

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS

“consultant”®

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NELSON - Serving Southeast Louisiana with Hurricane Flood Control

By: Stephen O. Johns, P.E.

Recently, Waldemar S. Nelson & Co., Inc. received a Certificate of Appreciation from the Corps of Engineers “for exceptional achievement in support of the Mississippi Valley Division's New Orleans District and the execution of the Hurricane and Storm Damage Risk Reduction System mission.” Within a month after Hurricane Katrina’s landfall, NELSON’s engineers were in the field providing assistance to the Corps in evaluating hurricane damage to more than 30 miles of levees, numerous pumping stations, hurricane protection floodwalls, floodgates, and flood control structures. Based on these evaluations, NELSON developed plans and specifications for the required repairs.

Shortly after the majority of the Katrina floodwaters receded, NELSON inspected all of the hurricane protection levees and floodwalls surrounding St. Bernard Parish by helicopter and analyzed Corps-provided LIDAR mapping data to

determine the volume of levee material washed away by the storm surge. Based on this, NELSON developed plans and specifications for the reconstruction of 11 miles of levee along the MRGO and provided onsite inspection during levee reconstruction. NELSON provided inspection services and plans and specifications for the repair of floodwalls, floodgates, and flood control structures damaged by barge impact and storm surge overtopping.

NELSON inspected eight St. Bernard Parish pumping stations damaged by Katrina, provided reports of damage and



MRGO Overtopping Damage

estimates for repair, developed conceptual designs as the basis of a design/build contract for repair of the three heavily-damaged stations, and provided onsite Quality



IHNC Floodwall Overtopping Damage



MRGO Levee Damage



Barge Overtopping Damage to IHNC Floodwall and Levee

provide horizontal support to the gate. Precise fabrication tolerances were required due to the project's requirements of a maximum allowable clearance of $\frac{1}{2}$ inch between the UHMW pads and the stainless steel plates.

Vertical support in the closed position is provided by four interior legs in the channel and four bearing plates at the base of the end posts. These 8 supports transfer the 140 ton weight to stainless steel plates embedded in the concrete monolith floor which is supported by a pile foundation. The bottom seal is compressed 1.5 inches when the gate is in the lowered position.

The Bayou Bienvenue Gate is lifted by cables using a winch and sheave system. Each end of the gate is supported by a single sheave. The gate is raised, lowered, and supported in the open position by sheaves attached to pad-eyes that are attached to the top of the gate end posts and secured to the sheaves with pins. Each sheave is supported by two independent cables. If one of

the four cables fails, the remaining three cables can support, raise, or lower the gate without overstress. Vertical support for the gate is provided by the cables in all positions except the lowered position.

Maintenance platforms are provided for inspection and maintenance of each sheave. Access to the platforms is from the monolith with the gate in the down position or from an access platform in the support tower with the gate in the raised position. During design it was discovered that the resulting slamming forces from wave overtopping on the gate would destroy any reasonably sized walkway. Therefore it was decided that no walkway would be provided to connect the two maintenance platforms.

Pedestrian and vehicular access across the channel is provided by a separate bridge on the protected side of the gate. The gate is

provided with 3 pad-eyes for use during installation.

In March 2011, prior to construction of the lift towers, the lift gate was installed in the closed position. Once the gate was installed, the Bayou Bienvenue structure attained 100-year level of hurricane risk reduction. The towers were completed a year later and Bayou Bienvenue was opened to boat traffic. It remained in the open position until the approach of Hurricane Isaac when it was lowered and provided risk reduction to St. Bernard Parish, New Orleans' Lower 9th Ward, and New Orleans East. It is again in the lifted position, none the worse for wear, ready to battle the next storm.

Lift Gate Slots and Access Bridge



Pump Station Damage





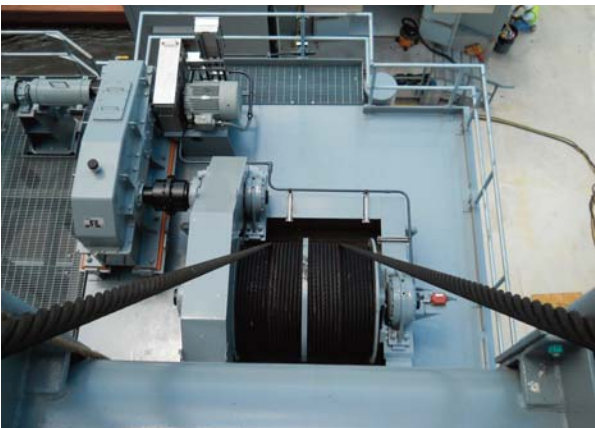
Bayou Bienvenue Lift Gate



Half Inch Clearance



Support Sheave



Lift Cables and Winch



Gate Installation

Other Hurricane Repair Work

In addition to the repairs of damages to our levees, floodwalls, and pumping stations caused by Hurricane Katrina, NELSON was also quick to respond to Superdome roof damage by Katrina when the push was on to be ready for the Saints 2006 season return. When it was determined that the damaged roof vents could not be replaced in-kind, NELSON engineering was quickly on the Superdome roof to design supporting frames to match the new vents.



Superdome Roof

SERVICE ANNIVERSARIES - 2012

Thank you to the following employees who have continued to offer their loyalty and talent to our company and clients. Your dedication allows NELSON to deliver the caliber of service to our clients which we all strive for. We congratulate you!

35 Years

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30 Years

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Barton W. Harris

20 Years

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The tropical weather in the South always provides surprising flora and fauna. The photo of the above bananas was taken on the patio of the NELSON building in New Orleans in late September.

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