



Improved Pumping Stations Keep Community Safe and Dry

Full Mitigation Best Practice Story

San Juan Municipio, Puerto Rico

San Juan, PR - Family heirlooms, furniture and appliances under floodwaters for a week is an experience Arlyn Alcaraz and her family would rather forget. As residents of the floodprone Ocean Park for 50 years, the Alcaraz family was recurrently affected by flood events. On every occasion, her family had to replace their belongings, clean up, and try to save what little was left behind.



“To see my mother’s favorite antique furniture standing in a pool of dirty water, to have little water snakes lurking around my ankles and being unable to do anything to avoid the situation, was overbearing and frustrating,” explained Alcaraz. “In addition to enduring frequent storm sewer flooding, we had to deal with ocean water brought by the storm surge. The floodwater also had oily patches drifting around our furniture, appliances, messing everything it touched.”

More than 30 years ago, the Puerto Rico Department of Natural and Environmental Resources (DNER) installed a water pump station in the Baldorioty Avenue to direct storm water away from the floodprone area of Ocean Park (an area below sea level), the Luis Llorens Torres housing project and nearby areas of Santurce. But the equipment became obsolete when business and residential development outgrew its capability.

In September 1996, Hurricane Hortense hit the Island causing flooding damages islandwide. Later that year, DNER proposed improvements to the pumping system and was awarded Hazard Mitigation Grant Program (HMGP) funds for mitigation measures to upgrade the mechanical and electrical equipment and install new storm sewer pumps. In addition, an upgrading of the emergency generators was included to operate the storm sewer pumps in case of electrical failures.

The project was completed in December 2002. Since then, three significant flooding events have occurred in the area and none have affected these families and their communities. Four other storm sewer-pumping stations within the municipalities of San Juan, Guaynabo and Catano were included in the upgrading project.

Furthermore, the upgrading improved the working conditions for the employees at the station. Station manager Angel M. Constantino explained the operational differences between the latest and previous events: “Two years ago, we had to keep an eye on the water levels, even under hurricane conditions. This meant an unprotected run from the building to the water pumps and the retention system to personally inspect the situation. Now, we just need to check on the pump control panels without taking unnecessary risks.”

The upgrade has simplified the operations at the station. The new pump control panels allow DNER to connect all the station’s storm water pumps to the backup system, thus making the response period shorter. The replacement of old storm sewer pumps and the installation of additional pumps have doubled the pumping station’s operational capacity. In addition, the backup generators would allow the pump station to work independently if necessary.

Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region II**

State: **Puerto Rico**

County: **San Juan Municipio**

City/Community: **San Juan**

Key Activity/Project Information

Sector: **Public**
Hazard Type: **Flooding**
Activity/Project Type: **Flood Control**
Activity/Project Start Date: **10/1996**
Activity/Project End Date: **12/2002**
Funding Source: **Hazard Mitigation Grant Program (HMGP)**
Application/Project Number: **9999**

Activity/Project Economic Analysis

Cost: **\$9,078,551.00 (Actual)**

Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster? **Unknown**
Value Tested By Disaster? **Yes**
Tested By Federal Disaster #: **No Federal Disaster specified**
Year First Tested: **2003**
Repetitive Loss Property? **Unknown**

Reference URLs

Reference URL 1: <http://www.fema.gov/about/divisions/mitigation/mitigation.shtm>
Reference URL 2: <http://www.floodsmart.gov/>

Main Points

- Over 30 years ago, the Puerto Rico Department of Natural and Environmental Resources (DNER) installed a water pump station to direct storm water away. But the equipment became obsolete when business and residential development outgrew its capability.
- HMGP funds provided for mitigation measures to upgrade the mechanical and electrical equipment and install new storm sewer pumps. In addition, an upgrading of the emergency generators was included to operate the storm sewer pumps in case of electrical failures.
- The upgrade has simplified the operations at the station. The new pump control panels allow DNER to connect all the station's storm water pumps to the backup system, thus, making the response period shorter.



Water pump station.



Arlyn Alcaraz showing the water level height.