



RESILIENCY ANALYSIS & DESIGN SERVICES

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FIRM PROFILE

RESILIENCY ANALYSIS & DESIGN SERVICES & EXPERIENCE



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INTRODUCTION TO RESILIENCY ANALYSIS & DESIGN

Superstorm Sandy was a wake-up call for the New York metropolitan area, vividly illustrating the shortcomings of the region's coastal areas and the susceptibility to flooding related storm surges and tides. Many facilities in New York City and Long Island suffered calamitous effects of the storm, including the loss of building functionality resulting from system failures due to flooding.

In the wake for Superstorm Sandy, PWGC, quickly recognized the need for resiliency-related engineering services targeting infrastructure improvement of residential, commercial and institutional facilities.

As Sandy illustrated, many traditional design cornerstones – utilities in the basement/lower levels - proved to be susceptible to the ravages of a significant storm event, leaving many buildings dead in the water, which presented issues for the tenants – many of whom have mobility challenges – and owners, who sought to minimize and repair damage caused by the storm.

PWGC is a vanguard for identifying new opportunities in the engineering community, and its recognition of the need for an expert resiliency consultancy was no different. The professionals at PWGC quickly adapted to the requirement associated with improved resiliency and formulated time-tested approach to facility assessment and recommending improvements to enable greater functionality and security in the face of severe weather events.

PWGC's resiliency assessment program starts with addressing the current state of a given structure, noting damage, if any, from previous weather events, the location of critical building infrastructure, such as mechanical and electrical components, drains, telecommunications, and the overall design of the facility.

We interviewed individuals associated with the design and operation of a given facility, from architects to owners and superintendents in an effort to gain the greatest understanding of building systems and issues related to its operation.

Outside of the building, PWGC examines connections to public utilities, topography, site layout and building access. These variables are taken into account to determine what improvements would best increase a facilities resiliency for a given storm event, whether it be a 50-year, 100-year or 500-year event.

With current infrastructure and damage inventoried, PWGC then maps out a plan to improve resiliency based on structural analysis and observation. We can then recommend improvements based on assessment and/or budgetary constraints to best position a given structure.

Current market demand has PWGC focused on facilities in low-lying areas, which face the greatest threat in the event of a catastrophic storm. Whether it is a multi-unit apartment building, hospital or a command and communication center, PWGC has worked with a myriad of facility owners affording the guidance needed to efficiently and affordably improve facility resiliency.

PWGC's expertise and experience in the realm of structural resiliency is unmatched in the industry, let us put our expertise and experience to work for you.



BUILDING RESILIENCY PROJECTS

Good Samaritan Hospital & Our Lady of Consolaton—Flood Mitigation

PWGC performed a hazard vulnerability analysis for the site by analyzing existing site conditions along with environmental variables. PWGC designed perimeter protection for coastal flood mitigation such as a vinyl sheet-pile floodwall, “active” aluminum floodplanks, and vegetated perimeter berms to protect the hospital campus from severe flood events. We designed stormwater mitigation options such as stormwater pump stations, catch basins, trench drains, re-routing of roof drains and well-pump discharge pipe from the sanitary sewer, replacing sanitary sewer manhole covers, regrading with permeable pavement, and sewage ejector pumps. She analyzed the depth to groundwater, base flood elevation, Hurricane Sandy flood elevation, and projected sea level rise to determine an adequate design flood elevation for the site. PWGC constructed a Feasibility Report based on environmental conditions, tide and storm projection modeling, project goals, and the proposed alternatives.

Freeport Electric Power Plant 2—Coastal Flood Mitigation & Stormwater Mitigation Design

PWGC designed engineering alternatives such as a vinyl sheet-pile floodwall, “active” aluminum floodwall, stormwater pump stations, in-line check valves for existing stormwater outfalls, a mechanical joint plug valve for an oil-water separator discharge pipe, and a sewage pump station to protect Power Plant 2 (PP2) from severe flood events. We analyzed geotechnical soil boring data to determine an adequate design depth for the floodwall to ensure that the wall would withstand storm surge, analyzed the depth to groundwater, base flood elevation, Hurricane Sandy flood elevation, and projected sea level rise to determine an adequate design flood elevation for the site, constructed a Feasibility Report based on environmental conditions, cost analysis, project goals and the proposed alternatives, and designed an “active” aluminum floodwall, made of removable aluminum flood planks, to span a portion of the site’s entrance. The locations of the active floodwall’s concrete footings were designed such that they would not interfere with the existing 69-kV and 13.8-kV electric transmission lines beneath the surface grade. PWGC designed two 1,200 GPM duplex stormwater pump stations to handle 8 inches of rainfall, designed a catch basin and associated piping for the SE pump station, designed a 250 GPM floor-mounted pump within the existing pump house for dewatering purposes, designed backflow protection options, involving removable duct sealant and expandable plugs, in order to prevent the backflow of floodwater into PP2 via open electrical ducts. analyzed the environmental impacts of these design alternatives using an Eight-Step Decision Making Process, per Executive Order 11988/11990, wrote and compiled technical specifications for all aspects of the design. and created a detailed cost estimate using RSMMeans Cost Data. PWGC performed a dye test to confirm the abandonment of a 30” diameter stormwater pipe.

Community Preservation Corporation—Brooklyn, NY Enterprise Community Partners, Inc.—Brooklyn, Manhattan, Staten Island and Queens Local Initiatives Support Corporation—Brooklyn, NY JASA Housing—Far Rockaway and Coney Island, NY

Various housing facilities located on Long Island, New York experienced severe flooding and loss of services as a result of Superstorm Sandy. A team assessed the individual buildings critical systems in an effort to determine the need for and the practicality of relocating components to avoid or minimize disruption by future severe storm events. PWGC recommended capital upgrades which, if applied, will strengthen the facility’s ability to stay operational after or quickly recover from a variety of anticipated extreme weather event impacts. PWGC recommended capital upgrades will increase the short-term and longterm resilience of the individual buildings and reduce the cost of repair and replacement in the future.

City of Long Beach Public Water Supply

PWGC performed a comprehensive Vulnerability Analysis for the City of Long Beach Public Water Supply. This in depth investigation included an examination of the water supply system’s key infrastructure to evaluate the system’s susceptibility to withstand events such as natural disasters, vandalism and terrorist attacks. Each event scenario was closely examined with the City to identify vulnerabilities in the water system that could compromise the normal operation of the water system in the event of such emergencies. PWGC then worked with City and local Health Department to create a prioritized list of actions the City could take to mitigate these vulnerabilities. PWGC also updated the existing Emergency Response Plan for the City based upon changes in the infrastructure of the water supply, the City’s organizational structure and the



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results of the vulnerability analysis performed.

Northwell Health—Southside Hospital

Southside Hospital tasked PWGC to conduct an analysis to evaluate the vulnerability of the hospital in the event of a natural disaster. An investigation to determine the vulnerability of the hospital was performed taking into account the hospital geography, the types of hazards that could occur, past storm occurrences, and effects of a design storm factoring in potential storm hazards.

Northwell Health—Staten Island University Hospital

Staten Island University Hospital (SIUH) retained the AKF Team (including The AKF Group, LLC, and PWGC) and Robert Silman Associates (Silman) to conduct a study to evaluate the vulnerability of the North and South Campuses of the hospital in case of a natural disaster. An analysis to determine the vulnerability of the hospital was performed taking into account the hospital geography, the types of hazards that could occur, past storm occurrences, and effects of a design storm factoring in potential storm hazards.

Northwell Health—15 Burke Lane

NSLIJ retained PWGC to conduct an initial assessment to evaluate the vulnerability of 15 Burke Lane, Syosset, NY to natural and manmade disasters. An initial analysis was performed to determine the baseline conditions of the building, identify areas of vulnerability, and recommend building modifications and improvements to improve resiliency and redundancy of the building structure and critical systems. PWGC analyzed the existing structure from foundation to roof, the stormwater flooding and the electrical and telecommunication system. PWGC then recommended preventative measures that NSLIJ could take.

Town of Islip—West Islip Community Wide Drainage Plan

The Town of Islip (Town) has commissioned PW Grosser Consulting (PWGC) and its sub-consultants to rid the area of excess storm water via drainage systems while preventing those same systems from acting as a conduit for storm surges, and improving natural drainage conduits, e.g., streams and creeks, to limit – if not prevent – flooding that can limit access and damage public and private property.

In review of the proposed scope of work the PWGC Team will utilize its skill set to tackle key project issues, which include:

- Flooding south of Montauk Highway
- Storm water that flooded creek systems in the hamlet
- A undersized and under designed subsurface drainage system
- Assisting the Town of Islip with CDBG application from HUD
- Assistance with federal and state regulatory compliance
- Identifying Drainage System Vulnerabilities and Designing Improvements to Eliminate Identified Vulnerabilities
- Construction Monitoring and Inspection Services

On behalf of the Town, the PWGC Team will provide the requested range of services including, but are not limited to, the scheduling of meetings with community stake holders, providing summary and analysis of existing data, the identification of potential issues, preparation of cost estimates for implementation and maintenance plans related to improving the drainage issues currently being experienced in the Hamlet of West Islip.

