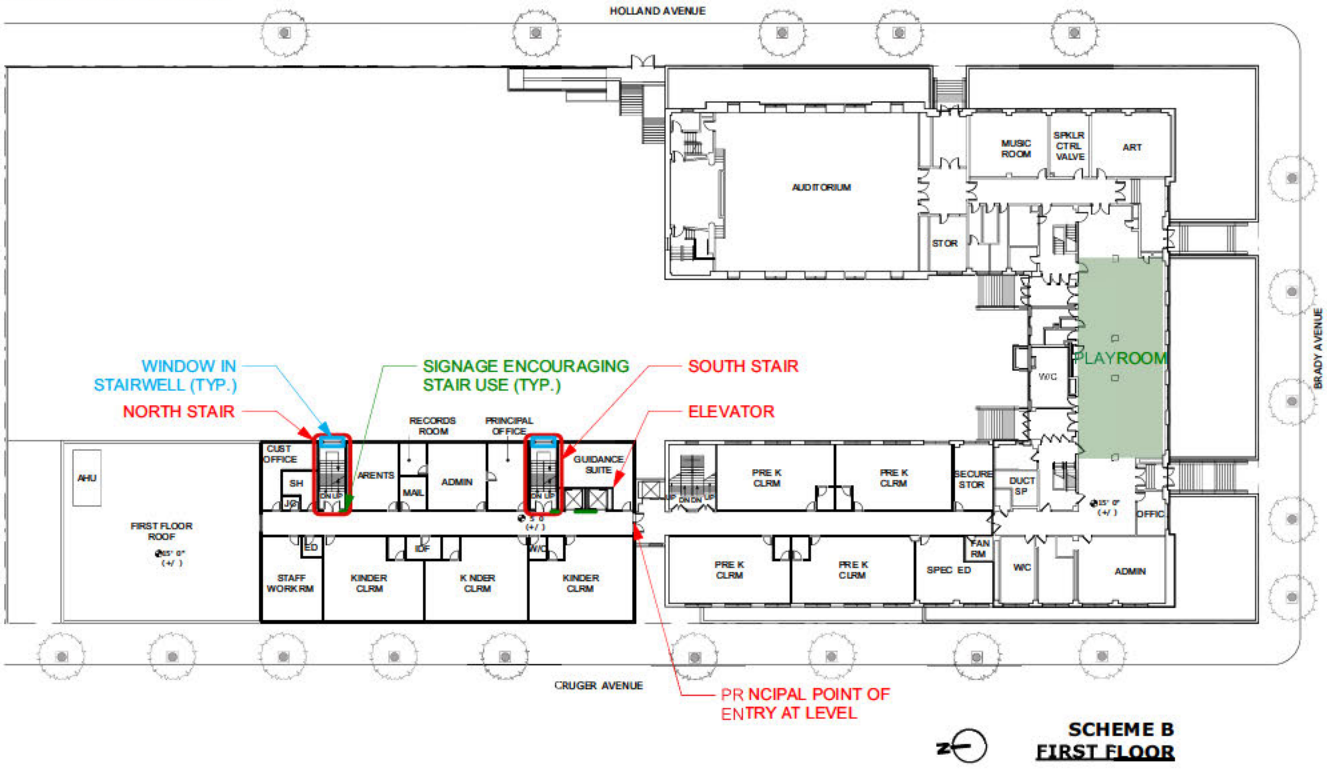


SCHEME A
GROUND FLOOR

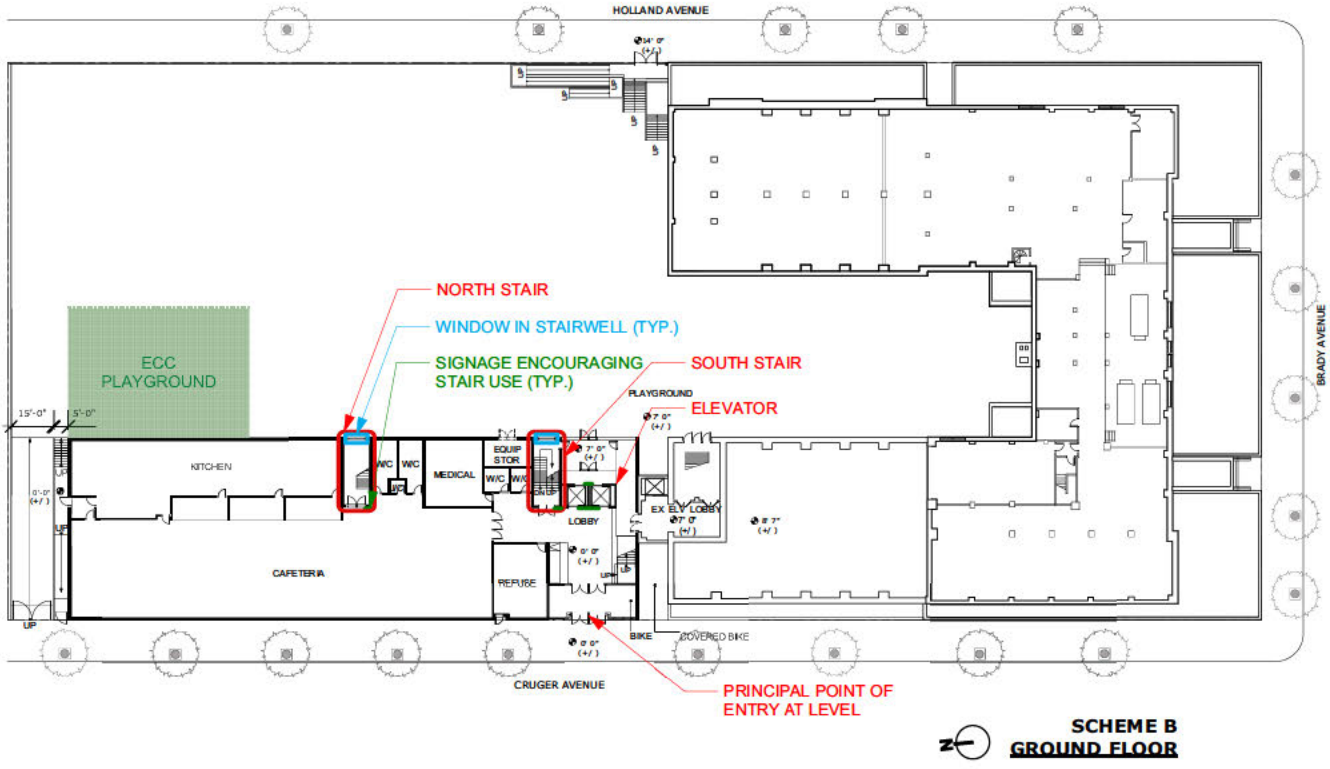


SCHEME A
FIRST FLOOR

SCHEME B DIAGRAMS

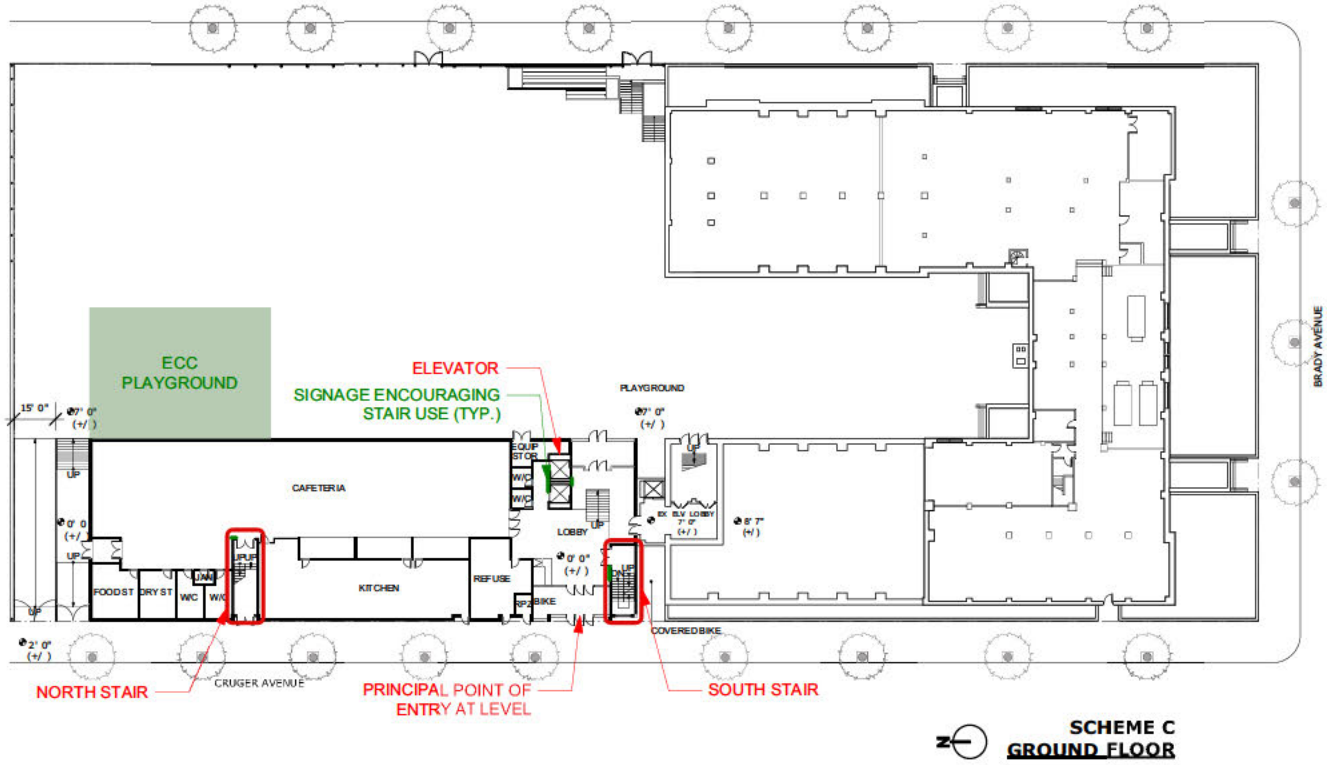


SCHEME B
FIRST FLOOR

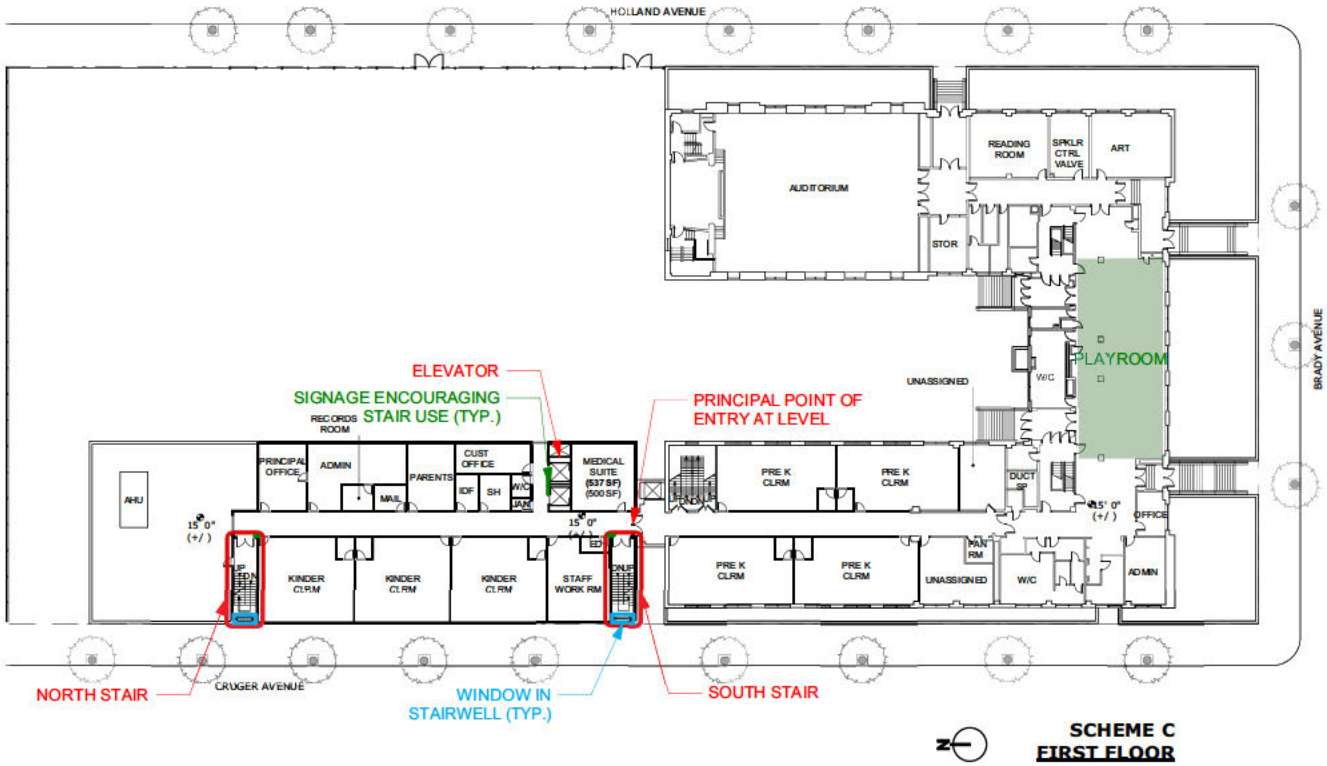


SCHEME B
GROUND FLOOR

SCHEME C DIAGRAMS



SCHEME C
GROUND FLOOR



SCHEME C
FIRST FLOOR

DISCOVERY SUMMARY

Active Design in a School Environment (S3.2) is a Green Schools Guide credit requirement. Assessment uses SCA's "Active Design in a School Environment Credit Form" to review scheme compliance. Each scheme must comply with Step 1 strategies and meet a minimum of 7 credits in Step 2. Scheme A and C comply, Scheme B does not meet the minimum 7 strategy requirement.

ACTIVE DESIGN PLAN

FINDINGS

Step 1: Comply with both of the following strategies					
#	Design Case	Base Case Code Minimum	Scheme A Complies?	Scheme B Complies?	Scheme C Complies?
R1	Building occupants shall have access via at least one main active mode of vertical circulation to and from all common use floors, and occupant's own floor(s)	In schools, doors may be locked on the stair side except at intervals of 4 stories or less.	Yes	Yes	Yes
R2	Provide an onsite recreation space that is open and accessible to all users. For schools that have more than 10 classrooms, the space must be at least 400 square feet. Include adult exercise and children's play equipment for a minimum of 5% of the building occupants. Gardening activity space and equipment may also count as adult active recreation space and equipment.	Not applicable	Yes	Yes	Yes

Step 2: Comply with seven of the following strategies					
DESIGN FOR INCREASED ACTIVE MODES OF VERTICAL CIRCULATION					
A	FOR THE MAIN STAIRCASE				
1	Classify all regularly occupied floors for re-entry, allowing all building users to have access to and from these floors. Service floors do not need access for all users.	In schools, doors may be locked on the stair side except at intervals of 4 stories or less.	Yes	Yes	Yes
2	Provide transparent glazing of at least 10 square feet at all stair doors or at a side light. OR Provide magnetic door holds on all doors leading to the stairs. OR Provide unenclosed stairs.	Not applicable	No	No	No

3	Provide accessibility to at least one open or interconnecting staircase to at least 50% of the tenant/occupant floors for convenient pedestrian vertical circulation.	Exact location not mandated	Yes	Yes	Yes
4	Locate a main staircase to be visible from main building lobby and within 25 foot walking distance from any edge of the lobby. Ensure that no turns or obstacles prevent visibility of or accessibility to the qualifying staircase from the lobby.	Exact location not mandated, follow SCA Design Requirements	Yes	Yes	Yes
5	Locate a main staircase to be visible before an occupant visually encounters any motorized vertical circulation (elevator/escalator). The staircase must be visible from the principal point of entry at each building floor.	Exact location not mandated, follow SCA Design Requirements	Yes	No	Yes
6	Install architectural light fixtures that provide a level of lighting in the staircase(s) consistent with or better than what is provided in the building corridor.	200 lux recommended by IES.	Yes	Yes	Yes
7	Provide daylighting at each floor/roof level of the stair(s) using either windows and/or skylights of at least eight square feet in size.	Follow SCA Design Requirements	Yes	Yes	Yes
8	Place signage encouraging stair use for health and other benefits at all elevator call areas, next to escalators and outside stairwells on each floor.	Not applicable	Yes	Yes	Yes
9	Use inviting sensory stimulation such as artwork and/or music in stairwells.	Not applicable	No	No	No
B	ELSEWHERE WITHIN THE PROJECT				
10	Provide exercise equipment or exercise opportunities for at least 5% of staff occupants that can be used at employee workstations to allow workers opportunities for physical activity while working at their desks.	Not applicable	No	No	No
11	Provide a dedicated or multi-use space to act as an on-site exercise room, which includes a variety of exercise equipment, for use by at least 5% of staff occupants.	Not applicable	No	No	No

Note: In facilities where stairs are not the main active mode of vertical circulation, other active modes of vertical circulation that promote physical activity, such as ramps and ladders can be used in place of stairs

Strategies Achieved	7	6	7
Project Complies	**Yes**	**No**	**Yes**

Integrative Design Process Discovery #5 Analysis - Acoustics

Public School
Jamaica, New York

Prepared for:

March 10, 2020

INTRODUCTION

This report reviews the NYC Green Schools Guide 2019 requirements for Minimum (Q8.1P) and Enhanced (Q8.2) Acoustic Performance, in connection with three schemes proposed for the PS [redacted] Addition project, and identifies risks to achieving each credit. The three schemes are referred to as 7, 8a, and 8b as prepared by [redacted]

Q8.1P - MINIMUM ACOUSTIC PERFORMANCE

Requirements

1. **HVAC Background Noise:** Achieve a maximum background noise level of 40 dBA from heating, ventilating, and air-conditioning (HVAC) systems in classrooms and other core learning spaces.

2. **Exterior Noise:** For high-noise sites (peak-hour Leq above 60 dBA during school hours), implement acoustic treatment and other measures to minimize noise intrusion from exterior sources and control sound transmission between classrooms and other core learning spaces. Projects at least one-half mile from any significant noise sources are exempt.

3. **Reverberation Time:** Adhere to the following reverberation time requirements:

    a. For Classrooms and Core Learning Spaces < 20,000 cubic feet: Design classrooms and other core learning spaces to include sufficient sound-absorptive finishes for compliance with the reverberation time requirements specified in ANSI Standard S12.60-2010, Part 1: Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools.

    b. For Classrooms and Core Learning Spaces > 20,000 cubic feet: Meet the recommended reverberation times for classrooms and core learning spaces described in the NRC-CNRC Construction Technology Update No. 51: Acoustical Design of Rooms for Speech (2002).

Analysis

1. **HVAC Background Noise**: It is expected that achieving a maximum background noise level of 40 dBA in classrooms and other core learning spaces will be feasible without the need to implement extraordinary noise control measures, based on use of multi-zone variable air volume (MZVAV) systems with roof mounted equipment. Special consideration will need to be given to potential unit noise break-out of supply and return ductwork if it will penetrate the roof directly above classrooms or other core learning spaces. In such cases it is often necessary to enclose initial ductwork runs in sound control lagging in order to sufficiently mitigate duct noise break-out.

    There are no significant differences among design schemes 7, 8a, and 8b with respect to achieving the HVAC background noise requirement.

2. **Exterior Noise:** The site is approximately 0.5 miles from the Belt Parkway and the boundary of the DNL 65 noise contour associated with Kennedy International Airport, and 0.25 miles away from the Van Wyck Expressway. These factors suggest that the new building addition may be

subject to higher-than-average exterior noise levels, and potentially higher than 60 dBA as referenced in the requirements.

An instrumented survey will be conducted in order to determine the peak-hour noise level at the site during school hours. Results will be utilized to determine measures that may be required to minimize noise intrusion to classrooms and other core learning spaces.

The Green Schools Guide does not specify to what level the exterior noise is to be reduced. However, SCA Design Requirements recommend that interior-transmitted noise levels be limited to NC (Noise Criterion) 45 for the L_{10} condition (noise level exceeded 10% of the time).

Exterior noise transmitted to classrooms and other core learning spaces will be controlled by the glazing configuration of exterior windows. Given the possibility of elevated exterior noise levels at the site, as described above, there is some potential that non-standard glazing configurations will need to be employed in exterior windows of classrooms and other core learning spaces.

Except where the size of exterior windows may vary significantly among design schemes 7, 8a, and 8b, there are no differences among the design schemes with respect to exterior noise impact on classrooms and other core learning spaces.

3. **Reverberation Time** – Employing standard ceilings per SCA Design Requirements will achieve reverberation time requirements as specified. There are no differences among design schemes 7, 8a, and 8b with respect to achieving reverberation time requirements.

Q8.2 – ENHANCED ACOUSTIC PERFORMANCE

Requirements

1. **HVAC Background Noise:** Achieve a maximum background noise level of 35 dBA from heating, ventilating, and air-conditioning (HVAC) systems in classrooms and other core learning spaces.

2. **Sound Transmission:** Design classrooms and other core learning spaces to meet the sound transmission class (STC) requirements of ANSI Standard S12.60-2010, Part 1. Exterior windows must have an STC rating of at least 35, unless outdoor and indoor noise levels can be verified to justify a lower rating.

Analysis

3. **HVAC Background Noise:** It is feasible to achieve a background noise level of 35 dBA from heating, ventilating, and air-conditioning (HVAC) systems in classrooms and other core learning spaces, although the requirement is considered to be stringent. Careful consideration will need to be given to equipment selection (particularly VAV terminal units), duct sizing, and selection of grilles, registers, and diffusers. Depending on the zoning and sizing of VAV terminal units, it may be necessary to locate the units outside the boundaries of classrooms and other core learning spaces.

4. **Sound Transmission:** The requirements specify minimum STC ratings of partitions separating classrooms and other core learning spaces from other adjacent spaces. Also specified are the STC and IIC (floor Impact Insulation Class) ratings of floor / ceiling assemblies separating classrooms and other core learning spaces from other vertically adjacent spaces.

   Employing standard partition types and floor / ceiling assemblies per SCA Design Requirements will satisfy specified STC and IIC ratings. There are no differences among design schemes 7, 8a, and 8b with respect to achieving these sound transmission requirements.

   There is one condition common to each of the schemes that will require non-standard construction in order to achieve specified STC and IIC ratings, and that is the Second Floor location of the Gymnasium directly above First Floor classrooms. SCA Design Guidelines prescribe that the Gymnasium shall have a 4 in. concrete slab supported 2 in. above the structural slab with resilient isolators.

CONCLUSIONS

Except as noted below, requirements for Q8.1P (Minimum Acoustic Performance) and Q8.2 (Enhanced Acoustic Performance) can be satisfied by following SCA Design Requirements and utilizing SCA standard details. There are no significant differences among design schemes 7, 8a, and 8b with respect to achieving the specified requirements.

1. Given the proximity of the site to transportation noise sources, it may be necessary to utilize non-standard glazing configurations in exterior windows to achieve required interior-transmitted noise levels in classrooms and other core learning spaces. There are no differences among design schemes 7, 8a, and 8b in these respects except if the windows among the schemes are significantly different in size.

2. In all schemes, the Gymnasium locates directly above classrooms, which will require a secondary concrete slab that is isolated from the structural floor slab.

******

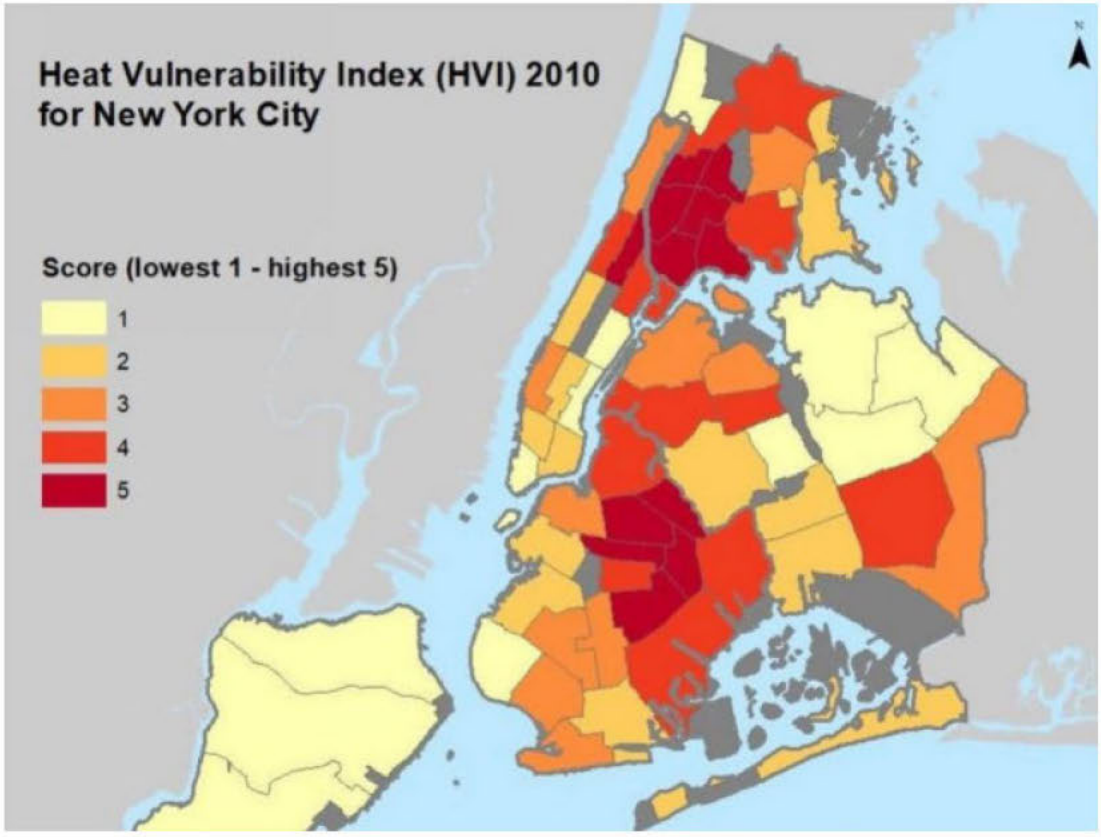
Integrative Design Report and Recommendations

7.0 Discovery #6 Climate Resiliency

7.1 Narrative Summary

The purpose of the climate resiliency is to analyze the site risk in relation to heat, precipitation and sea level rise. This influence the design strategies as in program, material & equipment location. Our proposed Project site is located in a medium heat vulnerability index with a score of three. Based on the heat vulnerability index map and the heat risk screening questions we have a score of seven, given a result of medium exposure rating. The next section is precipitation risk and after the question answered from the screening tool the score came to a two given a medium exposure rating. Lastly we are not at any sea level risk since we are not near the coast and are at elevation above sea level

. 7.2 Exposure Screening Tool



Pre-FIRM and FEMA Maps:

National Flood Hazard Layer FIRMette

FEMA

73°55'36"W 40°51'52"N

N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

73°54'59"W 40°51'25"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

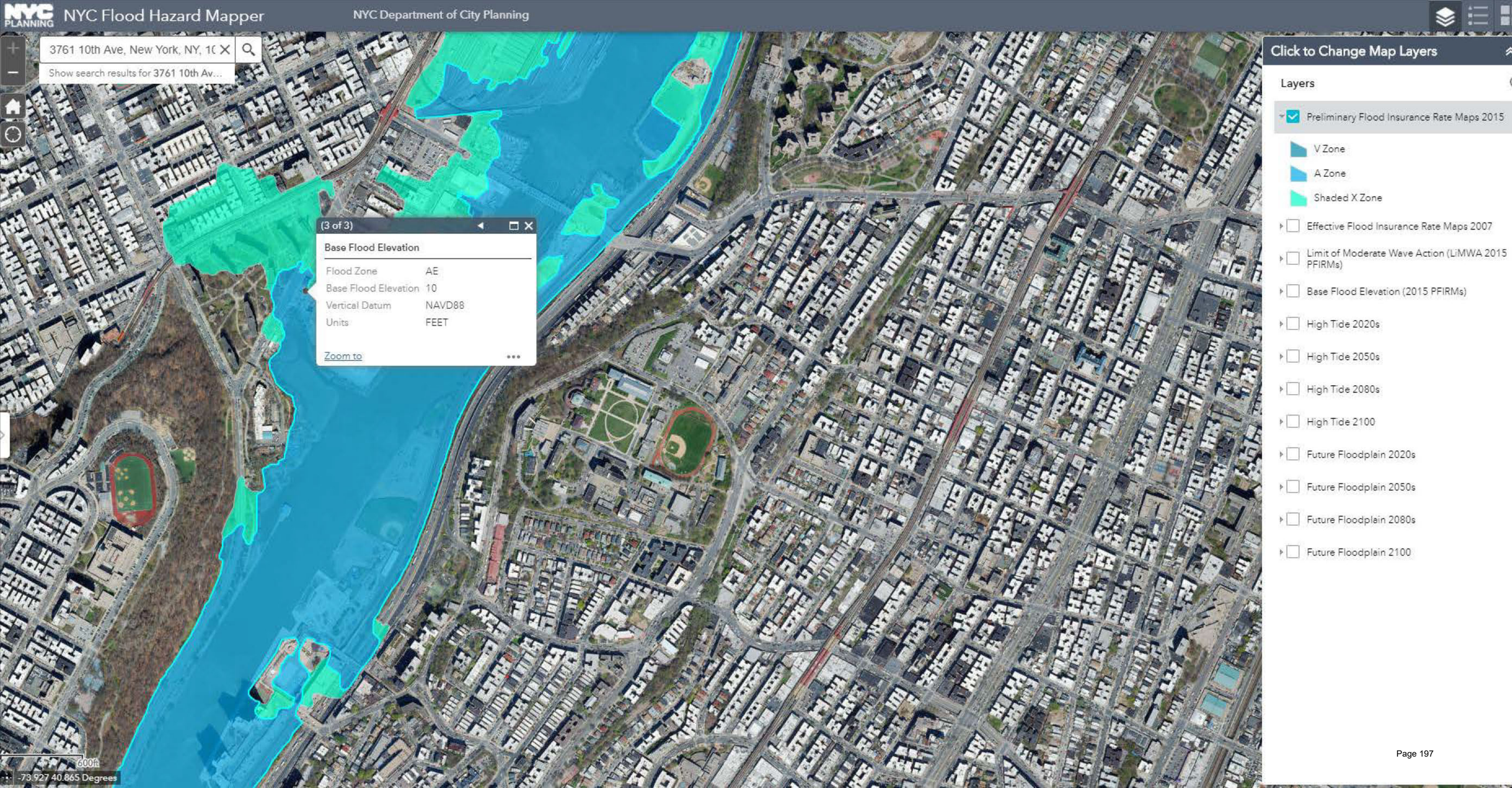
The pin displayed on the map is an approximate point selected by the user and does not represen an authoritative property location.

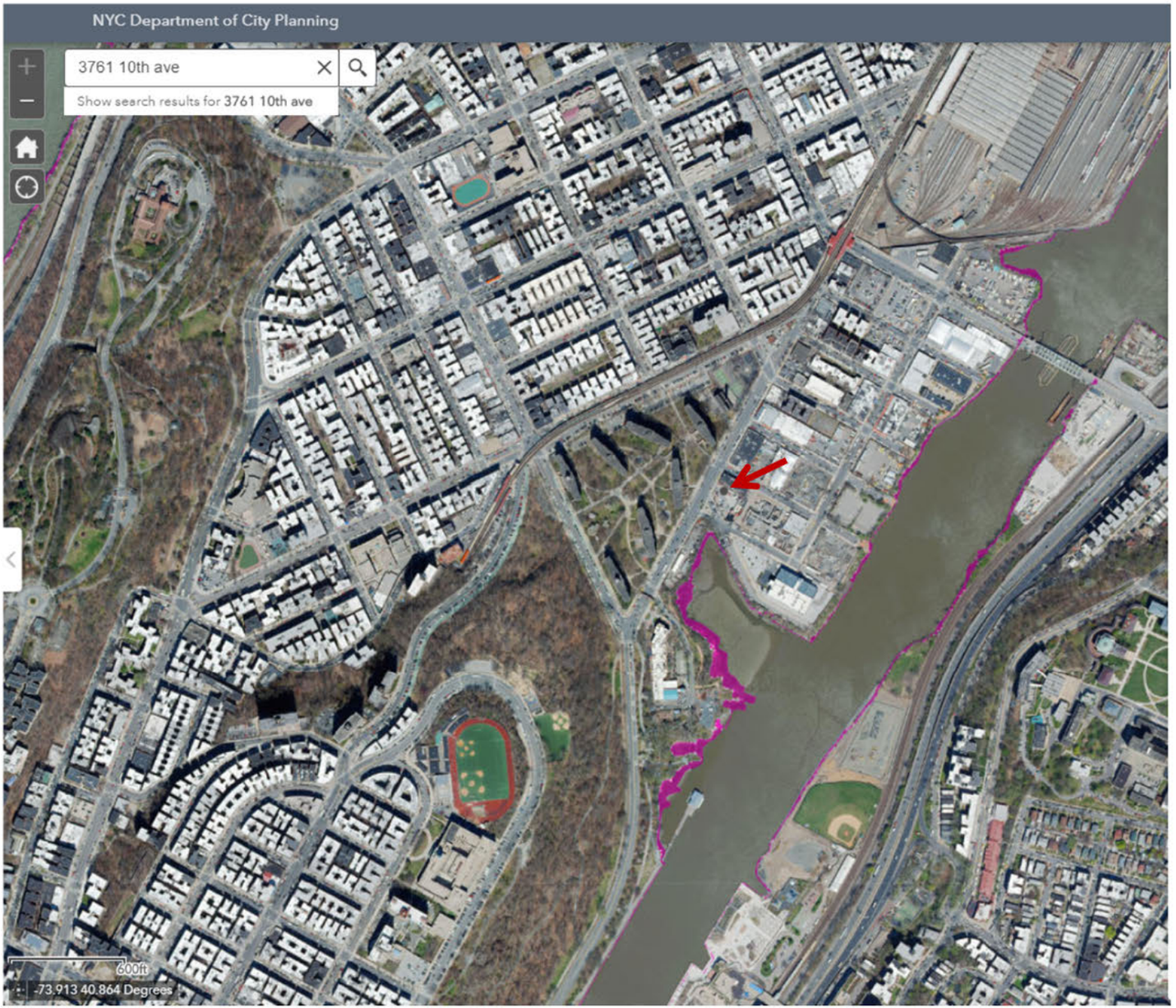
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/29/2020 at 8:34 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

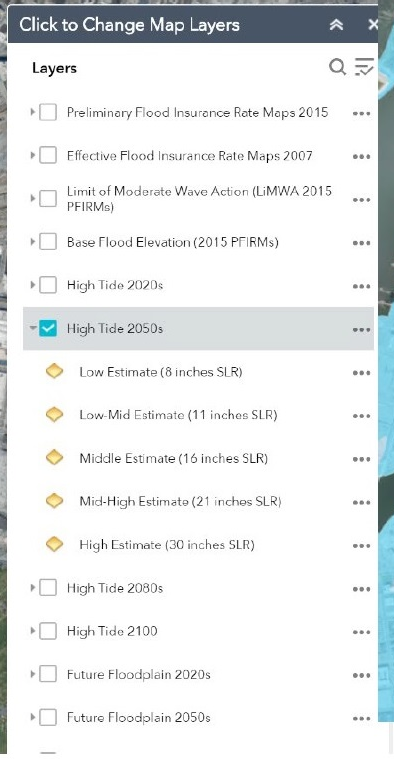
SCA
School Construction Authority


NYC Flood Hazard Mapper
NYC Department of City Planning
3761 10th Ave, New York, NY, 1(
Show search results for 3761 10th Av...
(3 of 3)
Base Flood Elevation
Flood Zone AE
Base Flood Elevation 10
Vertical Datum NAVD88
Units FEET
Zoom to
Click to Change Map Layers
Layers
Preliminary Flood Insurance Rate Maps 2015
V Zone
A Zone
Shaded X Zone
Effective Flood Insurance Rate Maps 2007
Limit of Moderate Wave Action (LiMWA 2015 PFIRMs)
Base Flood Elevation (2015 PFIRMs)
High Tide 2020s
High Tide 2050s
High Tide 2080s
High Tide 2100
Future Floodplain 2020s
Future Floodplain 2050s
Future Floodplain 2080s
Future Floodplain 2100
600ft
-73.927 40.865 Degrees

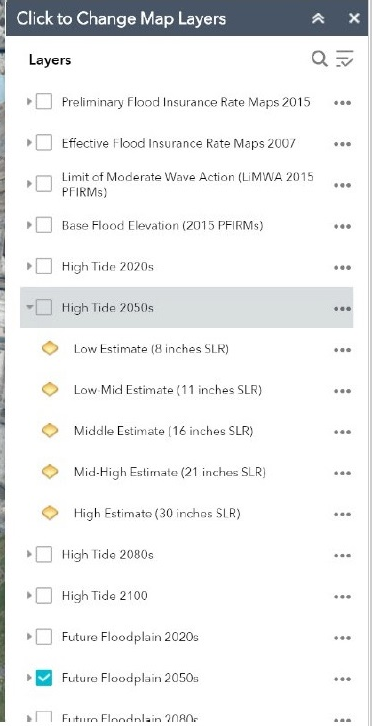


High Tide – 2020s

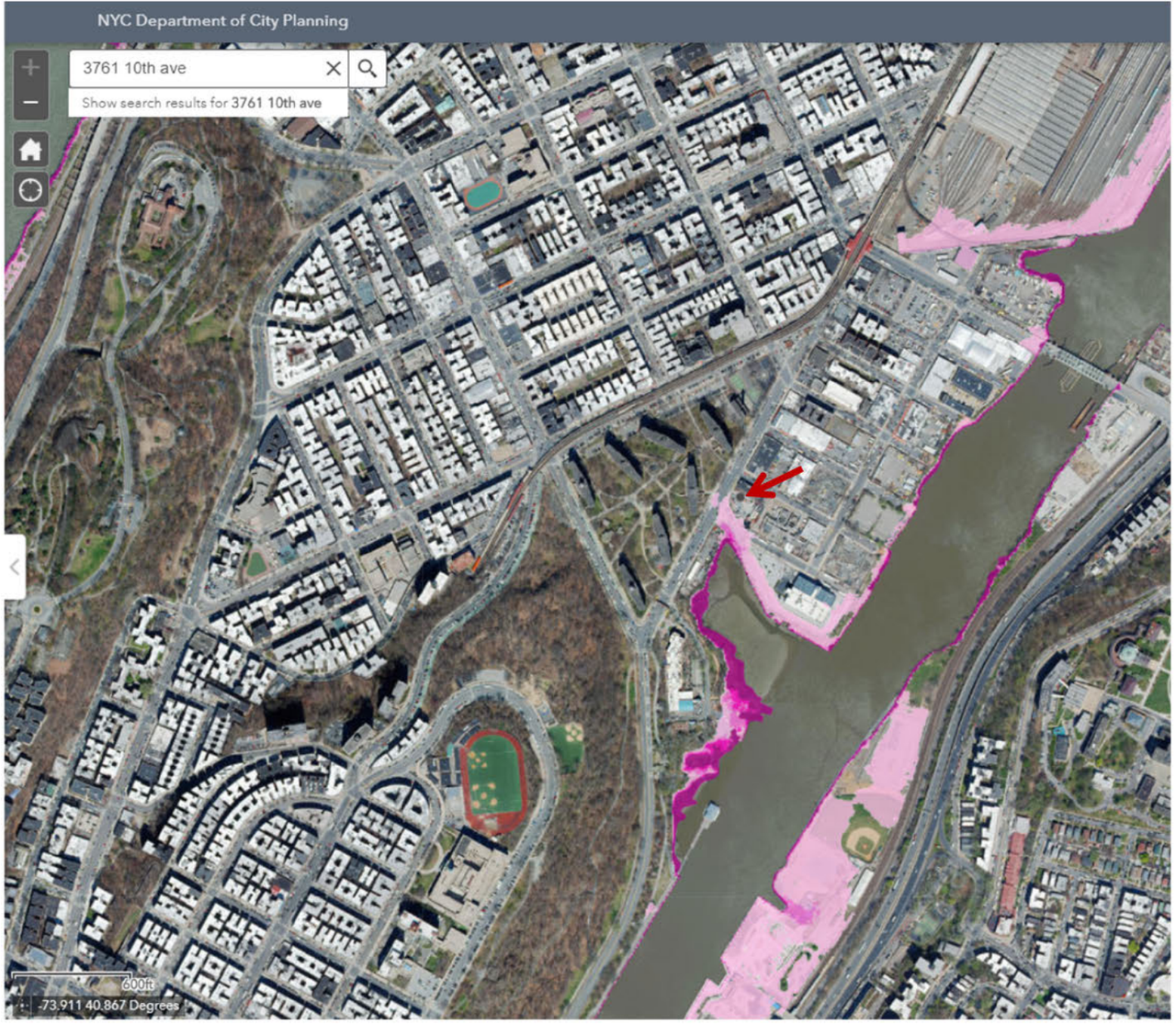
Future Flood Plain 2020s



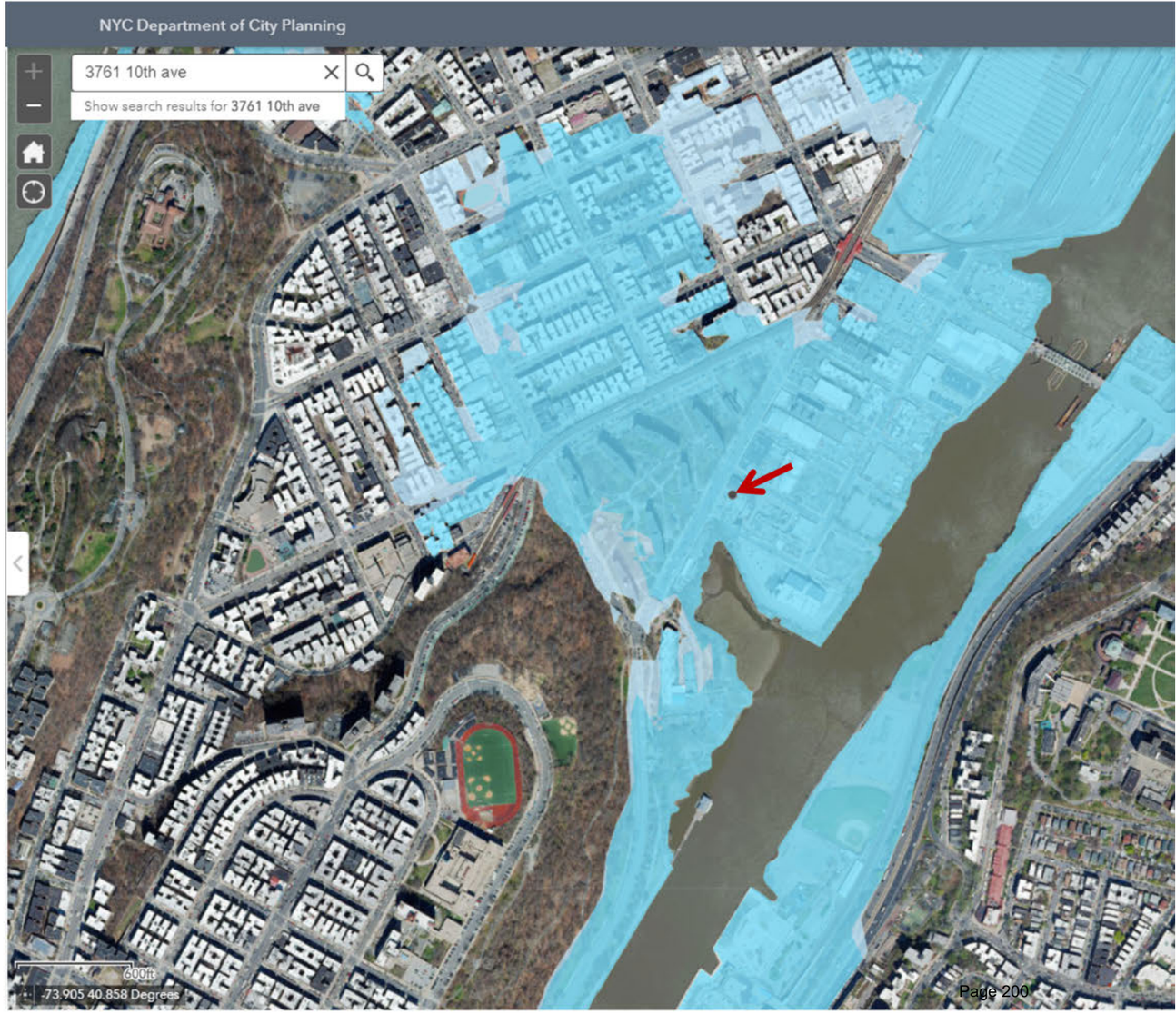
High Tide-2050s



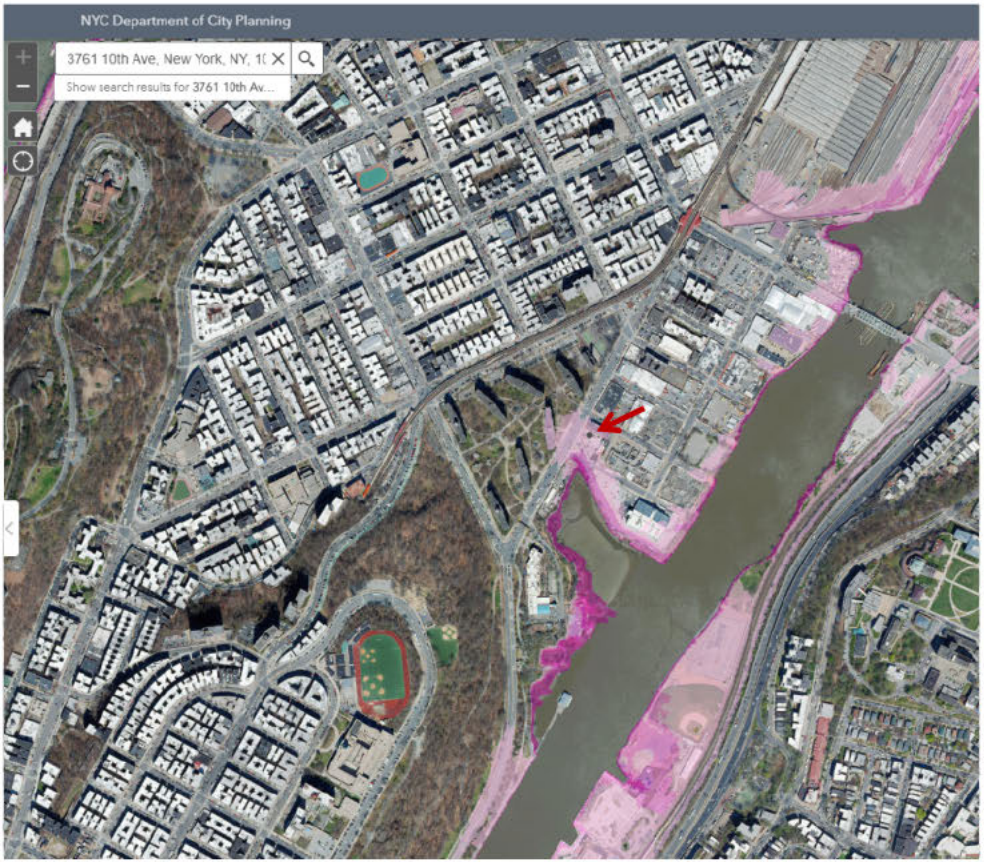
Future FloodPlain 2050s



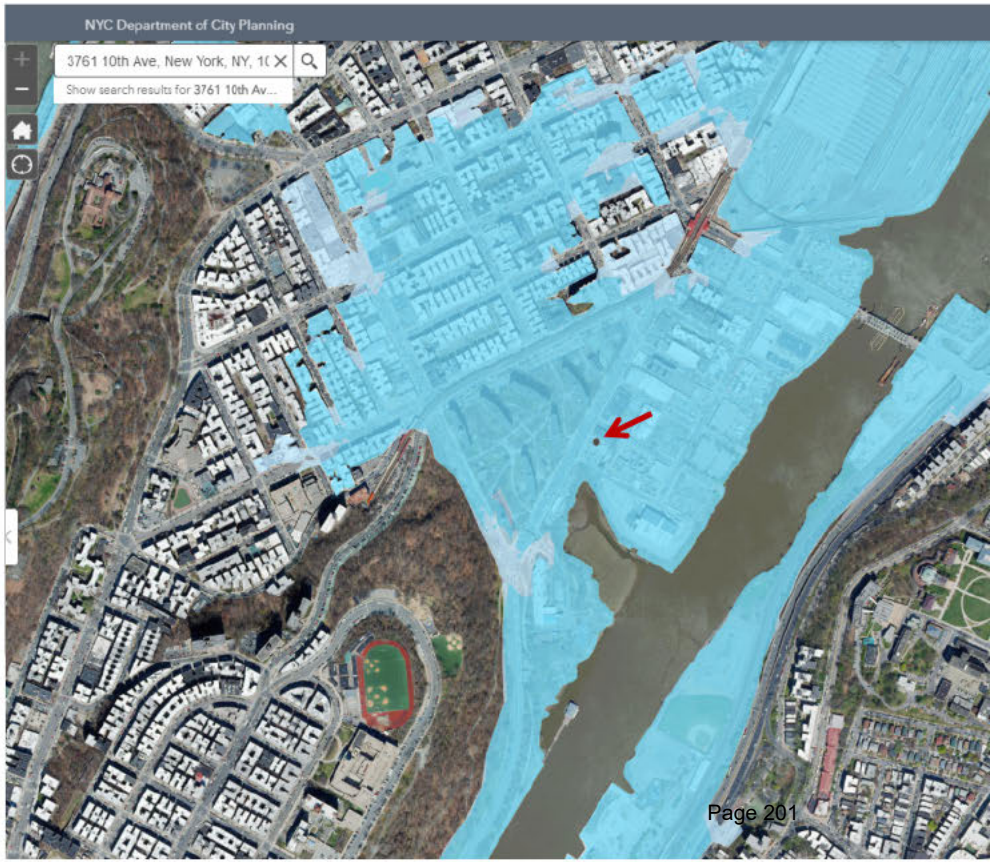
High Tide – 2080s



Future Flood Plain 2080s



High Tide – 2100s



Future Flood Plain 2100s

Integrative Design Report and Recommendations

B. Exposure Screening Tool

Use the Exposure Screening Tool to identify and assess climate change-related hazards and risks. A capital project's exposure can be determined based on preliminary project information available at the earliest stages of project planning and/or design. Results from the screening tool can inform if to include the Guidelines in the project scope.

Exposure Screening Tool

	Risk Screening Question	Directions	Answers and Score	Total Score and Next Steps
Heat	Does the facility include new construction of, or substantial improvements to, the landscape, hardscape, roof, HVAC, building envelope, ventilation system, or façade?	All parts of NYC are exposed to extreme heat. New construction projects or substantial improvements that include changes to the landscape, hardscape, roof, HVAC, building envelope, ventilation system, or façade could affect the material performance of a project, thermal comfort of occupants, and/or increase ambient temperatures. If the project includes any of those components, answer 'yes.'	Yes=1	Total Score / Exposure Rating 2-5 Low 6-8 Medium 9-10 High
Heat	Is the facility in community district with high heat vulnerability?	Identify the community district your facility is located in. Locate that community district on the Heat Vulnerability Index map located in Section II.A of the Guidelines and note the area's vulnerability. Select the corresponding answer.	Heat Vulnerability Score Moderate=3	If project budget is more than $50 million: ...and scores "Medium" or "High" provide a list of recommendations for modifications to the current design to address the triggered climate risk. Include an order of magnitude cost for each recommended measure.
Heat	How many annual heat waves are projected to occur during the facility's useful life?	See Section II.A of the Guidelines and note the annual heat wave projection according to the useful life of the facility. Select the corresponding answer.	# of heat waves 7 days = 3	Score 7 Medium
Precipitation	Does the facility require a new DEP site connection proposal, or a modification to the existing site connection plan?	The intensity and frequency of precipitation events are projected to increase across all parts of NYC, creating new challenges for stormwater management and impacts to the built environment. New construction projects provide opportunities to accommodate increased precipitation flow volumes, and typically require submitting a new site drainage connection proposal to DEP for review and approval. If a project is a substantial improvement, the scope of work of the substantial improvement would dictate if the previously approved DEP site connection plan will require modifications. If a new site connection proposal or modifications are required, answer 'yes.'	Yes=1	Total Score / Exposure Rating 1 Low 2 Medium 3 High
Precipitation	Does the site have a history of flooding during precipitation events?	Consult institutional knowledge (for example, if this site flooded during Hurricane Irene) and 311 service requests for flooding at or near this site (see hyperlink below) and select "yes" if there is a history of flooding at the site. https://data.cityofnewyork.us/Social-Services/Street-Flooding/wymi-u6i8	No=0	If project budget is more than $50 million: ...and scores "Medium" or "High" provide a list of recommendations for modifications to the current design to address the triggered climate risk. Include an order of magnitude cost for each recommended measure.
Precipitation	Will there be a net increase in impervious area on the site as a result of the project?	Refer to preliminary site plans (if they are part of the project scope) or consult with Capital Project Initiation team. Choose 'yes' if a net increase in impervious area is anticipated.	Yes=1	Score 2 Medium

Integrative Design Report and Recommendations

NYC Mayor's Office of Recovery and Resiliency — Climate Resiliency Design Guidelines - Version 3.0

Exposure Screening Tool

Sea level rise

Risk Screening Question	Directions	Answers and Score	Total Score and Next Steps
Current Flood Risk Is the facility in the current 1% annual chance floodplain (100-year)?	Visit NYC Flood Hazard Mapper.* Click on the Map Legend and select the 'Preliminary Flood Insurance Rate Maps 2015'. Search for or navigate to the site to see if it is located within the current effective floodplain. If the site is shown to be all or partly in the current floodplain, answer 'yes.' http://www.nyc.gov/floodhazardmapper	No=0	
Future Flood Risk Is the facility in the future 1% annual chance floodplain (100-year) at any point during its useful life?	Visit NYC Flood Hazard Mapper.* Click on the Map Legend and select the 'Future Floodplain' that corresponds to the project useful life. Search for or navigate to the property to see if it is located within the future floodplain. If the site is shown to be all or partly in the future floodplain, answer 'yes.' http://www.nyc.gov/floodhazardmapper	No=0	
Current Tidal Inundation Does this site have a history of flooding from high tide events?	Potential sources to answer this question include institutional knowledge (for example, if this site floods during regular high tides) or history of 311 service requests (see hyperlink below). If the site is shown to have a history of tidal flooding, answer 'yes.' https://data.cityofnewyork.us/Social-Services/Street-Flooding/wymi-u6i8	No=0	
Future Tidal Inundation Are there any critical access roads to the site that will be inundated by future high tides?	Visit the NYC Flood Hazard Mapper.* Click on the Map Legend and select the "High Tide" scenario that corresponds to the project useful life. Identify if any primary access roads are inundated from high tide plus sea level rise. If the site is shown to have roads at risk of tidal inundation, answer 'yes.' http://www.nyc.gov/floodhazardmapper	No=0	

Total Score	Exposure Rating
0	Not Exposed
1	Low
2	Medium
>3	High

If project budget is more than $50 million:
...and scores "Medium" or "High" provide a list of recommendations for modifications to the current design to address the triggered climate risk. Include an order of magnitude cost for each recommended measure.

Score 0 Not Exposed

*For more information on how to use the Flood Hazard Mapper, see Section II.C

Integrative Design Report and Recommendations

7.3 GSG checklist

Exposure screening tool results

Heat: Project site is located at a medium heat Vulnerability Index area.

Precipitation: The site is at a medium range, site drainage will be provided

Sea Level Risk: Project site has no sea level risk based on the screening and flood maps

NYC Mayor's Office of Recovery and Resiliency — *Climate Resiliency Design Guidelines - Version 3.0*

Design Strategies Checklist

This appendix provides a template for identifying possible design strategies to address climate change hazards, as described throughout the Guidelines.

Project Title: K676

Design Strategies Checklist (not exhaustive)

	Extreme Heat	Comments		Extreme Precipitation	Comments		Sea Level Rise & Storm Surge	Comments
☐	Select Site in Low Heat Vulnerability Index area	Site was given,no choice	☑	Select High Elevation Site		☑	Select High Elevation Site	
☑	Building Cooling System		☐	Green Roof	Hign structural and maintenance cost	☐	Raise Building Floor Elevation	Site limitation to have ramp or stairs
☐	Minimize East-West Building Orientation	Property size & orientation to fit program	☑	Protect Below Grade Areas from Flooding		☑	Waterproof Building Envelope	
☐	Passive Solar Cooling and Ventilation Systems	Maintenance & available system limitation	☐	On-site Stormwater Management (gray)	Site limitation	☑	Elevate Critical Building Functions	
☑	Cool Roof (SRI appropriate)		☑	Reduce Impervious Areas		☑	Elevate Critical Equipment	
☐	Green Roof (extensive)	ural cost and maintena	☐	Permeable Pavement	Play ground safety concerns	☐	Perimeter Floodwall[a]/ Levee (passive or active)	Avoid building below water level, not appicable
☐	Vegetative Structures	Higher structural cost and maintenance	☐	Increase Green Spaces and Planted Areas	Site limitation	☐	Dry/Wet Floodproofing	
☑	Enhanced HVAC System, including space layout optimization and system scalability		☐	Blue Roof	Not SCA standard roof type	☐	Utility Redundancy Design[b]	Additional construction cost
☑	More Efficient Building Envelope		☐	Bioswale	Site limitation	☑	Resilient Materials & Landscape Treatments	
☐	Parking Lot Shading	No parking space required	☐	Other:		☑	Design for Storm Surge Outflow	
☑	Light Colored Pavements (appropriate SRI)					☑	Install Backwater Flow Prevention	
☐	Increase Planted Areas	Property size limitation				☐	Design for Scour	Existing street storm line elevation fixed
☐	Permeable Surfaces and Open-grid Pavement	Not appropriate for playground				☐	Raise Road Elevation	Not practical/ DOT control road design
☐	Other:					☐	Other:	

[a] Permanent perimeter flood walls are not permitted to meet floodproofing requirements in buildings with substantial improvements and/or damages.
[b] Utility redundancy design should be pursued for critical systems, not all building systems.

Design Strategies Checklist

Integrative Design Report and Recommendations

7.4 Cost for Heat and Precipitation for each potential measure

1) A SRI appropriate roof is a minimal method to reduce the heat island effect. There is no additional cost.
2) One of the most effective methods to reduce heat island effect. Initial cost for an extensive green roof is estimated at an extra $[redacted] for a roof of appropriately 145,000 s.f. like this new school.
3) This can generally be translated to a thicker layer of insulation. Additional cost is estimated at $[redacted]s.f. or $[redacted] for this new school.
4) Light colored asphalt (SRI appropriate) is a minimal method to reduce the heat island effect. There is no additional cost.
5) Cost for planting is estimated at $[redacted] per s.f. only slightly higher than the estimates $[redacted] per s.f. for concrete pavement. Planting in a school setting is not ideal.
6) Permeable pavers are an estimation cost increase of $[redacted] per s.f. compared to concrete or asphalt pavement.
7) One of the most effective methods to reduce heat island effect. Initial cost for a (integrative) green roof is estimated at an extra $[redacted] for a roof of appropriately 14,500 s.f. like this new school.
8) Installing an on-site gray water systems for a building of this size is estimated at $ [redacted]
9) Reducing impervious areas is a good method to manage runoff if percolation rate at the site is suited. There is only minimal additional cost of an estimated $[redacted] per s.f.
10) There is an additional cost of $[redacted] per s.f. for pervious concrete installation.
11) Cost for green areas and planting is estimated at $ [redacted] per s.f. only slightly higher than the estimated $[redacted] per s.f. for concrete pavement. Planting in a school setting is not ideal.
12) Blueroof is a very effective way to manage storm water. Cost is estimated at appropriately @[redacted] per s.f. or $ [redacted] for a roof of approx.. 14,500 s.f.
13) A bioswale can be another effective method to storm water. Cost of bioswale is estimated at $ [redacted] per s.f. or $ [redacted] for a bioswale of 1,000 s.f.