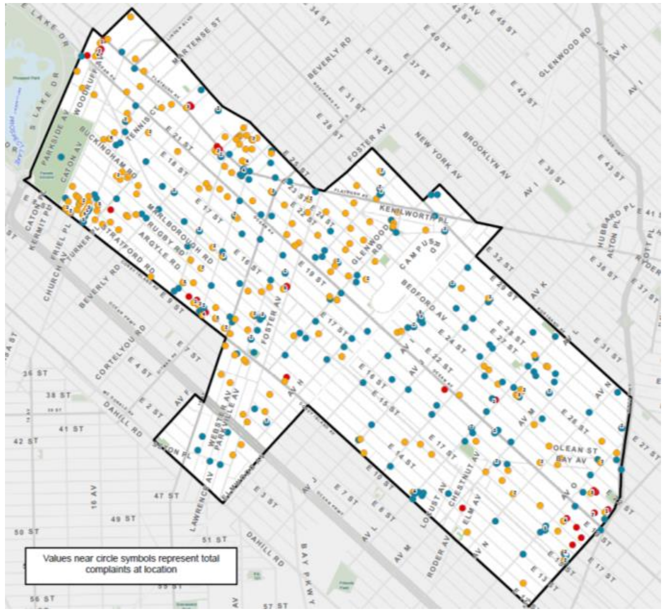
DEP Presentation on Flooding and Infrastructure Brooklyn Community Board 14

November 17, 2021



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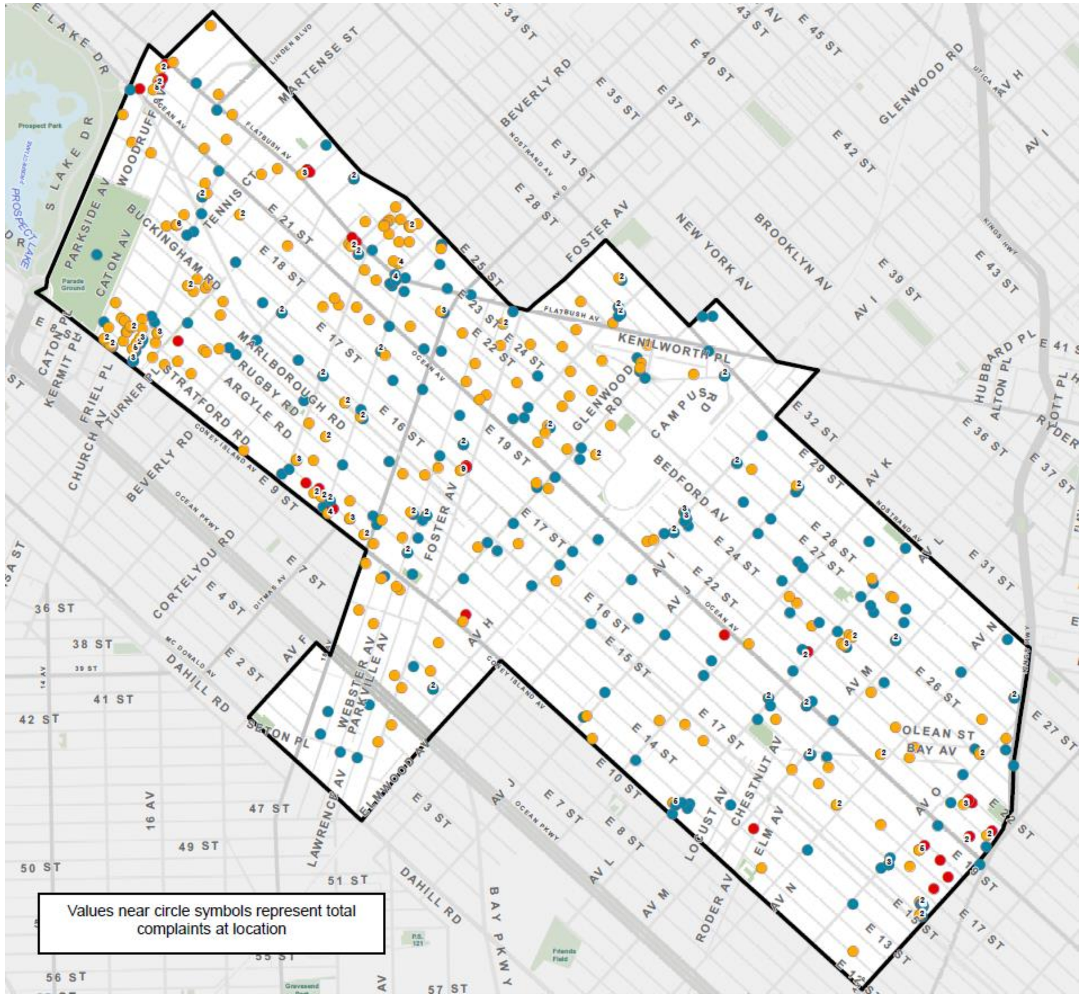
Flooding Complaints



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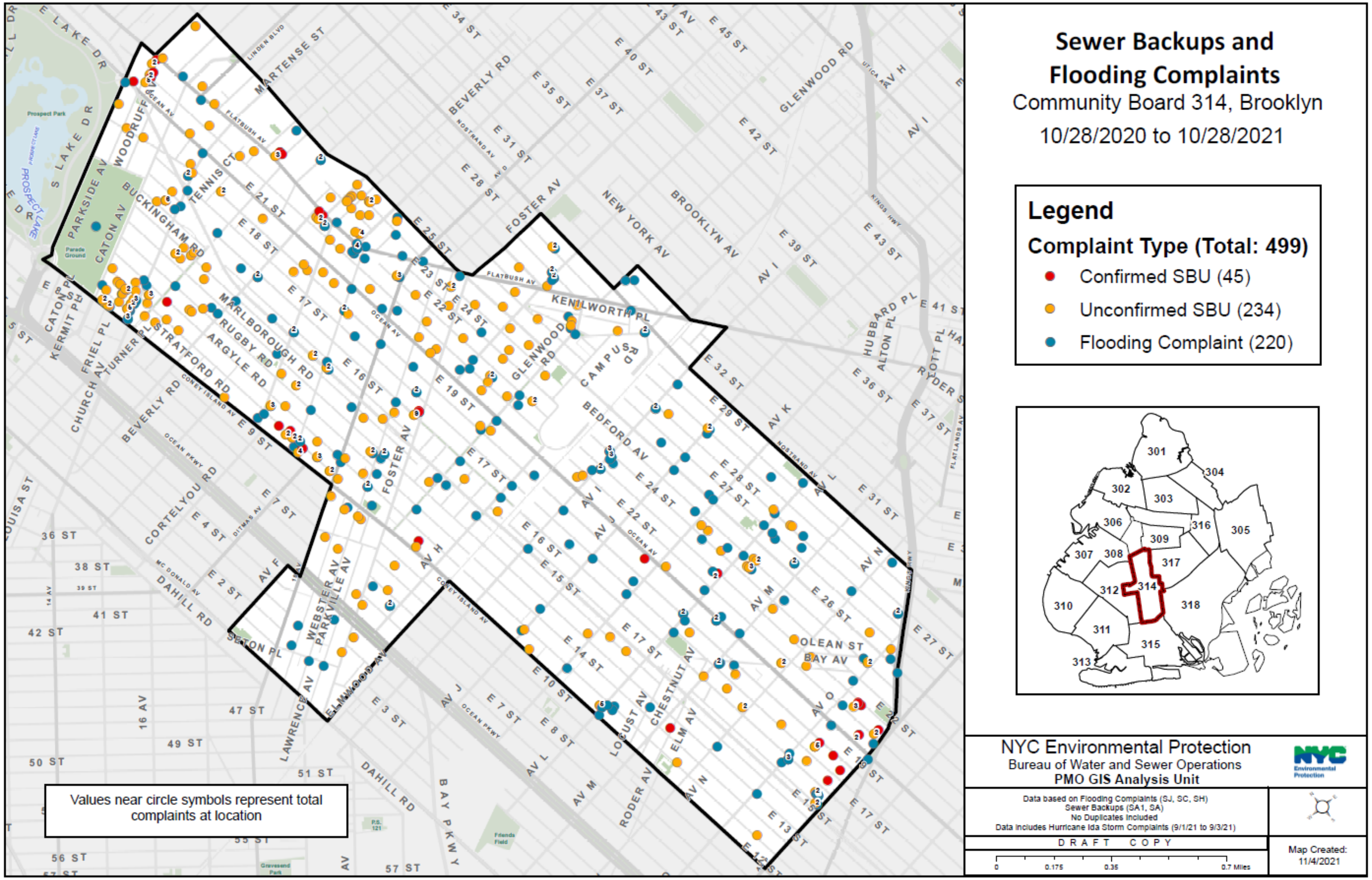
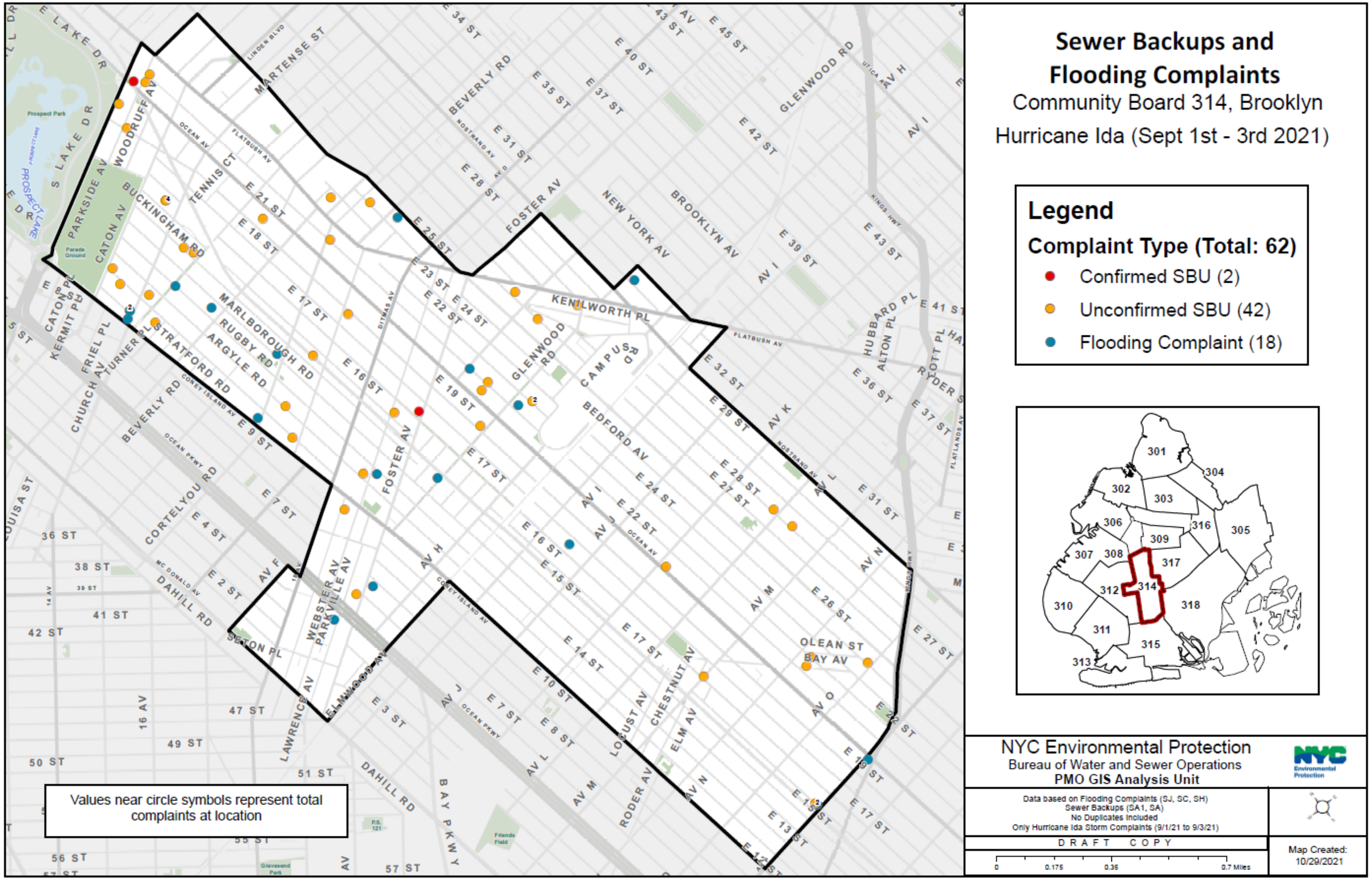
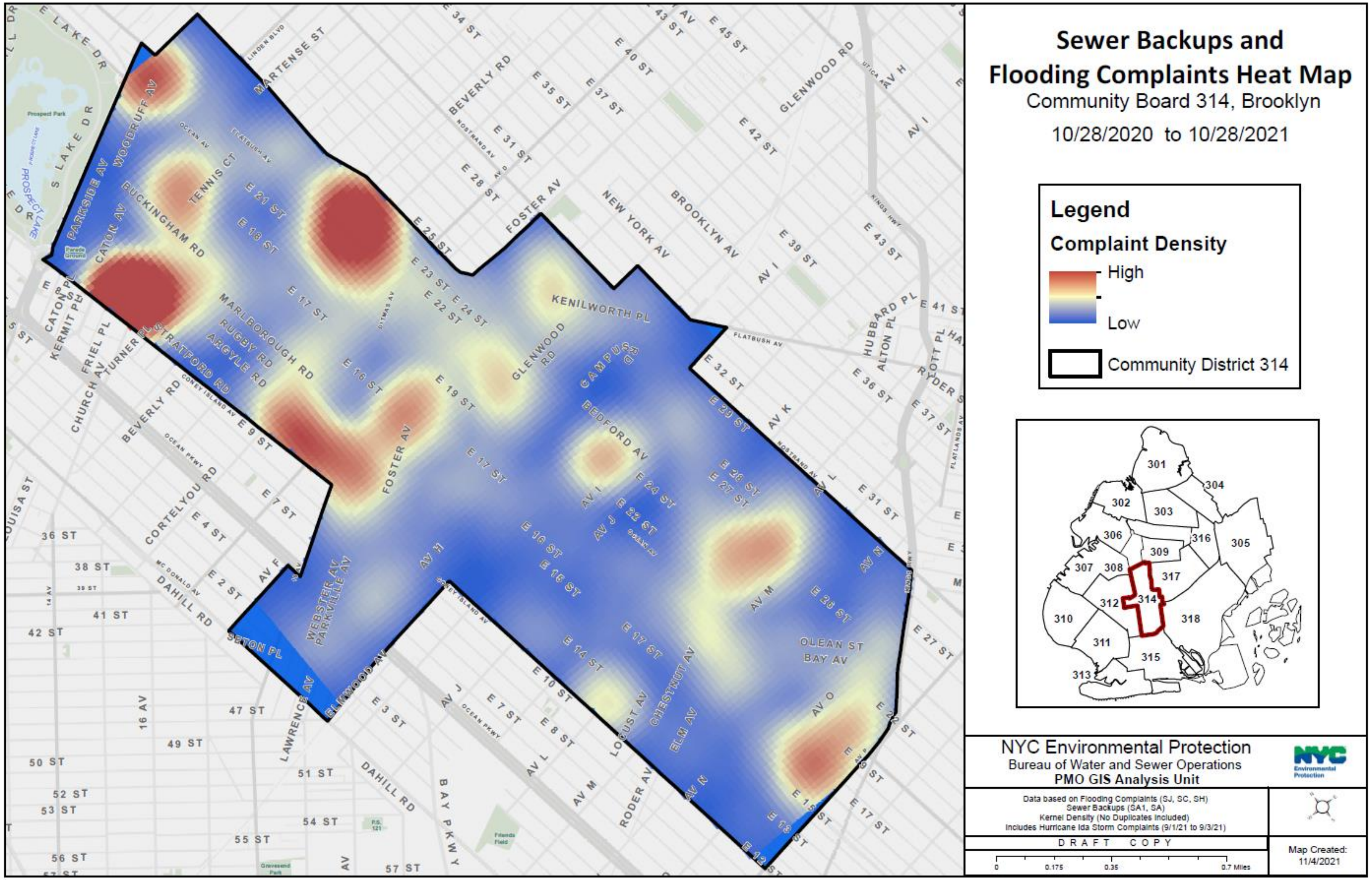
311 Flooding Complaint Locations



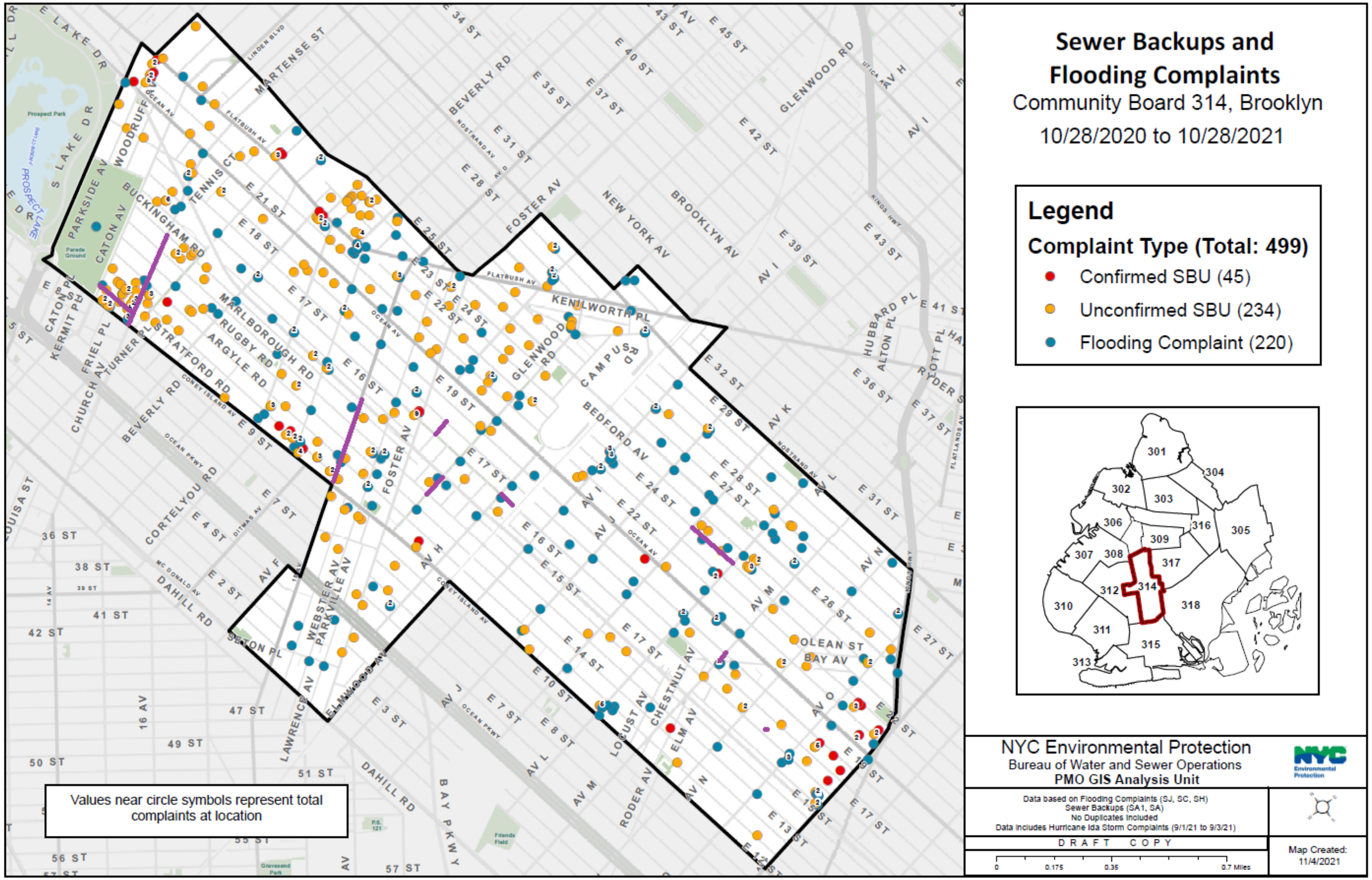
311 Flooding Complaint Locations: Storm Ida



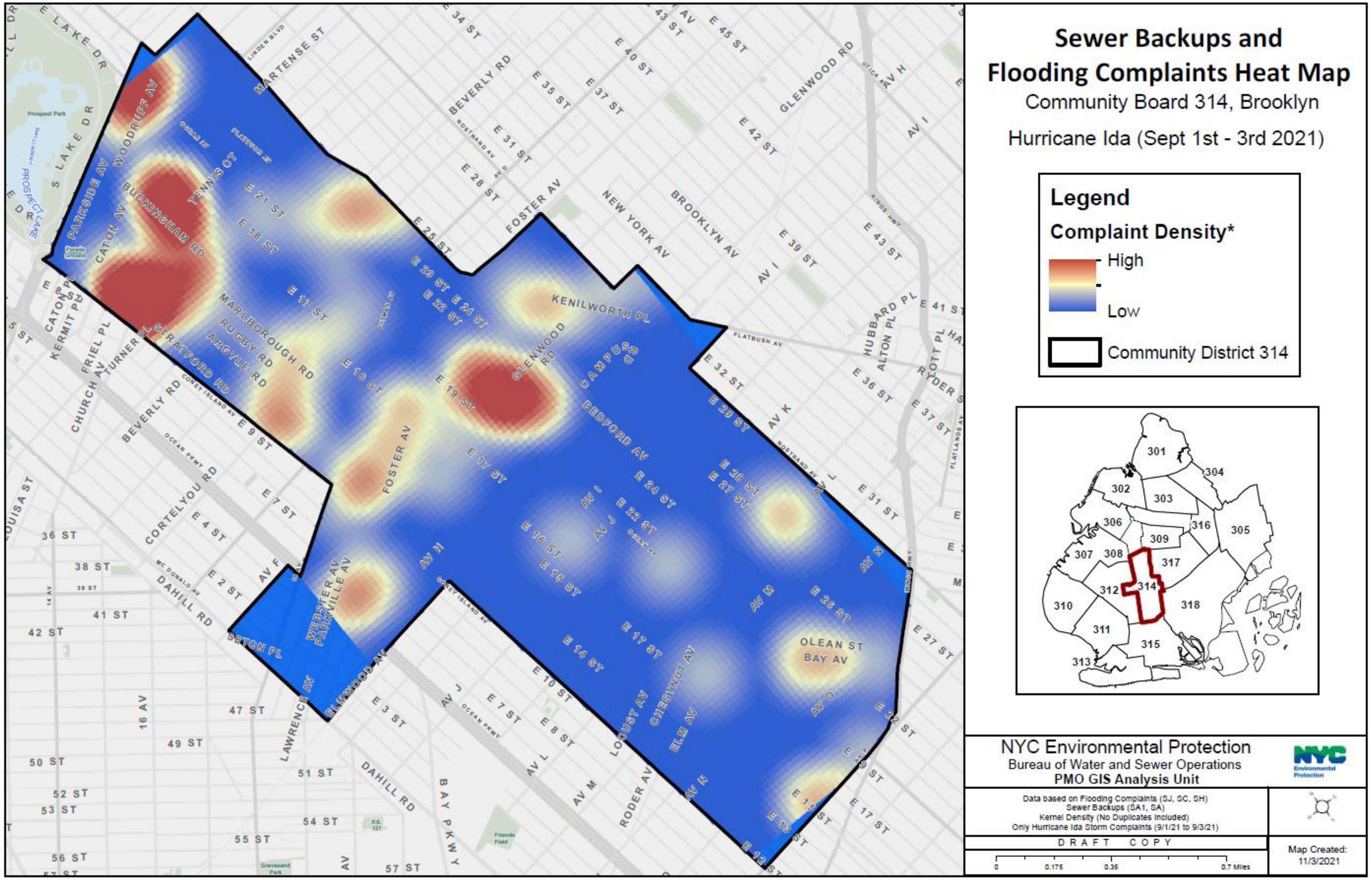
311 Flooding Complaint Locations Heat Map



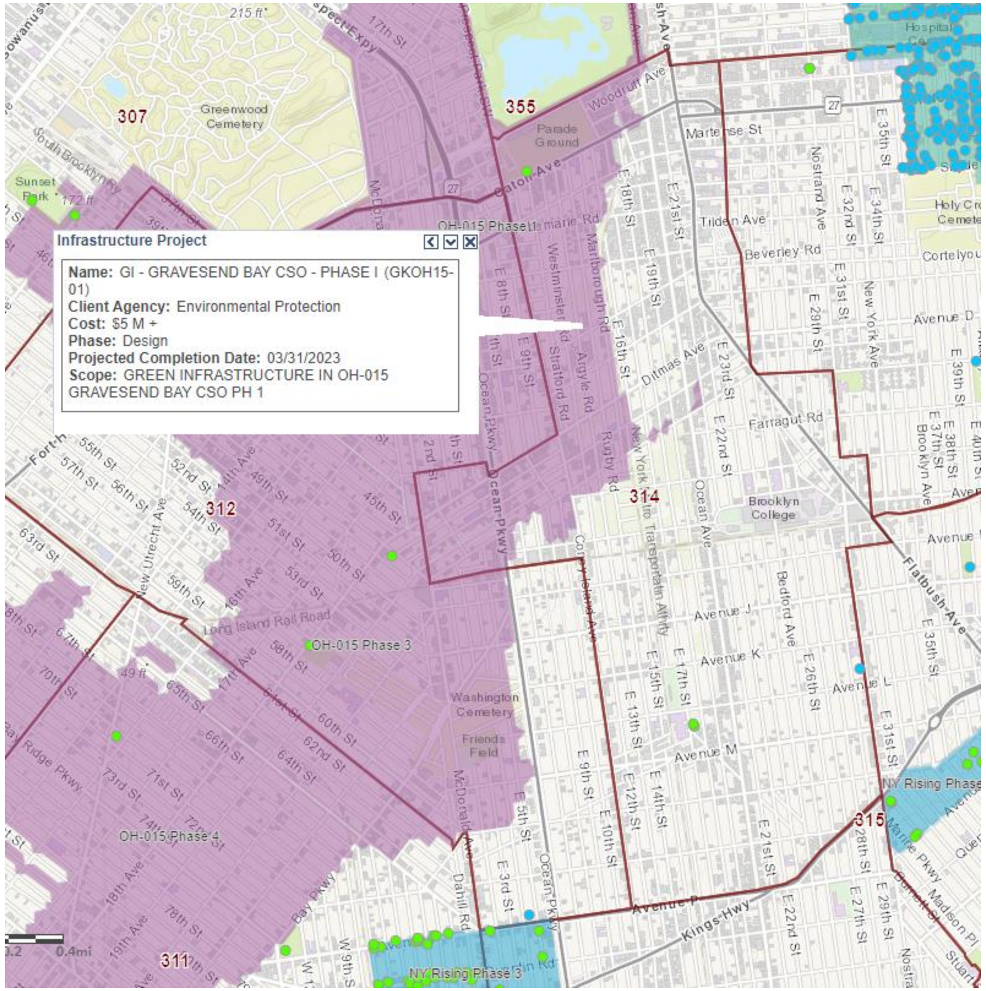
Flooding Complaint Locations from CB 14



Flooding Complaints Heat Map from Storm Ida



Infrastructure



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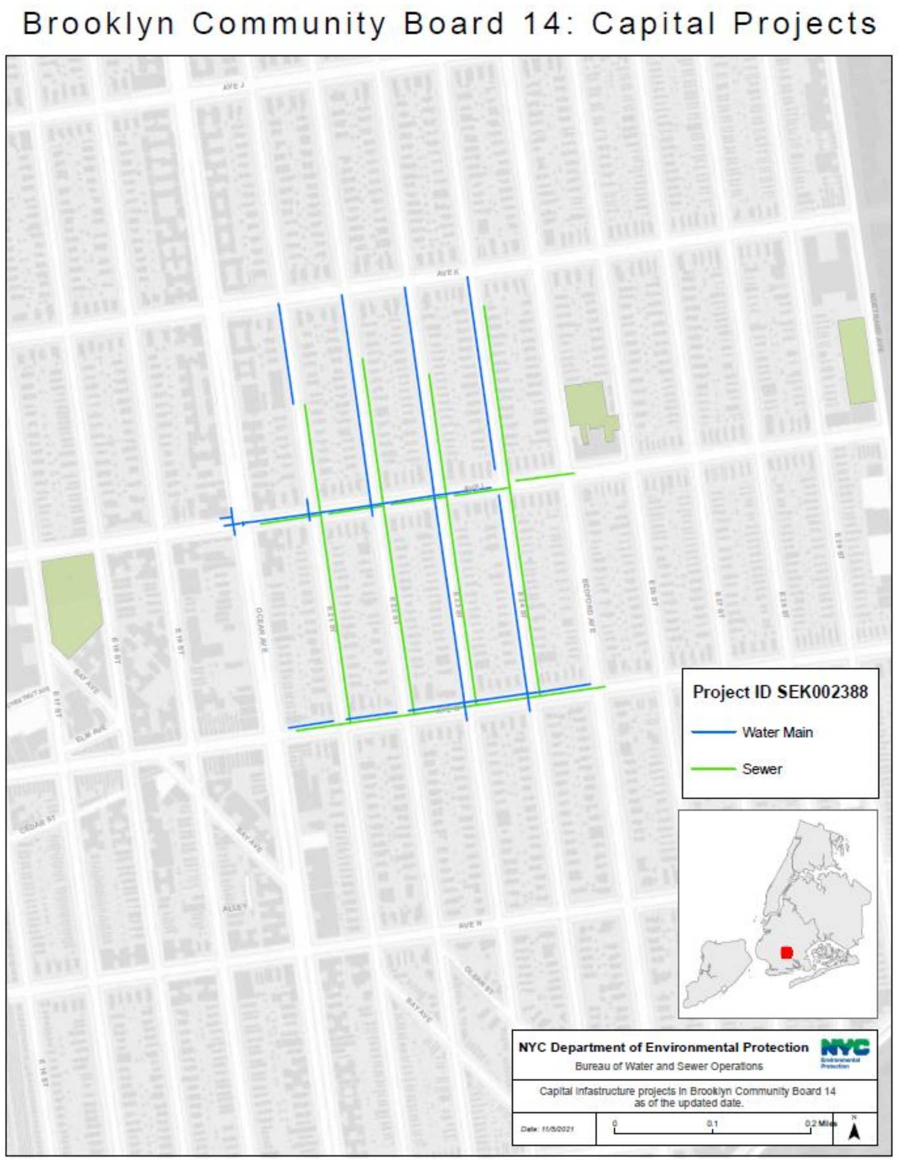
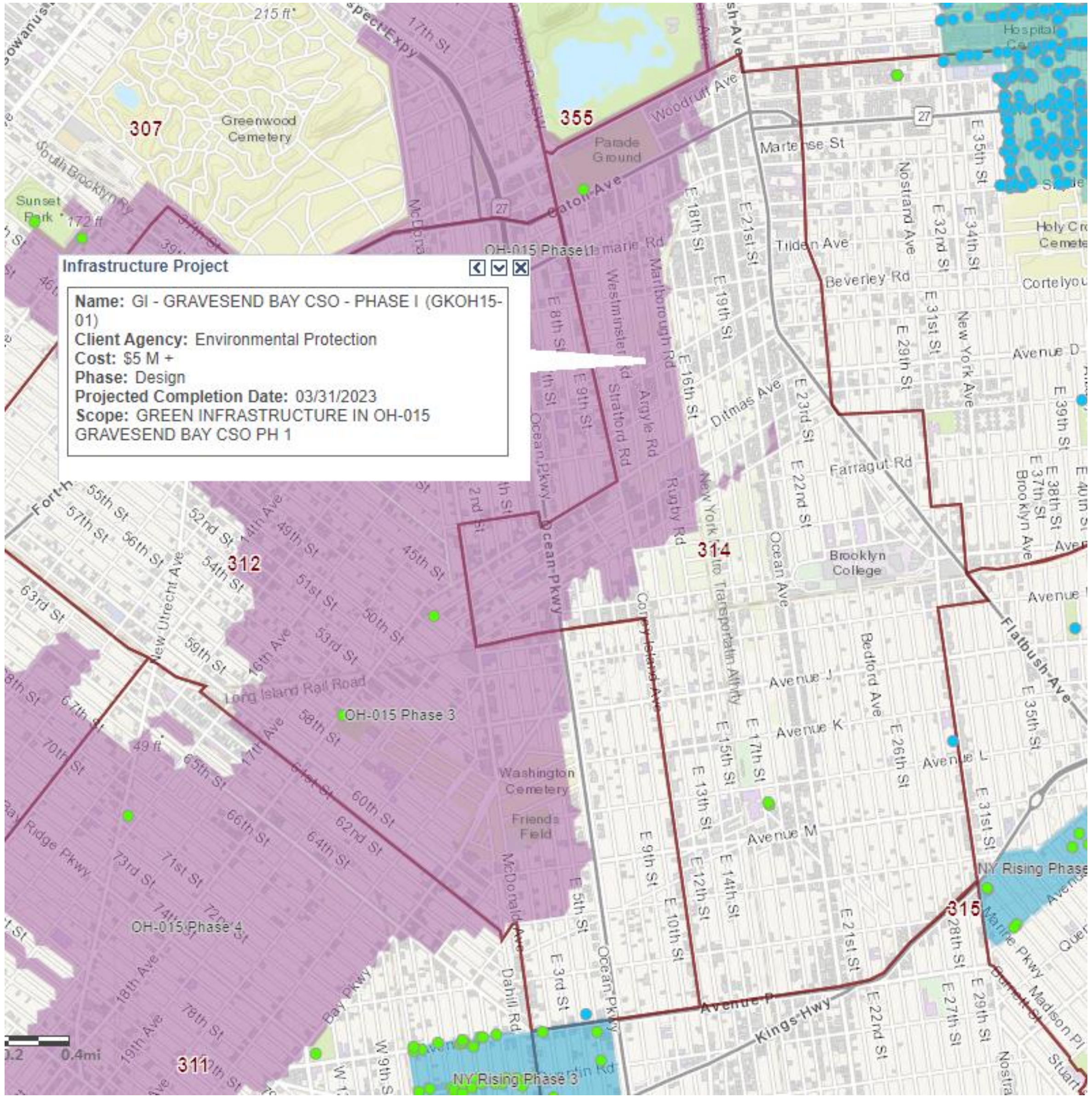
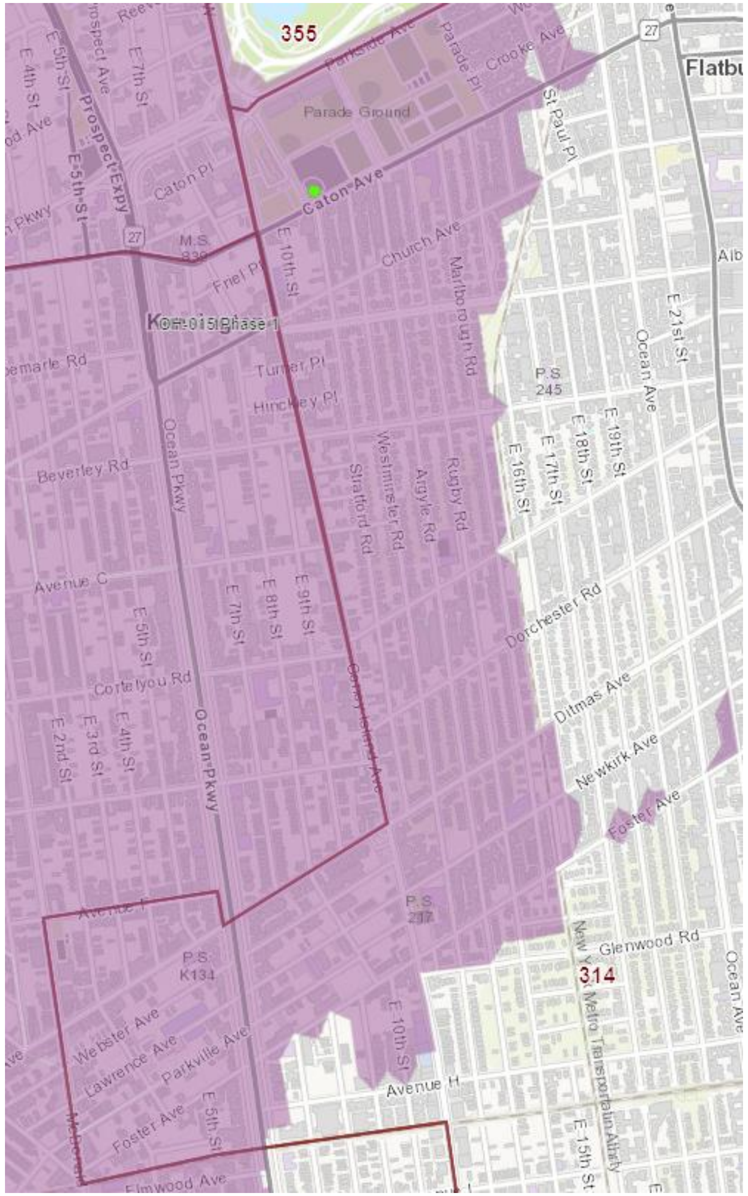
Capital Projects



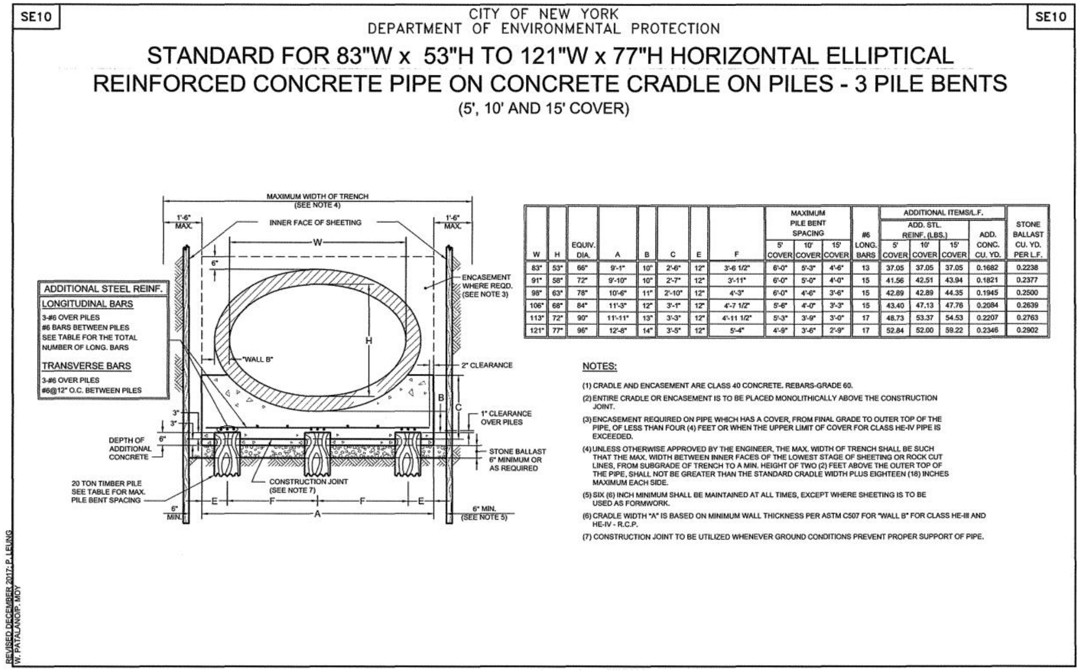
Green Infrastructure – Rain Gardens





DEP Site Connection Application Process

NYC
Environmental Protection



SE10

CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION

STANDARD FOR 83"W x 53"H TO 121"W x 77"H HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE ON CONCRETE CRADLE ON PILES - 3 PILE BENTS

(5', 10' AND 15' COVER)

W	H	EQUIV. DIA.	A	B	C	E	F	MAXIMUM PILE BENT SPACING 5' COVER	10' COVER	15' COVER	#6 LONG. BARS	ADDITIONAL ITEMS/L.F. ADD. STL. REINF. (LBS.) 5' COVER	10' COVER	15' COVER	ADD. CONC. CU. YD.	STONE BALLAST CU. YD. PER L.F.
83"	53"	66"	9'-1"	10"	2'-6"	12"	3'-6 1/2"	6'-0"	5'-3"	4'-6"	13	37.05	37.05	37.05	0.1682	0.2238
91"	58"	72"	9'-10"	10"	2'-7"	12"	3'-11"	6'-0"	5'-0"	4'-0"	15	41.56	42.51	43.94	0.1821	0.2377
98"	63"	78"	10'-6"	11"	2'-10"	12"	4'-3"	6'-0"	4'-6"	3'-6"	15	42.89	42.89	44.35	0.1945	0.2500
106"	68"	84"	11'-3"	12"	3'-1"	12"	4'-7 1/2"	5'-6"	4'-0"	3'-3"	15	43.40	47.13	47.76	0.2084	0.2639
113"	72"	90"	11'-11"	13"	3'-3"	12"	4'-11 1/2"	5'-3"	3'-9"	3'-0"	17	48.73	53.37	54.53	0.2207	0.2763
121"	77"	96"	12'-8"	14"	3'-5"	12"	5'-4"	4'-9"	3'-6"	2'-9"	17	52.84	52.00	59.22	0.2346	0.2902

NOTES:

(1) CRADLE AND ENCASEMENT ARE CLASS 40 CONCRETE. REBARS-GRADE 60.

(2) ENTIRE CRADLE OR ENCASEMENT IS TO BE PLACED MONOLITHICALLY ABOVE THE CONSTRUCTION JOINT.

(3) ENCASEMENT REQUIRED ON PIPE WHICH HAS A COVER, FROM FINAL GRADE TO OUTER TOP OF THE PIPE, OF LESS THAN FOUR (4) FEET OR WHEN THE UPPER LIMIT OF COVER FOR CLASS HE-IV PIPE IS EXCEEDED.

(4) UNLESS OTHERWISE APPROVED BY THE ENGINEER, THE MAX. WIDTH OF TRENCH SHALL BE SUCH THAT THE MAX. WIDTH BETWEEN INNER FACES OF THE LOWEST STAGE OF SHEETING OR ROCK CUT LINES, FROM SUBGRADE OF TRENCH TO A MIN. HEIGHT OF TWO (2) FEET ABOVE THE OUTER TOP OF THE PIPE, SHALL NOT BE GREATER THAN THE STANDARD CRADLE WIDTH PLUS EIGHTEEN (18) INCHES MAXIMUM EACH SIDE.

(5) SIX (6) INCH MINIMUM SHALL BE MAINTAINED AT ALL TIMES, EXCEPT WHERE SHEETING IS TO BE USED AS FORMWORK.

(6) CRADLE WIDTH "A" IS BASED ON MINIMUM WALL THICKNESS PER ASTM C507 FOR "WALL B" FOR CLASS HE-III AND HE-IV - R.C.P.

(7) CONSTRUCTION JOINT TO BE UTILIZED WHENEVER GROUND CONDITIONS PREVENT PROPER SUPPORT OF PIPE.

SE10

REVISED DECEMBER 2017: P. LEUNG
W. PATALANO/P. MOY

What is the DEP Site Connection Application Process?

Site Connection Proposal process was designed to assure that proposed new buildings will not overtax existing City sewer system.

- Builders and developers must submit a DEP Site Connection Proposal for all construction other than one, two and three family homes. (Builders of one, two and three family homes must submit a DEP House Connection Proposal form)

- Developer must hire licensed engineer or registered architect to develop Site Connection Proposal.

- Information must be provided on:
    - Size, type and number of connections (sanitary, storm or combined)
    - How and where connections will be made to the City sewers
    - Data on any proposed internal drainage systems
    - Hydraulic Calculations for site storm and sanitary flow

What is the DEP Site Connection Application Process?

Supporting documents include site engineering plans and engineer's hydraulic calculations, surveys, tentative lot sheet, if applicable

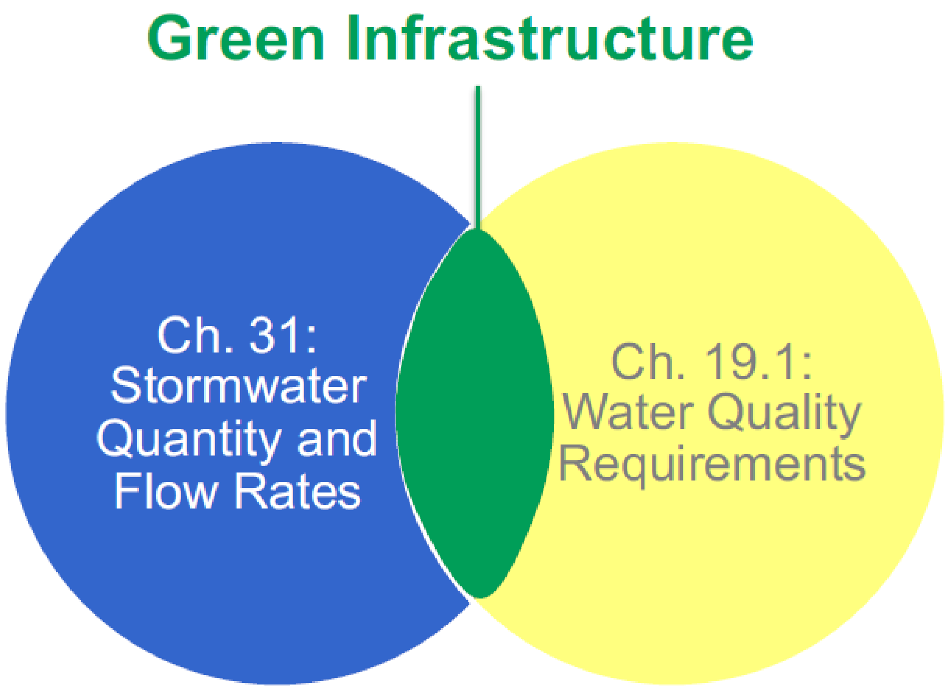
Approvals required from City Health and Buildings Departments, and DEP Industrial Waste Unit

- Documents on street mapping/de-mapping
- Builders pavement plan
- Ground boring logs

In addition to this information, in some cases DEP may even require that developer's engineer performs area drainage study to assure that City sewers are not overtaxed by proposed new construction. If area has been up-zoned/rezoned for large residential or commercial buildings and DEP has revised the City Drainage Plan for the area accordingly, and developer may be required to upgrade City sewer infrastructure to comply.

For more information download the DEP Guidelines for the Design and Construction of Stormwater Management Systems at:
https://www1.nyc.gov/site/dep/about/sewer-connections.page

Unified Stormwater Rule



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What is the NYC 2021 Unified Stormwater Rule?

Managers of construction sites will be required to develop plans for how stormwater runoff will be managed on-site during and after construction. Managing stormwater runoff near or where it falls lessens the amount of volume that ends up in our streets, sewer systems, and ultimately, our waterways.

The new rule will also require that on-site stormwater infiltration feasibility studies be conducted in an effort to prioritize green infrastructure solutions. DEP will review the studies and work with site managers to ensure that they have explored a series of on site stormwater management starting with GI practices and ranging in retention, detention and re-use solutions.

The most important aspect of the new rule is the change of lot size of sites that need to comply. The lot size will be reduced from one acre and above to a lot size of 20,000 square feet and above.

DEP will provide a revised design manual to help guide site managers on the types of solutions they can deploy.

Unified SW Rule – Background

- The Unified Stormwater Rule provides alignment of on-site stormwater management requirements. The Rule makes considerations for several stormwater related regulations across city and state agencies:

  - **Water Quality, MS4 areas** – retain and/or treat stormwater to reduce pollutants in runoff

  - **Water Quality, CSS areas** – retain and/or detain stormwater to reduce CSO volume and occurrence

  - **Sewer Operations** – detain or remove stormwater to maintain optimal stormwater quantity and
  - flow rates in the sewer system

  - **Building/Site Drainage** – adequate conveyance of on-site stormwater to reduce local flooding

  - **Increase in Green Space** – alignment with goals of 2019 Climate Mobilization Act

What's Changing?
Ch. 19.1 Rule Amendments

- Definition of Covered Development Project **(definitions)**
  - Expansion to Combined Sewer areas
  - Threshold reduction from 1-acre to 20,000 SF soil disturbance
  - Creation of 5,000 SF or more of impervious surfaces added as a trigger
- Infiltration/retention requirements **(§ 19.1-03.3 Permits**)
  - Applicants must follow Stormwater Management Practice (SMP) hierarchies for MS4/CSS and provide documentation if they cannot implement infiltration/retention practices

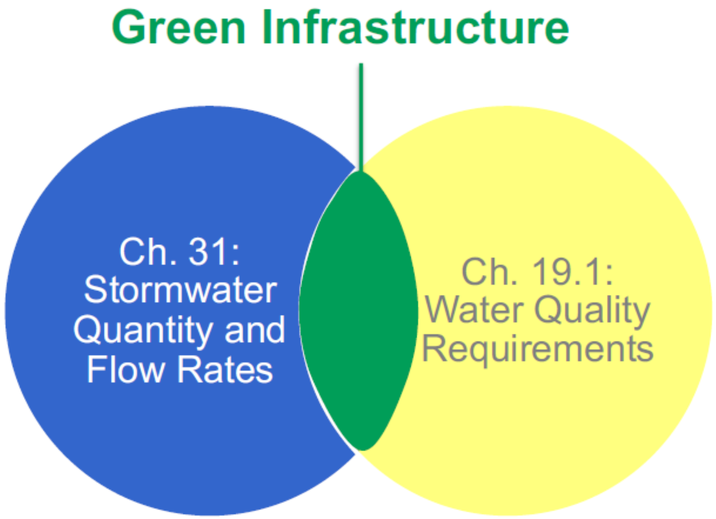
What's Changing? Chapter 31 Rule Amendments

Component I: Site/House Connection Permit Requirements (Chapter 31)

- **Why**: maintain optimal stormwater quantity and flow rates
- **When**: all new construction, additions/alterations, agency projects
- **How**: manage Vv volume on-site by detention or retention systems

Component II: Stormwater Construction Permit Requirements (Chapter 19.1)

- **Why**: water quality requirements
- **When**: sites that disturb ≥ 20,000 SF of soil or create 5,000 SF or more impervious area
- **How**: manage WQv volume on-site by retention systems
- **Note**: WQv is zero for sites that do not meet threshold or replace/create impervious area



Projects that trigger both requirements can receive credit towards Ch. 31 on-site volume requirements (Vv) by using green infrastructure

WQv = Water Quality Volume
Vv = Total Stormwater Volume

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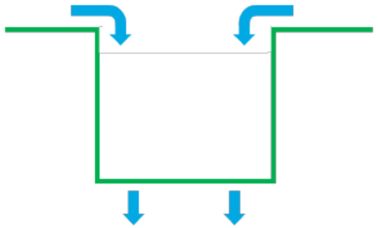
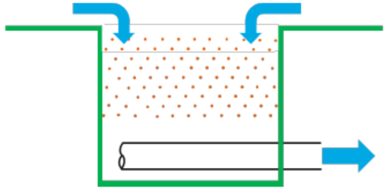
Stormwater Management Practice Function Diagrams



Infiltration

Water is captured and exfiltrated into the underlying soils. Relies on good PT rates of underlying soils. Practices typically do not have underdrains in order to maximize infiltration.
Example: Bioretention, no underdrain

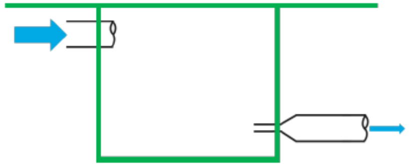


Filtration

Water passes through a filtration media to remove pollutants. Relies on steady flow of water through the filtration media. Practices are usually outfit with an underdrain to support filtration.
Example: Sand filter

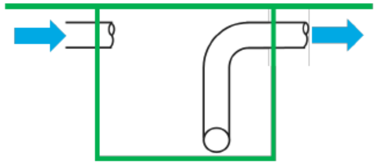
Evapotranspiration

Water is captured and evaporated or transpired back into the atmosphere. Relies on ET occurring between rainfall events. Practices are usually shallow and have no outlet or ability to exfiltrate into underlying soils.
Example: Green roof



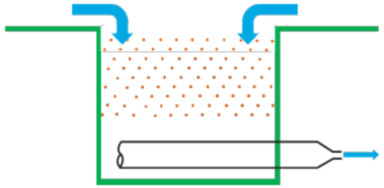
Detention

Water is temporarily stored and released at a lower rate. Relies on ability to control outlet flow rate. Practices usually have a low flow orifice.
Example: Detention tank



Reuse

Water is captured and reused for non-irrigation purposes. Relies on continuous reuse of water. Practices can be integrated into existing non-potable and non-contact water uses.
Example: Reuse in cooling tower



Hybrid Function

(Filtration + Detention Example)

Water passes through a filtration media to remove pollutants and is then restricted by the underdrain system. Relies on both steady flow of water and ability to control outlet flow rate. Practices require special design considerations.
Example: Bioretention with controlled release underdrain

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Stormwater Management Practices: Green Roofs

Green roofs are covered with vegetation to enable rainfall infiltration and evapotranspiration of stored water. A green roof can also reduce the effects of atmospheric pollution, reduce energy costs, decrease the "heat island" effect and create an attractive environment.

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Stormwater Management Practices: Rain Barrels and Cisterns

Rain barrels and cisterns harvest rainwater primarily from rooftops for reuse. Rain barrels are placed at roof downspouts, and cisterns store rainwater in larger volumes in tanks for use in non-potable applications such as toilet flushing.

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Stormwater Management Practices: Permeable Pavements

Permeable surfaces, unlike impermeable surfaces such as asphalt or concrete, allow stormwater to infiltrate through porous surfaces into the soil and groundwater. Can be used for parking lots, driveways or sidewalks, includes pervious concrete, porous asphalt, pervious interlocking concrete pavers or grid pavers.

Kiely Hall Plaza After Construction

Kiely Hall Plaza During Construction

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Stormwater Management Practices: Bioretention Areas

Bioretention areas are shallow, landscaped depressions that allow runoff to pond in a designated area, then filter through soil and vegetation. Small-scale bioretention areas are also known as rain gardens.

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Benefits for New York City

- Requires more on-site stormwater management
  - improved water quality
  - reduced urban flooding
  - lower burden on public infrastructure
  - reduced energy demands

- Increases green space and aligns with 2019 Climate Mobilization Act

- In Municipal Separate Storm Sewer System (MS4) - results in 10,515 tons total suspended solids (TSS) removed after 30 years

- In Combined Sewer System (CSS) - provides CSO reductions of 362 million gallons per year by 2030

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Timing and Next Steps

- **March 2020:** Interagency Technical Workshops Completed

- **August 2020:** City Council Hearing and Passage of Intro No. 1851

- **November/December 2020:**

(1) Finalize Draft Rule for Interagency Review
(2) Industry & Community Stakeholder Outreach

- **November/December 2021:** Draft Rule and Draft Manual Available for Public Review and Comment through the Citywide Administrative Procedure Act (CAPA) Process

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Questions?

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