

# THE {POST-SANDY} NEIGHBORHOOD ASSESSMENT PROJECT

architecture for humanity

←————— new york —————→

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## **FOR THE RESIDENTS OF NEW YORK CITY'S COASTAL COMMUNITIES.**

### **Architecture For Humanity New York**

Architecture for Humanity New York is the local chapter of the international organization of Architecture for Humanity. We provide a platform for socially responsible design advocacy; partnering design professionals with local non-profit organizations, schools, government agencies and community groups, to create innovative, sustainable, affordable solutions to the following humanitarian issues: Poverty Alleviations, Disaster Mitigation, Community Building, Design for At-Risk Populations, and Addressing Climate Change.

Since our chapter was founded in 2003, we have completed over 40 local projects to underserved New York City communities. Projects such as Under the BQE, Red Hook Vendors, The Homeless Shift Project, ARTfarm, and our response to Hurricane Sandy, among others, bring our mission to life and seek to improve New York City at large.

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### **Architecture For Humanity**

Architecture for Humanity is a nonprofit design services firm founded in 1999 by Cameron Sinclair and Kate Stohr. By tapping a network of more than 50,000 professionals willing to lend time and expertise to help those who would not otherwise be able to afford their services, Architecture for Humanity brings design, construction and development services where they are most critically needed. Together, we are building a more sustainable future through the power of professional design.

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# A LOCAL RESPONSE TO HURRICANE SANDY

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## A PRECURSOR TO RESPONSE

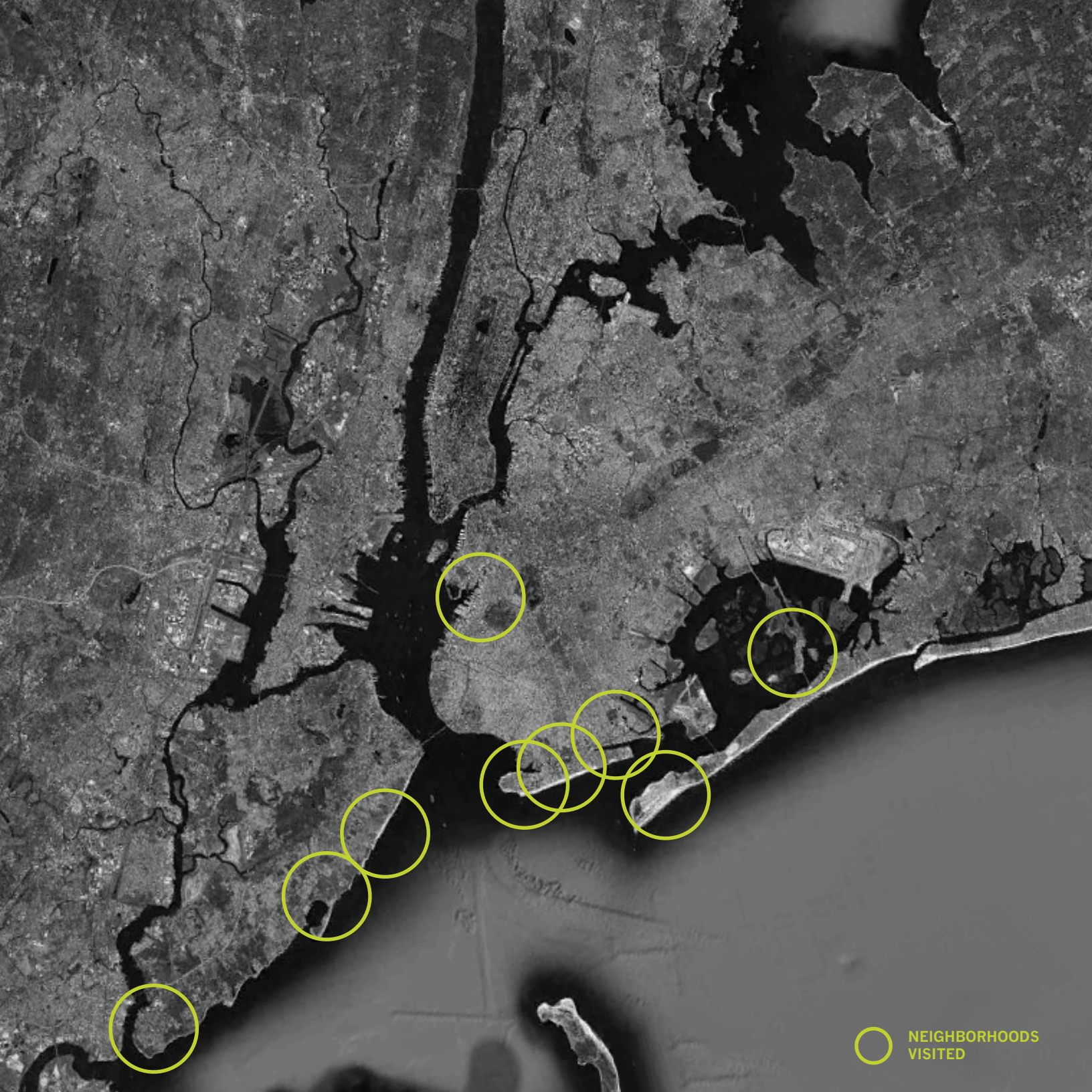
In the weeks, months, and even years after a disaster, there is often an overwhelming confusion about the state of the affected areas and what is going to happen next. As individuals, organizations, and government agencies come together or work separately to support and assist those living and working within these communities, a number of important questions arise:

- *What capacity do the affected communities have to recover on their own, and where do they need assistance?*
- *What needs are and are not being met on the ground?*
- *What is an appropriate reconstruction strategy, for the individual buildings as well as for the greater neighborhood community?*
- *What are the ideas and policies in place, and those that will develop responsively, that will determine how we rebuild?*

In New York City's coastal communities, it quickly became clear that it was critical to develop an understanding of the post-disaster context of each neighborhood before these questions could be thoughtfully answered. As a professional volunteer network seeking opportunities to provide design and reconstruction support, we would need to know what was damaged and, more importantly, what contributed to these damage patterns. We would need to understand the unique character of each neighborhood and the strengths and capacity for rebuilding within each community. We would need to understand the natural and urban systems that define the

complex landscapes across the five boroughs and we would need to understand the psycho-social responses that have influenced how residents choose to engage in recovery. Through developing understandings of this context, we hoped to engage in rebuilding in a collaborative, empowering, and resilient way that is rooted within and shaped by each community.

At Architecture for Humanity, we often refer to ourselves as the last responders. We work to identify areas that have critical needs that aren't being met and provide professional design, construction, and development services to those that otherwise wouldn't be able to afford this work. Since 1999, Architecture for Humanity has responded to nine major disasters throughout the world and has spearheaded reconstruction programs to support communities most in need. In this work, every disaster zone delivers a unique set of challenges. New York is a dense coastal city with a complex network of uniquely affected communities. It is also the first disaster zone that Architecture for Humanity has responded to where a local chapter was already established. As a result, the New York City chapter has played an integral role in Architecture for Humanity's collective response, collaborating closely with the Reconstruction and Resiliency Studio based in the Architecture for Humanity Headquarters in San Francisco.



○ NEIGHBORHOODS VISITED



## THE NEIGHBORHOOD ASSESSMENT PROJECT

After the landfall of Hurricane Sandy, the New York City Chapter developed a project to establish meaningful local engagement, investigating each of the diverse communities that were affected in order to carefully direct our resources, especially the time and expertise of our volunteer network. We modeled *The Neighborhood Assessment Project*, the initial phase of our post-disaster recovery program, after Architecture for Humanity's initial response in Biloxi, Mississippi. With careful consideration of past project tool kits, our project was adapted and expanded to address the unique characteristics of New York City's coastal communities.

During the months after Sandy, field teams spent time in each neighborhood. Through field visits with community partners, they collected information and stories, focusing on the experiences of residents during and after the storm, the damage patterns, needs, and challenges that materialized. This data set helped our team to understand the strengths and capacity for rebuilding within each community. Through this process, the gaps in support that our chapter and Architecture for Humanity's New York Regional Office could fill would become apparent and we could collectively create a series of effective, community-centric projects that would address the post-disaster conditions in the field.

*The Neighborhood Assessment Project* is comprised of three important phases:

### PHASE 01: PLANNING AND PREPARATION

#### IDENTIFYING NEIGHBORHOOD TARGET AREAS

Our first step was to identify the hardest-hit neighborhoods that our field teams would visit. We identified 10 critical communities along the coastlines of Staten Island, Brooklyn, and Queens; focusing our efforts on Tottenville, New Dorp Beach, Midland Beach, Red Hook, Sea Gate, Coney Island, Brighton Beach, Breezy Point, Roxbury, and Broad Channel.

#### DEVELOPING A SURVEY METHODOLOGY

Once we had identified these focus areas, we developed the methodology that would guide our field work. This methodology utilized a survey system that Eric Cesal, the Director of Architecture for Humanity's Reconstruction and Resiliency

Studio, had developed after Hurricane Katrina for use in Biloxi. This survey, which was modified and adapted to the context of New York City, was designed to collect quantitative data, including damage impacts, residents' needs, and assistance currently available.

To more accurately portray the context of each community, we decided to support this data collection with photographic and observational documentation, as well as with a story collection process. Through utilizing a layered approach, our field teams would have flexibility in gathering both quantitative data, as well as qualitative material, such as insights, ideas, and emotionally-driven information, which we felt was equally, if not more, important.

The neighborhood assessment process would happen on three levels: volunteers would speak with residents and conduct surveys, they would observe the buildings to get a better sense of the building typologies in the area and what damage had occurred to these, and they would walk the neighborhood to get a sense of the broader landscape and neighborhood character.

#### TEAM TRAINING

With a clear methodology in place, we reached out to individuals with strong leadership and communication skills and established a group of team leaders to guide volunteers in the field work. The team leaders conducted initial research on the communities, reached out to community leaders, and planned the logistics of their time in the field.

We then tapped into our extensive volunteer network and assembled teams to complete the field work. We held field orientation sessions to prepare volunteers and provide training on how to address situations they may encounter in the field in a way that is respectful of the difficulties residents have been experiencing. To provide additional insight, Alison Popper, our special advisor for the project, spoke to the groups about her experiences working in the field in New Orleans after Hurricane Katrina. Volunteers were then grouped according to their neighborhood of origin and were introduced to their team leaders.

### PHASE 02: FIELD WORK

Over a course of weekends from November 2012 to January 2013, team leaders worked with groups of up to 10 trained volunteers, spending time in the designated neighborhood to

...TIVE OF EACH INDIVIDUAL'S  
...RIQUE EXPERIENCE.  
...RK WITH SYMPATHY, NOT EMPATHY.  
...TRODUCE YOURSELF AND  
...CHITECTURE FOR HUMANITY  
...A CLEAR WAY.  
...K PERMISSION.



meet with residents and community members, collect data, and build a knowledge base. In most cases, teams conducted an initial canvass of the neighborhood before returning for more thorough visits. These initial trips helped the team to select the neighborhood areas they would focus on.

These sample areas are as comprehensive as possible, and though our teams worked to be scientific when possible, there are inevitable gaps in the collected data. Unforeseen challenges arose throughout the neighborhood visits, requiring teams to adapt to daily conditions in the post-disaster environment and modify their local field strategies to support a thorough and appropriate collection. In some cases, where residents were still experiencing high levels of both physical and emotional trauma, this meant forgoing the typical survey and respecting the space that residents needed to piece their lives back together. In other cases, this meant accessing parts of a neighborhood by boat. By remaining agile, our teams were able to complete approximately 570 surveys, in addition to archiving numerous images and stories that provide insight into the experiences of residents during and after the storm.

## PHASE 03: RESEARCH AND DATA ANALYSIS

### RESEARCH

In addition to the field work, a team of individuals from the New York Chapter of Architecture for Humanity, the Brooklyn Historical Society, the Modern League, and Architecture for Humanity's Reconstruction and Resiliency Studio worked to compile historical research on each of the focus neighborhoods. This information provides an overview of the historical periods of development in each community, with insight into the housing types, culture, and larger landscape of each community.

### DATA ANALYSIS

After a series of field visits, each team member uploaded their data, field notes, and photographs to a central server. This information was then sorted and processed into a shareable database, analyzed spatially and graphically, and ultimately compiled into this publication, with a special focus on each individual neighborhood.

## PHASE 04: NEXT STEPS

Our goal through this project was not only bring about a greater awareness of each community's unique situation, but to also reveal the gaps in support that our Chapter, Architecture for Humanity's Regional Field Office, and other community-driven organizations could potentially fill in support of these communities. It is our hope that our community-centric approach to situation analysis will encourage resources to be directed within these communities in a manner that supports residents' aspirations for their homes and for their neighborhood's future.

During our time in the field, we documented the thoughts and ideas that residents and team members conceived of as possible approaches to recovery and, collectively, this project has established the groundwork for revealing a number of potential next steps. While the community-centric considerations outlined in the following report provide an important starting point for action, this collection is the only the start of a conversation that responds to the needs of residents throughout the longer-term recovery process. The needs of each community will continue to develop over time, and resources will shift as reconstruction evolves. It is our hope that our Chapter and other organizations working to support these communities will continue to leverage volunteer capacity to address the changing needs within New York City's coastal neighborhoods.

One year after Hurricane Sandy, it is important to continue to engage with residents and collaborate with them to identify meaningful projects that will assist those who need our help the most. As you read this report, we encourage each of you to ask yourself: *What can I do to build off of this initial response and offer support to those who need help rebuilding their homes and communities?*



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# LESSONS FROM THE FIELD

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Although it would be impossible to summarize all of the lessons learned through this project here, we have provided a broad overview of the predominant conditions and challenges residents faced, elaborated upon in detail in the subsequent chapters of this report:

- A number of challenges were consistent across the affected communities, such as working through the insurance claims process. However, each neighborhood has also faced a diverse set of challenges and, as a result, has been experiencing a unique recovery process.
- There are a variety of diverse building types throughout the affected areas that will need to be retrofitted to address vulnerabilities, including both single family and multi-family housing. Among the most critically impacted buildings were those with basements, those that were originally built for seasonal use and later converted to year-round use (and thus had less robust structures), and those directly next to the water that took the brunt of the impact from the storm surge.
- Larger landscape processes exacerbated the damage in many cases. For example, some communities were inundated from two or more sides, some experienced more severe flooding due to elevation and/or topographical features, and some communities were more severely impacted due to engineering changes that had been made over time to natural long-shore deposition processes.
- Many of the residents we spoke with want to build back in a resilient manner, but are experiencing barriers to doing so. A larger share of residents, however, want to rebuild as quickly as possible and are not implementing measures to make their structures more resilient.

- Although the majority of residents we spoke with were determined to stay in place and rebuild, there were several residents that wanted to participate in buy-out programs and relocate.
- The communities that have been traditionally more geographically isolated, such as Breezy Point and Red Hook, tended to have the most extensive self-organization after the storm.

In the chapters that follow, each neighborhood is examined individually and a series of considerations are taken into account, including damage patterns, challenges during recovery, community capacity, and ideas for recovery.

## DAMAGE PATTERNS

Although a number of damage patterns were consistent across the neighborhoods, each community also exhibited its own unique set of damages and losses. Below is a summary of the damage patterns that were identified in the field, with commonalities highlighted:

### INUNDATION

Each of the communities surveyed were inundated during Hurricane Sandy. Some communities were impacted by strong storm surge and higher waterlines, while others experienced lower flood levels.

### CONTAMINATION

In several cases, fuel tanks and sewer system backflow came into contact with floodwaters, causing contamination issues. Many homeowners had to deal with this inside their homes, particularly in flooded basements.

### SAND

In areas in the neighborhoods particularly close to beaches, sand was pushed into the community by the rising water and storm surge. In some cases this caused an inconvenience, in others it became a more serious problem and an impediment to a speedy recovery process.

### THE COASTAL LANDSCAPE

Each of the neighborhoods visited has a unique elevation above sea level, topography, and physiogeographical processes. As

a result, communities were inundated in different ways, by different bodies of water. In addition, some communities have undergone engineering projects along the coastline in the past that have impacted natural deposition processes and increased vulnerabilities along the waterfront. Some residents felt that nearby dredging had played a part in how their communities were impacted.

### **MOLD**

It quickly became evident that mold would be a significant and persistent problem for the communities affected by Hurricane Sandy. At the time of survey, several communities had gone or were undergoing proper mold remediation. In other communities, mold was not properly being handled and continues to pose a serious health risk for residents.

### **MUCK**

By the time of survey, the majority of the muck that had inundated the homes had been cleaned out, with the assistance of local organizations doing “muck-outs.”

### **DEBRIS**

Hurricane Sandy generated significant amounts of debris. Loose items and building components that were not well-secured were relocated by the wind and water, in some cases causing damage to adjacent properties. In some instances, neighbors found themselves burdened with debris that did not originate from their own homes.

### **CONSTRUCTION WASTE**

In addition to wind and water-borne debris, a significant quantity of waste was generated in the weeks after the storm, as residents had to remove affected building materials and belongings from their homes. These items were piled along the street, to be carried away by the Sanitation Department.

### **HOUSING**

The housing inventory varies from neighborhood to neighborhood, ranging anywhere from modest single storey bungalows to high rise apartment buildings. Each building typology, described in detail in this report, sustained a series of damage patterns that will need to be considered and mitigated in order to establish resiliency for future events.

### **LOCAL BUSINESSES**

The impact on local businesses varied across the neighborhoods. Some businesses were able to quickly replace their inventory and reopen, while others were severely impacted and were suffering significant financial losses. Landlords were one business sector that was especially hard hit. In many cases, it was difficult for landlords to come up with the capital necessary to make repairs, especially when losing tenants due to damage incurred. This, in turn, had an impact on available housing, as many renters were forced to relocate and seek housing in other areas.

### **BUILDING SERVICES**

Immediately after the storm, many households were left without access to necessary building services, including gas, mechanical, electrical, and plumbing systems. These outages made several aspects of daily living and disaster recovery difficult, including the preparation of meals, the heating of homes, and the ability to use power tools for home repairs. The loss of heat was a critical concern for especially vulnerable residents, such as the elderly or those experiencing illnesses. The length of time it took to regain access to these services varied across the neighborhoods.

### **NEIGHBORHOOD INSTITUTIONS**

In many cases, important neighborhood institutions, such as public libraries, were unable to reopen immediately after the storm.

### **OUTDOOR PUBLIC GREEN SPACES**

Several communities sustained damage to public parklands and other outdoor green spaces, such as community gardens. These amenities were in various states of recovery across the neighborhoods, but in almost all cases clearing and reopening these spaces was a cited by residents as a priority.

### **INFRASTRUCTURE**

Although infrastructure was impacted in the majority of the communities we surveyed, it was affected differently in each neighborhood. Some communities experienced outages for significant periods of time, while others were able to repair infrastructure and regain services almost immediately. Some communities have experienced major disruptions to infrastructural systems such as sewer lines and will be undergoing major recovery projects in the future.

## PERSONAL IMPACT

### Loss of Life

Although most residents either safely evacuated prior to Hurricane Sandy or were able to flee to upper stories or neighbors' homes during the storm, some residents who lived in single storey homes were trapped by rising waters and did not survive the storm. Deaths attributable to the storm in the communities we surveyed were predominantly concentrated in Midland Beach.

### Personal Health

Several residents experienced exacerbated health problems after the storm, especially those that were already vulnerable prior to Sandy. It is also expected that respiratory problems may surface in the future as many buildings have not properly addressed the mold problem.

### Pets

Although most residents who evacuated prior to the storm made plans to take their pets with them, residents who stayed in place did not account for them when evacuating during the storm. Some pets were found wandering the neighborhoods after the storm, some died, and others remained missing.

### Belongings

Many residents found themselves with a tremendous amount of personal effects lost after the floodwaters receded. Such items included home furnishings, appliances, clothing, vehicles, and most importantly to some, objects of sentimental value that could not be replaced. Some residents were able to turn to family and friends for support, while others had to rely on aid agencies such as the Red Cross to provide supplies necessary to meet their daily living needs.

### Sense of Security

Several communities noted that they did not feel safe after the storm. This was attributable primarily to looting and power outages that impacted overhead street lights.

## CHALLENGES IN THE RECOVERY PROCESS

The following challenges were prevalent throughout each of the neighborhoods surveyed:

### INSURANCE

Insurance in the residential context can be separated into two groups: renter's insurance and insurance for building owners, which includes homeowner's insurance, flood insurance, and landlord insurance. One source of stress that was frequently cited was the conflict between what was covered in flood insurance vs. homeowner's insurance.

#### Homeowner's Insurance

Home insurance policies vary, but typically they may include coverage for damage caused by a hurricane or strong winds, but not damage caused by flooding. Flood insurance is usually acquired separately through the National Flood Insurance Program (NFIP). Some survey participants expressed difficulty in receiving payments from their home insurance policy because insurance companies have argued that the damage incurred was caused by the flooding, not from the hurricane. Likewise, NFIP policies may not cover the totality of damage to a home, only damaged caused by flooding. This resulted in homeowners being denied coverage by one or more of their policies, thus receiving less funding than was needed to effectively recover.

#### Flood Insurance

For those we spoke with that had flood insurance, the biggest issues were set in policy clauses that limited coverage of basements and spaces below ground level, since by code these spaces were not intended to be inhabited. Of those with basements, many had fully-furnished spaces, and none of the damage to drywall, carpet, or furnishings, among other things, would be covered by their flood insurance policy (Floodsmart). Thus, the cost of repairs and replacements would have to come out of pocket.

#### Obtaining and Maintaining Flood Insurance

Currently, anyone seeking a mortgage loan for a property located in a Special Flood Hazard Area (SFHA) is required to purchase flood insurance (Malliotakis). Thus, new Coney Island homeowners or those who recently re-financed their homes were likely to have flood insurance coverage. However, some deed-holders expressed discontent in a lack of information regarding flood-insurance requirements. They found that if they

did not need mortgage loans (for example, if the property was inherited) it was possible to let the insurance lapse.

Several residents cited the inadequacy of flood insurance and the frustrations they were experiencing with their policies. Among the difficulties encountered were that they “didn’t cover [certain] damage to basements and possessions,” that they did not cover storage areas, and that there was little or no communication about the claims process.

## **ACCESS TO INFORMATION**

Many of the affected homeowners had limited access to clear, reliable information after the storm, especially as it pertained to guidance for hiring contractors for repairs and demolition. The lag in reestablishment of communication services, such as cell phone service, landlines, and the internet further delayed access to necessary information.

Professionals who have useful information for residents’ repair or rebuilding efforts are reluctant to pass it on due to liability risks such as those posed by the lack of Good Samaritan statutes. This has deterred efforts for a better means of information sharing.

## **RECONSTRUCTION**

### **Inability To Start Repairs**

In many cases, owners have had to wait for inspections before proceeding with demolition and repair work. This was the case with a homeowner who was hesitant to remove damages until authorities, such as Department of Buildings, could come to assess it. This led to delays in recovery and the worsening effects of water damage on the home.

### **Rebuilding to Pre-Storm Conditions**

Many of the homes damaged by Sandy were considered legally non-compliant prior to the hurricane, as there were upgrades to building codes and zoning ordinances after the construction of the homes. Despite these upgrades and the susceptibility to future events, there are several means in place by which residents are able to or are encouraged to rebuild their homes to pre-storm conditions.

Entities such as the Rapid Repair Program were on hand after Hurricane Sandy to provide Coney Island residents with emergency services to return heat, hot water, electricity and gas to their homes quickly. The goal of this approach was to

return people to their homes and enable them to complete other necessary repair work on their own. Although this approach is admirable, lessons learned from the storm were not always incorporated into the repair strategy. For example, in some cases, damaged equipment, such as boilers, were replaced with new equipment in the exact same, flood-prone location.

In addition, if the cost of repairs is below a certain percentage of the value of the home, homeowners are not required to make upgrades in compliance with new codes. While this provision might be the most expeditious method for returning residents to their homes, it is not cognizant of long-term resiliency. This leaves the home vulnerable to increasingly severe damage patterns and the possibility that it will need to be rebuilt again after future events. Ultimately, this can negatively affect insurance premiums in the long run.

### **The Cost of Repairs**

The cost of repairs, due to the level of damage experienced, was across the board higher than residents and owners were prepared to or able to spend. Even with short-term financial support provided by friends, family members, or agencies such as FEMA, tenants, landlords, and homeowners have encountered financial hardship.

In some cases, the cost of repairs and inability to access assistance has caused delays in recovery. Particularly hard hit were building owners and landlords that lost their tenants as a result of the damage inflicted to their buildings and their inability to make immediate repairs. In these cases where tenants had to move out, the building owners lost a portion or all of their income, making repairs even more difficult to finance.

One of the consistently largest expenses encountered among the homeowners visited was the replacement of essential heating and electrical equipment. These included basement boilers and electric panels rendered dysfunctional by the flooding.

### **DECISION TO STAY IN PLACE OR RELOCATE**

Each homeowner and renter that was significantly impacted by Sandy faced the decision of whether they should stay in place or relocate. For some, this decision came easier than others.



# GENERATING IDEAS FOR RECOVERY

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During their time in the field, volunteers spoke with residents about their ideas for recovery in their communities. These ideas are documented in each chapter and cover a range of topics from engineering and natural approaches to storm surge mitigation, to how to retrofit buildings resiliently, to how to help local business owners reopen and generate income, among many others. Architecture for Humanity volunteers have added to residents ideas based on their observations in the field and generated thoughts on how local organizations could direct their resources where residents need them the most. The following ideas are broad approaches that are applicable to the majority of the surveyed communities:

## COMMUNITY DESIGN CENTER

A Community Design Center can serve as a central location where residents affected by the storm can meet with design and building professionals willing to donate their services in order to seek guidance on the repairs and reconstruction efforts necessary for their homes. This can provide:

- A place to share official information and guidelines for how to best perform repair and demolition work
- Information on code requirements and procedures required by the Department of Buildings
- Resources for resilient and sustainable reconstruction practices
- Advocacy for long-term thinking in community and individual reconstruction

Through establishing a presence in a community-centric space

in partnership with a respected local organization, the CDC can become an essential resource for the neighborhood.

## BUILDING RETROFITS

Existing homes can be retrofitted from two main standpoints: spatial organization and modifications to vulnerable components of the building envelope.

In order to reduce property damage, less investment must take place on the basement level and the first floor. Homes that heavily utilize these levels could benefit from space planning in order to understand and delineate appropriate uses and treatments of these two floors. As this reorganization can impact everyday life as well as systems in the home, a guideline document could highlight suggested changes and provide designed solutions for alternative spatial arrangements, with cost comparisons for each solution.

Another document could provide guidance on encouraged modifications to vulnerable building envelopes. For example, a strategy could be devised to address the major points of infiltration, such as the windows and vents at grade and the stairwells that lead to basements. In addition, suggestions could be made for upgrades to exterior cladding and roofing materials that will prevent future damage and loss in high wind, flooding, and surge conditions.

## NEW CONSTRUCTION

For homes that have to be built from the ground up, housing typologies should adapt to the latest code regulations and additional resiliency measures that exceed code expectations. This may include the following adaptations, among many others, as appropriate:

- The elevation of homes to design flood elevations (DFEs)
- The elimination of below grade spaces
- The use of building materials suitable to a coastal environment, installed for high wind and flood-prone conditions
- The relocation of critical equipment to upper levels
- The incorporation of sewer backflow valves
- The use of rain screen exterior wall assemblies
- The incorporation of protection for windows and doors, such as hurricane shutters and impact resistant glazing
- The secure fastening of all equipment and fuel tanks.

Solutions for upgrades to existing buildings and for new construction should be developed in close collaboration with

homeowners and other stakeholders.

### **SOFT INFRASTRUCTURE**

The existing combined sewer overflow system is overwhelmed during heavy rainfall and especially during storm surge. The community could explore several small and large scale solutions to alleviate the load on existing infrastructure during normal conditions and better handle water during flood conditions. Such solutions may include:

- Building wetlands, swales and/or other natural retention zones along the coastline in order to absorb rising water before it reaches the street and adjacent homes. Wetland conditions could be designed as a separate infrastructural network
- Building small scale bio-retention zones surrounding one's property or home in order to absorb water before it reaches the building
- Building retention tanks where water can be directed during a storm surge
- The use of bio-remediation strategies to remove contaminants from storm water

### **BUILDING AND CONSTRUCTION WASTE PLANNING**

Options for a network that recycles waste materials after a future event or alternative uses for debris could be explored.

### **COMMUNICATION PLATFORM**

A system for clear communication during and after a storm that does not rely on the grid could be designed and developed. This should include both a digital platform, such as a website, and a physical space within the neighborhood. For example, physical information sharing could be paired with existing public infrastructure such as bus shelters or community centers.

### **TOTAL COST OF REPAIRS**

One of the complaints that ensued from the homeowners was the disjointed nature of the estimates they received from the various authorities such as FEMA, ConEd, DoB, and insurance providers. Each took into consideration costs that were applicable to their domain of work, leaving it to the owner to make ends meet for the remainder. Having a team of experts come in and comprehensively evaluate the cost of repairs would allow homeowners to prioritize their projects more easily. Some

homeowners argue this might allow for fairer allocation of

money towards repairs of longer-term issues.

### **COMMUNITY CAPACITY BUILDING**

As a way to further strengthen communities after natural disasters, community capacity building can occur at multiple levels.

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# BUILDING TYPOLOGIES



# HOUSING IN NEW YORK CITY'S COASTAL COMMUNITIES

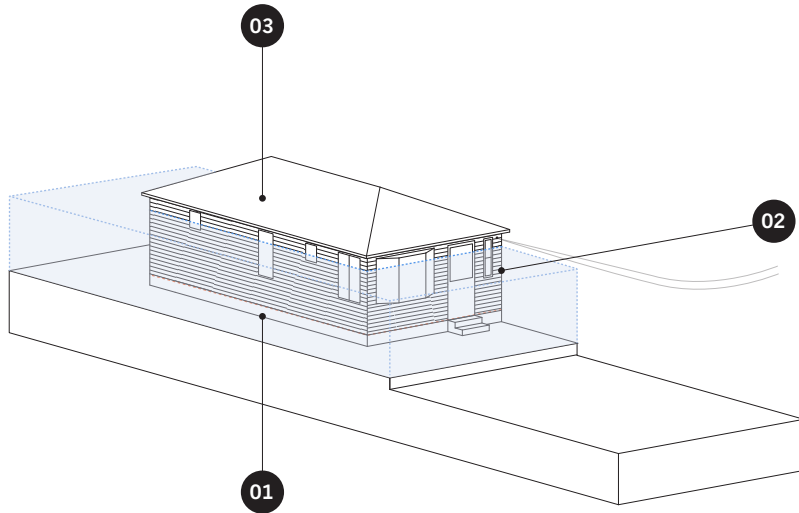
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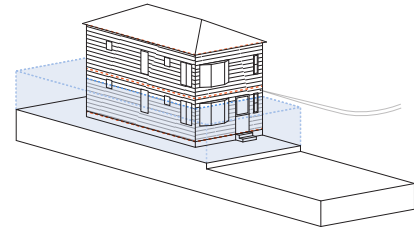
Due to their development across a number of time periods, New York City's coastal communities have a diverse building inventory, ranging anywhere from attached and detached single family homes, to attached multi-family housing of lower density, to high rises and other high-density multi-family configurations. In some cases, development corporations have developed significant areas of a community, leaving a repetition of building types of the same construction. In other cases, a wide range of types exist in one area, spanning a number of development periods and types of construction.

Each of the building types possesses a unique set of vulnerabilities in their current configuration that will need to be addressed during reconstruction. Following, in this chapter, are diagrams illustrating the housing types and vulnerabilities that our teams observed within the field.

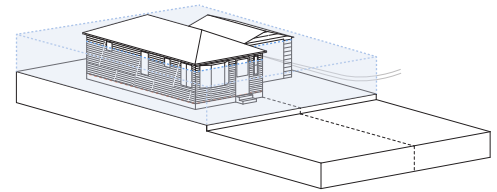
# THE BUNGALOW



## TWO STOREY VARIATION



## VARIATION WITH DETACHED GARAGE



### FOUNDATION 01

Most of the bungalows rest on a CMU foundation and are not strongly tied down. Many homes were either shifted off the foundation or the foundation developed cracks.

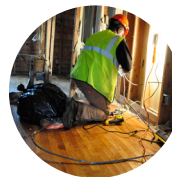


### 03 ROOF

Shingles were torn off by wind and, in many cases, structural damage caused the roof to develop holes or leaks. Overhangs were damaged by trees and debris, and many homes need to be re-roofed.

### BUILDING ENVELOPE 02

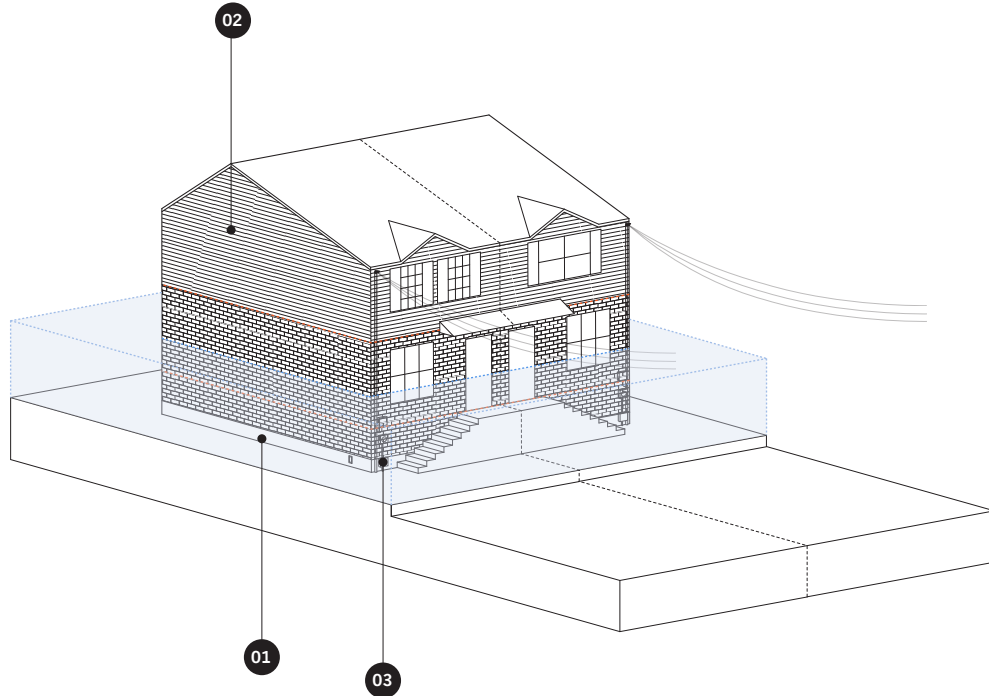
Siding (often vinyl) was torn off by high winds and windows were broken. In many cases, cracks developed in the structure, especially at corners.



### 04 INTERIOR

Many homes were completely flooded and need to be gutted and renovated. Electrical and mechanical systems and appliances were also damaged, and will have to be replaced. In cases where the structure shifted, cracks developed in the floor.

# NEW CONSTRUCTION ATTACHED SINGLE FAMILY



## FOUNDATION 01

These homes were typically built on raised concrete foundations with the first floor an estimated 4 feet above grade. In lieu of basements, there are crawl spaces below these homes, with vents to the exterior.



## 03 BUILDING SERVICES

The majority of these homes had mechanical and electrical equipment on the first floor and at the exterior above grade, and thus sustained damage to this equipment. A few homes had this equipment on the second floor, saving residents replacement costs.

## BUILDING ENVELOPE 02

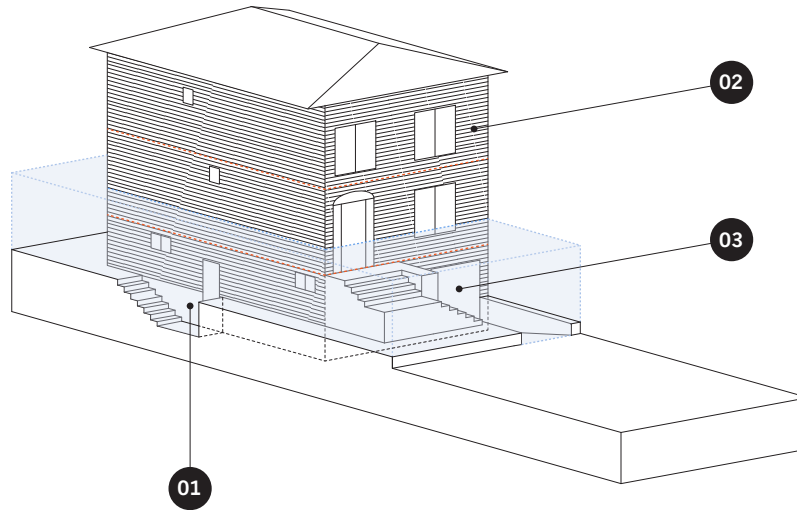
Many of these homes are clad in brick on the lower level and vinyl siding on the upper level. The upper levels were more vulnerable to wind damage and in many cases siding was pulled off by strong winds.



## 04 INTERIOR

Most homes had 1 to 3 feet of water on the first floor. Interiors had to be gutted, appliances thrown out, and, in some cases, floors and base heaters had to be removed and replaced due to warping.

# NEW CONSTRUCTION DETACHED SINGLE FAMILY



## FOUNDATIONS + BASEMENTS

01

These homes were strongly tied to their poured concrete foundations and, except when exposed directly to storm surge, did not suffer structural damage. Many of these homes have basements, however, which were completely inundated.



03

## GARAGES

Many of these homes have garages that are situated partially below grade. In these cases, driveways funneled water into the garage and these spaces had to be gutted accordingly.

## STRUCTURE + BUILDING ENVELOPE

02

The homes that were hit directly by wave impact suffered varying types of structural damage. Overall, this building type tended to suffer minor damage to the building envelope, which was typically limited to vinyl siding being blown off or, when non-mold resistant siding was used, it had to be replaced in parts.



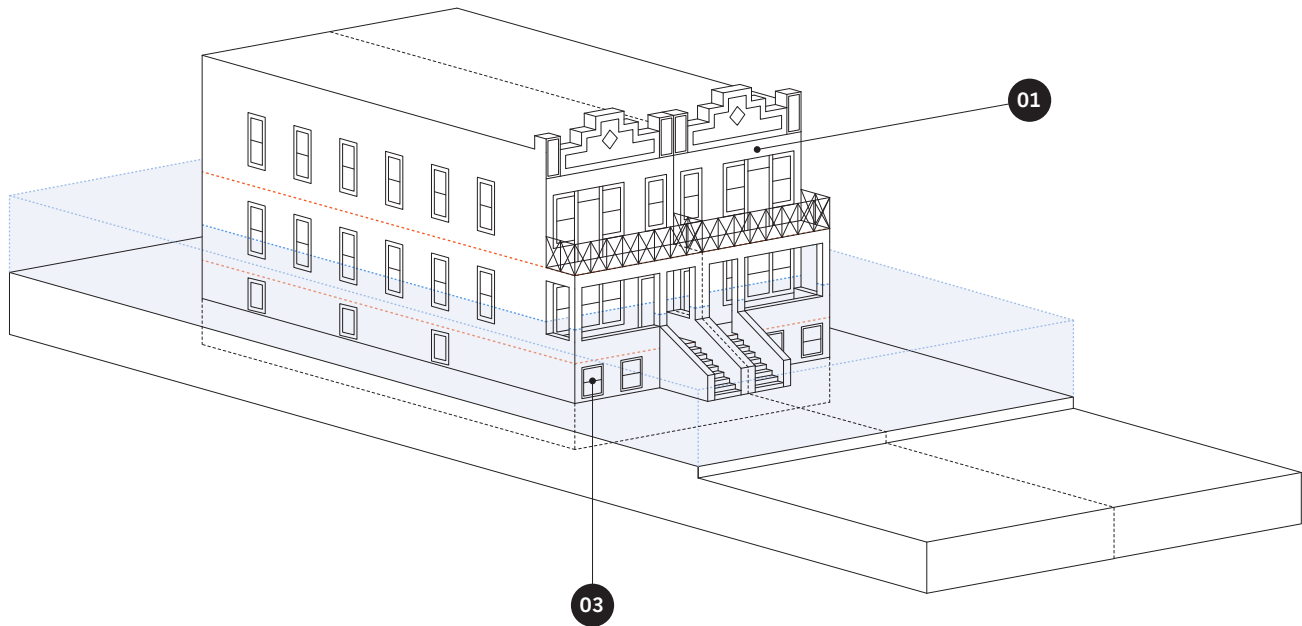
04

## INTERIOR

Many of these homes suffered typical flood damage from Sandy, with degree of damage depending on whether the home had been elevated or if it had below grade spaces. Interiors had to be gutted and dried out to remediate for mold.



# ATTACHED PRE-WAR MULTI-FAMILY



## BUILDING ENVELOPE

Pre-war homes are typically clad in brick and were secure against wind damage. Basement windows and vents at the sidewalk level and exterior stairs to the basement allowed for the infiltration of floodwater below grade.



## INTERIOR

These homes experienced typical flood damage, with water inundating the basement and first floors. In addition to having to gut interiors, residents also lost their appliances due to floodwater damage.

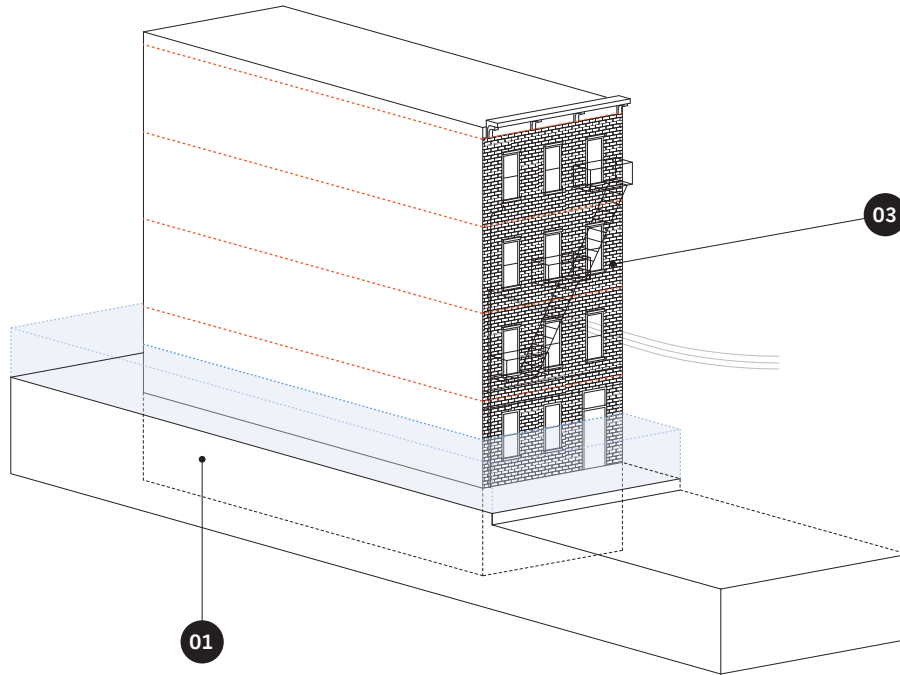


## BASEMENTS

These homes, built before World War II, are typically 2 to 3 stories in height, with a basement level below grade. These basements were being occupied at the time of Sandy and were completely inundated.

The majority of these homes had the mechanical and electrical systems in the basement, and these systems need to be repaired.

# ATTACHED MULTI-FAMILY APARTMENT BUILDING



## 01 BASEMENTS AND BUILDING SERVICES

Depending on their age, these buildings range from 2 to 4 stories in height. The majority have basements, which completely flooded during Sandy. Although there are cases where these spaces are occupied by tenants, the majority are service spaces.

Mechanical and electrical equipment for these buildings is typically located in the basement. These systems were damaged during the flooding and need to be replaced. In some cases, fuel was also stored in basements, causing spills and contamination issues. In addition, many of these buildings have sump pumps in the basement. When the floodwater overwhelmed the system, many of the pumps reversed and brought water in.



## 02 STRUCTURE AND BUILDING ENVELOPE

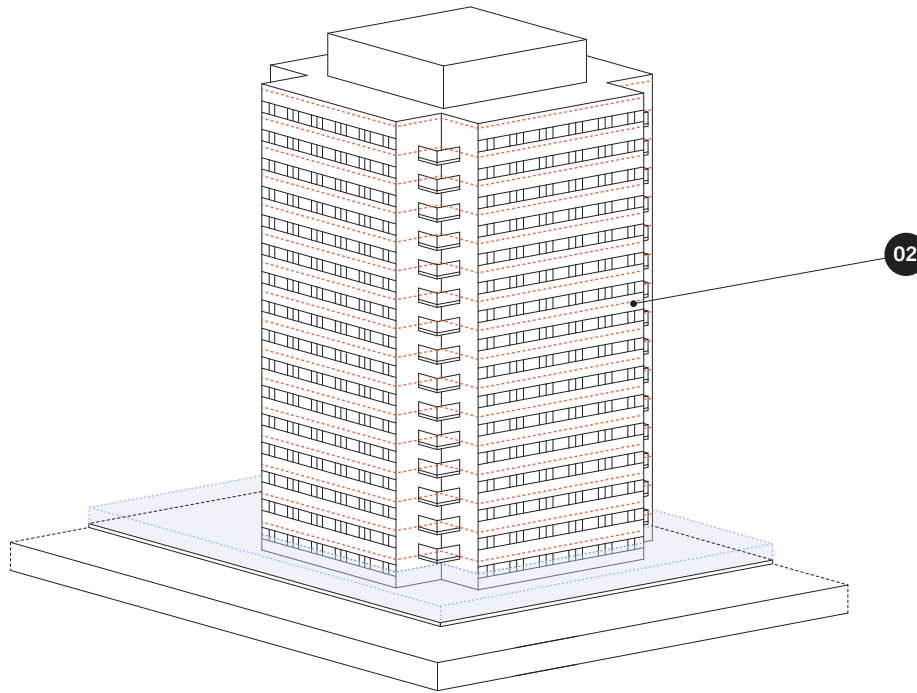
Buildings built in the early 1900s were constructed of light wood framing, typically with wood siding. Newer buildings are of non-combustible construction, with brick cladding. The majority did not suffer structural damage or significant damage to the building envelope.



## 03 INTERIOR

These buildings either have residential or commercial storefront space on the ground floor. Flooding on the ground floor necessitated that interiors be gutted and dried out. In several cases, this was not done due to low landlord involvement or inability to fund repairs.

# HIGH RISE APARTMENT BUILDING



## 01 BASEMENTS AND BUILDING SERVICES

Much of a high rise's building services are located in the basement, such as boilers and fuel supply. When floodwater inundated these buildings, these systems were damaged. This included damage to electrical systems and elevators. After Sandy, many of these buildings had installed temporary systems for service.



## 02 BUILDING ENVELOPE

As many of these buildings are of robust construction with brick cladding, they did not suffer significant damage to the building envelope. Some buildings cited wind damage to awnings and flashing.



## 03 INTERIOR

These buildings suffered interior damage only within the first floor and basements. This included damage to shared spaces such as lobbies and corridors, and required the gutting of affected building materials.





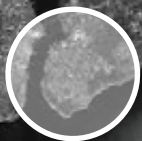
02

**STATEN  
ISLAND**



An aerial photograph of a coastal town, likely Tottenville, showing a large bay or harbor area with several smaller inlets and a prominent bridge crossing a narrow channel. The surrounding land is densely packed with buildings and infrastructure. The image is in grayscale.

# TOTTENVILLE





Hylan Boulevard

Massachusetts Street

Sprague Avenue

Billop Avenue

Surf Avenue



# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION AND AREA SURVEYED

Tottenville is the southernmost neighborhood within Staten Island and New York State. It is bounded on three sides by water, with parkland adjoining it to the northeast. It is connected to neighboring communities via Hylan Boulevard, Amboy Road, and Arthur Kill Road.

The field team focused its efforts within the hardest hit area of Tottenville, in the primarily residential southern portion of the neighborhood. The area surveyed is bounded by Hylan Boulevard to the north, Sprague Avenue to the east, Surf Avenue to the south and Massachusetts Street to the west.

## HISTORY

### EARLY DEVELOPMENT

The original inhabitants of the area now known as Tottenville were members of the Raritan tribe of the Lenape Nation, who formed a string of communities along the western shores of Staten Island. European settlers began to arrive on Staten Island as early as 1624. In 1630, the Dutch colonized the northern shore, and by 1661, the island fell under British control. Within a decade, the Native American population had permanently relocated.

Christopher Billopp was one of the first British immigrants to southern Staten Island. As a Captain of the Royal Navy, he was granted approximately 1,600 acres of land between 1676 and 1687, which encompassed the area that eventually became Tottenville. He named this estate “Bentley Manor” after his ship

the “Bentley”, building a two-storey stone house (still standing today) and converting the land to a wheat farm. This conversion to farmland was common across much of southern Staten Island at this time, as the sandy soils of the region were suitable for fruit, grains, potatoes, and other vegetables. Plots ranging in size from 1-5 acre parcels to over 20 acres dotted Tottenville’s mid-19th century landscape and homes were built in the Federal and Victorian styles.

After the American Revolution, Billopp’s descendants lost their property due to their Loyalist connections and the estate was divided into smaller farms and sold. After much debate over the course of 50 years, the community was named after another influential family and the area’s first postmaster, John Totten.

### EARLY INDUSTRY

The end of the 1800s brought about a time of significant growth for the area and the lands in Tottenville were further segmented and developed, leaving very few farms. During this early history, the town had developed a rich maritime industry, capitalizing on its position as a waypoint for travelers between Philadelphia and New York City (which Staten Island was not a part of until 1898). Contributing to the development of this industry was the construction of Tottenville’s 8 shipyards, used for boat building and repair, and the early 19th century demand for the oysters that could be harvested in the adjacent waters.

Oysters, harvested locally in the area, were a staple of the regional diet at the time and known worldwide for their quality, however demand led to the exhaustion of the native population in 1820. Not to be defeated, oystermen responded to this by repopulating the oyster beds, including species imported from other areas. The industry thrived once again, helping Tottenville to further establish itself as a maritime community.

### THE INDUSTRIAL REVOLUTION AND 20TH CENTURY CHANGE

By 1890, industrial pollutants and sewage caused the oyster industry to decline and, in 1916, the New York Department of Health declared oystering in Staten Island waters unsafe, putting an end to the trade. At the same time, the introduction of steel hulls to ships effectively ended Tottenville’s wooden shipbuilding. The decline of these early industries was partially offset by the introduction of a new era of industry. In 1898, the Atlantic Terra Cotta Works opened, becoming the world’s largest producer of architectural terra cotta and one of the largest employers on Staten Island. Its products were used in a number of famous

New York skyscrapers, including the Flatiron and Woolworth buildings. Tottenville Copper Company was established in 1900, later used as a smelting and refining company and then as a metal recycling plant.

This economic development, as well as the expansion of transportation to the area, encouraged an influx of travelers from Manhattan and New Jersey, arriving both on foot and by vehicle. In order to accommodate a new tourism industry, several hotels were constructed on Main Street and a number of amusement areas were built, including Raritan Bay Park, which began as a tent colony and was later developed into a resort with summer bungalows, a hotel, and waterfront entertainment. These resorts flourished until the First World War, after which many of the summer bungalows were converted into permanent residences and sold.

In addition to these transformations, there were other changes which affected the development of the area and the way people lived in Tottenville. These included: the Outerbridge Crossing opening in 1928; the end of ferry service between Tottenville and Perth Amboy, New Jersey (a major commuter point from Philadelphia) in 1963; and the Staten Island Mall opening in 1973. These three events contributed to the closure of many local “Mom and Pop” business and the decline of Main Street.

## TOTTENVILLE BEFORE SANDY

Tottenville’s transformation to the residential community it is today began in the 1980s, when workers in Manhattan and New Jersey began to purchase some of the area’s older properties, restoring them as private homes or redeveloping their land for housing. New condominium developments were also added and property values continued to increase significantly over time.

## DEMOGRAPHICS

**Population:** 14,096

**Land Area:** 2.03 square miles

**Density:** 6,944 people/square mile

**Median Age:** 38 years

**Median Household Income:** \$87,121

**Percentage Below Poverty Line:** 2%

**Housing Tenure:** 82% owner-occupied, 18% renter-occupied

**Median Unit Value:** \$600,500

**Cultural Background:** 87% Caucasian, 9% Hispanic, 2% Asian, and 2% African American

# DAMAGE PATTERNS

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## INUNDATION

The level of water rise varied throughout the neighborhood, with residents citing a range from 1 to 9 feet.

## THE COASTAL LANDSCAPE

### BATHYMETRY

One factor noted by residents as a potential contributor to the severity of the storm's impact is the dredging of Raritan Bay and the Arthur Kill tidal strait for shipping lanes. These deeper reservoirs of water near the shoreline are believed by some residents to have intensified the storm surge during Hurricane Sandy.

### PARKLAND

Extensive parkland borders the community to the southwest and served as a buffer to the storm surge. However, the use of heavy wooden fencing by the NYC Parks Department along the residential edge of the parkland was one contributing source of damage to homes. Residents stated that fencing elements were dislodged and acted as battering rams, pummeling nearby homes during the storm and, in some cases, penetrating buildings.

### COASTAL EROSION

Residents noted that coastal erosion occurs along the beach in Tottenville, reducing the distance between the coast line and the development within the community. This may have further exacerbated the effects of the storm.

## HOUSING

The majority of the housing in the affected areas of Tottenville is comprised of single family homes built using light wood frame construction. They range in size from one storey bungalows to modest two storey homes to large three storey homes with a garage occupying the first floor.

Homes in the blocks south of Billop Avenue, closest to Raritan Bay, saw the most extreme damage. Within this area, the shorefront block of Yetman Avenue was especially hard hit. Here, only the foundations remained for a few of the homes and others suffered extensive structural damage, with entire walls missing in some instances. It was noted by residents that the water within the shorefront blocks rose to the top of the first floor windows, requiring first floors and basements, if present, to be gutted, properly dried, and reconstructed. Some basements were situated below the water table and residents mentioned that flooding was common. Several of the homes with flooded basements were in the process of clearing them out during the team's visit. A resident also said the area has inadequate septic systems, which frequently back up.

In addition, damage caused by the parkland fence posts needed to be addressed, as well as damage to windows, exterior siding, decking/banisters, and roofing. At the time of the team's visit, some holes had been temporarily patched with plywood and, in other cases, exterior walls had been reconstructed and new tyvek wrap was visible.

North of Billop Avenue, at higher elevations, the homes generally saw less damage, with basement and first floor flooding being the primary concern. Power had not been completely restored, and at least one resident was running a generator, which required 5 gallons of gas per day.

Generally only minor home damage, if any, was noticed upslope, north of Clermont Avenue.

# CHALLENGES AFTER SANDY

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## AGENCY RESPONSE

Several residents expressed frustration with the delayed response of independent and governmental agencies, noting that the Police arrived on the Wednesday after the storm and the National Guard and the American Red Cross arrived on Thursday or Friday, “when the real urgency [was in] the first 24 hours.” This time lapse of three to five days left residents to rely solely on family, friends, and neighbors for immediate assistance. Fortunately, interpersonal support networks were strong in Tottenville and were an important asset during this initial response period.

Although residents felt that there was a lack of initial agency support, they noted that certain city departments, such as the Sanitation Department and Fire Department, were effective in the storm’s aftermath and their presence in Tottenville was appreciated. In addition, FEMA provided assistance to residents that needed temporary shelter, local elected officials (Congressmen and Assemblymen) came to the neighborhood to help every day, and there was strong volunteer support from across the city and nation. These services were reflected positively.

Despite a delayed arrival, the American Red Cross mounted an operation in the neighborhood and was observed distributing warm meals during the team’s visit. Unfortunately, some residents felt that this service was not needed by the point at which it was made available. One resident in particular felt strongly about the misalignment of resources, asking “Why don’t non-profits translate money and donations beyond food and water?”

Overall, the neighborhood was touched by everyone helping each other and was very welcoming and amenable to outreach.

## SHORT-TERM NEEDS

Residents cited that volunteer assistance was needed for park clean up, clearing debris, and removing fallen trees. In addition, several homeowners needed volunteer or professional assistance with roof repairs and drywall work.

## RESIDENTS IN POOR HEALTH

Residents that were in poor health prior to the storm were especially affected, as their conditions were, in some cases, further exacerbated by the wet and cold.

## ASSESSMENTS AND DESIGNATIONS

Residents noted that several agencies had performed or were performing assessments on site, including FEMA, the NYC Department of Buildings (DoB), and representatives from residents’ insurance companies. Overall, it was clear during the team’s field visit that there was frustration with an overall lack of information and the inability of residents to “get a straight answer” from these and other organizations regarding their property status.

The Department of Buildings designations in particular were a source of confusion. One homeowner that the field team spoke with, whose home was adjacent to the beach, suffered extensive structural damage and was tagged with a red “unsafe” sticker. His intention was to design and rebuild a new home that would be better adapted to the coastal environment. However, there was inadequate information available about the fate of red-tagged homes, with rumors circulating throughout the community that they would be promptly demolished by the City. This left homeowners unsure of how to address such designations and slowed the trajectory of their recovery process.

# COMMUNITY CAPACITY

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## COMMUNITY SUPPORT

Residents cited community cohesion and support as a vital factor in the initial response. Many homes uphill from the shoreline were largely spared from the impact of the storm, which allowed neighbors in these areas to more easily help those with damage and losses.

A home at the southwest corner of Billop and Yetman Avenues was being used as a depot for relief supplies, food, and general information, with tables and a tent erected outside for community outreach and materials distribution.

One resident summed up the overall spirit in the neighborhood at the time of survey, stating that Tottenville is “a great community to live and work in. People here have a sense of community. We all rallied together when the storm hit.”

## EMOTIONAL RESPONSE

At the time of the field team’s visit, residents indicated that they were experiencing a wide range of emotions, including:

- “I feel connected to my community.”
- “I feel positive about the future.”
- “I feel disoriented.”
- “I feel angry.”
- “I feel emotionally drained.”
- “I feel anxious about the future.”

## COLLECTIVE CONSCIOUSNESS

At the time of the team’s visit, the majority of the neighborhood planned to stay and engage in rebuilding. Several residents questioned whether this area should have historically been developed for homes and this attitude served to add to the community’s consciousness about how they would rebuild. Overall, the community was very cognizant of the importance of rebuilding in a more sustainable and resilient manner, and offered several suggestions for how to approach this (see page 38).

## INCOME DISPARITY

Income disparity played a central role in the speed at which residents were able to recover. Some homeowners were able to mount a more robust renovation effort than their neighbors and several private contractors were seen working in parts of the neighborhood during the team’s field visit.





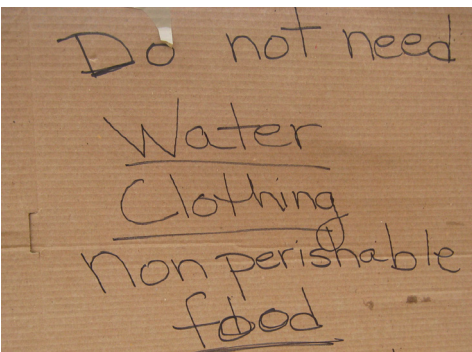
**UNSAFE**  
DO NOT ENTER











# IDEAS FOR RECOVERY

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## PLANNING CONSIDERATIONS

Residents cited inadequate planning considerations in place for coastal communities and felt strongly that the building code for these areas needed to be revised to require more robust construction and better protected equipment. A number of recommendations were provided for the repair and reconstruction of homes, as well as interventions along the coastline, such as:

- Electrical and mechanical equipment should be elevated above flood elevations.
- Robust foundations, such as pilings, should be mandated.
- Bungalow construction should no longer be utilized, as the bungalows were the hardest hit.
- The parklands should be expanded to provide a larger, natural buffer.
- Or, a sea wall should be constructed along the coastline for additional protection.
- A community center that can serve as a hub for recovery should be developed.

In addition to the above, at least one resident was interested in architectural help to make his future home more sustainable and utilize elements of “green building,” such as photovoltaics as an alternate energy source.

## IMPROVED OFFICIAL INFORMATION SHARING

Based on their experiences speaking with residents, field team members felt that a more reliable, official information sharing platform would benefit the community, which seemed to rely largely on word-of-mouth news on the status

of their homes. Overall, it was apparent that many residents want to rebuild, but do not know if or when they can and need answers.

## EXPEDITING APPROVALS

Residents were weary of a long process in regards to acquiring necessary approvals to make repairs and rebuild, and felt that these approvals should be expedited at the Department of Buildings and other relevant agencies in order to facilitate a smooth recovery process.

An aerial, grayscale map of a coastal area. A large, dark, winding waterway, likely a river or canal, runs vertically through the center. To the right, there are several large, irregularly shaped land parcels, some of which appear to be industrial or commercial sites. In the lower-left quadrant, a white circle highlights a specific area on the shoreline. The text 'NEW DORP BEACH' is overlaid in large, white, bold, sans-serif capital letters across the middle of the image.

# NEW DORP BEACH



Mill Road

Roberts Drive

Ebbitts Street

Cedar Grove Avenue

New Dorp Lane

# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION AND AREA SURVEYED

New Dorp Beach is located on the east coast of Staten Island, to the southwest of neighboring Midland Beach. It is roughly bounded by Miller Field to the northeast, the Lower Bay to the southeast, Ebbitts Street to the southwest and Hylan Boulevard to the northwest.

The field team visited the community over a period of weekends in December 2012. During their time in the field, the team canvassed the entirety of the neighborhood.

## HISTORY

One of the first areas in Staten Island to be permanently settled by Europeans, the name New Dorp comes from the Dutch 'Nieuwe Dorp', meaning 'new town'. Dating back to 1671, the town was established following the destruction of Oude Dorp in the Native American-Colonist 'Peach War' of 1655.

### EARLY HISTORY

During the early Dutch inhabitation of Staaten Eylandt (Staten Island), the area to the northeast of present day New Dorp was one of the first areas to be permanently settled, established as Oude Dorp (Old Village). In 1671, when the English took over the New Netherland colony, they expanded the grid of Oude Dorp southwards along the coast, establishing a settlement named Nieuwe Dorp (new village), later anglicized to New Dorp.

In 1776, 40,000 British soldiers set up headquarters here, and under the command of General Howe, went to war against the Americans led by George Washington. The Battle of Long Island

was a major victory for the British, who remained in New Dorp for the duration of the Revolutionary War.

### INFLUENTIAL RESIDENTS

One of the most influential residents to come from New Dorp was "Railroad King" and leading businessman Cornelius Vanderbilt (1794 – 1877) who began his career in transportation at the age of 16, soon surpassing his humble roots and establishing one of the wealthiest families in America. Common to many in New Dorp at that time, Vanderbilt's ancestors had arrived from the Netherlands around 1650 to settle and farm in the area. Miller Field, at the northern edge of the neighborhood today, marks the location of the family's former farmlands.

### DEVELOPMENT AND CHANGE

It wasn't until the late 1880s, when New York City residents began to flock to the beaches for leisure, that the New Dorp blossomed from a rural landscape into a vacation resort, with bungalows and campgrounds spawning along closely gridded streets. Piers were constructed on the waterfront and hotels developed. The area teemed with visitors who frequented attractions such as the bowling alleys, boxing rings, and fishing and boating facilities.

Development continued through to the middle of the twentieth century, and included the construction of Cedar Grove Beach Club's beach-front bungalows, designed to replace the previously established campgrounds. In 1962, many of the structures south of Cedar Grove Avenue were demolished to facilitate the vision of Robert Moses, New York City's Park Commissioner, to create parkways throughout the city. His plan to build a shoreline drive was later abandoned, leaving behind an area of deteriorating woodland adjacent to the bay. By this time, New Dorp Beach's attraction as a vacation destination had declined.

## NEW DORP BEFORE SANDY

Today New Dorp Beach is predominantly residential, with primarily single family homes and a concentrated business district. By 2006 the neighborhood was one of the fastest growing on Staten Island, residential expansion having taken place steadily since the 1964 opening of the Verrazano-Narrows Bridge. Despite the population increase, the waterfront deteriorated and the beaches began accumulating litter and debris. Faring slightly better is the beach in front of the former Cedar Grove Beach Club, despite the residents having been

evicted at the end of 2010. These properties have since been boarded up and fenced off.

## DEMOGRAPHICS

**Population:** 21,896

**Median Age:** 40.5 years

**Median Household Income:**

**Percentage Below Poverty Line:**

**Housing Tenure:** 69% owner-occupied, 31% renter-occupied

**Cultural Background:** 78% Caucasian, 14% Hispanic, 5% Asian, and 3% Other

# DAMAGE PATTERNS

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## INUNDATION

New Dorp Beach was inundated from the southeast by the Lower Bay. As could be expected, homes closest to the water were hit the hardest, with approximately 8 to 15 feet of floodwaters. Floodwaters extended into the community for several blocks, but did not cover the entire neighborhood. Homes near Miller Field were also hard hit, as the field channeled water into the community.

Many residents stayed in New Dorp Beach during Hurricane Sandy and did not evacuate, as Hurricane Irene the year before and other historical storms had had such a minor impact. One resident who rode out a storm in 1992 stayed in place during Sandy because water had only ever reached his front door before. This time, the first floor of his home was inundated with 6 feet of water and he had to take both of his children and flee to the upper level of their home.

## HOUSING

Cedar Grove Avenue, the avenue closest to the beach, was hardest hit by far as it took the brunt of the storm surge. Like many other coastal neighborhoods hit by Sandy, the first row of buildings received the most severe damage and served to protect the structures behind them.

New Dorp Beach primarily consists of single family homes. The homes surveyed were predominantly comprised of bungalows, attached single family homes and detached single family homes.

At the time of survey, some homeowners whose home sustained significant damage but were not destroyed were considering



elevating their homes and at least one bungalow had been lifted onto a temporary foundation. A new CMU wall was being constructed at ground level, which the bungalow would be lowered onto.

## **BUNGALOWS**

Given its history as a summer vacation spot, much of New Dorp Beach's building inventory consists single storey bungalows. Many of these structures rested on raised CMU foundations and were shifted off of their foundation during Sandy. In some cases, these bungalows crashed into adjacent homes and exacerbated the damage to their neighbors. In other cases, the homes remained on their foundation, but either the foundation was damaged or the home itself sustained extensive damage, such as penetrations to exterior walls and significant roof damage. As a result of these various scenarios, many of the bungalows in the community will need to be demolished.

Many of the damaged bungalows that were not severely structurally damaged were being gutted to their studs at the time of survey and those with broken windows were boarded up or being replaced. Others had basements which, due to windows and vents at the exterior just above grade and external stairwells to the lower level, were flooded. In some cases, trees had fallen on homes. In others, exterior fencing was damaged.

## **ATTACHED SINGLE FAMILY HOMES**

Attached single-family homes were also prevalent in the neighborhood, with 2-3 blocks being comprised primarily of this housing type. Most of these residences occupied three storeys, with the first floor being used as a garage. In these buildings, the garage had to be gutted, but the other living spaces were left unharmed.

## **DETACHED SINGLE FAMILY HOMES**

The field team observed several detached single-family homes in the neighborhood that were impacted in similar ways to the attached single family homes.

## **BUILDING SERVICES**

At the time of the survey, many homes in the neighborhood had been scheduled for gas and electrical inspection. Con Edison workers were reconnecting residential branch lines to the new primary gas line so that homes could have access to gas service.

This process involved digging down to the submerged lines every 20 feet and inspecting for possible gas line problems.

## **MOLD**

Although many interiors had been gutted and dried out, the smell of mold still permeated the neighborhood at the time the field team surveyed the community in December 2012.

## **LOCAL BUSINESSES**

One person the field team interviewed leased his building for mixed use, with commercial space on the first floor and residences upstairs. He was concerned about his tenants returning and did not expect to collect rent until January at the earliest. As a landlord, he also wasn't eligible for FEMA assistance but was instead told to apply for small business loans.

## **PETS**

One resident noted that he had a pet boa constrictor and various other snakes that had disappeared during the storm. He had not located them at the time of survey.

# CHALLENGES AFTER SANDY

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## A LACK OF ATTENTION

Many residents in Staten Island's coastal communities, and New Dorp Beach in particular, felt that they were not receiving as much attention from the media and response organizations as other communities. This was a source of frustration throughout the recovery process and, in many cases, contributed to a sense of disenfranchisement.

## RAPID REPAIR PROGRAM

The Rapid Repair program received mixed reviews from the residents of New Dorp Beach. Some residents expressed a positive experience, noting that it did help them get back into their homes, while others expressed a more frustrating experience. Some residents waited for 4-5 weeks for assistance, others reported that the contractors appointed to them did minimal work, and others had significant trouble setting up appointments for repair. In several cases, residents who had had to temporarily relocate wrote their phone numbers on the front door so they could be contacted by representatives from the Rapid Repair program. At the time of survey, at least one resident was still waiting on the program to restore their electricity and heat.

## INSURANCE

One resident the field team spoke with wanted others to know that they need to understand the implications of whose name their house is in. In his case, his home was in his brother's name, so it was counted as a second home and he received less insurance and recovery assistance funding.

Another resident who had homeowner's insurance was told that their policy would only cover any portion of the house damaged above the water line. Unfortunately, all of the damage to their home was sustained below the water line, so only damage to the roof could be conceivably covered.

## UNFORTUNATELY TIMED RENOVATIONS

In several cases, residents had just completed full interior renovations before the storm and were forced to re-renoate again after Sandy. This exacerbated the financial strain on these residents.

## DECISION TO STAY OR RELOCATE

At the time of survey, many of the homes were vacant, as homeowners had had to relocate until they could reoccupy their homes. Among those present in the community that the field team interviewed, at least one homeowner had no intention of returning and hoped that their home will be bought out through Staten Island's Blue Belt program and other government buy-out programs. It became apparent that many homeowners shared this outlook, as some homes had "for sale" signs out front or homeowners in the community communicated that their neighbors were not planning to return. Numerous other residents were eager to stay and rebuild their homes, many noting that they hoped that the homes in the area will be rebuilt in a resilient manner.

# COMMUNITY CAPACITY

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## COMMUNITY SUPPORT

New Dorp Beach has a strong sense of community, with many residents having lived there for decades or their entire lives. After Sandy, residents banded together to help others clean and gut interiors. One homeowner noted that volunteers were also an important part of the recovery process in the community and mentioned that volunteers from a church group were helping to clear their home.



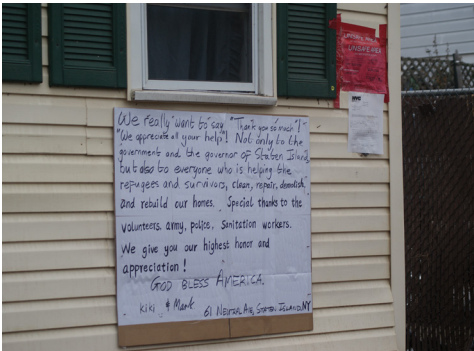












# IDEAS FOR RECOVERY

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## ACCESS TO MATERIALS AND RESOURCES

One homeowner stressed residents' need to have access to affordable building materials and resources throughout the reconstruction process.

## MITIGATING FUTURE STORM SURGE

### BUYOUTS THROUGH THE BLUE BELT PROGRAM

A number of homeowners hoped that their properties would be bought out, specifically through Staten Island's Blue Belt program. Some felt that this area was no longer appropriate for residential and commercial development and felt that the most resilient move would be to provide a natural buffer between the Lower Bay and inland communities.

### REPURPOSE THE FOOTBALL FIELD

During Sandy, a football field in Miller Field was destroyed and debris from the field was scattered throughout the neighborhood. One resident did not want the football field to be reconstructed and felt that it should be redeveloped as a wetland. By repurposing the field, future storm surge and inundation could potentially be mitigated in a more natural way and inundation into the neighborhood could be reduced.

### BUILD A SEA WALL

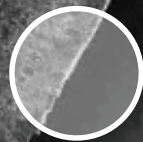
In contrast to recommendations to expand and restore natural buffers such as wetlands, one resident suggested that a sea wall be built along the coastline to prevent future storm surge from impacting the neighborhood.

## IMPROVED BUILDING CODES

One resident, whose home needed to be demolished after Hurricane Sandy, wished for one thing to improve resiliency in the neighborhood: building codes and zoning bylaws that are appropriate for flood-prone areas.

An aerial, grayscale map of a coastal region. The map shows a complex network of waterways, including a large central bay and several smaller creeks and rivers. The land is densely packed with buildings and structures, indicating a developed area. A white circle is drawn on the map, highlighting a specific location on the southern coast. The text 'MIDLAND BEACH' is overlaid in large, bold, white capital letters across the center of the map.

# MIDLAND BEACH





Moreland Street

Hunter Ave.

Midland Avenue

Graham Blvd.

Father Cappodanno Blvd.

# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION AND AREA SURVEYED

Midland Beach (formerly Woodland Beach) is located centrally on Staten Island's east coast. It is bounded by Bancroft Avenue to the southwest, Richmond Road to the northwest, Seaview Avenue to the northeast, and the Lower Bay to the southeast. Midland Beach was one of the borough's hardest hit communities during Hurricane Sandy, suffering several deaths and extensive damage.

The area surveyed was roughly bounded by Moreland Street to the northwest, Graham Avenue to the northeast, Father Cappodanno Boulevard to the southeast, and Midland Avenue to the southwest. This area appeared to suffer the most severe damage and overall trauma. The field team completed 15 surveys, along with extensive notes and mapping.

## HISTORY

### RESORT DEVELOPMENT

The coastal community of Midland Beach was originally part of the small Dutch settlement established in the mid-1600s, and remained largely unchanged until the end of the 1800s. In the late 19th century, however, Midland Beach, like several other coastal communities in New York City, was developed into a beach resort by investors who saw a potential for bustling beaches, filled with visitors escaping the summer heat of the city. These investors constructed piers, summer bungalows, hotels, bathing pavilions, theaters, and amusement rides, causing the beach-front neighborhood to grow in popularity and transform at a great pace. By 1896, tourists from New York and New Jersey were arriving by trolley or excursion boats.

In 1906, the Happyland Amusement Park opened. Its entertainments and shows, which included elaborate stage productions and vaudeville performances, attracted 30,000 visitors on opening day. It continued to draw a crowd throughout the 1910s and 20s with amusements such as the Japanese Tea Gardens, the Carnival of Venice, and a shooting gallery. However, fires, water pollution, and the Depression of the 1930s took their toll and visitors eventually faded away.

### NEIGHBORHOOD TRANSFORMATION

Subsequent to this period of deterioration, the beach-front property was vested to the City in 1935 and was renovated as part of President Roosevelt's Works Progress Administration. The empty music halls and amusements were demolished and a two and a half mile boardwalk was built in their place. The establishment of the boardwalk contributed to the area's revival and the transformation of the neighborhood from a tourist resort to a suburban community. Today, the Ocean Breeze Pier, the largest steel and concrete recreational pier built within the last 100 years, is a major feature of the area. Alongside this development, the summer bungalows were insulated for year-round use and new one-bedroom homes were constructed as far inland as Hylan Boulevard.

### A HISTORY OF FLOODING

Throughout the mid-20th century, Midland Beach drew in new residents looking for quiet, affordable real estate that was close to the water. This proximity to the water had its challenges – primarily flooding, which was worsened by the bowl-like topography of the neighborhood.

Throughout the 1950s, 60s, and 70s, heavy rain and thunder storms frequently brought water into the neighborhood. Since the housing was not designed with these conditions in mind, it did not fare well. In the late 1970s, in an attempt to relieve the area from flooding during heavy rains, the City built a storm sewer system on the west side of the neighborhood. However, this did not fully alleviate the problem and flooding still persists today.

## MIDLAND BEACH BEFORE SANDY

In addition to the established residents in Midland Beach, the community has also seen an influx of new residents since the year 2000, when many Russian immigrants moved to the area. The beach, the restoration of the Franklin Delano Roosevelt

boardwalk, and the addition of new restaurants has led to a renewal in the popularity of this area as a summer destination.

## DEMOGRAPHICS

**Population:** 21,896

**Median Age:** 40.5 years

**Housing Tenure:** 69% owner-occupied, 31% renter-occupied

**Cultural Background:** 78% Caucasian, 14% Hispanic, 5% Asian, and 3% Other

# DAMAGE PATTERNS

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## INUNDATION

Much of Midland Beach lies below sea level, with the streets west of the beach-front Father Cappodanno Boulevard sloping downward to create a bowl formation. During Sandy, tidal surges flowed several feet above normal high tide, following the downward slope and inundating the entire neighborhood. Miller Field, which separates Midland Beach from New Dorp Beach to the southwest, was also cited by residents as a conduit for water. Residents noted that water levels during Sandy reached heights ranging from 4 to 12 feet.

Many of the residents that the field team spoke with had stayed in their homes during the storm, despite a mandatory evacuation order. Some residents intended to evacuate, but stayed too late and were caught off guard by rising water, while others stayed intentionally, believing that Sandy would be “like Irene,” which hadn’t caused significant damage. Some residents who stayed in place lived in one storey homes and either had to exit their homes during the dangerous storm surge or were trapped inside and did not survive. Residents who had upper stories or attics were able to escape the rising water and others were able to be evacuated by boat.

## LOSS OF LIFE

Eight people drowned in Midland Beach, each living “within about eight short blocks of one another...The highest concentration of deaths...attributable to the storm” (Semple). Team members spoke with a woman who lost her mother within her home during the storm, as well as others who had witnessed neighbors drown in front of their buildings. These losses further compounded the level of trauma experienced.

## LANDSCAPE

The wetlands north of Midland Beach are part of the Staten Island Bluebelt program, an ecological storm water management system covering approximately “one third of Staten Island’s land area.” This program “preserves natural drainage corridors, including streams, ponds, and other wetland areas [and is designed to allow these areas] to perform their [inherent] functions of conveying, storing, and filtering storm water” (Staten Island Blue Belt). Although these areas were planned to mitigate the effects of heavy rainfall, they were not designed for storm surge and were overwhelmed during Hurricane Sandy, funneling water into the area.

## HOUSING

The housing in Midland Beach is predominately comprised of two typologies: older single-story bungalows and newer two or three-storey townhouses, with a mix of homeowners and renters. While the majority of the neighborhoods affected by Sandy had the worst damage closest to the shoreline, in Midland Beach extensive damage occurred in the center of the neighborhood as a result of the bowl-shaped topography. Within the area that the field team visited, most of the homes had been tagged by the DoB with red or yellow stickers and the majority of residents considered the damage to their home to be severe.

### BUNGALOWS

The bungalows, originally designed for summer use and later winterized for year-round occupation, were heavily impacted. Many of these lightweight structures were completely shifted off their foundation and the ones that remained in place were typically completely flooded. Some of the bungalows that had not been shifted off of their foundations had vertical cracks in their foundations and walls, while others had been so extensively damaged that they would require demolition and a complete reconstruction.

### TOWNHOUSES

The two and three-storey multi-family townhouses were of newer, more robust construction, with the first floor typically elevated anywhere from several feet to one storey above ground level. As a result, they generally fared better than the bungalows, although there were varied levels of damage depending on how they were articulated. Some of the buildings were arranged as duplexes

with a basement, while others were arranged as duplexes with a garage at the lower level and elevated living areas. The former suffered more extensive damage, as standing water had to be pumped out of the basement and both the basement and first floor required a gut renovation.

There were a variety of cladding types used for both the bungalows and townhouses, varying from stucco, vinyl, and wood on the least flood resistant end of the spectrum, to brick on the more flood resistant end. Many of the homes had damage to cladding, windows, and roofing. In addition, trees had fallen on some properties, some had damaged fencing, and others had pools in their backyard, which were filled with muck and debris during Sandy.

## SERVICES

In comparison to other affected neighborhoods, it took a considerable amount of time to have services restored in Midland Beach. Several residents noted that it took approximately a month to have power restored.

## LOCAL BUSINESSES

On the main thoroughfare of Midland Avenue, only two businesses appeared to be open during the survey period: a deli and a wine and liquor store. Both reported that they had needed to replace their stock and were struggling with a significant loss of their customer base. The owner of the wine and liquor store cited the need for low interest SBA loans and “time” for businesses to recover.

# CHALLENGES AFTER SANDY

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## TEMPORARY HOUSING

For some whose homes were severely damaged or destroyed, especially those with pets, finding temporary housing close to home was a struggle. Several residents relocated to live with friends or family, including some whose homes were deemed structurally safe by the DoB, but were uninhabitable. The field team spoke with several people who were still unable to return home at the time of survey.

## AGENCY RESPONSE

Several people within the neighborhood expressed frustration with the initial lack of response or delayed response in Midland Beach. One resident noted that the Red Cross arrived three weeks after Sandy and “no one” had arrived before that. Others stated that politicians had not come to visit the area.

At the time of survey, representatives from the National Guard and NYPD were present in the neighborhood. The NYPD had set up mobile observation towers for security, to help deter the looting of materials from businesses and valuable items from homes, including copper pipes. In addition, there were numerous agencies evaluating damage to properties, which presented a level of confusion. These agencies included the Department of Buildings, FEMA, SBA, the National Flood Insurance Program (NFIP), ConEd, National Grid, and representatives from the Rapid Repairs program. Residents had mixed feelings about the City’s official response in the neighborhood, citing the following programs in particular:

## DEPARTMENT OF BUILDINGS INSPECTIONS

Residents and the Architecture for Humanity New York field team noted what seemed to be some arbitrariness to the Department of Buildings color-coded stickers placed on homes, with adjacent, similarly-affected homes receiving different designations.

## THE RAPID REPAIR PROGRAM

The City’s Rapid Repair program was cited positively by residents and the field team observed contractors from the program at work at the time of the survey. Some local officials, however, questioned whether such programs were premature, encouraging impulsive rebuilding. They felt that a broader community discussion needed to be held on how to redevelop increasingly dangerous, flood-prone coastal zones.

## DECISION TO STAY IN PLACE OR RELOCATE

In Midland Beach more than other areas visited, several residents that the team spoke with were faced with making a decision between staying in place and rebuilding or relocating. At least two homeowners were considering leaving to return to their home countries in Europe, and at least one renter intended to leave Staten Island. Some expressed that, if the government offered buyouts for the area, they would go, while others felt strongly that they should remain and rebuild.

The desire to relocate was fueled by the level of tragedy and sadness experienced in the neighborhood, the belief that Sandy-type storms would become a regular occurrence, and the severity of damage in comparison to the amount of assistance that was available. At the time of survey, many residents had not received enough funding to make repairs to their property, citing that their insurance companies were responding slowly and, in some cases, they had been denied FEMA assistance. Some residents were paying out of pocket, hoping to be reimbursed, including one resident who was retired.



# COMMUNITY CAPACITY

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## COMMUNITY SUPPORT

Community support after Hurricane Sandy was strong and included help from neighbors, churches, and volunteer relief groups. Some examples of community support observed in the field included:

- St. Margaret Mary Church held mold remediation seminars.
- The gymnasium of the Olympia Activity Center, affiliated with the church, was a major hub for relief services, including food distribution, sheltering, and supplies. It was noted that All Hands volunteers and FDNY retirees were present here at the time of survey.
- An adjacent building, the Presentation Hall, was being used by Occupy Sandy for free legal counseling, a tool library, and supply distribution.
- Oasis Christian Center was cited by residents as a key community presence involved in coordinating relief efforts.
- The Church of Staten Island was also responsible for relief coordination and had been working with Habitat for Humanity and the New Hope Community Church. They split the island into 8 zones, and had helped 2,000 people so far in rebuilding.
- A group of 5 men (4 retired cops and a fireman) created the Comfort Grill, recruiting “friends and other volunteers to serve meals to relief workers, victims, and uniformed service workers seven days a week for seven weeks.” (Staten Island Live)

- One resident noted that volunteers from the Hospital for Special Surgery in New York had come to clean her home for her.
- Time Warner Cable established a charging station.

Overall, the majority of the community felt that a lot of people ultimately came to help out and appreciated this outreach. The field team was well-received and residents seemed welcoming of the opportunity to share their stories, relay their present needs, and communicate some of their emerging thoughts about the future of the neighborhood.

In contrast, at least one resident felt that some of the aid being offered was misaligned with the needs of the neighborhood, stating that they received food and water but only needed cleaning supplies and access to funding.

## TIME SPENT IN THE NEIGHBORHOOD

The majority of the people that the field team spoke with were long term residents in the neighborhood, falling into the 10- 20+ year range.

## INCOME DISPARITY

It was clear in Midland Beach in the aftermath of Hurricane Sandy that “wealth mattered,” as some residents were able to recover more quickly and independently than others.

## EMOTIONAL RESPONSE

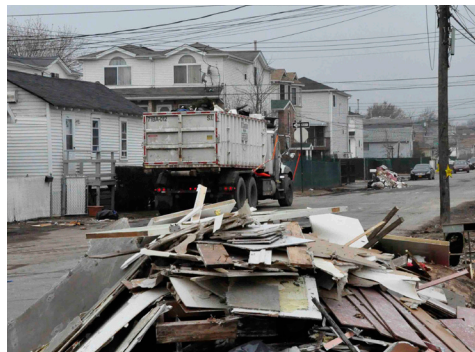
At the time of the field team’s visit, residents indicated that they were experiencing a wide range of emotions, including:

- “I want to talk about the Hurricane.”
- “I feel emotionally drained.”
- “I feel anxious about the future.”
- “I have difficulty talking about my emotions.”
- “I feel disoriented.”
- “I feel angry.”
- “I feel connected to my community.”
- “I feel positive about the future.”

The strong impact of the stress and anxiety experienced was

evident in one resident's response in particular, who expressed that he was having trouble sleeping. Others expressed affinity for their community, including one resident who cited the churches, neighbors, and the Comfort Grill as important cornerstones after the storm. Another resident felt strongly that people should know that Midland Beach is not a bad neighborhood, noting rumors that the area has a less desirable reputation.

Although Midland Beach residents were experiencing a number of serious difficulties, they expressed concern and compassion for neighboring communities, noting that people in Oakwood (to the northeast) and New Dorp Beach (to the southwest) were also hit hard and needed help.











# IDEAS FOR RECOVERY

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It was evident during the team's field visit that there was a strong sense of self-reflection within Midland Beach, as well as a diversity of opinions and ideas about the future of the neighborhood. The following suggestions were offered:

## COMMUNITY PREPAREDNESS

Some thought that the community would benefit from additional preparedness, suggesting that training be offered to help residents get ready for future disasters and develop coping skills. They felt that this could help save lives in the future, help residents learn to prepare their home or business before a storm, and to address damages and losses afterwards.

## SUMMER STREET MARKETS

The owner of the wine and liquor store suggested that a summer-long street market be organized on Midland Avenue to encourage foot traffic and promote community and business renewal.

## PLANNING CONSIDERATIONS

When discussing how shortcomings in the buildings and infrastructure could be addressed to provide resiliency for future storms, residents in Midland Beach focused primarily on engineered approaches to keeping water out, repeatedly citing the need for a sea wall and/or levees. Many felt that the Blue Belt was not effective, and in some cases, may have acted as a conduit bringing more water into the neighborhood. The inability of the Blue Belt to strategically redirect storm surge

and flooding may be one reason that residents tended to prefer engineered approaches over "soft" infrastructural approaches. One resident felt particularly strongly that a wall should be built, regardless of how it would affect the community's relationship to the beach, stating that she "didn't care about the beach anymore."

Residents also felt strongly that building codes needed to be changed and some noted a lack of leadership in not addressing these issues previously. In addition, suggestions were made to elevate the homes, to consider relocating the bungalows to a safer location, and to lengthen the beach to provide a larger buffer at the waterfront.



03

**BROOKLYN**



# RED HOOK





# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION

Red Hook is located on the western edge of Brooklyn, immediately south of Governors Island. It is bounded by the Gowanus Expressway (I-278) to the northeast, the Gowanus Bay and Erie Basin to the south, the Red Hook Channel to the west, and Buttermilk Channel to the northwest.

## HISTORY

### EARLY HISTORY

Named after the shape of the land and reddish color of the soil, “Roode Hoek” was originally inhabited by the Lenape and used as tobacco farmland until the Dutch settled in the area in 1636. For over two centuries the hills and marsh meadows of Red Hook, as it is now known, remained largely undeveloped and in use as farmland.

### URBANIZATION AND EXPANSION

In the 1830s, existing infrastructure along the Manhattan waterfront was deteriorating and wasn't able to sustain a growing shipping industry. Merchant and landowner Daniel Richards developed a solution: the Atlantic Basin. He would transform forty acres of marshland off of Buttermilk Channel into a harbor capable of handling larger ships. As this Red Hook marshland was extremely shallow at low tide, it was dredged to accommodate ships that drew up to 20 feet. The sediment removed during the dredging process was used to fill in the surrounding marshes, creating the nearby neighborhood of Carroll Gardens.

Growth in the neighborhood followed the construction of the

Atlantic Basin in the 1840s, and the Erie Basin in 1864. During this time, piers were built and the subsequent construction of wharves in the area quickly changed the peninsula's pattern of development, creating one of the busiest shipping centers in the United States. During the Civil War, the area bustled with ships from around the world docking to undergo maintenance and transfer cargo, and warehouses were built to store supplies. Consequently, Red Hook grew in both population and industrial might, and the neighborhood continued to prosper into the 1940s.

By this time, the waterfront industry employed over 7,000 people, many of whom were immigrants. These workers and their families needed a place to live; a demand that was met with the construction of new two to three storey light wood frame homes in the area, many of which still remain today. Additional developments included the city's first high-rise public housing complex in 1938 (the Red Hook Houses) and recreational space (part of which would become Red Hook Park) assigned to the City's Parks Department in 1934 and designed by landscape designer Gilmore D. Clarke.

In the 1950s, Columbia Street (and the adjacent district north of the expressway known as Columbia Heights) became the first Puerto Rican enclave in the United States. The area had also become home to many African-Americans during this time.

### ISOLATION AND DECLINE

During the 1950s, residents began to move away from Red Hook because it had become geographically isolated from the rest of the borough. The area was inaccessible via subway and was further cut off from adjacent areas when the Gowanus Expressway (1946) and Brooklyn Battery Tunnel (1950) were constructed. A trolley service, which connected residents of Red Hook with the other parts of Brooklyn, also ceased its service in the 1950s. The advent of container shipping and the draw of new ports in New Jersey capable of handling larger ships led to the decline of Red Hook's docks in the second half of the 20th century. By this time, many of the older buildings and warehouses had deteriorated due to the lack of funding available to maintain them.

Ultimately, the number of new immigrants moving in to Red Hook at this time was less than the number of residents relocating, and the neighborhoods' population began to decline. Investment and interest in the neighborhood stagnated for decades. Unemployment, poverty and crime increased and in 1988 LIFE magazine accused Red Hook of being one of the

worst neighborhoods in, and “the crack capital” of, the United States. The introduction of community outreach programs and increase in police presence, however, helped to alleviate some of the challenges faced by the community and bring about positive change. In the late 1990s, residents became more involved in promoting community development and building more affordable homes for working class families became a goal.

## RED HOOK BEFORE SANDY

Over time, economic change has begun to trickle into the area and the waterfront area, in particular, has become a haven for artists drawn to the neighborhood by its affordability. The artists established themselves in the former warehouses, with tech and creative companies, shops, bars and restaurants quick to join them. Private developers have constructed new buildings and business, overall, has begun to pick up in the neighborhood. The 2006 opening of the Brooklyn Cruise Terminal reintroduced ships to Red Hook and a number of large retail stores, such as IKEA, have also brought new jobs and visitors to the community, adding to the small manufacturing and service-related businesses already established.

# DAMAGE PATTERNS

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## INUNDATION

Flooding is a persistent problem in Red Hook, as the water table in this area is high and the ground is easily saturated. As a result, the majority of residents and business owners are used to and equipped to handle normal flood conditions. However, storm surge during Sandy brought in unprecedented levels of water, inundating homes and businesses up to 5 feet at the ground floor.

Homes and businesses located near the commercial wharf reported that diesel fuel from boats and equipment was mixed in with this water. In addition, the combined sewer overflow system was overwhelmed, and one resident reported that sewage-tainted water was erupting “like a fountain” from a street corner drain.

Some residents were able to begin pumping water out of their basement soon after the storm hit. However, due to the high water table and water from neighboring basements, water kept migrating back in and complicating recovery efforts.

## HOUSING

Private housing in Red Hook is comprised predominantly of attached apartment buildings, two to four storeys in height. Older apartment buildings, built in the early 1900s, are light wood framing with wood cladding. The newer buildings are typically clad in brick, with either housing or commercial storefront space at the ground level and a basement in many cases.

The majority of the homes in the community were flooded

during Sandy, with water completely filling basements and rising up to 5 feet at the ground floor. This damaged critical building service equipment located in the basement, such as heaters, and in some cases where fuel tanks were stored below ground, caused spills.

At the time of the team's visit, some of the spaces that had been flooded had been reduced to studs. One resident had just finished gut renovating her home before Sandy hit, and was waiting for insurance payments to arrive to re-renoate to address Sandy damage. In the meantime, her contractor was helping her by moving forward with renovations and fronting the cost himself. Other spaces throughout the neighborhood that were flooded had not been gutted, but had been cleaned and were being occupied. This meant that mold growth had not properly been mitigated, leaving residents at risk.

While many residents and business owners were in the process of addressing storm damage, in some cases renters found themselves in a position in which their landlords were unresponsive or unable to afford repairs. One such resident noted that his landlord was an older woman who had inherited the building and relied on the building as a supplemental income. As she was not in a position to address the damages, the residents of the building took care of the problems themselves the best they could. However, this left plenty of room for error and it is possible that mold growth will be a problem in this building in the future.

## GRANDFATHERING

At least one resident noted that the block that they live on was rezoned for manufacturing and they are residing on their property only because it was grandfathered in. This makes it very difficult for them to make any substantial improvements to their home.

## MOLD

Mold in Red Hook presents a significant challenge as it has not been properly mitigated in a number of cases. In some instances, residents were not able to get their landlord to properly address the mold problem after the storm, either because they were unresponsive or were not to afford these efforts. In other cases, residents' desire to return home quickly meant that walls were not properly deconstructed, dried out, and reconstructed to prevent the growth of mold spores. This has created a dangerous situation, in which the homes appear

to be safe to occupy, but most likely have mold growth occurring behind the sheetrock. A politician working in the neighborhood was especially concerned about this and the negative health impacts this would lead to, stating that "no one is talking about this in a way that makes it a first priority." He felt that this challenge needed to be addressed throughout the neighborhood as a critical part of the recovery process.

## UTILITIES AND SERVICES

Natural gas lines filled with water during Sandy and had to be dried out with forced air prior to service being restored. One resident that the field team spoke with had approximately 60 feet of gas line damaged that would need to be replaced in order to restore heat to his home. The gas company was very quick to respond to the community's needs and was cited as being very helpful. On another positive note, at least one business owner mentioned that the sanitation department had been very helpful in collecting debris during the weeks after the storm.

In contrast, restoring electricity in the community took longer and some blocks were without power for 10 days. Others had only had power restored approximately a week before the field team's visit. Power restoration may have been complicated by the fact that power and phone lines had been positioned above the ground in Red Hook, making them especially vulnerable to damage during Sandy. This was done because of the high water table in the area.

## LOCAL BUSINESSES

Businesses throughout the community were impacted by Hurricane Sandy to varying degrees. The majority of businesses in the area lost their inventory due to flooding, and others suffered damage to their spaces. The businesses along the waterfront were especially hard hit, including the Fairway grocery store, the Widow Jane whiskey distillery, and the businesses on the Van Brunt Street adjacent pier, among others.

IKEA, also along the waterfront, suffered relatively minor damage in comparison to other businesses in the area, as their shopping space and inventory were located upstairs and were not impacted by flooding. As a result, IKEA was able to provide the following assistance to its neighbors after Sandy:

- Donated essential provisions to the Red Hook Initiative for

residents in the community who were without electricity, such as blankets, flashlights, candles, water, and food.

- Supported local businesses with basic furniture to help them re-open.
- Donated furniture to local firehouses impacted by Sandy.
- Provided space on-site at the store for FEMA to assist Red Hook residents and for the SBA to assist local businesses.
- Helped locally impacted IKEA co-workers secure temporary housing and provided them with home items based on their individual needs.
- Offered seasonal job opportunities at the IKEA Brooklyn store for displaced Red Hook residents who may have lost jobs due to the hurricane.

Storefront spaces located in the interior streets of the neighborhood were also affected by flooding to various degrees, depending on their elevation. An employee at the Chelsea Garden Center on Van Brunt Street shared that most of their inventory was destroyed. Fortunately, the building suffered little damage and they would be back in business as soon as they could get new shipments of goods to sell.

Another business owner expressed frustrations with bureaucratic processes, stating that due to the amount of paperwork required by FEMA, the potential assistance wasn't worth the time it would take to apply for it. Overall, he felt that these issues, among others, could potentially complicate his ability to get his business up and running again.

Overall, the business community in Red Hook was strongly committed to re-opening and remaining in the neighborhood. Businesses that did not have to close or were able to reopen quickly became hubs and gathering places within the community and were a critical part of the recovery process. Local bars in particular were important cornerstones, and helped rally fundraising efforts wherever possible.

# COMMUNITY CAPACITY

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## RED HOOK REBUILDS ITSELF

Red Hook is a close-knit community with incredibly resourceful people that are organized and mission driven. A series of initiatives were organized within the community quickly after the storm and residents and business owners were going out of their way to help each other wherever they could. One resident provided additional insight into the community's drive to recover quickly, stating that he didn't believe that Red Hook would receive much aid from the rest of New York City and would have to take care of and rebuild itself. This sentiment, which was also echoed in other Sandy-impacted communities that were more remote by nature, is representative of Red Hook's geographic isolation and an inherent resilient attitude that has developed in the community over time.

Generally speaking, it was clear that the community was taking care of itself, but also appreciated the concern for their neighborhood and were very willing to share the impact that the storm had had on their community, despite the evident emotional toll that it had taken. Although the field team noted that several renters in affected properties had left the neighborhood, the majority of homeowners and business owners in the community were planning to stay.

## LOCAL INITIATIVES

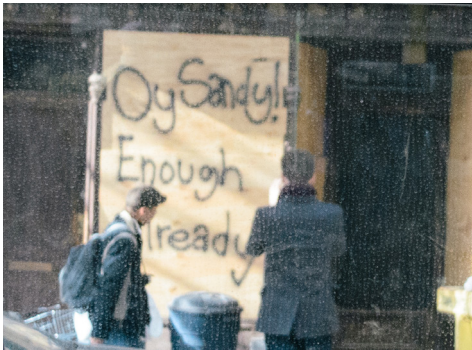
A number of people that the field team spoke with noted that they were very grateful for the efforts of the Red Hook Coalition, a collaborative entity of residents, not-for-profits, and small businesses assembled to respond to the aftermath of Hurricane Sandy. Their operations included data collection and processing,



the distribution of essential emergency goods, and the organizing of various sectors of need (NYCHA residents, small businesses, utilities, etc), among others.

Another vital organization within the community after Sandy was the Red Hook Initiative, a non-profit operating in the community since 2006. In the weeks after Sandy, they organized volunteer efforts in the neighborhood, collected donations, and worked with a number of individuals and groups to address the various needs in the community.

Concern for neighboring communities was also noted by a politician working on recovery efforts within Red Hook. He stated that Sheepshead Bay is in dire need of help as well, and had received little to no effective assistance from the city at that point in time. He was especially concerned about this community, as it is a naturally occurring retirement community with an average age of 70 years. He felt that the valuable lessons learned from the initiatives in Red Hook could be extended and applied to neighboring communities as well, if capacity for such an initiative could be developed.



# IDEAS FOR RECOVERY

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## LOCAL EMERGENCY CENTER

One suggestion that was offered by the community is to establish an emergency center within the neighborhood, as the nearest evacuation centers are currently located at John Jay High School in Park Slope, New York City Technical School, and Brooklyn Tech High School. Residents felt that a closer location needed to be selected to serve their community, especially as Red Hook is less connected to other areas geographically and houses a larger population of older residents. For example, a location could be selected within one of the higher elevation areas just outside of the evacuation zone.

## ADDITIONAL SUPPORT AFTER THE STORM

Several un-met needs became evident after the storm, and the field team felt that the following would provide residents and business owners with additional support in recovering:

- Senior care facilities: At least one resident that the team spoke with is a primary caretaker for an elderly member of his family and needed additional help after the storm in order to both provide care for his mother and take care of everything he needed to do to recover. Temporary assistance in caring for his mother would have been greatly appreciated and enabled him to take advantage of necessary opportunities.
- Childcare Facilities
- Temporary counseling centers
- Longer term access to volunteers for demolition and clean up assistance.

## RESTORING JOB OPPORTUNITIES

A number of community members that the field team spoke with cited the need to restore job opportunities within the community. Several people mentioned that Fairway and IKEA are an integral part of the economy in the community and that restoring the Fairway in particular would help bring job opportunities back into the community. Job restoration and creation was especially critical to residents that had lost their jobs after the storm, or who were unable to work far from their homes due to their responsibilities as caretakers for elderly or ailing members of their family.

## FOSTERING PARTNERSHIPS

During the team's field visit, it was very evident that a number of important initiatives were already in place and that the community was leading its own recovery effort. As a result, the field team felt strongly that one of the best ways that individuals and groups can assist the recovery process in Red Hook would be to foster partnerships with the initiatives already in place.

## REBUILDING CENTER

Several members of the Red Hook community were interested in architectural design services and technical support at the time of the team's field visit and many community members were in need of initial supplies for demolition and reconstruction, including:

- dry wall nails and tape
- nails
- tools of all kinds
- N95 and P100 respirators
- dehumidifiers and heaters

Over time, a wide variety of additional supplies will be required and, as a result, the field team felt that a rebuilding center would be an asset to the community and could be done in collaboration with initiatives already in place. This could be modeled after the REbuilding Center in Portland, Oregon, which houses a large volume of used building and remodeling materials and "provides resources that make home repairs affordable to everyone" (The Rebuilding Center). Such an initiative could be housed within existing warehouse space

within the neighborhood to provide design advice, information resources, and necessary materials, and could tap into the gardening, composting, arts, and DIY culture that already exists in the community. At the end of the rebuilding period, it could remain as a community resource or be converted into another use to respond to emerging community needs.

## PLANNING CONSIDERATIONS

Overall, it was clear that better urban planning strategies and infrastructural considerations are needed for Red Hook and other communities in low-lying areas, to reduce the impact of future storms and subsequent recovery times. The following were cited as important planning considerations for resiliency in Red Hook:

- Locate mechanical, electrical, and plumbing equipment in areas well above flood levels.
- Install automatic shut off devices for utility services.
- Use appropriate building materials and finishes that can withstand flooding, high winds, and heavy rains.
- Provide sea walls or green space buffers to mitigate future storm surge.

## MOLD REMEDIATION PLAN

It was noted again and again at the time of survey that mold is not being mitigated properly within the community and the dangers are being downplayed. Several people felt that a more systemic mold remediation plan and providing assistance to residents and business owners in properly and successfully removing mold is critical.



# SEA GATE





West 37th Street



# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION AND AREA SURVEYED

Sea Gate is a seaside neighborhood located on the western tip of the Coney Island peninsula, in Brooklyn's southwest corner. Surrounded on three sides by water, with beaches facing onto the Atlantic Ocean, Gravesend Bay, and an inlet to Coney Island Creek, its eastern boundary lies along West 37th Street.

The field team visited Sea Gate over 3 weekends from mid-November to mid-December 2012 and canvassed the entirety of the neighborhood.

## HISTORY

### EARLY HISTORY

In its early days, following European settlement, the western end of the Coney Island landmass remained largely undeveloped, due to the complexities of land ownership, difficulties of access, and the lack of a potable water supply at the time. Prior to its development as a residential community, this area was a rougher place, known for its drinking, gambling, and fighting. The land on which Sea Gate was constructed was previously named "Norton's Point," after Michael Norton, a 19th century politician and the owner of a casino that was located where the Coney Island Lighthouse now stands.

### RESIDENTIAL ORIGINS

The area's residential origins began in 1892, six years prior to the unification of the five boroughs into New York City, when the Norton Point Land Company purchased the land west of West 37th Street in Coney Island (an area of approximately half

a square mile) and began to construct a neighborhood called "Sea Gate." Seven years later, a number of property owners joined together to buy out the developer and formed the "Sea Gate Association" as a private corporation. A 12 foot high fence was built along Sea Gate's boundary, in order to provide a barrier from visitors to Coney Island and protect residents from intruders. After delineating this boundary, still in place today, the residents effectively became a self-governing enclave. By 1906, the neighborhood was comprised of 150 homes, a chapel, a yacht club, baseball fields and tennis courts, and boarding houses and a hotel. As the end of the 1920s approached, the community had grown to accommodate a year-round population of approximately 3,000 people.

### COASTAL EROSION

Although a quiet and safe community, residents do experience challenges associated with their coastal position, especially the erosion of the beach. As far back as the turn of the twentieth century, groins were constructed along the public beaches of Coney Island and bulkheads were built around the point, in order to prevent receding shorelines. In the 1990s, the Army Corps of Engineers carried out a number of projects to further these efforts. These included the construction of a groin at West 37th Street, at the boundary between Coney Island and Sea Gate, as well as others along the Coney Island waterfront. Thousands of tons of sand were brought in to shore up the groins and replenish the public beaches. Unfortunately, this infrastructure damages the beach on the Sea Gate side of the groin at 37th street, as it prevents natural sand deposition from reaching the point at Sea Gate and the shoreline continues to recede behind the groin today. Negotiations over public infrastructural projects to restore Sea Gate's beaches have been difficult, due to the Association's private ownership of the land and the fact that the community's beaches restrict public access. Most recently, the City stated that federal assistance will not be made available for beach restoration and erosion prevention projects unless Sea Gate opens its beaches to the public. At the present, the community is reluctant to grant public access and the problem of erosion remains.

## SEA GATE BEFORE SANDY

Over the last century, Sea Gate has remained a private gated community, governed by the Sea Gate Association. This association "maintains and repairs approximately 4.5 miles of streets, a complete sewer system which discharges into New York City sewer lines, [and an] association office, police lodge,

police booths, chapel, beaches and maintenance yard, and Lindberg Park.”

Aside from these community facilities, Sea Gate is entirely residential, with no permanent commercial units. The secluded community has 900 households, comprised almost entirely of detached, single-family homes. The residential base is remarkably stable, with very little property turn over and is comprised of numerous multi-generational families living in close proximity to each other, if not together in the same house. Although predominantly Hasidic Jewish by the 1970s, in recent years the neighborhood’s demographic makeup has diversified further, with waves of eastern Europeans and ethnic Russians moving into the neighborhood and an increasing African-American and Hispanic population.

## DEMOGRAPHICS

**Population:** 4,800

**Land Area:** 0.263 square miles

**Density:** 18,250 people/square mile

**Median Household Income:** \$61,500

**Percentage Below Poverty Line:** 14%

**Housing Tenure:** 48% homeowner-occupied, 52% renter-occupied

**Median Unit Value:** \$614,600

# DAMAGE PATTERNS

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## INUNDATION

As Sea Gate is surrounded by water on three sides, it was inundated by water from Coney Island Creek from the north, as well as strong storm surge from the Lower Bay.

## COASTAL EROSION

Coastal erosion, a chronic problem for the Sea Gate community, played a central role in the severity of the impact during Sandy. Due to the groin at the boundary between Coney Island and Sea Gate, the beach along the south is of minimal width and, as a result, the homes along the waterfront here were hit directly with strong waves. This is evident in the severe structural damage seen after the storm.

## THE SEA WALL

One major factor that contributed to the damage in Sea Gate was the sea wall, which had been constructed between the waterfront homes and the beach. This sea wall is incongruous and constructed of a range of materials, including timber, brick, poured concrete, and steel, each of which has a different structural capacity to withstand storm surge. The reason for this “piecemeal” construction is that the sea wall is not built and maintained by the Sea Gate Association, but is rather constructed (or not constructed in some cases) on a lot by lot basis. Furthermore, the Sea Gate Association does not require lot owners with properties adjacent to the beach to build and maintain a portion of the sea wall to a certain standard.



As a result, there are openings in the sea wall, which served as infiltration points during Sandy, allowing storm surge to damage not only the homes without the sea wall, but also the homes and infrastructure adjacent to them. On some properties, the bulkhead was missing due to the costs of maintaining it or due to procrastination in constructing it by homeowners. In other cases, a sea wall was in place, but was not constructed of a high enough structural capacity to withstand the impact of high velocity waves. In these locations, especially in the areas where the wall was constructed of brick or timber, the wall was destroyed.

## BUILDING DESIGN

Although there was flooding throughout this community, residents with homes directly on the beach, especially between West 37th Street and Beach 45th Street, fared the worst by far. Many of these homes were red-tagged by the Department of Buildings as unsafe to enter and suffered severe structural damage. It was also noted by some residents that the homes along the shoreline served as barriers that protected the homes behind them from damage.

The homes in Sea Gate, predominantly single family homes, are of a variety of architectural styles and ages, with some homes dating back to the early 20th century. Many residents own their homes and in some cases, their homes had been passed down through multiple generations.

The majority of the homes throughout the community were flooded during Sandy. In many of the flooded living spaces, wall, floor, and ceiling materials were not mold-resistant. This meant that rapid mold growth caused by flooding had to be quickly counteracted through removal of all contaminated materials, furniture, and equipment. On the exterior of the building, a similar problem was encountered with non-mold resistant siding replacement and, additionally, where the wind damaged roofing or siding, these had to be replaced. In some cases, the movement of sand throughout the neighborhood placed additional pressure on foundation and basement walls.

For homes that were not structurally damaged, one of the consistently largest expenses encountered among the homeowners visited was the replacement of heating and electrical equipment essential for the functioning of the systems in the home. These included basement boilers and electric panels rendered dysfunctional by the flooding.

## INSURANCE

While many residents had both homeowners and flood insurance, the individual companies disagreed about which damage their respective agencies covered, with the responsibility being passed back and forth. One particular problem for residents in this process was their use of basements as living spaces. Although these areas were damaged due to flooding, their insurance did not cover this as the basements were, in many cases, not supposed to be considered living spaces.

## MOLD

Many residents expressed concern about the mold in their homes. One resident, who had worked in construction for many years, was surprised at the speed at which the mold developed. Other residents noted the smell of the mold and were concerned about the air quality. One resident was using mold removal spray in the basement without proper ventilation, and when asked if it was safe, responded with a frustrated “Who will do it for us?” Many residents are planning on replacing sheet rock.

## SAFETY

Many residents did not feel safe after the storm as there were no streetlights after Sandy due to power outages. According to some residents, there were issues with looting after the storm.

## INFRASTRUCTURE

The homes of Sea Gate were not the only damaged elements of the community. Infrastructure was also damaged in many places. Sidewalks were uprooted, as the inundation caused the soil to shift and resettle. Another piece of infrastructure affected by the storm was the sewer system. This infrastructure, an outdated ceramic system, was originally installed by the city and now falls under the jurisdiction of the Sea Gate Association. During the storm, the sewer system was inundated with sand, and sewage backed up throughout the community.

# CHALLENGES AFTER SANDY

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## INFRASTRUCTURE MAINTENANCE

Being a private community, the Sea Gate Association, and ultimately the residences of Sea Gate, are responsible for the maintenance of all the public spaces and public infrastructure within the gated community. This includes the sewer and storm water management systems, which quickly filled with sand and failed to handle the unprecedented storm surge.

Homeowners in Sea Gate pay the same city taxes for sewage, water, and property as other city property owners, but they also pay a premium on top of that to the community association to defray the cost of maintenance of public space, public infrastructure, and police protection within the gates. But following a time of great catastrophe, when residents struggle to rebuild their homes and properties, this private community is also responsible for rebuilding the 100+ year old sewer system that is not equipped to handle storm surges and is currently settling due to the movement of the surrounding ground. The median household income in Sea Gate is \$62,000 and if some residents can barely manage to rebuild their own homes, the burden of rebuilding their community systems may be a great financial hardship.

## THE SEA WALL

Many homeowners, including those who will need to completely rebuild their own homes, may be faced with the financial burdens associated with rebuilding the sea wall. For those residents who might be able to afford to this, it is feared that unless the sea wall is rebuilt as a continuous element constructed of appropriate materials, the damages caused by Hurricane Sandy will be experienced again in the next major storm. As a barrier for other properties in the neighborhood

and not only the homes along the waterfront, the community is trying to obtain financial support from the federal government or to change legislation in hopes of redeveloping this infrastructure.

## ABSENT HOMEOWNERS

After the storm, many homeowners had to temporarily relocate, as their homes were not habitable. This sense of absence has been a source of frustration for homeowners and residents who remained in the community and are actively engaging in recovery efforts.

## FINANCIAL ASSISTANCE

At the time of survey many homeowners and residents had been unable to receive financial assistance for recovery. Some noted, however, that this is due to the relative affluence of the individuals.

# COMMUNITY CAPACITY

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## TIME IN THE NEIGHBORHOOD

Sea Gate has a long history, with many residents having lived in the community for decades, as well as a number of families that have lived in the community for multiple generations. The majority of the residents field team members spoke with intended to stay within the community and rebuild.

## EMOTIONAL RESPONSE

Although residents experienced a wide range of emotions after Hurricane Sandy, anger was one prevalent emotion that was cited at the time of survey. Many residents were angry at the damage that had been sustained within their community and felt that this type of construction should have not happened here in the first place. Many felt further frustrated by the experience of dealing with insurance companies and programs providing financial assistance.



















# IDEAS FOR RECOVERY

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## BUILDING A BETTER SEA WALL

Field team volunteers felt that one potential approach for aiding in recovery would be to produce a document for the community that outlines effective strategies for reconstructing the sea wall. The document could include such information as how to design a resilient sea wall, which construction methods and materials should be used, and case studies of other effective examples.

## NATURAL MITIGATION STRATEGIES

As a counterpoint to constructing a new sea wall, another suggestion was to develop natural mitigation strategies, such as sand dunes, that could offer heightened protection for the residents along the shoreline.

## GUIDELINES FOR WATERFRONT CONSTRUCTION

Field team volunteers felt that one potential approach would be to produce a document of guidelines for waterfront construction for residents located along the shoreline that will be engaging in reconstruction. The document can explain the new flood zone delineations and related code compliance issues, and provide diagrams of how residents could effectively retrofit their homes and properties in a resilient manner.

## SOFT INFRASTRUCTURE

The existing sewer overflow system is overwhelmed during heavy rainfall and especially during a storm surge. The community

could explore several small and large scale solutions to not only alleviate the load upon the existing infrastructure, but also retain the water during a storm surge and slow down its movement. Such solutions may include:

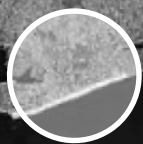
- Building swales and retention zones just above the water's edge, in order to absorb the water before it reaches the streets and adjacent homes. These wetland conditions could be designed as a separate infrastructural network, possibly following the existing street grid, and could be related to a redesign of Coney Island Creek and Coney Island beach amenities for better flood mitigation.
- Building small scale bio-retention zones surrounding one's property or home, thus absorbing water before it reaches the building.
- Designing and building retention tanks where water can be directed during a storm surge. Alternatively, bio-retention should be considered in order to remove contaminants and sedimentation from storm water runoff and temporarily store storm water.

## CAPACITY BUILDING FOR THE SEA GATE ASSOCIATION

For a private community such as Sea Gate, the proper functioning of its association is essential to the overall recovery of residents and the community. Therefore, it is crucial that the community facilities that serve the association and residents are designed to be resilient during and after a disaster so that they can be used as support centers for residents and remain operational for the essential organizations working to support recovery in the community. This may include the Chapel, which is normally used as the Sea Gate Association offices, and the local synagogue. Guidelines and design and construction services could be provided to ensure that these centers are resiliently retrofitted. This could include, among other things, strategies to ensure that these facilities can successfully operate off the grid during emergency scenarios.

An aerial, grayscale photograph of Coney Island, New York. The image shows the coastline, buildings, and a network of roads. A white circle highlights a specific area on the beachfront. The text "CONEY ISLAND" is overlaid in large, white, bold, sans-serif capital letters.

# CONEY ISLAND





Coney Island  
Creek

West 37th Street

West 15th Street

# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION AND AREA SURVEYED

Coney Island, located on the southernmost edge of Brooklyn, is bounded by Coney Island Creek to the north, Ocean Parkway to the east, the Lower Bay to the south, and West 37th Street to the west. The majority of the community is residential, with commercial areas running east to west along Neptune Avenue, Mermaid Avenue, and Surf Avenue. The famous amusement district and public beaches line the southern shore.

The area surveyed by the field team is bounded by Coney Island Creek to the north, West 15th Street to the east, Surf Avenue to the south, and West 37th Street to west.

## HISTORY

### EARLY SETTLEMENT

Prior to European settlement, Coney Island was a narrow barrier island of sand dunes, clam beds, and scrub grass, separated from the mainland by a tidal salt marsh. The island was used by the Konoh (or Bear Band) of the Canarsee to collect clams and as a place of refuge for women and children during times of conflict. At this time, the island was called Narriock, or “land without shadows.” The sunny disposition of the Island, referenced in its name, would later lead to its popularity for development.

In 1654, Narriock was purchased as part of the Dutch colony. The Dutch re-named the island “Conyne Eylandt,” which translates as “Rabbit Island.” This new name is referenced on the Nieuw Nederland map of 1639 and is thought to indicate the presence of a rabbit population on the island at that time,

as was typical on several of Long Island’s barrier islands. Ultimately, the English adaptation, “Coney Island,” would survive as the modern name for this landmass, referenced in maps as early as 1779.

During the early years of European occupation, Lady Moody, the leader of a new colony at Gravesend to the north, had plans to develop a new port at Coney Island. However, the bay was too shallow for large boats and the Coney Island land mass was seldom used, with the exception of livestock grazing.

### LEISURE

By the 1800s, Americans with leisure time began to discover the beaches at Coney Island as a means of escaping the crowded city. Visitors first arrived by boat or were able to wade across the tidal marsh from the mainland to the island during low tide. In 1823, a mile-long shell road and wooden bridge opened, providing access to the island by carriage. This, along with a ferry service that opened the following year, greatly increased the number of visitors and spurred development on the island, transforming the shore into a popular resort destination for wealthy city-dwellers.

Over time, accessibility to the Island improved and became more affordable, which served to increase development. The property north of the boardwalk and south of Surf Avenue was zoned for recreation and amusement and, throughout the late 19th and early 20th century, much of this landmass was developed. Inns, hotels, amusement parks, and bathhouses formed much of the landscape and, as early as the 1870s, bungalow colonies began to pop up as summer vacation homes.

### A CHANGING LANDSCAPE

In the early 1900s, a large portion of the area adjacent to Coney Island Creek was infilled to expand the neighborhood street grid. After World War II, additional landfill used for the construction of the Belt Parkway converted the creek from a natural strait connecting Gravesend Bay and Sheepshead Bay into a smaller inlet. This transformed Coney Island from a barrier island into a peninsula connected to the mainland.

Also influencing the local physiography was the addition of the Breezy Point jetty. After this was constructed, natural sand deposition to Coney Island’s beaches was cut off and, in order to maintain the beaches today, sand must be pumped in from offshore sand reservoirs. This is very costly and is typically executed by the Army Corps of Engineers through

federal funding. The beaches were most recently restored after Hurricane Sandy through the Sandy Relief Bill, in which 600,000 cubic yards of sand was placed on the beaches through a \$7.2 million dollar contract.

### **DECLINE AND MODERN DEVELOPMENT**

Until the early twentieth century, Coney Island had very few year-round residents. This changed when Irish, Italian, and Jewish immigrants settled into two-storey stucco homes and smaller apartment buildings in the area near West 15th, 16th, and 17th streets, between Neptune and Surf Avenues.

Following the stock market crash in 1929, development ceased in Coney Island and a number of businesses closed. At this time, the City took control of the beach and boardwalk, moving the latter inland to reduce the amusement areas and expand the beach. Private investment in the area stalled and, eventually, after a 1944 fire damaged Luna Park (one of the three enclosed parks built at the turn of the century), City Park Commissioner Robert Moses rezoned the land for residential use.

In order to accommodate housing shortages after World War II, there was an attempt to insulate the beach bungalows for year-round use. However, the small, lightweight structures were ineffective in this area given desired densities and land values. In 1953, Moses extended the rezoning to the entire island. This resulted in the redevelopment of many areas north of the boardwalk and included the construction of several large-scale apartment complexes and public housing projects.

As these housing developments rolled out across Coney Island in the 1960s, residents became concerned about the changes in their community and the potential for deterioration, especially in respect to developer Fred Trump's plan to build "Trump Village" in the area. In response, the Astella (Associated Tenants and Landlords) Development Corporation was formed in 1975 and was able to postpone this development through protesting and demonstrating that Coney Island was a strong, coherent community.

Since its inception, Astella has been essential in the development of the neighborhood as it exists today and has built nearly 1,000 affordable, low-rise prefabricated homes for the community, many of which were visited during the Post-Sandy field work. Astella was also able to halt the construction of all new high-rise public housing buildings in Coney Island after 1975, in an effort to maintain a healthy balance of public and market housing in the community.

## **CONEY ISLAND BEFORE SANDY**

Coney Island remains a popular summer destination and attracts an eclectic range of visitors to its waterfront amusements. Although the residential area of Coney Island is a close community with many wonderful characteristics, quality of life in the neighborhood today is lower than adjacent communities, and 1 in 6 residents lives in public housing. Some note that the community lacks diversity in housing options and basic commercial and service-oriented opportunities.

## **DEMOGRAPHICS**

**Population:** 45,000

**Land Area:** 0.7 square miles

**Density:** 64,286 people per square mile

**Median Age:** 38.4 years

**Median Household Income:** \$32,100

**Percentage Below Poverty Line:** 23%

**Housing Tenure:** 21% owner-occupied, 79% renter-occupied

**Median Unit Value:** \$320,800

**Cultural Background:** 32% African American, 31% Caucasian, 26% Hispanic, 9% Asian, and 2% Other



# DAMAGE PATTERNS

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## INUNDATION

Bounded by the Lower Bay to the south and by Coney Island Creek to the north, the low-lying landscape of Coney Island is vulnerable to flooding even during mild storms.

The natural capacity of the landscape to handle flooding and storm surge was eliminated over the course of development, through several major alterations: The tidal wetland along Coney Island Creek was infilled to make way for the expansion of the urban grid, Coney Island was connected to the mainland of Brooklyn by a land-bridge, and the soft perimeter of the non-beach areas of the island was replaced by hardscaping.

In October, as Sandy hit the shoreline, rising water from the bay and creek, as well as sewer overflow, all contributed to the flooding of the neighborhood. Residents and business owners in the northern-most areas of the community along the creek experienced the most substantial flooding. Across the neighborhood, residents estimated an average of 3.5 feet of flooding, ranging from 6" at minimum to almost 8 feet at the deepest.

## SAND

Storm surge from the southern side of Coney Island pushed back the sand from the beach in significant quantities. At the time of survey, several of these sand piles remained to be dealt with, including one adjacent to one of the NYCHA buildings.

## HOUSING

The field team spoke with the owners and residents of 36+ buildings, which were representative of the building typologies and damage patterns found throughout the neighborhood. Of these buildings, 61% had remaining damage, the majority of which was cited as severe. Two properties were inaccessible, at least one building had tenants move out as a result of damages incurred, and another building had 3 tenants occupying it even though it was deemed legally unoccupiable.

There are two predominant private housing typologies in Coney Island:

### PRE-WAR HOMES

The majority of these homes, built before World War II, are two to three storeys and include a basement level, which were, in many cases, occupied as living spaces prior to Hurricane Sandy. There are several characteristics of these homes that contributed to their vulnerability and damage during Sandy:

- Basement levels were located 5-6 feet below grade and, in many cases, were completely flooded. The water had to be pumped out of the basements after the storm.
- Windows and vents located just above the sidewalk and exterior stairs to the basement level aided the infiltration of water below grade.
- Mechanical, electrical, and plumbing systems were typically located in the basement level or on the first floor. In nearly all cases, these systems were damaged and incurred high costs for repair.

### PREFABRICATED HOMES

The prefabricated homes, developed by Astella, were typically built with the first floor 4 feet above grade, with a crawl space in lieu of a basement. These homes, on average, had approximately 1 to 3 feet of flooding on the first floor. They also suffered more wind damage to siding and roofing than the pre-war homes, which were typically clad in brick.

A few of these homes were designed with the mechanical, electrical, and plumbing systems located on the second floor, which saved homeowners costs associated with replacement and enabled them to repair their homes more quickly.

Across all of the housing typologies, in many cases appliances, such as refrigerators, washers, and dryers, were destroyed

during the flooding and needed to be replaced. Additionally, in cases where flooring was not already gutted, especially wood flooring, it was warping and needed to be removed and replaced. Many of the homes also had baseboard heating, which was damaged or destroyed by the flooding.

## BUILDING SERVICES

Immediately after the storm, many households were left without access to necessary building services, such as electricity, gas, and plumbing. These outages made aspects of daily living and disaster recovery difficult, including the preparation of meals, the heating of homes, and the ability to use power tools for home repairs. The loss of heat was a critical concern for especially vulnerable residents, such as the elderly and those with health concerns.

In at least one of the NYCHA buildings, the trash compactors were among the equipment damaged by the flooding. This meant that the building was unable to process its garbage properly and the hallways smelled of trash. At the time of the team's visit, several of the NYCHA buildings had set up porta potties and generators, in an effort to keep residents in place.

The length of time that it took to replace necessary equipment and regain complete access to building services varied across the neighborhood.

## MOLD AND MUCK

At the time of survey, 27% of buildings had muck remaining, 44% had mold, and only 1 building owner had been able to completely eradicate mold growth. In the majority of the flooded living spaces, wall, floor, and ceiling materials were not flood-resistant. This meant that rapid mold growth had to be counteracted through the removal of affected materials, furniture, and equipment. A similar problem was encountered on the exterior of the buildings, necessitating the replacement of siding with mold-resistant materials.

## DEBRIS AND WASTE

Hurricane Sandy generated significant amounts of debris in Coney Island. Items and building components that were not well-secured were relocated by the wind and water, in some cases

causing damage to adjacent properties. Several residents found themselves burdened with debris that did not originate from their own homes, including one homeowner who had to deal with fallen trees, bricks, and miscellaneous debris from a neighboring property in order to continue repairs to his own home.

In addition to wind and water-borne debris, a significant amount of waste was generated in the weeks after the storm, as residents had to remove ruined building materials and belongings from their homes. These items were piled at the side of the street and carried away by sanitation workers, whom residents cited as doing an excellent job after the storm. At the time of survey, these piles could still be seen accumulating throughout the neighborhood as a result of adjacent building renovations.

## LOCAL BUSINESSES

The majority of the businesses in Coney Island suffered damage during Hurricane Sandy. Immediate damage, in addition to physical damage to the buildings, included the loss of inventory and other items important to the functioning of the business, such as office furniture, computers, and other equipment. Several businesses in the area suffered the loss of their paper files and did not have backups of their physical archives or the files on their computers.

In addition to the initial costs of building repairs and the recovery of inventory and equipment, financial losses over a longer period of time quickly became apparent. As a result of closure after the storm, businesses lost their ability to earn revenue. This severely limited the capital flows that were necessary not only for business recovery, but also for the livelihood of owners and employees. Levels of income loss varied throughout the neighborhood, depending on the scale of overall damages incurred. At one end of the spectrum, a few small food establishments were able to reopen just two weeks after the storm. At the other end of the spectrum, the impact on larger retailers was more significant. One retailer in particular cited that their losses over a one month period amounted to millions of dollars.

## PERSONAL IMPACT

### BELONGINGS

Although the majority of buildings in Coney Island were structurally intact after the storm, many residents found themselves with a tremendous amount of personal effects lost after the floodwaters receded. Such items included home furnishings, appliances, clothing, vehicles, and most importantly to some, objects of sentimental value that could not be replaced.

### SENSE OF SECURITY

Many residents had to evacuate their homes and were unable to return permanently until essential repairs could be completed. Unfortunately, this absence, sometimes for weeks, opened a gap for looting of building materials and personal belongings, mostly immediately after the storm.

# COMMUNITY CAPACITY

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## COMMUNITY SUPPORT

After Sandy, some residents were able to turn to their communities, family, and friends for support, while others had to rely on aid agencies such as the Red Cross to meet their basic needs. At the time of survey, several community groups were offering assistance, including legal workshops.

## EMOTIONAL RESPONSE

At the time of the field team's visit, residents indicated that they were experiencing a wide range of emotions, including:

- "I feel emotionally drained."
- "I feel anxious about the future."
- "I have difficulty talking about my emotions."
- "I have difficulty sleeping."
- "I feel angry."
- "I feel connected to my community."
- "I feel positive about the future."

## TIME IN THE NEIGHBORHOOD

The majority of the residents that the field team spoke with were deeply rooted within the community, having lived in Coney Island for an average of 19 years (ranging from "less than 5 years" to "my whole life"). When asked if they planned to stay in Coney Island, almost everyone answered yes, 3 people planned to relocate, and 2 homeowners were considering selling their property.



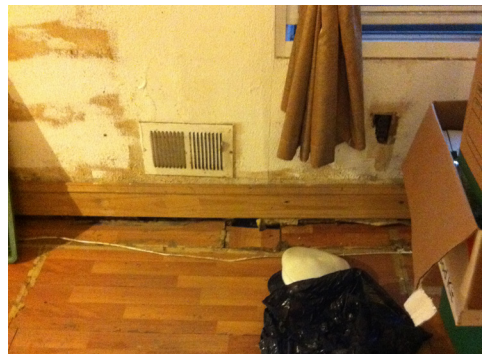
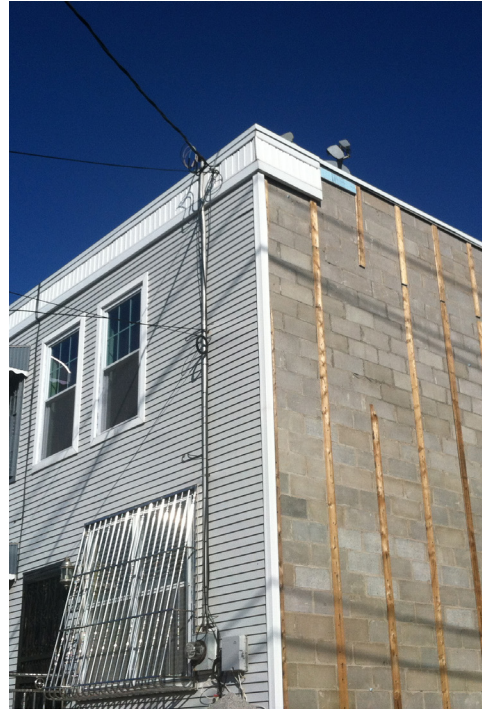


















# IDEAS FOR RECOVERY

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## POST-DISASTER RESPONSE

The community voiced a wide range of experiences, which were echoed in their suggestions for improving response after future storms:

- Create an evacuation shelter nearby.
- Provide more general assistance and better clean up immediately after the next event.
- Provide more support to local merchants (including auto shops) and residents, especially those who are displaced and want to return to the neighborhood.
- Teach people not to steal/loot after the storm or; after evacuations, have security teams patrol the neighborhood to deter looting.
- Invest in homeowners who reinvest in the neighborhood.

## SUPPORT NEIGHBORHOOD INSTITUTIONS

Several important community institutions were damaged in the storm and could benefit from strategic upgrades. At the time of survey, the local neighborhood clinic was in need of reconstruction, the Coney Island Branch of the Public Library was closed, and centers of worship were experiencing various levels of damage. These spaces provide important services after emergency events; for example, centers of worship serve as gathering spaces for the distribution of food and clothes and as a place for the community to share their experiences. In addition to measures that would improve the resiliency of the buildings that house these institutions, such spaces could be designed to support additional capacities after future events.

## MAKING HOMES RESILIENT

Residents offered the following suggestions for improving the resiliency of the homes within the neighborhoods:

- Move all building services out of the basement and relocate everything critical upstairs.
- Elevate the buildings.
- Install pump systems for basements.
- Elevate pipes.
- Incorporate alternate energy sources.
- Overall, design and build the homes in a smarter, safer way moving forward.

Several homeowners experienced frustration that their homes have been built the way that they had, and felt that architects, developers, and contractors need to be held accountable for their work in these communities.

The field team felt strongly that community design workshops would be well-suited for this neighborhood and would provide an opportunity for homeowners and design professionals to work together to address vulnerabilities in existing buildings. This could be especially helpful in addressing conditions that are repeated systemically throughout the neighborhood that exacerbated damages during Sandy. For example, one exercise could be to brainstorm ways to reconfigure details that provided for water infiltration, such as the windows just above grade. Another exercise could be to do space planning with the homeowners to find solutions for reorganizing their homes in a way that would move critical items and living spaces out of basements. These are just two of many examples of how the existing homes that did not suffer structural damage could be made more resilient.

## BUSINESS CONTINUITY STUDY

Business continuity was a serious issue in Coney Island after Hurricane Sandy. Many of the serious impacts experienced by business owners could have been avoided, such as the loss of records and inventory, if a business continuity plan had been in place. Although many businesses in Coney Island were hard-hit during and after Sandy, there were others, such as Tom's Restaurant on the elevated boardwalk, that were able to open for business almost immediately after the storm.

A study of the practices that allowed businesses such as Tom's to reopen shortly after the storm, as well as other best practices, could serve as a model for other businesses in the community. This could be combined with a feasibility study of community facilities or other spaces within the neighborhood that could accommodate temporary work areas for displaced businesses after a future event, as well as recommended upgrades to existing business facilities to provide for disaster resiliency.

## INFRASTRUCTURE

One suggestion offered by the community was to improve the storm-water system to help alleviate future flooding, as the existing combined overflow system is overwhelmed during heavy rainfall and especially during storm surge. Another engineering approach suggested by the community to prevent flooding included constructing a sea wall along Coney Island Creek, and assessing the creek area for safety overall.

The field team felt that an approach that incorporated "soft" infrastructure would be more effective, and that options could be explored for small and large scale solutions to alleviate the load on existing infrastructure during normal conditions and better handle water during flood conditions. For example:

- At the macro-scale, building wetlands, swales, and/or other natural retention zones along the coastline in order to help absorb rising water before it reaches the street and adjacent homes. These measures could be designed as an infrastructural network and could be coordinated with a redesign of Coney Island Creek and beach adjacencies.
- At the micro-scale, smaller bio-retention zones could be constructed within individual lots, to help absorb water at the inner block.
- In order to address flash flooding and storm surge, retention tanks could be installed on individual lots and water could be directed to these tanks in a high volume scenario.
- Bio-remediation strategies, such as the use of specific vegetation, could be employed throughout the neighborhood to remove contaminants from storm water.

# BRIGHTON BEACH





Ocean Parkway

Oceanview Avenue

Coney Island Avenue



# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION AND AREA SURVEYED

Brighton Beach is located between Coney Island and Manhattan Beach in south-western Brooklyn. It's bounded to the north by Neptune Avenue, to the east by Corbin Place, to the south by the Lower Bay, and to the west by Ocean Parkway. Its primary frontage is the south facing the waterfront.

The Brighton Beach field team visited the community in early December 2012 and canvassed the area primarily bounded by Oceanview Avenue to the north, Coney Island Avenue to the east, the Lower Bay to the South, and Ocean Parkway to the west.

## HISTORY

### DEVELOPMENT AND PROSPERITY

Brighton Beach is located on the lands of the 17th century settlement of Gravesend. The land was used primarily for farming until the 1860s, when this oceanfront neighborhood was built out by William A. Engeman, an enterprising property developer and entrepreneur. Seeking to profit from the growing demand for clean air and leisure opportunities, Engeman purchased several thousand acres of land and began to construct the district. Early structures included a steamboat pier, the Ocean Hotel, and the Brighton Beach Bathing Pavilion and Ocean Pier. Family vacationers were drawn out to the area by these attractions, and his addition of the Brighton Beach Race Track in 1979 gave even more excitement for afternoon visits. As railroads were built to bring even more people to the area, the Brighton Beach Hotel was built to accommodate more travelers.

Also under development during this period was Coney Island to the west, followed, shortly after, by Manhattan Beach to the east. Additional transportation links were introduced to the area at this time, including railways and a toll road (now Coney Island Avenue). Numerous boats docked in the area, bringing more visitors. In order to compete with its neighbors, Brighton Beach offered rather extravagant attractions. Of particular note was the performance of William 'Buffalo Bill' Cody in 1883, who excited crowds with his "Cowboy and Indian" spectacular. Other unusual entertainments on offer included the "Midget's Palace" and the "Convention of Curiosities." Vaudeville shows were also popular, music concerts were frequently staged, and horse racing took place on the beach.

### CHANGING FORTUNES

Following the closure of the horse racing track in 1908, wealthier visitors, for whom betting had been a key attraction, stopped coming to Brighton Beach, and the grand hotels that lined the shore declined. Despite this, the area's popularity remained and attractions such as a carousel, roller coaster, scenic railway, Irish fairground, and wild animal arena were developed on the mile-long boardwalk, part of the Brighton Beach Park that opened in 1905. However, tragedy struck in 1919, when a large fire destroyed many of these sights.

Surviving the fire, although ultimately not the area's decreasing affluence was the private members club Brighton Beach Baths. Opened in 1907, it offered three swimming pools, a nude beach, tennis courts, and a miniature golf course. Losing members, the Baths were eventually closed in 1994, replaced in 2002 by the Oceana Condominium and Club.

### CULTURAL AND DEMOGRAPHIC SHIFTS

Despite its appeal and attractions to the middle classes, Brighton Beach never reached the entertainment heights of Coney Island, but then neither did its fortunes drop as low. This was, in part, due to the diversity of the community that grew in the area. Jewish residents, in particular, held a significant cultural presence and were instrumental in the establishment of numerous neighborhood improvement groups. As an additional contrast to Coney Island, Brighton Beach was attractive to year-round residents. In order to house these new residents, developers built over 30 six-storey apartment buildings.

By the mid-1930s, the boardwalk was extended and the oceanfront had been redeveloped, in order to accommodate this crowded residential area. The race track had been replaced

by summer bungalows, and these were winterized for the new residents. The population grew further in the 1940s with the arrival of those fleeing Nazi persecution in Europe. Immigration over time from countries including Mexico, Vietnam, Pakistan, and China also added to the diversity of Brighton Beach.

The beach's popularity continued throughout the 1950s and 60s, but infrastructural problems set in and the neighborhood began to deteriorate. The population gradually shifted towards a poorer and elderly demographic. Middle-class families moved to the suburbs and their homes were converted into single-room units, many of which were not adequately maintained by their landlords. As a result of this deterioration, crime levels also began to increase.

### RECENT IMMIGRATION & REJUVENATION

The area's fortunes changed once again in the 1980s with a wave of Russian immigrants. New families and commercial enterprises enlivened the community and added to its unique cultural heritage. Russian nightclubs, stores, and restaurants opened on Brighton Beach Avenue and real estate values began to climb. Immigration continued, most of the more recent arrivals having come from Mexico, Honduras and Pakistan, and the area is now very ethnically diverse.

## BRIGHTON BEACH BEFORE SANDY

Today, the main commercial strip along Brighton Beach Avenue is bustling again and the beach and well-maintained boardwalk have attracted chess players, walkers, and those who just want to sit and enjoy the ocean air. New housing has been constructed along the waterfront, making the most of the beach views, and residents are again being drawn to the area from elsewhere in New York.

## DEMOGRAPHICS

**Population:** 31,500

**Median Age:** 45.7 years

**Median Household Income:** \$31,700

**Percentage Below Poverty Line:** 24%

**Housing Tenure:** 22% owner-occupied, 78% renter-occupied

**Median Unit Value:** \$487,000

**Cultural Background:** 70% Caucasian, 15% Hispanic, 13% Asian, and 2% Other

# DAMAGE PATTERNS

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## INUNDATION

In Brighton Beach, inundation came from the Lower Bay to the south and the neighborhood began to flood at approximately 8:15 pm the evening of October 29, 2012, according to one resident.

Homes closest to the waterfront were hit the hardest, while homes further back or on higher ground were less affected by flooding. The majority of buildings in the community experienced some level of flooding, with the highest levels of inundation being approximately 4 to 6 feet of water. Residents made several observations about the flooding, noting that water remained in the neighborhood for two days, it did not reach as far inland as Corbin Place between Brighton 13th and Brighton 14th Streets, and that wind blowing strongly towards the bay may have helped reduce overall storm surge.

Many residents stayed in the community during Sandy, including one person who spent time outside during parts of the storm. This resident noted that he is a sailor and a cave diver, so he felt safe, but does not recommend that others go outside during a hurricane. Another resident noted that this was the biggest disaster in the area in either of his aunts' memories and they have lived here their whole lives.

## HOUSING

Brighton Beach has a diverse housing inventory both in gated and non-gated communities, comprised of bungalows, lower-density 1 to 3 family attached, semi-detached, and detached homes, pre-war apartment buildings, Two- to four-storey multi-family walk-ups, rooming houses (single room occupancies), and

high rise apartment buildings.

One resident emphasized the rich history of the older buildings in the neighborhood, with some residents living in homes built by their parents or grandparents in the early 20th century. One home, located within the bungalow district, was even noted to have a building from the historical Brighton Racetrack in its backyard.

## BUNGALOWS

Bungalows make up a small section of the neighborhood, located in the “bungalow area” bounded by Coney Island Avenue to the north, Neptune Avenue to the east, Ocean View Avenue to the south, and Brighton 1st Street to the west. These homes are built on small lots “typically measuring 40x40 feet [and] are arranged along narrow pedestrian lanes on the interiors of the blocks.” This area occupies the former site of the Brighton Beach racetrack, which was sub-divided and redeveloped in the 1920s by Brighton-by-the-Sea Corporation. Several of these bungalows had been condemned prior to Hurricane Sandy.

The bungalows in Brighton Beach, like those constructed in other coastal communities in the city, are of light wood frame construction and brick, wood, vinyl, or stucco siding. A number of these are elevated approximately 2' to 3' above grade, with a basement below. These basements, which have small windows to provide light below grade, were completely flooded during Sandy. After the storm, the majority of the bungalows in the neighborhood were condemned due to damage sustained.

## ATTACHED SINGLE FAMILY

The attached single family homes in Brighton Beach are typically two storeys, with a brick exterior at the ground level and vinyl or wood siding on the upper level. In many of these homes, the first floor is elevated approximately 3' above grade, with a basement below this level. The front entrance is typically accessed by a stoop.

One resident of an attached single family home sustained a small electric fire in the basement after the storm and all of the affected circuitry in the home had to be replaced. As a result of flood damage, the floor also began to sink and all affected materials had to be removed and reconstructed. Another resident noted that their home went 20 days without power and that they needed to have a licensed electrician inspect the building.

## **DETACHED SINGLE FAMILY**

The smaller detached single family homes in Brighton Beach are much like the attached single family homes, with side yards. It is clear that many of these homes were developed during the same time period, possibly by the same developer. Other single family homes in the neighborhood are uniquely developed and vary in style and construction method.

One resident, whose home is on higher ground and only had water come up to the first step of his stoop, had his basement flooded with 2' of water from the sewer system. When the electricity went out in his home during the storm, the pump in his basement allowed water to run in reverse and enter the basement. He was unable to find a shut-off valve during the storm that could have stopped the water, but now knows where it is for the future. There are two sewer lines on this resident's block, and older one that runs through the alley and a newer one that runs on the street side. He never paid to connect his home to the new one on the street side, and feels that this may have helped him during the storm, as not as many homes are still connected to the older one. Although his basement flooded, he and his son were able to save some of their belongings located below grade, and he blocked the windows to the basement with plywood, caulk, and paper towels.

Another resident noted that floodwater flowed down their driveway into their lower level. They were inundated with approximately 5'-6" of floodwater and, among other things, their washer and dryer were destroyed. Another resident noted that it took 3 days to empty water from the basement level, and in yet another building, the tenants renting the basement level moved out, as the basement was flooded to the ceiling.

One homeowner noted that the only damage to their home that had been covered by insurance was wind damage to siding that flew off on the back of their house.

## **PRE-WAR APARTMENT BUILDINGS**

One resident, the nephew of the building owners, noted that his grandfather had built their brick apartment building in 1936. During the storm, several of the windows at the basement and ground floor levels had been broken and would need to be replaced. As these windows were older and a unique size, they would need to place a custom order. Due to the varying ages of the building stock in the neighborhood, it is likely that this would be required for several buildings and would require these homeowners to spend more on repairs than newer buildings with

stock window sizes.

In addition, the underground electrical services were damaged during the storm, and the building is now running on temporary electrical service. The nephew of the building owners and his son are now in the process of demolishing and rebuilding the basement and ground floor of the building.

## **HIGH RISE APARTMENT BUILDINGS**

Many of the residents who live in the high rise apartment buildings chose not to evacuate prior to the storm, and some stayed in place during Hurricane Irene. The basements in these buildings were flooded during Sandy, causing significant damage to electrical equipment and boilers. Due to power outages, elevators in these buildings were not operational after Sandy.

In a brick co-op building, named Brightwater Terrace, tenants and a former board member reported that the building had considered purchasing a generator years ago after a blackout affected the area. Unfortunately, the cost of implementing this was prohibitively high, estimated at \$1 million, so they did not move forward. In addition to electrical outages after Sandy, this building suffered some wind damage to the exterior of the building, particularly to awnings and flashing.

On another high rise property, 50 cars in the parking lot were destroyed by floodwater and sand. One resident noted that their car insurance is paying the full cost of the car and it is being taken to auction. It was also noted that there are many tow trucks in the area. In addition to damage in the parking lot, property management had to clean out sand from the basement level and surrounding property.

Residents in another high rise noted that their power was not restored until November 21, 2012.

## **PUBLIC HOUSING**

At least one of the public housing buildings did not have significant water damage, but remained without power for 3 days.

## **BUILDING SERVICES**

### **ELECTRICITY**

The majority of residents in Brighton Beach did not have electricity for 2 to 4 days after Sandy. However, in some cases,

power outages lasted significantly longer, within the range of 5 weeks.

## HEAT AND HOT WATER

In addition to the lack of electricity, residents were without heat and hot water for up to 2 weeks after the storm. In more extreme cases, one home was without heat for 5 weeks, and another had the heat back on the day of the field team's visit.

## GARBAGE

Residents noted that the storm generated significant amounts of garbage and debris, which had not been picked up for 2 weeks at the time of survey. As a result of the delay in garbage collection, trash lined the streets and sat in front of buildings, even blocking access to fire hydrants in some cases. One resident noted that flood waters carried garbage and debris throughout the neighborhood and into everyone's yards. He raked garbage out of his property as the flood waters receded.

## LEAKS + CONTAMINATION

At least one apartment building developed a gas leak during the storm, which has led to the risk of health problems and concern from residents about air quality. Other residents noted that residue from sewage and oil is still visible from the flooding in their basement.

## BOILER

Many residents lost their boilers due to the fact that they were stored in their basements. Some homeowners have a temporary boiler in place, while others have installed a new permanent boiler. One landlord had recently purchased a new boiler, on December 2nd, and was planning to install it within a week. This meant that residents were without heat for 5 weeks in total. Another landlord purchased electric heaters for each of the apartments in his building as an interim solution until the boiler in the basement could be fixed.

## BOARDWALK

Two residents interviewed hypothesized that the beach boardwalk acted "like a moat," protecting the adjacent apartment buildings from the storm surge. During the storm, flood water, which had a strong odor and appeared to be contaminated, reached the steps of the boardwalk. As a result, the residents were concerned about the boardwalk

being contaminated and the air quality in their building if the contaminated materials were not removed. Residents were also concerned about the lights above the boardwalk being out for multiple sections, reducing the safety of that area.

Several residents noted that the boardwalks in the area have been damaged not only by Hurricane Sandy, but also by past storms. One person interviewed noted that there used to be an esplanade that connected Brighton Beach to Manhattan Beach, the neighborhood to the east, but this was destroyed by Hurricane Donna in the 1960s and was never rebuilt.

## MOLD

One of the residents' major concerns is the handling of mold remediation, as many homeowners and landlords were not removing building materials touched by the flooding and properly drying out the structures. Many tenants refused to stay in their housing arrangements if the mold persisted, as they were concerned about the health issues associated with mold contamination. One tenant attempted to air out his basement by keeping the door open since nothing had been repaired or cleaned by his landlord. Another tenant worried about an elderly neighbor's well-being, as he had sustained flooding between 3 and 6 feet, had not remediated for mold, and was keeping his apartment closed due to the lack of heat. According to the tenant, a strong smell is detectable from the outside of the apartment and FEMA and 311 had been contacted for assistance but neither party had responded.

Other residents who were able to were being more proactive by removing damaged building materials, drying out affected areas, and replacing the sheetrock and other materials.

## PERSONAL PROPERTY

Within the neighborhood interior, cars parked on the street were damaged due to the flood waters and falling trees. One resident noted that trees that came into contact with salt water have the potential of dying, as was the case for a tree in his yard.

## DEBRIS

Along the waterfront residents worry about how long it will take to remove the debris that has gathered at the east end of the

beach, as trucks only have access to certain areas for beach cleaning. In addition, community structures along the beach, including a red brick enclosure used for lifeguard parking, were filled with sand and other debris during Sandy.

## LOCAL BUSINESSES

Banks, laundromats, and other important services took a big hit during Sandy and remained closed after the storm. At the time of survey, many businesses along the main commercial strip were still closed and without power, including medical and dental offices, and residents were not sure when they will reopen. This has left the neighborhood “without storefronts,” and it was noted that at least one medical office had to relocate.

One resident noted that his favorite bakery, Golden Chocolate Bakery, was closed, as was The King Meat Market. Although this resident was able to buy fresh meat from other locations in the city, there was concern that other residents may not be able to travel this distance. Some other businesses, such as local restaurants, were able to replace their inventory more quickly and have reopened.

## INSTITUTIONS

A local school, the Bay Academy, was hit particularly hard due to its location adjacent to the waterfront. The local branch of the public library was also closed due to the storm and the community has not received any information as to when they were reopening or what type of damage the structure had sustained. In the meantime, members of the community have been visiting the library in Coney Island.

Brighton Playground has been closed since the storm with locked gates.

## PETS

One resident the field team spoke with noted that two cats got sick as a result of the storm impact, with one cat dying due to dehydration and bronchitis after drinking sewage and salt water.

# CHALLENGES AFTER SANDY

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## PERCEIVED ABILITY TO RECOVER VS. THE REALITY

A number of residents noted a discrepancy between the response in Brighton Beach and the response in neighboring communities, including Coney Island. Unlike Brighton Beach, Coney Island was provided with assistance by Occupy Sandy, a church that organized donations, and others. A theory shared by several residents is that, since Brighton Beach is considered a higher income area and has higher real estate values, it is not getting as much attention as lower income neighborhoods, despite the prevalence of need.

## INSURANCE

Many residents in Brighton Beach did not have flood insurance. Three residents interviewed indicated that they did have flood insurance. Of these, one had had their apartment inspected, one hasn't had anyone from the insurance company come to their building, and one was experiencing a slow response from their insurance company.

Another resident noted that they did not have flood insurance, but were sold terrorism insurance by their insurance company.

## AGENCY RESPONSE

Several agencies responded within the community, to varying degrees of success. Residents noted that the National Guard took a week to arrive at Brighton Beach and that the Red Cross

set up a Disaster Relief Truck at the end of Coney Island Avenue at the boardwalk. Some residents, especially those who were able to receive assistance earlier on, responded more favorably to these official efforts than others, noting in particular that the City “did a great job.”

## FEMA

Initially, FEMA established a general drop point in the neighborhood, but did not have people going from door to door for 2 weeks. Some residents noted that they were able to qualify for FEMA assistance, receiving anywhere from \$4,000 to \$7,000. One resident used this money to purchase new furniture and a car. Another resident and his wife, who had been diagnosed with cancer, received assistance to relocate to a hotel and to replace a boiler and damaged walls.

On the other hand, many residents didn’t qualify for FEMA assistance, citing a number of reasons: union associations, not having a SSN, or renting out their basement as a living space. One resident, who has not received assistance, mentioned that FEMA is “too much paperwork, too much time” while he needs to be working.

## HOUSING TENURE: RENTING VS. OWNING

Brighton Beach is one of the few neighborhoods that we visited that has a higher percentage of renters than homeowners, with approximately 78% of all units renter-occupied. This was significant after Sandy, as many renters in this community did not feel that their basic needs were being met after the storm. While at first glance, it appeared that many of the landlords in the area were simply negligent in making repairs, speaking with a building owner that rented out his units revealed a more complex scenario.

Several residents the field team spoke with were frustrated with their current living conditions and felt that their landlord was not doing their best to help the building recover. In one case, a tenant felt as though a hired electrician didn’t do his job properly and that the building owner should have tried harder to get the work done effectively. Because he feels that part of the problem was due to negligence on the owner’s part, the tenant has attempted to deduct the days when the building did not have hot water, heat, and electricity from his rent, causing a dispute with the owner who is requesting that he pay the full amount. The tenant was worried that other residents in the building, especially elderly residents and non-English speakers,

will continue to pay the full amount of rent if asked. Other residents noted that their building is in bad condition, with warped staircases and walls that have not been replaced. In this case, they felt that the landlord simply doesn’t care and that the building has not been inspected after the storm. In another case, a tenant owned appliances that were damaged and was trying to come to an agreement with the owner who had received FEMA assistance.

From another perspective, many landlords in the area had a difficult time obtaining assistance to finance reconstruction and were dependent on the income coming from their tenants to make repairs. When tenants did not pay rent or vacated their damaged apartments, this made it even more difficult for landlords to take care of the damages to their buildings.

In one case, tenants who owed 2 months of rent moved out because their basement apartment was flooded to the ceiling. In another case, the landlord has been unable to remediate the mold in the basement units and tenants there will need to move out. In another case, a landlord who was seeking assistance for recovery was unable to receive FEMA funding, since the damage sustained was to rental units and was thus considered damage to a business. Homeowners in this position were told to seek small business loans.

## LANGUAGE

Brighton Beach is a diverse neighborhood, with residents of many nationalities. A number of residents are not English speaking, and thus require translation services throughout the recovery process. One volunteer from the Shorefront Y noted that he had a team of Russian translators working with him in order to communicate effectively with residents.

## ELDERLY RESIDENTS

Many residents that live in Brighton Beach are elderly and, due to physical limitations, some of these residents were unable to perform repairs or clean out their homes after Sandy. Some elderly residents had family to assist in this recovery process and ensure that they had everything they needed to safely and comfortably stay in their homes.

One resident expressed concern that his aunts’ car was flooded and that they would be more homebound after Sandy. He wanted

to make sure that their apartment would be fixed and that they would be comfortable for their last few years, and that they would not have to relocate to a new apartment. Luckily, their health was not impacted by Sandy.

# COMMUNITY CAPACITY

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## COMMUNITY SUPPORT

After Sandy, the community received support primarily by three local organizations: The Bay Improvement Corporation, Cleanup Sheepshead Bay, and the Shorefront Y. The Bay Improvement Corporation organized a large number of clean ups and Cleanup Sheepshead Bay was organizing and sharing information on Facebook. The Shorefront Y, the primary community center in Brighton Beach, was coordinating volunteers and conducting building surveys of the high rises to understand the extent of the damages. They were also organizing weekend volunteers to assist in gutting and cleaning flooded basements, and organized food and water deliveries to residents living in the high rises. In addition to this support from the Y, other volunteers came through the neighborhood to donate cleaning supplies for clean up efforts.

Although there was generally a positive response in regards to these efforts, residents noted that information wasn't being shared amongst the various groups and government organizations responding in the community.

In addition to more formal support, neighbors also came together to help each other where they could. Neighbors exchanged food with each other, especially those with working freezers.

## TIME IN THE NEIGHBORHOOD

Although there are residents in the neighborhood who have moved here in recent years, there is also a significant population of people who have lived in the community for decades or their whole lives. Other residents noted that their building was



constructed by previous generations of their family and has been passed down.

## **DECISION TO STAY OR RELOCATE**

Many homeowners and renters who were strongly rooted within the community chose to stay in place and rebuild. Elderly residents, for whom it was critical to be able to stay in place, often had family members or organizations helping them recover so that they could stay rooted within their homes and communities.

However, the field team noted that many residents had chosen to relocate. This seemed to be especially true of renters whose units suffered damage and were not being repaired as quickly as they would have liked.













# IDEAS FOR RECOVERY

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## PSYCHOLOGICAL ASSISTANCE

One resident suggested that providing psychological assistance would assist the community throughout the recovery process.

## GENERATORS OR OFF-THE-GRID SYSTEMS

Due to the lack of heat, electricity, and power, one resident suggested that providing access to small generators would restore comfort and help residents run appliances and electricity.

Another idea is to consider how these homes could operate effectively off the grid in cases of emergency, so that they would not be affected by larger scale power outages in the future.

## BOARDWALK RESTORATION

Brighton Beach residents, especially those that lived along the waterfront were concerned about the boardwalk restoration. They felt that the damaged portions should be repaired using wood rather than concrete.

## THIRD PARTY CASE MANAGEMENT

As was the case throughout the city's coastal communities, residents in Brighton Beach were frustrated by the insurance claims process. One resident felt that a third party case management service that could answer questions, gather necessary information, and keep residents informed of the

status of their claims would make the recovery process smoother.

## COMMUNITY GARDEN RESTORATION

One resident noted that a lot of community gardens in the area were destroyed by Sandy and needed to be restored. In addition to restoration work days, this would also require environmental assessments to determine if the gardens had been contaminated by sewage, fuel, or other toxic substances. This could impact what could be planted in the garden, as it may not be safe for residents to plant edible items or may require additional remediation.

## ACCESS TO GROCERY STORES

In several cases, Hurricane Sandy revealed conditions that were present before the storm that needed attention. Walkable access to healthy food and grocery stores was one problem that was cited several times throughout the Coney Island peninsula. After Sandy, the inability to obtain quality food within walking distance was exacerbated and became even more evident when cars were destroyed and residents had to rely on walking and public transportation services that were operable. In other cases, residents that could easily access grocery stores still encountered problems after Sandy, when these facilities were temporarily inoperable due to electrical outages.


These conditions highlight the need to ensure that critical food sources, especially in areas that are considered geographically isolated, are taken into account as an important component in the infrastructure that needs to remain operable in times of emergency. In order to make grocery stores and other food stores more resilient, business continuity studies could reveal vulnerabilities that need to be addressed, electrical systems could be upgraded and reconfigured to ensure that these businesses remain operable, and space planning and retrofitting can help ensure that inventories are not completely lost during future events.



04

**QUEENS**





# BREEZY POINT





# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION AND AREA SURVEYED

Breezy Point is a low-lying land spit, located on the southwestern tip of the Rockaway peninsula. This land area is bounded by the Rockaway Inlet to the north and the Atlantic Ocean to the south. The neighborhood is surrounded by the Gateway National Recreation Area, managed by the National Park Service, which includes Jacob Riis Park and the decommissioned military base of Fort Tilden to the east and Breezy Point Tip park immediately to the west.

The field team visited the entire neighborhood of Breezy Point, completing approximately 264 visual surveys. At the time of survey, the neighborhood as a whole had suffered severe damage, most of which had not been repaired. Residents were experiencing a range of difficult emotions and were busy sorting through debris and dealing with the critical tasks that needed to be done for their homes while they had daylight hours. As a result of the level of trauma and stress within the community at the time of survey, interactions with residents were limited to those who had time to talk and felt up to it. The field team was careful not to disturb people working, and thus opted to perform visual surveys instead of the more exhaustive surveys completed in other neighborhoods.

## HISTORY

### LAND FORMATION THROUGH DEPOSITION

Prior to the Civil War, the landmass on which Breezy Point sits was largely nonexistent. According to the U.S. Geological Survey, the westward extension of the peninsula formed after the construction of the Breezy Point jetty (designed to prevent

natural sand deposition from filling Rockaway Inlet) and the creation of a groin field (intended to protect the beaches at nearby Fort Tilden). The landmass west of Jacob Riis Park developed within a century through natural westward long shore drift along the southern coast of Long Island. Although this formation of new land area continues today, the changes implemented to encourage sand deposition at the western end of the Rockaway peninsula have also impacted the deposition processes along the Coney Island landmass, leading to higher rates of erosion there.

### EARLY NEIGHBORHOOD DEVELOPMENT

This beach-side community was initially developed in the early 1900s by the Rockaway Point Company as a summer vacation spot for working class families. This company rented tent sites for approximately \$20 per summer for visitors, many of whom were Irish immigrants. By the 1920s, a colony of summer bungalows had been constructed by owners on rented land. Over time, the community at Breezy Point continued to develop, primarily consisting of vacationing residents from areas of Brooklyn such as Marine Bay, Sheepshead Bay, and Flatbush. The construction of the Cross Bay Boulevard in 1923, as well as other improvements to transportation infrastructure, made access to the Rockaway peninsula easier, and encouraged the further development of year-round communities.

### THE CREATION OF A COOPERATIVE

In 1961, Northern Properties purchased 1,200 acres of land west of Jacob Riis Park (excluding Fort Tilden) for \$17.5 million. In response to Northern Properties' plan to redevelop the area and construct high rises to house 220,000 people, residents joined together to buy back approximately 420 acres for \$11.5 million. Through this process and a mutual desire to protect their community from unwanted change, the Breezy Point Cooperative was formally established. The remaining land not owned by the cooperative continued to be developed under the control of the Atlantic Improvement Company. This, including the construction of two 14-storey apartment buildings, lasted until 1963, when the city announced plans to acquire the western end of the Rockaway peninsula for parkland.

In 1978, the apartment towers were demolished and the City placed restrictions on all new construction and developed plans to demolish the residential areas. In response, the Breezy Point Cooperative sued the City over land rights, which led to a dispute that would continue for several years. In 1982, a compromise was reached: the Breezy Point Cooperative would retain the title

to their land and the remaining city-owned land would become part of the Gateway National Recreation Area. Two years after the settlement was reached, building restrictions put in place by the city were lifted.

## BREEZY POINT BEFORE SANDY

Since the establishment of the Breezy Point community, it has developed into a multi-generational residential base, which has grown to over 2,800 homes. Today, Breezy Point is a predominantly white residential neighborhood, home to a large number of New York City sanitation workers, police officers, and firefighters.

Due to the Cooperative's stringent rules on home sales and development, which is limited to the enlargement or replacement of existing buildings only, the neighborhood has remained relatively stable over time. A number of the original bungalows have been demolished to make way for larger newly constructed homes and the remaining bungalows have since been winterized for year-round use. This has created an eclectic mix of housing styles within the community, including stucco-sided Mediterranean-style homes, wooden-sided contemporaries, hip-roofed bungalows, and saltbox-roofed colonial homes. A 2008 profile of the community by the New York Times notes that the ratio of permanent residents to vacationers is approximately 3 to 1 in Breezy Point, with a full time population approaching 5,000.

## DEMOGRAPHICS

**Population:** 4,079

**Land Area:** 0.78 square miles

**Density:** 5,230 people per square mile

**Median Age:** 49.4 years

**Median Household Income:** \$86,941

**Percentage Below Poverty Line:** 1.9%

**Housing Tenure:** 95% owner-occupied, 5% renter-occupied

**Median Unit Value:** \$557,300

**Cultural Background:** 98% White, 1% Latino, and 1% African American

# DAMAGE PATTERNS

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## INUNDATION

Breezy Point lies just above sea level, with homes situated at elevations ranging from approximately 3.5' to 6' above sea level. Due to its location on the Rockaway peninsula, the community was inundated from both the inlet to the north and the ocean to the south. Storm surge affected the areas closest to the ocean, and the entire neighborhood was flooded, with water levels ranging anywhere from 1 to 6+ feet.

Many residents did not evacuate during the mandatory evacuation order, as they thought that Sandy would be like Irene in 2011. One resident noted that her son had to evacuate her in a wheelchair during low tide, while her neighbor had to jump into the water in the street during high tide because the gas line in their home exploded.

## FIRE

In the immediate aftermath of Hurricane Sandy, several communities on the Rockaway Peninsula were affected by fires, which were caused by the interaction between salt water and electrical equipment. In Breezy Point, the origin of the fire is believed to be an electrical short due to flood waters, which ignited an unoccupied home at 173 Ocean Avenue in the area known as "the Wedge." Within the dense fabric of the Wedge, there are no roadways, and access to homes is instead provided by sidewalks and unpaved beach walks that weave between the closely situated homes. Once the home at 173 Ocean Avenue was ignited, wind caused the flames to spread to adjacent homes to the northwest. Due to the flooding at the time, the volunteer fire houses were not able to respond to the fire and, ultimately, 126 homes were completely destroyed

and an additional 22 were damaged (Kleinfield). Residents in Breezy Point estimate that they were finally able to put the fire out 4 hours after it started. However, they had a difficult time executing this as they were using hoses that drew water from the flooded streets, which kept clogging with debris.

## A RESIDENT'S STORY OF THE FIRE

One resident who stayed in his home with his family during Sandy showed the field team his lot and shared his story about how he watched the fire spread across the neighborhood and approach his home. They approached the lot from the path on the ocean side, as it was less emotional for him to arrive along this path because the devastation was less visible than from the other approach. This lot has been in his family for over 20 years. A few years after they moved into the house, he and his wife were expecting their first child (of four) and demolished the bungalow that had been on the site to build a new two-storey home. He had drawn the plans and had a contractor build it in 1992.

They chose to remain in their home, as they thought the storm would be like Hurricane Irene. However, at about 6:30 pm, water began to rush up the beach walks, rising to 1 to 2 feet, the most he had ever seen. Around 9 pm, they became nervous about the rising water and moved valuable items upstairs, including their daughter's Irish dancing outfits, and were preparing to leave the house. 30 minutes later, he smelled something burning and went outside onto his deck, where he saw a house on fire, about 10 houses away from his.

He called his friend who works at one of the volunteer fire departments, but unfortunately the firefighters were stuck on the second floor of the firehouse and were not able to get their trucks out, as they were sitting in several feet of water. The fire was spreading, but he thought the path would not cross their home and stayed to watch. Unfortunately, the fire spread until it engulfed his neighbor's home, at which point, his wife grabbed their insurance papers and they went out the back exit of their house. They waded in several feet of water, pushing their youngest son on a surf board, to a neighbor's house a few houses down. They had to move once more to a safe spot on the opposite end of Oceanside Avenue when the fire reached their neighbor's home.

Despite this hardship, they want to rebuild, noting that everyone in the area devastated by the fire has told them the same thing.

## SAND

Storm surge moved high volumes of sand from the beaches and residents estimate that there was a depth of approximately 2 to 3 feet of sand carried from the beach into the neighborhood.

## HOUSING

The housing inventory in Breezy Point is predominantly comprised of single family housing in the form of bungalows and newer single family homes. The majority of these are light wood frame homes, considered “combustible” by New York City building codes. At the time of survey, the field team found that almost every home had been affected in some way by the storm, with approximately 51 homes (19% of those surveyed) receiving a red tag, 65 (25%) receiving a yellow tag, and 115 (44%) receiving a green tag by the DoB. The remainder were either unknown or had not yet received a designation.

The areas closest to the ocean suffered the most extensive structural damage due to storm surge, while the homes at the interior suffered damage from flooding or, in a portion of “the Wedge,” were destroyed by fire (in which case only the foundations remain). Some of the homes in the neighborhood have been raised off of the ground approximately 2 to 3 feet, which reduced the flood level on the first floor.

Regardless of whether they had been raised or not, the first floors of homes that did not have to be demolished had to be gutted to above the flood line, dried out, and reconstructed. Much of this work had been or was being done at the time of survey.

Several additional patterns were evident across both housing types. Many of the homes had wooden decks, which were either destroyed or had separated from the homes. At least one resident noted that, although her home was not structurally damaged, she had received a yellow tag from the DoB because her deck was structurally compromised. Another resident noted that their neighbors deck, which had become detached during the storm, was ramming against their home and causing damage. In addition to the decks, wood and vinyl siding was missing from homes in many cases, as were roof shingles and canvas awnings covering many of the porches. Others reported leaky roofs caused by roof damage.

Several residents noted that they had just finished major renovations prior to Sandy. One resident, who was very proud of his renovation, was in the process of re-renovating his first floor to deal with Sandy damage. Although he had to discard the majority of the building materials removed from his home, he was able to salvage and re-use the marble counter tops from his cabinets.

## BUNGALOWS

As in the other coastal communities with the bungalow typology, the bungalows in Breezy Point were especially hard hit during Sandy. Many of these homes had been passed down from generation to generation, with one resident noting that his bungalow was constructed in 1930 and his family had owned their home for 75 years. This made it especially difficult for residents after Sandy, as these homes have had a long history, full of personal memories.

During Sandy, many of the bungalows in Breezy Point were either completely destroyed or suffered severe structural damage as a result of being shifted off of their foundations. The majority of the bungalows had concrete block foundations, which were easily damaged during the storm. In some cases, the blocks separated from one another, especially at the corners. Damages to the foundation had significant impacts on the rest of the bungalow, including damage to main structural elements and, in some cases, the separation and cracking of the floor.

One couple noted that sand and debris had been pushed under their deck and crawl space. As a result, the wood siding on their home, their deck, and their floor had been pushed up. They noted that there was a large crack in their living room floor, which looked like it was separating. In addition to the work they had to do to remediate the damage on their first floor, they also needed help removing the sand and debris under their home, which they noted smelled “like a cesspool,” so that they could address any structural damage that may have occurred and properly remediate for mold damage. They had just renovated their home prior to Sandy and wanted to fix the home, but were considering demolition, which was free before December 31st. They planned to discuss this with the DoB to see if the damage to their structure was significant, so that they could make a proper decision.

In many cases, the bungalows were tightly arranged next to one another, which meant that as one bungalow was lifted off of its foundation, it posed the threat of causing damage to its neighbor. This arrangement also proved to be a fire hazard,



illustrated by the devastating fire within the “Wedge.”

Another pattern that was evident in many of the bungalows was damage to the roofs that were designed to extend several feet beyond the home to create a covered entry porch. For many of these homes, the corner support columns holding up the roof either buckled or were knocked out, causing the extended portion of the roof to collapse.

One resident, whose bungalow was constructed in 1930, noted that his home was valued at \$400,000. In addition, he had recently spent \$60,000 doing asbestos abatements and \$7,000 on a new boiler prior to the storm. The high value and costs associated with even a smaller home in the community is worth noting as, although many of these homes have been passed down for generations and have long been paid for, uninsured losses and damages quickly reach a value that surpasses the capacity of homeowners.

### **NEWER SINGLE FAMILY HOMES**

With the exception of the homes closest to the ocean and those destroyed by fire, the majority of the newer single family homes did not sustain structural damage as severe as the bungalows. Many of these homes suffered typical flood damage and nonstructural damage to items such as porches.

In some cases, homes that would have been structurally sound on their own suffered damage resulting from neighboring homes. One couple shared that their house and foundation were strong, but their neighbors house had been lifted off of its foundation and had crashed into their home. Their neighbors house had already been demolished and removed. However, the young couple had to relocate to an apartment and were not able to move back home until their damage was remediated.

Many of the newer homes had basements, which were completely flooded during the storm. It was noted that basements in this neighborhood lie below the water table, and thus have had sump pumps installed to address flooding. One resident, whose home was destroyed by the fire, noted that his home had a concrete block foundation, which began to leak during the storm. In several cases, the basements were filled with debris, muck, sand, and garbage.

## **BUILDING SERVICES AND INFRASTRUCTURE**

Many residents noted that they lost all services during and after the storm, including electricity, gas, and water. There was no power within the community for an extended amount of time, as power is supplied by the Long Island Power Authority (LIPA) and their power plants sustained damage during the storm. In addition, many of the homes in Breezy Point had to replace the wiring, electrical panels, and other electrical elements for the first floor and basement. Electrical infrastructure throughout the neighborhood also had to be repaired or replaced, including electrical poles.

Many of the homes with basements kept their critical equipment there, which meant that boilers and water heaters had to be replaced. Another family noted that they kept their generator on their front deck, which was reached by flood waters.

Sewer lines and septic tanks were also affected in some cases. One resident noted that their sewer line had been moved 4 feet during the storm and would need to be reconstructed.

## **DAMAGE FROM CLEANUP**

Although this was not a common occurrence, one family noted that their property sustained additional damage from the cleanup process after the storm. A bulldozer had come through to remove debris the day before the team’s visit, and damaged their roof eave and collapsed the septic tank in the backyard.

## **LOCAL BUSINESSES AND COMMUNITY CENTERS**

Although Breezy Point is a predominantly residential neighborhood, there are several businesses and community centers within the community, which were also hard hit by the storm. At the time of survey, the field team spoke with a learning center, which had lost all of its computers, books, and learning materials due to the storm and was working on reacquiring new materials. In this particular case, Habitat for Humanity was assisting with the remediation and cleanup of their facility.

## PERSONAL BELONGINGS

Many residents were conscious of the fact that there would be flooding and took precautionary measures to protect their belongings. One couple shared that they had placed their inherited valuables on top of their bed before evacuating. Luckily, the flood water within their home came within 1" of the top of the bed and their valuables were spared. Several other residents took their cars with them when they evacuated or moved them to other neighborhoods to protect them from the flooding. Unfortunately, many residents who did not take this precaution lost their cars to the flooding.

At the time of survey, many found objects had been placed carefully throughout the community, including children's toys. One man noted that military plaques from a memorial on a beach far away had drifted into his house during the flooding.

Residents whose homes were consumed by the fire suffered, overall, the greatest loss of their personal belongings. One resident noted that, in addition to the personal items within his home, he had a workshop in his basement with power tools, which would have been helpful to have after the storm.

## PETS

Many residents in Breezy Point remained home to weather the storm, staying with family and pets. When water began flooding into their homes, residents evacuated with their families, but in some cases left their pets behind. One resident noted that a neighbor's dog died during the storm. Other residents found pets wandering through the neighborhood and fostered them until their owners could be found.

# CHALLENGES AFTER SANDY

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## INADEQUATE SPACING BETWEEN HOMES

Many of the homes within the Breezy Point community are constructed in close proximity to one another, as the homes were originally built as summer residences prior to the implementation of new building code and zoning regulations. In one area in particular, "The Wedge", the homes are separated only by walking paths and vehicular access is not provided. While this spacing has partially contributed to the strong ties within the community, it also posed a challenge after Sandy. Without vehicular access to the homes, fire fighting and repairs were significantly harder to accomplish.

## PRICE GOUGING

Although there were many reputable, honest contractors working within the community, at least one resident reported contractor price gouging. This further exacerbated the challenges she experienced while trying to recover.

## RUBBLE SORTING

For many of the homes that were completely collapsed or burnt down, residents had to sort through the rubble to recover personal belongings. This was a lengthy and difficult process, and at least one resident noted that they could use additional help salvaging what they could.

# RELOCATION

## HOMES

Due to the severity of damage to the homes in the community, many residents had to relocate to live with family, friends, or neighbors, often located in other parts of Brooklyn or Queens.

## SCHOOLS

Many residents that attended schools in the community had to be relocated to study elsewhere. One resident noted that she had to be relocated to a school that had been closed for 5 years, which was reopened for this emergency. She noted that she had seen cockroaches in the school, and that it “feels like a dungeon.” Another noted that his son’s school had burnt down, and his daughter’s school was providing temporary room and board for her.

# EMOTIONAL IMPACT

The residents of Breezy Point are a resilient, self-sustaining, tight-knit community, which came together after the storm to help one another. Regardless of the support available, residents experienced significant levels of stress and a wide range of difficult emotions as a result of their experiences during and after Sandy.

In addition to the damages and losses caused by the storm itself, additional stressors developed after the storm, including debate about the fate of their community. Residents noted that rumors were circulating that the city would demolish homes in the area without giving notice. This caused worry that something would happen to their homes while they were away from the community.



























# IDEAS FOR RECOVERY

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Given the state of the neighborhood at the time of survey and feelings of uneasiness about the future of the community, there was less conversation on site about the community's ideas for addressing resiliency and more emphasis on what had happened and how residents were coping. It was also clear while the field team was on site that the community was very proactive, planned to rebuild their homes as fast as possible, and was very much leading their own recovery. As a result, there are fewer ideas offered here for addressing resiliency during the recovery process.

## RECOVERY GUIDANCE

Given that the homeowners in Breezy Point are leading the reconstruction of their homes, field team members thought that it could be beneficial to provide homeowners with additional support and guidance throughout the recovery process. A homeowner guidance program could provide homeowners with the information they need to make informed decisions about how to proceed with renovations, demolition, and reconstruction, based on information about their insurance, financial support available to them, new building codes in place, and a variety of other factors.

## COLLABORATIONS WITH ARCHITECTS

Although Breezy Point is managed by a cooperative that has a set of rules, homeowners are allowed to rebuild, renovate, and adjust their property as they see fit. While this piecemeal system has worked in the past, it has not been able to scale well with the growing needs of the community.

In addition, many of the homes have been designed either by homeowners or home builders, not by architects. By collaborating with an architect or group of architects, the community may be able to resolve some of the systemic issues that contributed to vulnerability within the community. This process could lead to the generation of potential approaches to adapting the building inventory, such as how to reconfigure the beloved bungalow typology to be more resilient, how to address the problems posed by the close proximity of structures during the next disaster, and how to develop solutions for the community that include planning processes for the larger landscape, among others.

## POLICIES

Several residents noted that they want to see stronger building codes implemented, have standards in place for better-protected equipment, and comprehensive management of the shoreline.



An aerial photograph of Broad Channel, New York, showing a complex network of waterways and land parcels. The water is dark, and the land is a mix of light and dark gray tones. A white circle highlights a specific area on the eastern shore, near the tip of the channel. The text "BROAD CHANNEL" is overlaid in large, white, bold, sans-serif capital letters in the upper right quadrant of the image.

# BROAD CHANNEL



# NEIGHBORHOOD OVERVIEW

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## GEOGRAPHIC LOCATION AND AREA SURVEYED

Broad Channel is located on the southern section of Rulers Bar Hassock (also known as Broad Channel Island), the only populated island within Queens' Jamaica Bay. Sited within Big Egg Marsh, the community is approximately 4 blocks wide and 20 blocks long, with wildlife refuges, wetlands, and parks dominating the remainder of the island. Bridges to the north and south connect Broad Channel to the neighboring communities of Howard Beach and Rockaway Beach respectively, and are linked by Cross Bay Boulevard, the only through road.

Architecture for Humanity's field team visited the majority of the neighborhood, within the bounds of East 6th Road to the north and East 20th Road to the south. Team members also spent time visiting the community with one resident by boat. The initial canvass of the neighborhood took place in early December 2012. A field team member returned to the community in October 2013 to document progress that had been made in the community since the initial canvass.

## HISTORY

### EARLY DEVELOPMENT

This area of Jamaica Bay was inhabited by the Canarsee and Jameco branches of the Lenape Nation until the early 17th century, when European settlers began to establish a small community on the island. Until the late 1800s, the community consisted primarily of a few angler's shacks and could be reached only by boat. The bay's rich natural ecology provided important sources of food for both the Native Americans

and early European settlers, who drew sustenance from the surrounding waters.

The area surrounding Jamaica Bay remained largely undeveloped until the late 1800s, when major infrastructural "improvements" and landscape modifications took place to establish new transportation routes. The first major development was a railroad running north-south across the bay, with a stop and fishing pier opening in Broad Channel in 1881. With the railroad providing additional access to Broad Channel, a hotel and saloon were built, and fishing and clamming became more commercialized in the area.

### NEIGHBORHOOD BEGINNINGS

In 1915, the land upon which Broad Channel now sits was leased from the City by the Broad Channel Corporation and then passed onto individuals who built permanent single family homes and summer bungalows, ultimately with renewable 10 year lease terms.

By 1916, the Board of Health declared Jamaica Bay polluted and prohibited fishing. Despite this assessment, Broad Channel continued to grow with the development of additional access routes. A trolley line, built to connect Brooklyn with Rockaway Beach, crossed over the island. In 1923, the Cross Bay Boulevard was constructed. Within 5 years, a larger residential community developed. A series of nine inlets were dredged along the western shore and the dredged earth was used to fill in and construct approximately 15 short streets. This development was further fueled by the construction of the southern Cross Bay Parkway Bridge in 1939 (reconstructed in 1970 and later renamed Cross Bay Veterans Memorial Bridge). Between 1950 and 1955 the railroad route was realigned, drastically changing the shape of the islands in the bay. In order to maintain connection to Broad Channel, a subway station opened in 1956.

Over time, the Broad Channel Corporation built out the infrastructure for the town, including additional streets, boardwalks, water mains, fire hydrants, a well, and a power station. As expansion continued, sections of the marshlands were filled in to accommodate growth. A number of homes were constructed along the inlets, many with docks providing boat access to the bay, leading to the town being occasionally referred to as "the Venice of New York." Due to the marshy ground conditions, many of these homes were constructed on stilts. For many years, these homes used septic tanks, as there was no central sewer system.

## LEGAL WRANGLINGS

The City retained the title to the land upon which Broad Channel was constructed and, after years of litigation, the City took possession of the area's property titles when, in 1939, the Broad Channel Corporation filed for bankruptcy. Plans were made to further develop the island, but were resisted by residents and in 1982 homeowners were allowed to purchase the titles to their land. The average value of these properties rose rapidly, from an estimated \$10,000 to \$100,000.

## BROAD CHANNEL BEFORE SANDY

Today, Broad Channel is comprised of a close-knit community of approximately 2,400 residents. It is served by two churches, a library, post office, and a compact business district lining Cross Bay Boulevard. Many families have lived in the neighborhood for generations and are deeply embedded within the landscape, both physically and culturally. Many residents have been strong advocates of protecting the local environment and have played a crucial part in improving the wider area, including the waters of Jamaica Bay. In 2011, the community worked together to oppose an expansion of Kennedy Airport into the bay.

## DEMOGRAPHICS

**Population:** 2,400

**Median Household Income:** \$78,200

**Percentage Below Poverty Line:** 1%

**Housing Tenure:** 78% owner-occupied, 22% renter-occupied

**Median Unit Value:** \$424,000

# DAMAGE PATTERNS

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## INUNDATION

The narrow neighborhood of Broad Channel is situated on a marsh that juts into Jamaica Bay, in one of the lowest lying areas of New York City. Surrounded by water on all sides, this area is highly susceptible to flooding; from tides, heavy rain, and storm surge. Tidal flooding occurs approximately twice a month and residents have learned to live with these conditions. In fact, in a recent profile of the neighborhood by the New York Times, Broad Channel is described as “a place where residents cling to tide clocks and, some joke, every child gets wading boots for Christmas. Neighbors will honk a car horn in the middle of the night to warn others of an approaching tide, and some have made pencil markings on their homes to show water levels from storms past.” However, the severity of the surge from Hurricane Sandy, which inundated the neighborhood from the both the east and west, took everyone by surprise.

One resident that the field team spoke with noted that water rose to an unprecedented height during the storm and was strong enough to topple several homes into the bay. In addition, the sewer system backed up, fuel tanks were dislocated, and there was contaminated water everywhere. The water drained quickly after the storm, allowing residents to see the damage.

## HOUSING

As Broad Channel was inundated from both the east and the west, the majority of the homes in the area were impacted. In addition to water damage, the homes on the east side of the island sustained wind damage.

The majority of the homes in Broad Channel are single family

homes and typically fit into three categories: bungalows, narrow two-storey single family homes, and larger single family homes. Many of these homes are elevated anywhere from 1 to 4 feet, and the bungalows and older single family homes are typically constructed on concrete block foundations. Many of these homes also have occupied basements, with windows providing daylight below grade.

In addition to basement and first floor flooding, damage to exterior siding was one common pattern that was seen throughout the neighborhood. At the latest survey date in October, 2013, a field team member noted that several homes had stripped the siding down to the insulation and were in the process of repairing the exterior of the building. Also at this time, several of the homes with basements had boarded up or filled in the basement windows, seemingly in an effort to prevent future flooding through these openings. Many homes had elevated their electrical equipment onto platforms several feet above grade (notably still below the waterline reached during Sandy), although others had replaced the electrical equipment but not elevated it.

### **BUNGALOWS**

The bungalows in Broad Channel experienced much the same damage as those in New York City's other coastal communities.

One homeowner on the west side of the island, a former ranger in the Jamaica Bay Wildlife Refuge, had his first floor completely submerged during the storm. In December 2012, he noted that the inside of his home reeked of mold and was taking forever to dry out. It was clear at this time that mold will be a persistent issue for a lot of people in Broad Channel.

In October 2013, a field team member noted that, at this point in time, many of the damaged bungalows remained unoccupied or were listed for sale. Others were just beginning the process of being gutted and reconstructed. One such bungalow had sustained significant damage to the roof, with a hole opening to the interior.

### **NARROW TWO-STOREY SINGLE FAMILY HOMES**

These homes have a similar footprint, construction method, and architectural aesthetic to the bungalows. One resident, who was in the process of rebuilding his home in December 2012 with the help of his family and neighbors, showed the volunteers the inside of his home and the damage caused by the flooding. He remarked that the water rose up to six feet in his house, in "less

than 15 minutes," and receded quickly as well.

Another resident estimated that he lost approximately \$50,000 worth of antiques, as his house was flooded with 4' of water. He was at home as his house was being inundated and tried to save as much of his belongings as possible, relocating them to the second floor of his home. At the time of survey, he was in the process of resolving claims with the insurance companies and seeking FEMA assistance. However, he noted that FEMA was only providing assistance if they received property assessments from insurance companies.

In October of 2013, it appeared that only one resident in Broad Channel was in the process of elevating his home. He had sustained significant damage on the first floor of his home and had his home lifted and on a temporary foundation. He was in the process of constructing a new garage below his home.

### **LARGER SINGLE FAMILY HOMES**

Although the majority of the community is comprised of the characteristic bungalows and narrow two-storey homes, a number of larger, new construction single family homes are scattered throughout the community. Although it can be extrapolated that these homes experienced the same level of water inundation as the other homes in the community, they appeared to sustain less significant overall damage than the older homes in the neighborhood.

The exception to this rule are the homes built out over the bay, raised on stilts above the water. During Sandy, the storm surge caused structural damage to several of these homes, causing some to even topple into the water.

### **DOCKS**

On the western end of Broad Channel, man-made inlets off the bay separate the streets, and many homes have docks in the back with boats. Many of these docks were severely damaged during Sandy and, at the time of the team's visit, at least one resident was in the process of reconstructing theirs.

## **BUILDING SERVICES**

Residents of Broad Channel were typically without power for two weeks and, at the time of initial survey in December 2012, many homeowners were in the process of replacing their electrical systems, including receptacles and electrical panels.

## INFRASTRUCTURE

One piece of infrastructure that is unique to Broad Channel is “the street,” an accessible elevated wooden walkway that provides access to several homes on the eastern end of the island. According to one resident the team spoke with, the community had been asking the City to strengthen this boardwalk for years to no avail. The boardwalk was structurally damaged during Hurricane Sandy and, without this path, residents who live off of “the street” can only access their homes by boat during high tide. Several residents haven’t been able to reach their homes since the storm and do not know how much damage they’ve incurred.

## DEBRIS

At the time of survey, wet debris was in the process of being removed from homes. Residents noted that “diesel and propane tanks were floating all over [and the] debris shot down most of the roads.” Several trees throughout the neighborhood were either removed by the storm surge or had to be cut down after the storm.

## PERSONAL BELONGINGS

The water levels in Broad Channel rose so rapidly that people didn’t have time to save their belongings by bringing them to the second floor, if they had one. The rapid rise of water meant that residents couldn’t relocate their belongings to higher floors if they were available. One resident lost about \$50,000 worth of antiques because his house flooded.

In addition to the belongings in their homes, residents in Broad Channel noted that their boats, dockside storage containers, and fuel tanks were displaced and/or damaged during the storm surge. Flooding also damaged the vehicles that remained in the street. During the time of survey, volunteers noted that “dead vehicles” lined Cross Bay Boulevard, waiting to be towed away.

## SAFETY

Despite a curfew being put in place for the first two weeks, several residents were concerned with looting and other acts of crime taking place.

# CHALLENGES DURING RECOVERY

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## AGENCY SUPPORT

At the time of survey, residents mainly discussed the FEMA response in the community and issues that had developed throughout the insurance claims process. The City of New York had representatives in the area, conducting a Full Service Survey with the National Guard in order to restore heat within the community. Additionally, they were able to provide shelter or a hotel room for residents whose homes were not habitable and noted that Nurse Service referrals are available for elderly residents in need at the Restoration Centers in Queens or by calling 311.

When discussing FEMA’s response in the community, residents citing varying degrees of assistance. One resident noted that FEMA had been a help and was providing financial assistance in amounts varying from \$3,000 to \$30,000, depending on damage. Another resident noted that FEMA and the Federal Flood Insurance Program had helped the community by handing out \$300 cards for food and supplies.

Despite this support, many in the community did not respond positively to FEMA’s presence in the neighborhood. One person the field team interviewed noted that funding was only available for the homeowners in the neighborhood, not for commercial properties. In October, 2013, several residents had placed signs saying “Stop FEMA now” in their windows facing the street.

## DECISION TO STAY OR RELOCATE

Broad Channel is a tightly knit community largely composed of blue collar civil servants; fire fighters, police, sanitation, and EMT employees. Residents feel a strong sense of connection to

the ocean, the surrounding environment, and their community. The majority of residents chose to stay and rebuild, but one resident expressed concern about the number of other residents who would return after Sandy, stating: “the ocean is our way of life, we fish, sail, it’s part of us...we don’t want to move...but some neighbors lost everything and around 25% [of them] are starting to relocate.” On West 12th Road, which sustained heavy damage, only about half of the families have returned.

# COMMUNITY CAPACITY

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## COMMUNITY SUPPORT

In Broad Channel, the community has self-organized and residents are helping each other recover. Local organizations have played an important role in this process. The local Veterans of Foreign Wars (VFW) post and the Church of Latter Day Saints have been serving the community by collecting and distributing donations. The American Legion Hall donated its space and had been set up as the recovery headquarters for FEMA, Con Edison, and the Red Cross.

## ENVIRONMENTAL STEWARDSHIP

Several residents in the community recognize the importance of the unique ecosystems on the island and surrounding bay, and have been involved in environmental stewardship and restoration programs. After Sandy, these residents not only considered the reconstruction of the buildings and infrastructure in the area, but also dedicated time to environmental recovery.

One resident in particular, a retired gentleman who served as a park ranger for the Jamaica Wildlife Conservatory for 30 years, is involved in a number of projects in the Broad Channel area and is currently overseeing reconstruction projects for nearby islands. In addition, the American Littoral Society is restoring the marshes that were damaged in the area during Sandy.







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# IDEAS FOR RECOVERY

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connection of residents to the bay and adjacent marshlands, strategies could be developed to further integrate these homes with the surrounding landscape. A number of strategies could be explored, ranging from permanently elevating homes and allowing the water to smoothly enter the neighborhood and recede to developing floating infrastructure that can adjust with changing water levels.

## RECONNECTING HOMES VIA “THE STREET”

During Hurricane Sandy, damage to “the street,” the elevated pathway that provides access to homes across the marsh on the east side of the island, left residents unable to access their homes regularly. According to one volunteer who discussed the matter with both residents and the Department of Transportation (DoT), this infrastructure doesn’t fall into the DoT’s jurisdiction, despite it appearing as a mapped street. At the time of survey in October, 2013, this pathway had still not been repaired.

An important element of recovery for this community is to re-establish access to these remote homes, enabling residents to address the damage and return home.

## RESILIENT DOCK INFRASTRUCTURE

Many residents in Broad Channel have an intimate connection with the bay and have incorporated dock infrastructure into their homes. This infrastructure was heavily damaged during Sandy, highlighting the need to re-imagine how this infrastructure can be incorporated into the community in a more resilient manner.

## ADDRESSING SEA LEVEL RISE

Broad Channel is a low-lying community, highly susceptible not only to future storms, but also longer term sea level rise. A critical component of implementing approaches to resiliency in this community will need to incorporate this inevitable change to the neighborhood’s landscape. Given the intimate

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# APPENDIX





# THE PROJECT TEAM

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Architecture for Humanity New York would like to thank the following individuals, who have very generously given their time and expertise for this effort.

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Photographs are by field team members. In particular, the majority of the photographs from Tottenville and Midland Beach are courtesy of Shan Jayakumar.

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Jacob Nadal, Director of Library and Archives  
Chelcey Berryhill  
Adam Rubin

## THE MODERN LEAGUE

A Docomomo US initiative, The Modern League is a young professionals community for those interested in the preservation of modern architecture. The Modern League seeks to connect young professionals across the country that are interested in the built history of the mid-20th century and preserving and promoting that legacy. Focused on experiencing and enjoying

modern architecture, we invite Docomomo US' next generation to come together for our gatherings and events throughout the United States!

The following individuals at the Modern League provided generous research support for the neighborhoods in the Coney Island Peninsula:

Katherine Malishewsky, Francine Morales, Inna Guzenfeld,  
Liz Waytkus, Sean Conway

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# A NOTE ABOUT THIS BOOK

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The purpose of this book is to summarize the information gathered by Architecture for Humanity New York’s field teams after Hurricane Sandy. Although every effort has been made to ensure that this document is an accurate representation of each neighborhood’s post-disaster context, this document should not be considered a representation of the experiences of every single resident, but rather as a reflection of the stories told by those in the community during our field visits.



