LOUISIANA CIVIL ENGINEER

Journal of the Louisiana Section http://www.lasce.org

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INNER HARBOR NAVIGATION CANAL
LAKE BORGNE SURGE BARRIER

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Inner Harbor Navigation Canal - Lake Borgne Surge Barrier

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Louisiana Infrastructure Report Card

LOUISIANA SECTION AMERICAN SOCIETY OF CIVIL ENGINEERS 1852 1914

AUGUST 2010
VOLUME 18 • NO 4

The Louisiana Section of the American Society of Civil Engineers was founded in 1914 and has since been in continuous operation. The Section consists of the entire state of Louisiana and is divided into four branches that directly serve its almost 2000 members. They are the Acadiana Branch centered in Lafayette, the Baton Rouge Branch, the New Orleans Branch, and the Shreveport Branch.

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The Louisiana Section is located in ASCE Region 5 that consists of the Louisiana, Mississippi, Alabama, Georgia and Florida Sections.

President's Message
By Christopher P. Knotts, PE, D.WRE

Christopher P. Knotts, PE, D.WRE

As I write my last President's Message message, the BP Deepwater Horizon Well has been capped. Let us not forget the families of the 11 workers that lost their lives in this tragedy. The responses of the federal, state, and local officials were numerous, and at times tense as everyone functioned under extreme stress. In waterborne matters, the U.S. Coast Guard is the Incident Commander per the National Incident Management System (NIMS). NIMS was created by the federal government following the 9/11 tragedy; but continues to evolve after each major emergency. I believe adjustments to the procedures, based on effectiveness during this response, will also occur following this very long event. The magnitude of the BP Deepwater Horizon oil spill is unprecedented. The recovery phase has begun with shoreline and marsh clean up. Assessments are underway to quantify impacts; the Natural Resource Damage Assessment (NRDA) efforts will dominate the gulf coast region for some time as the duration of the BP Deepwater Horizon NRDA will likely be measured in decades. The state of Alaska is still addressing effects from the 1989 Exxon Valdez spill.

In Section developments, the Board of Directors voted to approve the revised constitution at our June meeting. I need to thank Ali Mustapha for taking the lead on this effort and bringing it to completion. E. Ray DesOrmeaux is working on the corresponding modifications to our By-Laws and Operating Guide. These should be finalized this fall. The Board also voted to begin the effort of producing a State of Louisiana ASCE Report Card. The Report Card committee had our initial meeting in July which began setting the process of developing the state-wide team necessary to accomplish this very important task. If you are interested in working on the Louisiana Report Card in your area of expertise or a geographical area of which you possess knowledge, please contact one of the Section Board members and we will put you on the team.

In case some of you are not aware, there is an effort by some to lower the number of credit hours for a BSCE to 120 to allow for a larger percentage of students to graduate in four years. The majority of civil engineering bachelor programs currently require between 128 and 135 semester hours. In the 1950's and 60's a BSCE required over 150 hours and was a 5 year program. I can understand that some of those hours may have involved classes that are no longer needed or could be combined with others due to the rapid technological advances our profession has experienced. However, after graduating from a 134 hour program I cannot identify the 14 hours that are no longer needed…especially given the requirements for university minimums with respect to humanities and social sciences. At a presentation last year comparing engineering to other professions' education, we were informed that doctors, lawyers and accountants have all increased their educational requirements through the years. Architecture remains a five year degree and landscape architects are looking into raising their requirements. Meanwhile engineering has decreased from a five year to a four year degree, and is now considering a decrease in hours. It is my belief that the fragmentation of the engineering profession into distinct disciplines, some of which do not place a value on licensure, have allowed this to happen. The Industrial Exemption allows those engineers to practice without a license. The primary purpose of licensure in any technical area, be it medicine, law or engineering, is to protect the health, safety and welfare of the public. We must not reduce the hours required for a bachelor's degree in engineering. We must also eliminate the industrial exemption in the United States and require that all practicing engineers be licensed! I'll step down off the soap box now.

It is with mixed emotions that I write this, my last President's Message. The honor of serving as your Louisiana Section President has not diminished during my year, but I'm glad this is my last President's Message. The time passes too quickly and you never feel like you were able to accomplish all your goals, but my philosophy is if you accomplished all your goals they were set too low. I wish to thank all of the 2009-2010 Section Board members for their dedication and hard work during the past year.

The Officers of the 2010-2011 Section Board will be installed at noon on September 17, 2010 at A La Carte Restaurant in Lafayette. President elect Patrick Landry will be installed as President. Please join me in Lafayette to congratulate the incoming Louisiana Section Board of Directors.

I'll close this President's Message in a manner similar to the way I closed my last Baton Rouge Branch President's Message 10 years ago…thanking someone who unfortunately is no longer with us. My first engineering job was at Brown & Butler, Inc. At that point, Mr. C. Carter Brown had been a consulting engineer for 36 years, the Director of the State Department of Public Works before that, and served in the military before that. He had a long history with many professional organizations. He used to make me go with him to ASCE meetings. He didn't actually make me, but he would invite you in a way that you could not decline. I was young and didn't want to go because I felt out of place. Mr. Brown showed me that being active in professional organizations was a fundamental part of being a professional. Twenty-six years later, as Section President, I still think about the gift Mr. Brown gave me by bringing me to those meetings. Those of us who are now "more experienced" need to look around and see if we can be a Mr. Brown to young civil engineers. Mentorship is vital to the long term health of our profession.

ASCE – Region 5 News

By E. R. DesOrmeaux, PE, FASCE

E. R. DesOrmeaux, PE, FASCE

The next Region 5 Board Meeting is being held in Fort Lauderdale, Florida from July 14 – 17, during the Florida ASCE annual state convention. Norma J. Mattei, PE, Region 5 Director, and E. R. Desormeaux, PE, Region 5 Governor are attending the convention. Region 5 includes Louisiana, Mississippi, Alabama, Florida, and Georgia.

The new Region 5 Website includes the following noteworthy items. Members are encouraged to “log on” to the website for additional information.

- Announcements & Schedule of Events
- Outreach links
- Newsletter links

The ASCE Society recently revised its Mission Statement, and each Region Board is currently addressing the identified goals in fulfilling that Mission. The following “Goals Statement” is on the Agenda for the July meeting.

- Communicate with Region Members about:
  1) Section/Branch activities & issues
  2) Regional issues, including regulatory alerts
  3) Society level issues and strategic focus items

The purpose is identified as better communication between Branches/ Sections/Region.

- Support ASCE Members:
  1) As a Communications conduit and provide them with a list of potential speakers/topics (for their meetings)
  2) Inform them about regional issues
  3) Give Members Section/Branch advice by sharing ideas among Sections & Branches about successful activities and operations

- Help ASCE Members achieve their Section/Branch goals by
  1) Providing speakers at Section/Branch functions who will talk on Society focus areas
  2) Publish a quarterly newsletter with regional calendar

An implementation and action plan is currently under development with measures for success.

Inner Harbor Navigation Canal-Lake Borgne Surge Barrier

By Nick Silbert

Construction of the massive Inner Harbor Navigation Canal-Lake Borgne Surge Barrier is progressing more than a year after crews drove the first 66-inch pile. The surge barrier, stretching 1.8 miles in length and budgeted at $1.3 billion, is perhaps the most critical link in the U.S. Army Corps of Engineers' (USACE) 350 miles of levees, floodwalls, barriers, gates and other structures that constitute the Hurricane and Storm Damage Risk Reduction System (HSDRRS).

The Inner Harbor Navigation Canal-Lake Borgne Surge Barrier (also referred to simply as the Lake Borgne Surge Barrier) is the largest design-build civil works project in the history of USACE, and it will be operational in June 2011. When complete, the Lake Borgne Surge Barrier and the entire HSDRRS will reduce risk of storm surge from a storm that has a one percent chance of occurring in any given year, or a 100-year storm.

PROJECT HISTORY

Before Hurricane Katrina, there was a "hurricane protection system" in name only. It consisted of a collection of projects in various stages of completion providing different levels of protection throughout the greater New Orleans area.

On August 29, 2005, Hurricane Katrina battered the Louisiana and Mississippi coasts, packing a 28-foot storm surge, the highest ever recorded in North America. Levees and floodwalls were compromised, and New Orleans—a city partially below sea level—filled with water. Katrina's storm surge was responsible for 90 percent of the destruction in New Orleans.

Following Katrina, the USACE worked tirelessly to repair and improve 220 miles of levees and floodwalls by June 2006. Additional Congressional appropriations in the years following Katrina funded a strengthened and integrated Hurricane and Storm Damage Risk Reduction System (HSDRRS) throughout the five-parish greater New Orleans area to reduce the imminent and continuing threat to life, health and property posed by flooding from hurricanes and other tropical events. The HSDRRS, budgeted at over $14 billion, is the largest hurricane risk reduction system in the world.

Some of the areas hardest hit by Hurricane Katrina included New Orleans East, metro New Orleans, Gentilly, the Ninth Ward and St. Bernard Parish—all areas along the Inner Harbor Navigation Canal (IHNC; also known locally as the Industrial Canal), the Gulf Intracoastal Waterway (GIWW) and the Mississippi River-Gulf Outlet (MRGO).

Prior to Katrina, floodwalls and levees along this corridor (known as the IHNC corridor) served as the primary line of defense. These structures, which were located immediately adjacent to homes and businesses in some of the more populated areas of the corridor, were overwhelmed by Katrina's storm surge. Storm surge entering the corridor from the GIWW and MRGO combined in the IHNC to overtop and collapse a 4,000-foot-long section of floodwall, among other floodwall and levee breaches in the area.

Nick Silbert

To provide greater risk reduction in an extremely vulnerable area, USACE developed an innovative proposal to construct a 10,000 foot long surge barrier at the confluence of the MRGO and GIWW, thus relocating the first line of defense eight miles out from the more populated areas. USACE also proposed building the Seabrook Floodgate Structure, which will work in tandem with the Lake Borgne Surge Barrier to reduce risk along the IHNC corridor. Seabrook will reduce risk from surges entering the IHNC from Lake Pontchartrain.

The Shaw Group of Louisiana was awarded the design-build cost plus contract for the surge barrier on April 4, 2008, the first 100-year construction contract awarded for the newly designed HSDRRS. The design-build project delivery method allows the design and construction phases to happen concurrently, thus potentially shortening the delivery schedule of the project.

Although USACE's proposed action was to construct a surge barrier, other alternatives were investigated as part of the environmental compliance process under the National Environmental Policy Act (NEPA). These alternatives, as outlined in "Individual Environmental Report # 11, Improved Protection of the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana" (IER 11 Tier 1), included, but were not limited to: (1) constructing a breakwater system in the western edge of Lake Borgne; (2) raising the existing levees and floodwalls along the GIWW and IHNC to the 100-year design elevations; and (3) restoring the levees and floodwalls along the corridor to pre-Katrina authorized heights (the no-action alternative).

USACE did not favor the above mentioned options for different reasons. The breakwater system was considered an incomplete solution because it would need to be augmented by other structures. Raising the existing levees and floodwalls to the 100-year design specifications would greatly increase the footprint of these structures and have negative socioeconomic impacts because hundreds of homes and businesses would have to be relocated. The no-action alternative did not meet the project's purpose of providing 100-year hurricane risk reduction.

The proposal of building a surge barrier moved forward in March 2008 when Col. Alvin B. Lee, commander of the New Orleans District, signed the Decision Record for IER 11 Tier 1. However, USACE still needed to explore several different alignments and their associated impacts within a pre-determined location range as part of the second tier of NEPA compliance.

The IER 11 Tier 2 Borgne document outlined the location range for the surge barrier, which extended from the Paris Road Bridge east along the GIWW to the Maxent Canal and south to the MRGO approximately four miles south of the existing Bayou Bienvenue floodgate. Five separate alignments within this location range were further explored, each with different lengths, structural elements and environmental impacts.

The surge barrier's chosen alignment and design, known as Alternative 4a in the IER, consists of a bypass barge gate and a flood control sector gate (each 150 feet wide with a sill elevation of -16 feet) at the GIWW that would connect to the risk reduction system in Orleans Parish approximately 1,150 feet east of the Michoud Canal, a new sector gate (later redesigned as a vertical lift gate) measuring 56 feet wide with a sill elevation at -8 feet at Bayou Bienvenue, a braced concrete wall across the MRGO that would connect to the risk reduction system in St. Bernard Parish about 2,700 feet southeast of the existing Bayou Bienvenue floodgate and a concrete floodwall across the Golden Triangle marsh between these waterways.

The flood, or unprotected, side of the Lake Borgne Surge Barrier
Credit: USACE Photo by Paul Floro

(*Note: In this article, no distinction will be made between the braced concrete wall across the MRGO and the concrete floodwall across the marsh because they essentially are the same, with the minor exception that the partial filling of the MRGO resulted in a different design condition for the portion of the barrier crossing that channel. They will both simply be referred to as the "barrier wall."*)

This alignment was favored because it was the option that would provide the greatest risk reduction to the IHNC corridor with the fewest negative impacts. Real estate acquisition and construction were able to move forward when Col. Lee signed the Decision Record for IER 11 Tier 2 Borgne in September 2008.

USACE acquired real estate for the project in December 2008. A notice to proceed for all portions of the barrier, with the exception of the part transecting the GIWW, was issued in November 2008. The notice to proceed for the GIWW portion of the barrier was issued in January 2009.

A cutter-head dredge excavated a 350 foot construction and access channel to serve as the footprint for the barrier. Additionally, this 15 foot deep dredged channel would be developed into an approximately 250 foot wide access channel on the flood side for use during and after construction for maintenance purposes and an approximately 96-foot-wide plunge pool on the protected side to absorb impact from overtopping. The dredging produced about 1.4 million cubic yards of dredged material which was deposited for beneficial use via dredge pipe in a disposal area east of the structure.

As previously mentioned, the recently de-authorized MRGO, which was at elevation -40 feet in some locations along the alignment, had to be partially filled with rock and sand to serve as the foundation for the new barrier.

Crews filled the de-authorized MRGO to raise its bottom elevation before driving piles in the channel

Other pre-construction activities included surveying land and water, soil boring and pile load testing. Construction officially commenced in May 2009.

BARRIER WALL
VERTICAL PILES AND BATTER PILES

The main elements of the surge barrier wall include 66-inch spun-cast soldier piles (also known as plum piles), 18-inch closure piles, 36-inch steel batter piles, pre-cast and cast-in-place concrete caps and a parapet wall. T-walls measuring 26 feet above sea level extend from the barrier on the north and south ends and tie into the risk reduction system in New Orleans East and St. Bernard Parish, respectively.

The barrier wall consists of 1,271 soldier piles, 2,514 closure piles, 647 steel batter piles, 673 pre-cast and cast-in-place concrete caps and 7,490 linear feet of parapet wall. All of the wall components were engineered not to exceed 100 tons so that they could be handled with single crane lifts.

The 66-inch piles give the wall most of its vertical height and serve as the first line of defense against powerful storm surges. Each 66 inch diameter concrete pile is 144 feet long and weighs 94 tons.

Gulf Coast Pre-Stress, Inc., (GCP) and Bayshore Concrete Products Corp. began manufacturing the spun cast cylinder piles in July 2008. Much of the engineering was performed to allow the project to move ahead at top speed, including building the spun-cast piles into 16-foot lengths to allow for post-tensioning to the final length—in this case, 144 feet—required in the completed design blueprint. Barges subsequently transported the piles from GCP's Mississippi warehouse and Bayshore's Virginia facility to the surge barrier worksite.

Shaw and one of its subcontractors—TMW, a joint venture of Traylor Brothers, Inc. of Indiana; Massman Construction Co. of Missouri; and Weeks Marine of New Jersey—utilized two 500-ton cranes fitted with hammers to drive the soldier piles 130 feet deep. Only the top 14 feet of the piles are above the waterline.

The trestle track provided a level surface for rigs to move along the barrier wall

To facilitate the aggressive construction schedule, TMW designed and fabricated a trestle system using railroad technology. A trestle is a semi-permanent track that moves along with wall construction carrying pile templates and rigs. The trestle provides a level surface on which to work; rather than have cranes install piles from boats, which is less reliable since boats are susceptible to the rocking motion of waves.

There was 1,000 feet of track for the entire 10,000 feet of wall. To quicken the pace of construction, crews had to leap-frog 50-foot sections from one end of the trestle to the other up to six times per day. The gap between each section of the trestle could be no more than nine millimeters. Six bolts were put in place to ensure a solid connection between the trestles.

Crews started driving piles in the middle of the barrier, approximately 1,300 feet north of the Bayou Bienvenue opening, so the subcontractors did not interfere with one another. The Whirley Tower served as the template and the leads for the 66-inch piles on the north heading. The tower was previously used for construction of the Rigolets bridge and was in the area during Hurricane Katrina, though it suffered no damage during the storm.

For the south heading, a specially-built template aided in positioning the soldier piles. The Weeks 526 Rig installed the soldier piles on both the north and south headings. The template and leads on the south heading and the Whirley Tower allowed accurate placement of the 66-inch piles six inches on center. Weep holes along the sides of the soldier piles drained water and released pressure that built up inside the piles as they were driven deep into the water and soil. The final soldier pile was installed on October 21, 2009, just over five months after pile driving began.

The Whirley Tower (yellow structure) served as the leads and the template for the soldier piles on the north heading

In preparation for installing the 18-inch closure piles, Shaw and TMW used a bi-jet grout rig to install 3 foot diameter jet grout columns to depths of up to 105 feet for in-situ treatment of stiff clays and sand fill found throughout the project alignment. Over 555,000 cubic feet of soils were treated reaching strengths averaging +500 psi.

Once the grout plumes were installed, a pair of concrete closure piles was placed in the gap between soldier piles. Crews drove the base of the closure piles to depths of 55 feet below sea level. A tie rod and an industrial sized clamp held the closure piles in place while the grout cured. GCP supplied the precast closure piles, and the last pile was installed on February 11, 2010.

Seventeen closure pile pairs were outfitted with a Teflon flap to divide the barrier wall into 400-foot sections. These expansion joint piles allow for differential movement of each 400-foot monolith. The expansion joint closure piles were outfitted with a concrete expansion joint cap.

An expansion joint pile Credit: USACE Photo by Paul Floro

Crews placed grout bags made of ballistic-grade nylon in the interstitial spaces between the closure piles and soldier piles, allowing the wall to become one continuous structure and providing a means of mitigating potential seepage and scour below the mud line. The spaces between the expansion joint piles, however, were not filled to allow movement.

Steel batter piles provide the fortification needed to hold back a 20.3 foot storm surge. The piles are 248 feet long with a diameter of 36 inches and were driven at a 57-degree angle on the protected side of the barrier with a hammer of 88,000 foot pounds. This was the first time that piles of this length had been driven at an angle.

TMW created the one-thousand-ton "D Template" leads, which extended from a large three-story template and drove the piles at precise 57-degree angles. The leads had four chutes, which allowed four piles to be driven before having to move the massive template, thus cutting five months of construction time. The steel batter piles were placed on the protected side of every other 66-inch concrete pile.

The D Template could not drive the batter pile 200 feet deep in one drive, though. Each batter pile is composed of two separate sections. The first section is 158 feet long and weighs more than 13 tons. The second section, which is 90 feet long, was lined up with the first section after it was driven and then welded together on site.

To minimize operation and maintenance and ensure design life, a 44 foot portion of the welded steel batter piles were sheathed in a high-density polyethylene (HDPE) sleeve. The annular space was also grouted to prevent seepage and ensure a continuous bond. The final batter pile was installed on April 10, 2010, approximately nine months after batter pile driving began. All HDPE sleeves were placed later that month.

The three-story template

Once batter pile installation began, another crew turned its attention toward removing the built-up mud from within the soldier and batter piles. A drill bit augered out the mud, and a steel-reinforcing cage was then installed in the piles below the mud line before a sheer pin was placed in the center of the piles and filled with concrete. The operation wrapped up in May 2010.

CONCRETE CAPS AND PARAPET WALL

Concrete caps were fitted into the sheer pins atop the soldier and batter piles to serve as the apex of the surge barrier wall's A-frame. These 673 precast and cast-in-place concrete caps are essential in creating one structural unit and transferring the lateral load into the batter piles. The precast caps weigh 96 tons, while the smaller cast-in-place caps are about 36 tons.

The surge barrier was designed as an A-frame, as opposed to one solid structure like most levees and floodwalls, as a means to mitigate for the soft, absorbent soil within the alignment. The A-frame is lighter than a single structure, yet it is also strong enough to hold back 44 million gallons of water in the event of a large hurricane storm surge.

The precast concrete caps were supplied by Tindale Corporation of South Carolina. A waterproof seal was placed between the piles and the precast caps, and a 300-ton crane located on a barge then swung the 17-foot-long and six-foot-high precast caps into place on top of the piles to increase the vertical height of the barrier from 14 feet to approximately 20 feet.

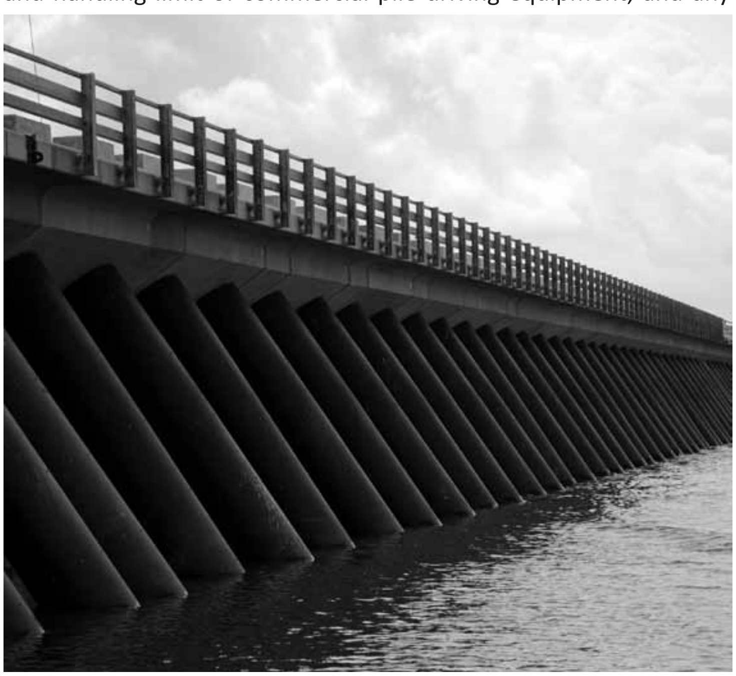
A six-foot gap was purposefully left between precast concrete caps. The cast-in-place concrete caps line up perfectly with the precast caps by using custom designed 10,000-pound forms that quickly snapped into place with alignment pins. Nearly 36 tons of concrete were needed to fill each gap. All expansion joint caps are cast-in-place.

Crews installed precast caps via barge crane and were thus not precisely aligned due to the barge's susceptibility to the rocking motion of waves. The cast-in-place caps, due to their tight fit and formwork, smoothed out any minor errors in the placement of precast caps. This system, as opposed to installing only precast caps and placing them all within millimeter tolerances on site, slashed an estimated six months from the project delivery schedule. The final concrete caps are expected to be installed in July 2010.

As soldier piles were driven deep into the water and mud, weep holes along the side of the piles allowed for drainage to relieve pressure

Crews topped off the barrier wall with a medieval-castle-like parapet wall. The parapet wall's top notches, known as merlons, measure 26 feet above sea level and the wall's lower notches, referred to as crenels, are 25 feet. The parapet wall is composed of two-foot-thick poured concrete.

Because a portion of a storm surge can pass between the merlons, the parapet wall's notches reduce the wave load, thus allowing for a reduction in pile length. The piles are already at the upper weight and handling limit of commercial pile driving equipment, and any



Angled steel batter piles line the protected side of the surge barrier wall Credit: USACE Photo by Paul Floro

extra length in the piles would result in another splice of the batter piles (from two segments to three) and potentially a custom crane to drive the soldier piles. This would have increased costs and construction time.

The procedure to construct the parapet wall consisted of, two 36-foot-long molds were placed each night on exposed rebar. Each morning, crews poured the concrete into those molds, and the two 10 ton molds were then shifted to another section of the wall, exposing the cured parapet wall for the first time. To lift and set the molds, crews used a 240 ton barge crane. Wooden blocks placed in the poured concrete gave the parapet wall its smooth, 90 degree notches. These operations are expected to be complete in July 2010.

The concrete caps and parapet wall, along with a metal guard rail running parallel to the parapet wall, provide a 12-foot-wide roadway for construction, operations and maintenance crews.

The parapet wall (left) and metal guard rail line the construction and maintenance roadway on top of the barrier wall Credit: USACE Photo by Paul Floro

T-WALL TIE-INS

In addition to the barrier wall itself, T-wall style floodwall tie-ins are being constructed on the north and south shoreline that tie the barrier into the rest of the risk reduction system. The floodwalls extend linearly from the barrier and curve onto the levee on both the north and south sides of the barrier.

The north T-wall is approximately 850 feet long, while the south T-wall tie-in is be about 500 feet long. The portion of the floodwall on the levee is at elevation +32 feet on both sides of the barrier, while the rest of the north and south tie-ins are 26 feet above sea level.

The floodwalls were built similarly to other T-walls throughout the system; however, scour stone was added to the protected and flood sides of the T-walls that extend linearly from the barrier to reduce potential foundation erosion. Scour stone was added only to the flood side of the T-wall tie-ins located on the levee.

The barrier and 26 foot high T-walls were built to allow a maximum 1.5-foot water elevation increase in the IHNC. The 32 foot high T-walls that extend onto the levee are not meant to be overtopped, however, since they are built to prevent water from entering New Orleans East and St. Bernard Parish.

The barrier wall and the south T-wall tie-in are expected to be substantially complete by July 2010. Three parts of the north T-wall tie-in will remain open throughout the construction of the nearby sector gate. In the event of an approaching hurricane this year, temporary sheet pile will be installed in these openings to minimize potential damage to the adjacent construction site.

THE GATES

In addition to the barrier wall and the T-walls that tie into the Lake Pontchartrain & Vicinity Risk Reduction System, three gates were incorporated into the barrier's design to allow ships, barges and recreational boats to pass to and from Lake Borgne. As specified in the IER, the gates would remain open to allow tidal flow and the movement of marine life and close only during a tropical event.

The IER originally called for a barge gate and sector gate on the GIWW and a sector gate on Bayou Bienvenue. However, in December 2009, Col. Lee signed IER 11 Tier 2 Borgne Supplemental, which proposed the use of a vertical lift gate operated by winch systems instead of a sector gate at Bayou Bienvenue. USACE favored a vertical lift gate over a sector gate at Bayou Bienvenue because a lift gate is stored in the dry, open air and is easier to maintain, hence a lower maintenance cost over the life of the project.

The Bayou Bienvenue gate maintains its original sector-gate dimensions of a 56 foot wide opening and a minus 8 foot sill. The vertical lift gate and an independent vehicular lift bridge system, which will be located on the protected side of the gate to allow vehicles to cross Bayou Bienvenue without the need to lower the gate, will provide 35 feet of clearance in the raised position from water elevation of +1 feet when complete.

Crews construct a cofferdam at the Bayou Bienvenue gate

The gate system over the GIWW consists of a barge gate and a sector gate, each measuring 150 feet wide with a minus 16 foot sill. Until the main barge gate is floated into place, the barge gate opening is referred to as the bypass gate. USACE chose this gate system for multiple reasons.

The Request for Proposal (RFP) prohibited complete closure of the GIWW to navigation traffic. Because the barge gate and its abutments could be constructed more quickly, it was chosen as the navigation by-pass during construction of the sector gate. Also, despite the identical dimensions, the barge gate has a smaller footprint and therefore impacts less of the nearby Central Wetlands. A sector gate was chosen as the main navigation passage because it is very reliable and, unlike the barge gate, can be quickly operated in adverse conditions.

While the barge gate abutments are under construction, vessels use the future sector gate footprint to pass. Once the barge gate abutments are complete, GIWW traffic will be re-routed through the bypass gate and the rest of the channel will close for sector gate abutment construction.

Bypass barge gate construction began before construction of the other two gates, and it is thus the furthest along. Manson Construction Co. of Washington began bypass gate construction in June 2009.

An overhead view of construction of the north T-wall tie-in, with the bypass gate cofferdam in the top left of the photo

To construct the bypass gate, soil was dredged so that a barge with a large crane could drive piles deep into the mud to support the foundation. A cofferdam (also known as a temporary retaining structure, or TRS) consisting of sheet piling with internal bracing and support piles (known as king posts) was then placed around the foundation piles. To increase construction efficiency, the cofferdam for all three gates will also serve as the permanent seepage cut-off wall for the structure.

To create a sub-base upon which to construct the foundation of the gate and to prevent heave, an approximately five foot thick tremie concrete slab was poured in the wet as a single, continuous pour through pipes using divers to help control the pour. Tremie casting for the barge gate occurred on October 25, 2009. About 4,900 yards of concrete was poured over a 36 hour period. A similar tremie pour was executed in June at the Bayou Bienvenue gate, and the tremie concrete at the GIWW sector gate will occur in the next few months.

Manson began work on the Bayou Bienvenue gate monolith in January 2010. The lift gate will provide commercial and recreational boat access to and from Lake Borgne.

Since the entire Bayou Bienvenue is blocked during construction, four 48 inch diameter water conveyance pipes, or culverts, have been inserted in the cofferdam to allow tidal flows to pass. Culverts are not installed in any of the GIWW gates because, as previously mentioned, portions of the channel had to remain open for shipping purposes and so flow is not blocked.

Once barrier construction is complete, the vehicular access bridge and the two structural steel towers and a steel-trussed span over the gate and channel that serve as the frame for the lift gate will be constructed. The culverts will then be removed, and the cofferdam will be re-watered and removed.

Final steps at Bayou Bienvenue include the construction of a control house on the protected side of the gate. A concrete monolith on the protected side will provide access to the control facility, as well as to the towers and a generator. In addition, the monoliths will provide adequate space for a truck turnaround. The north and south ends of this monolith will tie into the surge barrier's braced concrete wall. The Bayou Bienvenue control house will be complete in June 2012.

Finally, the gate itself will be installed, as will the guide walls and dolphins to protect against any potential boat collisions.

Meanwhile at the GIWW, once the barge gate abutments are complete and the cofferdam removed, traffic will be re-routed to the bypass gate so that cofferdam construction can begin on the sector gate. Crews began night-time pile driving at the GIWW sector gate in April 2010 and finished in June 2010. The bypass gate is expected to open in July 2010, and crews will begin sector gate cofferdam construction shortly thereafter.

The general construction sequence for the sector gate will be similar to the bypass gate's construction sequence, except for one major difference. A temporary tie-back wall was constructed on the northern shore to stabilize the bank and allow dredging of the channel. Once the sector gate abutment reaches elevation +5 feet, material will be backfilled between the temporary tie-back wall and the cofferdam. Once the backfill operation is complete, the tie-back wall will be removed.

The steel sector gate and concrete barge gate will then be floated into place. Because of the narrow passage way, crews will incorporate a "touch" system approach to the sector and barge gates by installing touch guide walls. Barges will be able to lay up on these guide walls and use them to assist in passage.

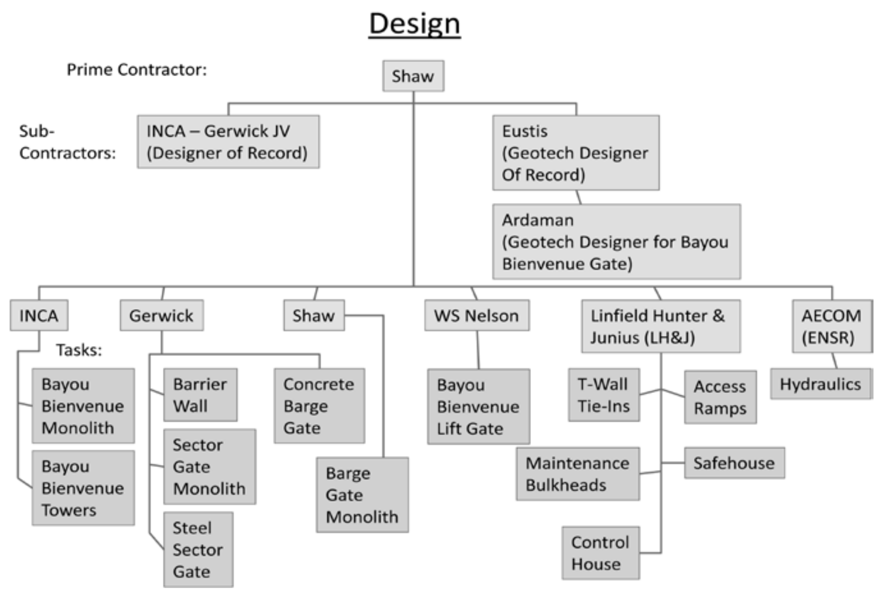
A safehouse with generators and an elevated access ramp will then be built on the shore near the sector gate. This safehouse, which contains the gate controls, will be complete in June 2012.

Although all three gates will be operational in June 2011, they will not be fully complete until June 2012. During this time, tug boats will close all three gates in the event of an approaching storm surge. Once fully complete, the gates' mechanisms will operate electronically.

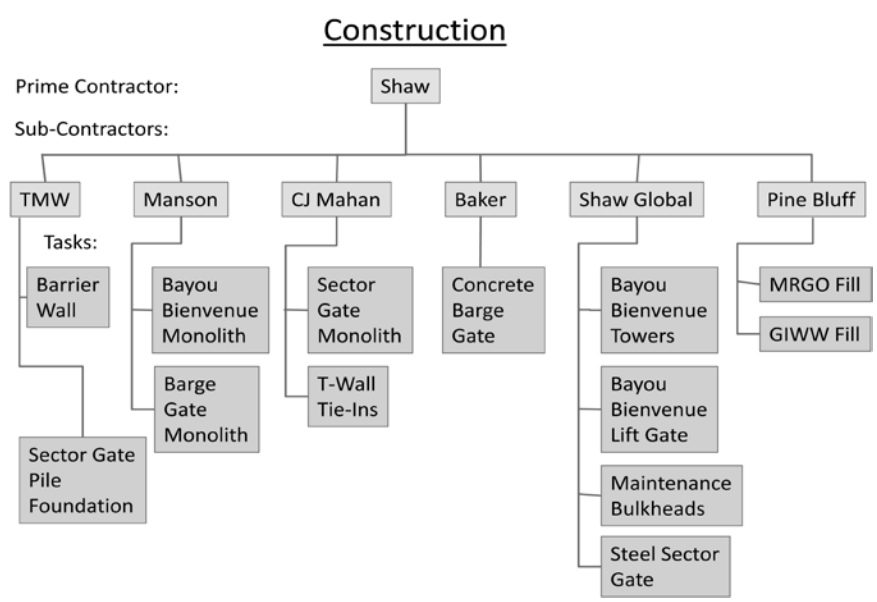
CHALLENGES

As would be expected for a project of this magnitude, bringing in the necessary equipment and labor was challenging. At the high point of barrier wall construction, there were as many as 38 marine-based cranes of all types on the job.

In addition, three out of the world's five largest commercially-available marine-based pile drivers are employed on the project.



A breakdown of the design sub-contractors and their tasks



A breakdown of the construction sub-contractors and their tasks

One, the Haakon, which is used for constructing the bypass gate and the Bayou Bienvenue vertical lift gate, arrived via the Panama Canal.

Shaw sub-contracted the work to dozens of firms to assist in the design and construction of the massive 10,000 foot long surge barrier. There are 101 small businesses working for the team, 71 of which are Louisiana firms. The subcontractors for the design phase of the work are: Inca, Designer of Record; Eustis, Geotech Designer of Record; and Ardaman, Geotech Designer for Bayou Bienvenue Gate. The subcontractors for the construction phase of the work are: TMW, Manson, CJ Mahon, Baker, Shaw Global, and Pine Bluff. Of the total cost, about 24 percent of the contracts have been awarded directly to small businesses. At the high point of construction, nearly 380 workers were employed on site. Crews are working 20 hours a day, seven days a week in order to expedite construction.

With dozens of vessels out on the construction site, USACE has to coordinate with federal, state and local partners to move barges out of the area in the event of a hurricane. During the 2009 hurricane season, there were up to 184 vessels of all types working on the surge barrier, and the various firms out on the site had to account for all of their vessels and ensure that they were all moored in a safe location if a storm approached. Although there are fewer vessels this year, Shaw and the sub-contractors have the same responsibility in ensuring the barges are transported to a safe location.

Another challenge was designing and constructing three gates that would meet the requirements for public safety and navigation while minimizing environmental impacts. USACE held dozens of public meetings and sought participation from various local, state and federal government agencies and some of the firms constructing the surge barrier, as well as local maritime businesses and navigation special interest groups, to share ideas about the project.

USACE's Coastal Hydraulics Lab at the Engineering Research & Development Center (ERDC) in Vicksburg, MS, used the Ship-Towboat Simulator to help develop the optimum channel and develop the safest and most economical navigation project design. The simulator accurately recreated vessel handling characteristics (barge size and numbers, loaded or unloaded, towboat power, etc.) and environmental impacts (channel depth and width, water current velocity, winds, etc.) in the project area being studied.

For the Lake Borgne Surge Barrier project, ERDC ran simulations for various barge-towboat configurations that represented typical vessels navigating the area during normal and high tides, pre- and post-hurricane conditions, and high winds from various directions. The simulator helped determine the surge barrier's gate width and optimal gate layout, orientation and guide wall location. Industry pilots from the area were used to "drive" the vessel during the simulation runs.

An aerial view of the bypass gate cofferdam and abutments

CONCLUSION

The Lake Borgne Surge Barrier is an integral part of the improved Hurricane and Storm Damage Risk Reduction System, providing 100-year risk reduction to the IHNC corridor. The line of levees and floodwalls along the corridor will then serve as the second line of defense once the surge barrier at Lake Borgne and the Seabrook Floodgate Complex at the Lake Pontchartrain-end of the IHNC are operational.

Constructing the surge barrier has its many challenges—weak soil conditions, the tight project delivery schedule, material supply and transport, coordination among USACE and its contractor and sub-contractors. Despite these challenges, though, construction is driving ahead.

By the height of the 2010 hurricane season, significant portions of the barrier wall and T-wall tie-ins will be substantially complete and provide an increased level of risk reduction. Although gate construction will not be complete, cofferdams will be in place at the Bayou Bienvenue vertical lift gate and GIWW sector gate openings and provide +5 feet of risk reduction. Maintenance bulkheads will plug the bypass gate.

When fully complete, the barrier wall, gates and T-walls will create a single, massive risk reduction structure that will defend against a 100-year storm surge event. With hard work and innovative design and construction, USACE and its partners are working around the clock to give residents and businesses the confidence to return and rebuild.

Nick Silbert joined the U.S. Army Corps of Engineers' Hurricane Protection Office as a public affairs contractor in February 2010. He holds a bachelors degree with a concentration in mass communications from the University of Georgia. Contributors to this article include several members of the Corps of Engineers' Lake Borgne Surge Barrier project delivery team: Angela DeSoto-Duncan, lead engineer; Vic Zillmer, resident manager; Jason Ragolia, deputy resident engineer; and Ron Elmer, branch chief for the Inner Harbor Navigation Canal. Other contributors are Ron Carle and Gerry Doton, both of whom are engineers with the Shaw Group.

Professional Liability for Engineers
An Overview of Louisiana Law

By James B. Frederick, Jr., Office of the General Counsel, LA DOTD

James B. Frederick, Jr.

INTRODUCTION

This article will attempt to explore and analyze some of the basic Louisiana law governing professional liability of engineers. Although we do not propose to provide legal advice, we will examine some of the legal roots as well as sources of liability.

Professional liability claims generally arise in the context of alleged negligent acts or omissions. Although negligent conduct often involves breach of specific contractual obligations, it may also occur outside of the employment contract and may adversely affect others who may not be parties to the professional services contract of the engineer as well.

THE LOUISIANA CIVIL CODE

The Louisiana Civil Code, with roots in the European civil codes of Rome, Spain and France, generally provides the groundwork for our discussion of liability in any form.

Articles 2315 through 2324 of the Code address responsible conduct between individuals and the consequences of failing to exercise reasonable care in dealing with one another. They establish that we can be held liable for "every act whatsoever" that causes damage to another, not only by our actions, but by our failures to act, our imprudence, or "want of skill". They go on to describe various types of damages and losses, including economic losses, which we might be required to redress for failure to exercise reasonable care.

TORT LIABILITY AND THE STANDARD OF CARE

The Civil Code generally classifies these actions or inactions as "offenses". We are accustomed to calling them "torts", the legal term universally adopted to describe conduct between persons which falls below the customary and acceptable standards of care. Negligent conduct falls below the established standards, and tort law endeavors to provide compensation for injuries and losses suffered as a result of those substandard acts or omissions.

ENGINEER'S LIABILITY AND THE STANDARD OF CARE

For engineers and other professionals; however, our courts have exacted a higher standard in the exercise of their professional duties which transcends the ordinary standard of reasonable care expected of a reasonably prudent person. This heightened standard requires engineers, as well as comparable professionals who engage in the exercise of technical skills, such as architects, physicians, and attorneys, to comply with the level of skill and competence usually exercised by others of the same profession in the same general locale in which they are serving.

CONTRACTUAL LIABILITY OF ENGINEERS

In addition to the responsibility for exercising skill and care in performing their duties commensurate with the requirements of their profession, engineers are governed by the requirements of their employment agreements. Beginning with Article 1906, the Civil Code classifies these agreements as "conventional obligations" or contracts, and defines the parties as "obligors" and "obligees". Article 1994 further describes breach of the employment contract in terms of "failure to perform" resulting from "nonperformance, defective performance, or delay in performance," and subsequent articles of the Code provide for payment of damages for failure to perform, including authority to include clauses allowing for payment of "stipulated" or "liquidated" damages often found in professional employment agreements and in construction contracts.

BURDEN OF PROOF

Our courts have clearly and consistently placed the burden of establishing liability against engineers squarely upon the party who claims damages as a result of an alleged failure, whether for a claimed breach of contract or for general failure to comply with customary standards in tort.

In order to successfully establish liability in a breach of contract suit, the Court will require the plaintiff-claimant to demonstrate and prove: (1) a valid contract; (2) failure to perform by the defendant-engineer according to the terms of the contract; and (3) damages sustained as a result of the engineer's failure to perform.

Where a claimant is not a party to the employment agreement with the engineer and the agreement does not otherwise provide a benefit for the claimant as a third party beneficiary of the agreement, our courts will often allow an aggrieved claimant to bring an independent, direct action in tort against the engineer. On a tort claim the court will apply a duty-risk analysis to assess the alleged tort liability. Under this duty-risk test, which features the acceptable standard of care discussed earlier, the plaintiff must prove that: (1) the engineer had a duty to conform his or her conduct to a specific standard of care; (2) the engineer's conduct failed to conform to the appropriate standard; (3) the engineer's substandard conduct was a cause-in-fact of the loss or damages; (4) the engineer's substandard conduct was a legal cause of the claimant's loss or damages; and, (5) the claimant was actually damaged.

Perhaps the most challenging aspect of establishing the essential standard of care and failure to conform to it involves obtaining the testimony of other qualified engineers who possess the requisite degree of professional competence in the particular engineering specialty involved, who can also attest to the level of skill and competence usually exercised by comparable professionals in the specific locale in which the deficient performance allegedly occurred, and who will also be willing to provide detailed, credible testimony of the failure to conform.

Although our courts invariably require expert testimony to establish this standard, ironically we find them on occasion accepting lay testimony alone in the face of professional conduct so remarkably unprofessional, "so clearly improper, and so manifestly below reasonable standards dictated by ordinary intelligence" as to justify applying a common sense standard "lay persons can infer".

THE BURDEN OF PERSUASION

Unless the law governing a particular issue or area specifically calls for the higher standard of "clear and convincing" evidence, which generally does not apply in professional liability cases, the more relaxed "preponderance of evidence" standard in civil litigation will suffice to establish the enumerated elements required to prove a case for breach of contract or tort liability. This means that the amount of affirmative evidence required to prevail must only persuade the trier of fact, whether judge or jury, that the evidence presented by one of the parties "more probably than not" outweighs the evidence submitted by the other. It does not require the prevailing party to dominate by the higher and more stringent "clear and convincing" evidence standard.

COMBINED ACTIONS IN CONTRACT AND TORT

It is also important to understand that the actions for breach of contract and for damages in tort, which require different elements of proof, are not so different as to be mutually exclusive all the time. In some instances plaintiffs have successfully claimed damages for breach of specific requirements in the engineering contract, while recovering at the same time under an additional element based upon tortuous conduct of the engineer. It is customary to ask for relief under both theories of recovery if both may be present. If the court fails to find liability under one, such as breach of contract, for example, it may, nevertheless, find liability in tort for failure to comply with the customary standard of care. Additionally, damages recoverable in tort may exceed those recoverable for breach of contract, because the law typically provides additional elements of damage in tort claims.

DAMAGES

Louisiana law generally recognizes four distinct categories of damages: nominal, punitive, stipulated, and compensatory.

Today our courts rarely, if ever, award nominal damages. Updated procedures and expansion of judicial discretion have largely eliminated the need for a nominal, or trifling, damage award. Occasionally we will see an award of something like $1.00, which recognizes a breach of duty, with little or no actual adverse impact or damage to the claimant.

Likewise for punitive damage awards, which Louisiana law restricts to specific legislation designed to punish for and deter from certain conduct considered particularly reprehensible. Those statutes do not apply to the professional liability of engineers.

Regarding stipulated damages, often called liquidated damages; however, Articles 2005 through 2012 of the Civil Code allow parties to agree in advance to pay damages under a stipulated method or formula for nonperformance, defective performance, or delay in performance. A stipulated damage clause, commonly used to account for delay in performance, normally obviates the burden of proving and quantifying actual losses incurred due to the failure or delay. In unusual circumstances, however, the defendant/engineer may force the claimant to produce proof of its actual losses by moving the court to modify or deny the stipulated damages provision on the basis of its overbearing nature and manifest unreasonableness to the extent of violating public policy.

We call the fourth and most relevant category "compensatory damages" because they contemplate full compensation or recovery for damages sustained, and endeavor to reposition the claimant as if the breach or failure had never occurred. Compensatory damages apply to damages caused by breach of contract as well as for damages resulting from tortuous conduct below acceptable standards of care. They are further characterized in terms of special and general damages. Special compensatory damages are those which can be determined with relative certainty, such as medical costs, property damages and quantifiable business losses. General damages usually cannot be fixed with mathematical certainty and may even involve some inherent speculation, such as damages for pain and suffering, and loss of future wages, and inconvenience in tort cases. Some claims for business losses may involve elements of both special and general damages, such as those arising from disruption and acceleration claims, and demands for anticipated lost profits and certain unforeseeable losses.

COMPENSATORY DAMAGES FOR BREACH OF CONTRACT

The Civil Code generally limits a claimant's recovery for breach of contract to the losses actually sustained and quantifiable, including delay damages, plus lost profits. Under Civil Code Article 1996, if the engineer fails to perform or fully perform in good faith, the damages will be limited to those that were "foreseeable at the time the contract was made". On the other hand, if the court finds that the engineer has failed to comply with the terms of the contract in bad faith, the engineer may be held accountable for all direct consequences of the failure, whether foreseeable or not. The courts equate bad faith with intentional and malicious failure to perform, in contrast to an honest mistake, or mere bad judgment, or negligence.

COMPENSATORY DAMAGES IN TORT

Compensatory damages in tort may also include general damage recovery of a more speculative nature, such as mental and emotional distress, as well as inconvenience associated with the series of events surrounding the breach. Where the case against the engineer is founded in tort for failure to adhere to the established standard of care, and causes damage to property, such as foundation failure, for example, our courts have awarded the owners additional damages for mental anguish and inconvenience beyond the actual amount of their economic losses.

More significantly; however, where the failure results in an accident and personal injury, such as from collapse of a building or a vehicular collision arising from faulty design, the court may also award general damages for past, present and future pain and suffering, temporary or permanent disability, loss of enjoyment of life, scarring and disfigurement, mental anguish, emotional distress and inconvenience, as well as past and future medical expenses, past and future lost wages, loss of earning capacity, and damages to property. Although some of these may appear to overlap a bit, courts often consider them as separate elements in determining damage awards. Additionally, in some instances certain family members may be entitled to recover for "loss of consortium", meaning loss of the company, affection and services of the injured person. In another situation, close family members who observe another family member receiving a traumatic injury, or who come upon the scene shortly afterwards, may also obtain compensation for the mental anguish and emotional distress they suffer as a result of the family member's injury.

MITIGATION OF DAMAGES

Whether a claimant seeks damages under breach of contract or in tort, the Civil Code and the case law uniformly require the claimant to make a reasonable effort to mitigate the damage caused by the alleged failure to perform or the substandard conduct of a professional. The burden of proving that the claimant failed to exercise ordinary prudence and failed to take reasonable steps to minimize the damages, rests with the defendant/engineer. If the court finds that the claimant did not take reasonable steps, then the court may reduce the damage award as it sees fit.

COMPARATIVE NEGLIGENCE

Where the claimant's negligence contributes to the professional's failure to perform either under an alleged breach of contract or in tort, the civil code requires the court to reduce the damage award in proportion to the negligence of the claimant. Additionally, where the court finds more than one party at fault, the code requires the court to apportion the damage award among the defendants according to the degree or percentage of fault it considers attributable to each.

LEGAL INTEREST AND ATTORNEY FEES

Legal interest, also called judicial interest, in a suit for damages in tort begins to run from the date of judicial demand, that is, the date of filing the suit, rather than from the date the court renders judgment at the conclusion of the trial. On the other hand, legal interest in a suit for breach of contract begins to run from the date the claimed amount is deemed due for payment, which may be when the court signs the final judgment several years after the suit is filed on a professional services complaint. Since the court may not render a final decision until years after the filing date, characterizing the action as one in tort or in contract could become quite significant for the interest alone where large sums are involved.

The judicial rate of interest usually changes from year to year. By law the Louisiana Commissioner of Financial Institutions determines the rate for each calendar year beginning on January 1st. The Commissioner has set 3.75% as the annual rate of legal interest for the current year, 2010. From 1982 through 1987 the Commissioner held the rate of judicial interest at 12%, and even as recently as 2007 set the rate as high as 9.5% for that year.

Attorney fees in Louisiana are almost never recoverable in suits for tort damages or for breach of contract unless a statute provides for recovery of attorney fees in a specific situation or the contract itself calls for payment of attorney fees in the event of a breach.

APPELLATE REVIEW

In determining and apportioning damages, the civil code gives "much discretion" to the judge or jury in contract as well as tort cases, because they observe the witnesses, hear the arguments and receive all the demonstrative evidence first hand and in person. By contrast, the courts of appeal only receive a written transcript of the live proceedings and do not have the benefit of seeing and hearing the demeanor of the witnesses and attorneys in evaluating the credibility of their presentations. For that reason the broad discretion given to the lower court receives great deference upon review at the appellate level. In fact, our courts of appeal generally view challenges to the amount of an award as questions of fact rather than issues of law, which they will not disturb or set aside unless they find the lower court so clearly and manifestly wrong as to have actually abused its broad discretion in determining the amount. Accordingly, it is probably not advisable to count upon relief from the amount of a damage award at the appellate level unless you are dealing with an outrageous assessment or relying upon a mistake in application of the law by the lower court which would reverse the determination of liability in full or in part and eliminate fully or partially the claimant's entitlement to damages in any amount.

PRESCRIPTION AND PEREMPTION

Statutes of limitation typically place limits on the right to pursue and enforce claims in court by prescribing time limits for filing suit on them. Our civil code refers to these time limits as prescriptive periods or "prescriptions" and when a claim has not been filed within the prescribed time we declare the claim "prescribed". Prescriptive periods limit the right to exercise rights which we would normally be able to exercise without limit. With a few specified exceptions, the civil code prescribes a one year prescriptive period for filing suit on a tort claim from the day the injury or damage is sustained, and a ten year prescriptive period to file for breach of contract.

In contrast to prescriptive periods which limit existing rights, peremptive periods are said to create rights for a limited period of time. Prescriptive periods may be extended by events which interrupt and suspend their running, whereas peremptive periods cannot be extended. Two sections of the Louisiana Revised Statutes, namely R.S. 9:2772 and R.S. 9:5607, provide peremptive periods which limit actions for damages against professional engineers, whether in tort or in contract, to five (5) years from recording the acceptance of construction by the owner, which appears to reduce the ten year prescriptive period for breach of contract actions to a five year peremptive period for engineers, architects, surveyors, and a few other named professionals. R.S. 9:2800.3 also attempts to limit the liability of engineers who design or supervise hazardous waste and asbestos removal, mitigation, abatement, or cleanup by limiting recovery against them to those instances in which their violation of established guidelines or their negligent performance actually caused the injury.

CONCLUSION

We have sought in this brief sketch to provide some insight into how our legal system approaches basic issues in the complex area of professional liability of engineers. In reality, cases involving professional engineers present some of the most difficult challenges to our legal and judicial system, because the context and technical framework in which they arise invariably far exceeds customary knowledge and experience of the laypersons who must present and defend them, as well as the judges, and sometimes juries, who are expected to resolve them with precedent setting clarity and precision. Hopefully, reviewing some of these fundamental aspects together will increase our understanding of the process and enhance our mutual ability to make it work.

James B. Frederick, Jr. is a 1970 graduate of the Paul M. Hebert Law Center at Louisiana State University. He has been engaged in the public and private practice of law in Baton Rouge since that time. He has served as an assistant parish attorney and prosecutor, and for the past 30 years as a staff attorney for the Louisiana Department of Transportation and Development in its Construction and Public Works Unit.

Leadership in Times of Crisis

Editorial By Deborah Ducote Keller, PE

As I write this, the 5th anniversary of Hurricanes Katrina and Rita are approaching and it's day 70 of the Gulf oil spill disaster, another record-breaking crisis striking Louisiana. Although the debates continue about whether the former was a natural or man-made disaster and the latter is clearly a man-made disaster, comparing and contrasting between the two events are inevitable. The hurricane took only hours to destroy, while the oil spill is lingering for months, yet full recovery from both will take years, and maybe decades. Any disaster, as well as recovery from the havoc it wreaks, painfully reminds us of our vulnerabilities, lack of resiliency, and other deficiencies as we scramble to restore what once was. Perhaps after studying such events we as civil engineers should refrain from asking, "What lessons did we learn?" and instead ask, "What lessons were we taught?"

I have pondered this each day since April 20th, "What is the oil spill teaching me?" I live in St. Bernard Parish. I know the locals who are affected, as well as those who are actively working the crisis. It didn't take very long for me to conclude that leadership in times of crisis is the most important variable that will determine the extent of loss and the recovery required. I use the term variable, because there are different levels of leadership at work.

Picture a dog sled team. There's the last dog on the team for whom the view never changes, yet the dog is responsible to do its part to pull the sled as best it can. The dogs in the middle of the pack pull the ones behind them and follow the dogs ahead. Most importantly, there is the leader of the pack, the visionary that can bring the team to their destination, or run them in circles, or even take them all over a cliff. They each have a different level of leadership.

The second most important variable is the organizational culture that each leader must function within. When leadership suddenly changes, whether it's in government, private sector, the military, or a non-profit organization, it doesn't necessarily mean the leader was lacking critical leadership skills. More often, it's a case that the leader was not compatible with the culture of the organization. Although people can change their style, learn new skills, and enhance their strengths, organizations, by their very nature, are slow to change their core values and what their emphasis and priorities are. The organizational culture is akin to the musher who rides along and steers after harnessing the dog sled team.

If you have ever worked for more than one organization, you know how much cultures can differ. During a time of crisis, several organizations, each with their different cultures and leaders, are suddenly thrust together and collaboration won't happen naturally.

All too often during a crisis, precious time and valuable resources are wasted when the organizational cultures clash, figuring out such things as, "This is what I will do because I can and you can't, and I will do it because it's important to me, but not to you. This is what you will do because you can, and you will do it because it's important to you, but not to me."

Deborah Ducote Keller, PE

Nothing will be as productive or efficient as it should be until everyone is saying, "This is what we agree we can each do and we will do it because it's important to mitigating the loss and moving forward with recovery together and successfully."

Unfortunately, sometimes that realization comes very slowly and sometimes not at all. There's always an overwhelming need for the same resources or mutually exclusive goals that interfere with collaboration. Leaders with the authority to make progress are often given such a broad span of control that it hinders effectiveness, while those with a single-focus approach have little authority to execute a plan.

Most engineers receive little, if any, coaching in the subject of leadership; however, civil engineers are very likely to be called to respond in some capacity during a crisis when understanding leadership principles is valuable. As engineers we need to continually evaluate our personal abilities in order to eliminate any fatal flaws and to concentrate on improving those qualities that make us more effective. We need to recognize the leadership culture of own organization, as well as the other organizations that we will have to connect with.

New research is revealing what makes for great leaders and challenging some previous beliefs about leadership. If you want to read more about current discussions regarding leadership, organizational culture, and leadership in times of crisis I suggest the following:

• "The Extraordinary Leader" by John Zenger and Joseph Folkman

• "Good to Great" by Jim Collins

• "Preliminary Leadership Lessons from the Response to the 2010 Deepwater Horizon Oil Spill" by the National Preparedness Leadership Initiative www.meta-leadershipcommunity.org/uploads/files/x/000/038/578/Oil%20Spill%20Lessons

Deborah Keller will be presenting the topic "Leadership in Times of Crisis" at the ASCE/ACI Louisiana Civil Engineering Conference and Show in Kenner, LA in September 2010.

Integration of Advanced Tools for Three Dimensional Data Collection

By Toby Lee

Toby Lee

INTRODUCTION

The use of high precision measurement tools to collect three dimensional (3D) data for engineering design (both large and small scale) is becoming more common place. This is primarily because recent advances in hardware and software technology have allowed for the development of acoustic and laser based tools that are relatively user friendly and cost effective. The use of high density, precise 3D data sets gives engineers many advantages in project development, implementation, and management. Having the ability to better visualize existing conditions, measure multiple parameters individually or simultaneously, and easily develop models from an all encompassing data set increases overall efficiency and accuracy. Specifically, terrestrial laser scanners, underwater acoustic imaging tools, aerial LiDAR, and vessel based LiDAR are now more commonly used by surveyors and engineers in many construction and fabrication industries.

In this article, I will give you a brief overview of just a few advanced tools and ways that they are being utilized by project managers at John Chance Land Surveys, Inc. in Lafayette, Louisiana which is a member of the Geospatial Services Division of Fugro.

TERRESTRIAL LASER SCANNING

Recent advances in terrestrial laser scanning for survey grade applications have lead to a growth in utilization of 3D imaging technology to address the increased demands for higher precision and accuracy in commercial and industrial settings. 3D imaging laser scanners are now used in industries ranging from aircraft and ship hull inspection to municipal and plant site surveys, ports and harbor facilities, and more interestingly, criminal forensic science. With the increased acceptability of the terrestrial laser scanners as an advanced survey solution, software developers have also stepped up efforts to customize their software products and offer innovative specialty solutions to the expanding array of laser scanning applications.

Because of the increased awareness and acceptance of terrestrial laser scanning technology as a superior solution, surveying and engineering groups have re-evaluated the feasibility of integrating these systems into their data collection toolbox. Terrestrial laser scanners, both static and mobile, are quickly being embraced as a way to collect extremely precise and comprehensive data sets while reducing exposure of field personnel and resources.

There are several different options available between the various brands of terrestrial laser scanners. The two most distinguishing differences are the Time-based pulse lasers and the Phase-based continuous lasers. The pulse laser system is most commonly found in the everyday survey total stations which use a laser diode that sends a laser pulse to an object and its diffused laser return is precisely measured for distance, azimuth and zenith angles, and return intensity amplitudes. The pulse laser systems' measurement rates can vary from 1,000 points/second to 50,000 points/second with maximum ranges from 300 meters to 6,000 meters. Vertical line-of-sights range from as little as 80 degrees to 135 degrees on a single azimuth. The Phase-based or "modulated-based" lasers use a continuous light source as opposed to pulsing on and off. These systems modulate the laser with a sine wave and measures the phase differences between the transmitted signals to the reflected signals. The speed of measurement is up to 100 times faster than the pulse systems, but is limited to shorter ranges of 70 meters to 100 meters. Phase-based are ideally suited for mobile platform applications because of their high scan rates. Data is stored either internally or transferred through a cable connection or wireless to a laptop. Some systems have internal photographic equipment and may or may not include inclinometers or dual-axis compensators.

UNDERWATER ACOUSTIC IMAGING

Terrestrial laser scanning systems that incorporate dual-axis compensators can be deployed as a robotic total station with backsight, foresight, and traverse capabilities, or can be operated in free-station mode. When combined with GPS units in the field, global coordinates can be incorporated into all scanner control points and all observations recorded with real-time positioning. By utilizing GPS equipment with the terrestrial laser scanner's ability to function as a conventional surveying instrument for setting control monuments, employing the terrestrial laser scanner in full robotic mode and traversing through these monuments further refines the monument positions. The combination of these techniques results in greater vertical and horizontal closures than what is normally acceptable. Higher accuracies can be achieved because of the elimination of human factors such as parallax error and physical equipment interactions. One of the unique features of the Leica ScanStation Terrestrial Laser Scanner is the green-colored laser light emitted from its laser pump. The characteristics of the green laser frequency gives it the potential to penetrate water and is the laser light spectrum needed for aerial bathymetric LiDAR operations currently utilized as an industry standard. Infrared laser frequency is easily absorbed by water and is used to detect water surface, while the green laser frequency achieves the maximum penetration in shallow water with clear water depths of 50 meter. Terrestrial lasers have a shorter laser pulse which is easily scattered into the water column. The bathymetric system uses a longer pulse wave length on the order of 250 nanoseconds as opposed to 10 nanoseconds. The laser measurements of sub-water surface returns from the terrestrial laser system are often 3-6 centimeters longer from the laser source at 0.5-1.5 feet below the waterline due to timing return errors measured through a denser medium, and will be defused in a xyz planar direction. However, in a visual point cloud, bulkheads and pillars can easily be identified as a horizontal offset in relation to the laser returns measured above water.

AERIAL LIDAR

One of the challenges that land surveyors and engineers have always been faced with in the electrical transmission industry, particularly in high-voltage power stations, is the ability to safely operate in hazardous and confined areas where conventional survey methods and equipment pose potential electrical conductive hazards, as well as the degradation of GPS satellite and radio signals by high-voltage overhead utilities. Terrestrial laser scanners are ideally suited for this type of survey environment because of the ability to measure, with high levels of precision, all of the electrical support structures, bus lines and insulators, building structures, and ground features from the facility periphery. Terrestrial laser scanning enables field personnel to acquire topographic millimeter grid resolutions from a non-tactile data acquisition approach at raw data accuracies of ±3 millimeters. By being able to interact with the digital point cloud data, bus line deformations and height clearances can be easily identified and measured quickly and safely.

We are currently working with electric transmission companies to survey and map electrical power distribution lines and power stations throughout Texas, Louisiana, Mississippi, and Arkansas. This work is being conducted through a combination of terrestrial laser and aerial LiDAR managed by our Lafayette, Louisiana FLI-MAP® Corridor Mapping Division. Figures 1 and 2 are renderings of an electrical substation from data collected during a terrestrial laser scanning survey. The entirety of the substation was captured with four scans from different ground positions on the periphery of the substation. All data collection was completed in less than a day. In this particular case, the utility company was interested in knowing the dimensions, elevations, and positions of all concrete support pads within the site. Additionally, a bare earth digital terrain model was created for drainage purposes of the site. This may seem like a lot of horsepower for some relatively simple tasks. However, the real value of collecting the data with the terrestrial laser scanner is the advantage of having a complete 3D high precision data set available for use in asset inventory, future expansion planning, or structural damage assessments. More importantly ALL site data was collected from safe operating distances from the high-power electrical structures with virtually no risk to field personnel. The fact that all of this data was collected in less than one day is also a big plus.

Our Airborne Sensing & Corridor Mapping Division uses a high-resolution aerial LiDAR system (FLI-MAP®) integrated with IMU and GPS technology to collect dense point cloud data, high-resolution video and imagery for various markets such as transmission engineering, railway, levees, pipelines, and roadways. Project deliverables have primarily been used for engineering analysis of the transmission lines, railways, and levees. Typical deliverables include digital terrain models (DTM), transmission and distribution infrastructure positioning to perform re-rating analysis, and surveys for new build/re-build of transmission infrastructure, centerline of rail and rail features in the right-of-way, and high resolution ortho-imagery in support of these engineering and GIS related tasks. Typical deliverables for the transmission industry are PLS-CADD models for line rating analysis. The most common software platforms and data deliverables for rail, levee, highway, and pipeline markets are MicroStation and AutoCAD files populated with LiDAR derived digital terrain models, planimetric mapping, and ortho-imagery.

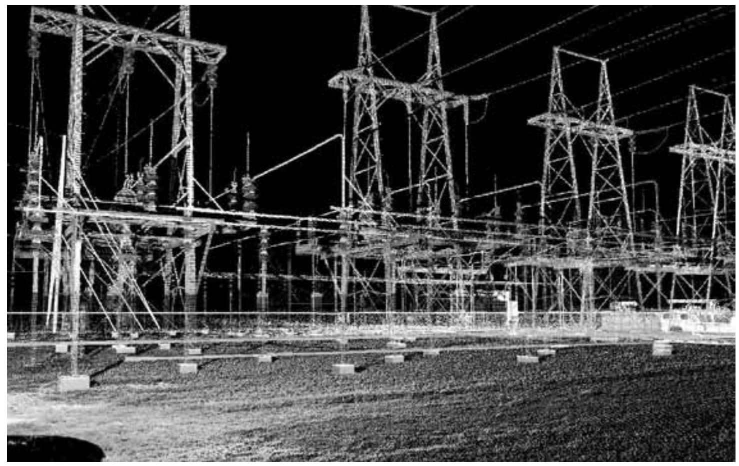


Figure 1: Point Cloud data of Electrical Substation

Figure 2: Point Cloud data of Electrical Substation

APPLICATIONS

Another application for the terrestrial laser scanner is the dimensional control fabrication and validation surveys on oil and gas sub-sea manifolds and jumpers. During the fabrication process for these sub-sea manifolds, placement of key components, such as hub connectors, pipe supports, flange connectors, and valve interfaces, must meet fabrication tolerances of 1/16 to 1/8 of an inch. The employment of the terrestrial laser scanning equipment helps to quickly assess temporary fabrication placements for key components, validate fabrication positions in relationship to design positions with the required fabrication tolerances (1/16 inch or ±1 millimeter), and calculate corrections on site before the end of the survey day, and limits construction down time and costly fabrication resources. Once the hub alignments are corrected and final welds are made, a full As-Built Validation Survey Study of the entire manifold structure is performed for validation reporting. Due to in-field fabrication corrections by the fabrication personnel, some design changes may be needed on key components. These changes have to be identified upon completion of the fabrication build and identified for a sign-off from the design engineers without delaying the painting, insulation, and shipping preparation process. Terrestrial laser scanners are well suited for quick and accurate data acquisition without impeding final manifold preparation. The scanner provides invaluable documentation for quality assurance and the point cloud of the as-built structure can be archived for future analysis and comparisons. In the event that further questions may arise, or greater evaluations are needed on the previously surveyed structure, then secondary site visits for re-surveys may ultimately be eliminated due to the abundance of point cloud data from the previous survey. Figures 3 and 4 are renderings of sub-sea structures in which dimensional control surveys were performed and as-built measurements and drawings were delivered on-site usually before the closing of the work day.

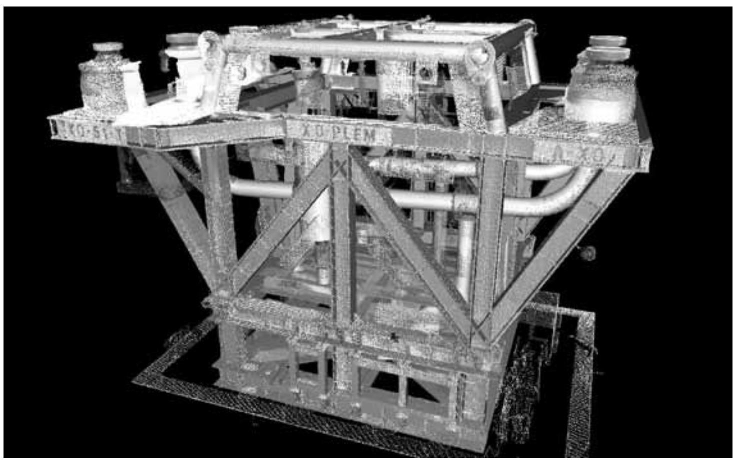


Figure 3: Point Cloud data of Subsea Manifold

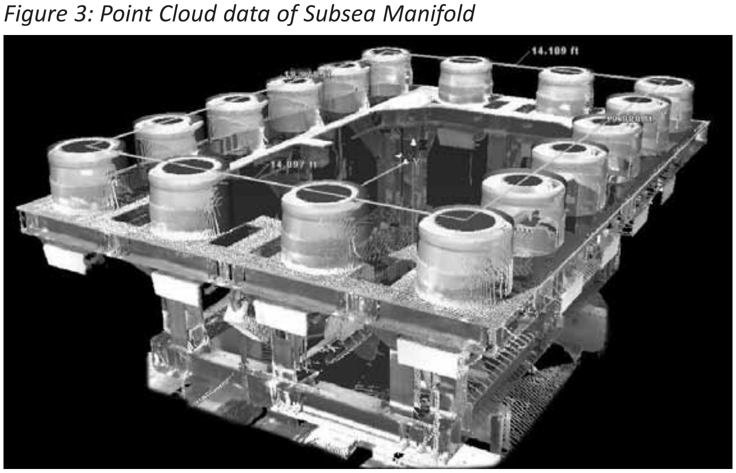


Figure 4: Point Cloud data of Subsea Manifold

We have also been successful in combining terrestrial point cloud data collected from the terrestrial laser scanner with acoustic 3D imaging technology from our Shallow Water Survey Division. By combining multiple geo-referenced terrestrial laser scans with the mobile shallow water multi-beam mapping systems and side scan sonar, a complete 3D point cloud database can be compiled. Water bottom-to-bridge or water surface-to-bridge clearances, structure profiles, as well as water bottom profiles are easily performed to assess existing structure and canal conditions. Figures 5 and 6 are a good example of 3D data collected and combined from above and below the water surface. This particular data set was collected near

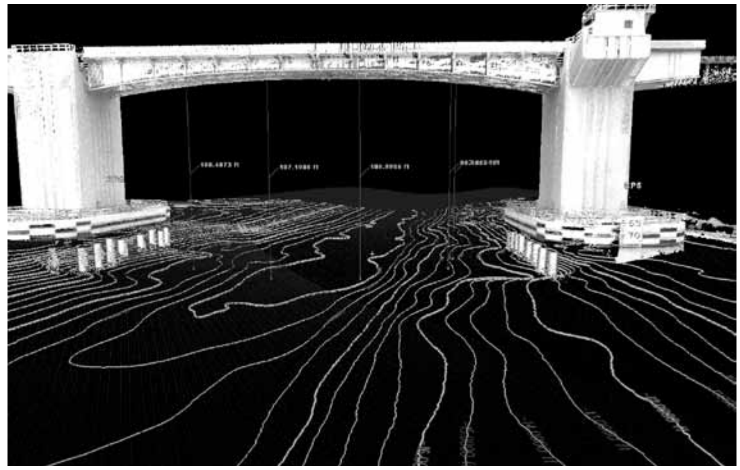


Figure 5: Bathymetry and Terrestrial Laser Data of Cypremort Point Bridge

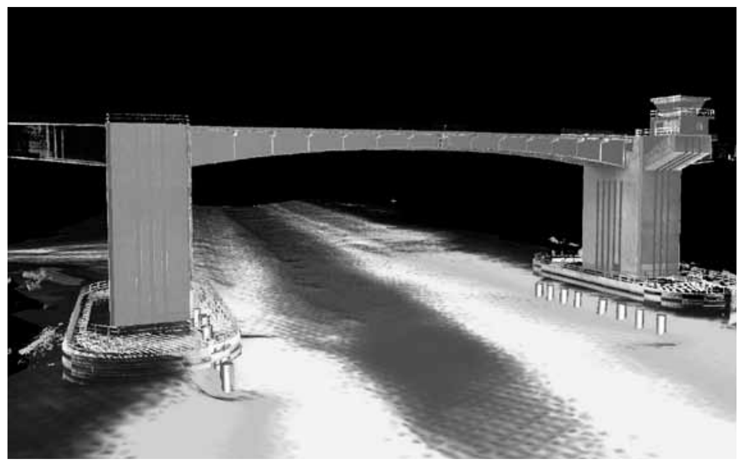


Figure 6: Bathymetry and Terrestrial Laser Data of Cypremort Point Bridge

the Cypremort Point Bridge in St. Mary Parish, Louisiana. The data below the water surface level was collected with two passes of a shallow water multi-beam system mounted on a 24-foot boat. The data above the surface of the water was collected from four setups with a stationary terrestrial laser scanner. All of the data was collected in less than a day. We utilize shallow water multi-beam systems, scanning sonar, and side scan sonar for shallow water bathymetric surveys, canal route assessments, lock and dam studies, environmental monitoring, hull-bridge-pile inspections, and dredging operations. Other sensors such as magnetometer and sub-bottom profiler are often incorporated into the bathymetric portion of a survey for hazard and route assessments.

The effective combination of terrestrial laser scanning, shallow water multi-beam systems, and side scan sonar at the Freshwater City Lock channel and associated lock structures located in Vermilion Parish, Louisiana is a great example how well these advanced technologies complement each other. Figure 7 shows a snapshot of bathymetric data contoured along with terrestrial laser point cloud data of the lock infrastructure. With this robust dataset, profiles and cross-sections were effortlessly created, and water bottom scour was easily identified. All data was geo-rectified based on a local coordinate system that can be utilized with most engineering packages.

Figure 7: Bathymetry and Terrestrial Laser Data of Freshwater City Lock Structure

The terrestrial laser scanner and shallow water acoustic multi-beam systems allow field personnel not only to collect data for planning and maintenance but also to perform on-site assessments of existing conditions and structural damage very quickly and efficiently in the event of maritime accidents or natural disasters.

CONCLUSION

By integrating data from terrestrial laser scanners, underwater acoustic imaging tools and aerial LiDAR, 3D imagery from the land, sea, and air can be combined to create a virtually seamless point cloud image for practically any job type. This enables clients to perform quality assessments on construction as-builts, perform a more comprehensive asset inventory of existing infrastructure, or perform damage assessments. Regardless of the need, these assessments can be completed in a timely and cost effective way.

For further information please view our website at www.jchance.com or www.fugro.com.

Toby Lee is a Project Manager with over sixteen years of experience in all aspects of land surveying and civil engineering. He spent four years in the utilization of terrestrial laser scanning and its implementation for metrology studies for structural assessments and as-built/as-is surveys. He has over thirteen years of experience as a civil engineering technician/analyst and is a graduate of Louisiana Technical College.

Section News

HIGHLIGHTS OF THE APRIL 16, 2010, BOARD MEETING

The Board met at the Clarion Hotel after the conclusion of the Louisiana Section Spring Conference in Shreveport. President Christopher Knotts called the meeting to order and welcomed everyone. Ten of fifteen board members, as well as three guests, were in attendance.

After approval of the agenda and the minutes of the February board meeting, Kurt Nixon presented the financial report. As of April 15th, the current balance in the operating account was $ 14,427.84 in the Capitol One checking account and $ 2,105.85 in the Whitney Bank checking account.

Ronnie Schumann gave a brief report on the 2009 tax return which is now required by the IRS and ASCE National. He has received financial information back from all branches, institutes and most of the student chapters. All of these groups now have to file under the Section's federal tax id number.

The Constitution and By-Laws have been modified significantly, and the final version will voted on at our June board meeting. The Baton Rouge and Acadiana Branch By-Laws have been modified and the changes will be voted on as well.

Chris Sanchez gave an overview on ASCE National's desire for all Sections to undergo a self-audit. His recommendation is that the Section and all branches set up Quickbooks, with all budget categories standardized, to allow for easily combining data. The proposed audit would include a Compilation Review of the branches and Review Level Audit of the Section. This service would cost approximately $ 7,500.

Pat Landry initiated discussion of modifying some of the Section Awards for 2011. Discussion ensued and a committee will be formed next year to review and propose possible changes. Ronnie Schumann is the Section Awards Chairman for 2010 and will be putting the voting committee together and soliciting award nominees from the branches soon.

President Knotts adjourned the meeting at 2:31 pm. The next board meeting will be held in September in Lafayette.

LOUISIANA SECTION INFRASTRUCTURE REPORT CARD

The Louisiana Section has initiated efforts to produce a report card for our state's infrastructure needs based on criteria set up by ASCE National. Last year, ASCE National produced a national report card and several Sections have created report cards for their individual state's needs.

The Louisiana Section's organizing committee has identified eight categories to develop grades for our report card: aviation, roads, bridges, levees, dams, wastewater, drinking water and hazardous & solid waste. Additional categories may be considered as well.

Anyone interested in volunteering to work on the report card should email Mr. Joey Coco at joey.coco@engensus.com.

BATON ROUGE BRANCH

By Jeffrey L. Duplantis, MS, PE, PMP, Branch President

For many of you receiving the August issue of the Section Journal means that summer is winding down and your kids are going back to school, or for those of you who are past that stage in your life (as I am), it means that fall is on its way and the blistering heat of summer is almost behind us. For me however, it means that I only have a few more months left in my term as President of the Baton Rouge Branch.

As reported in my last Journal write-up, the Board started the year out with several great meetings which were very well attended by our membership. The last few months were no exception. In May we joined with LES and APWA to welcome Mayor Kip Holden to our monthly luncheon. As always this drew a large crowd. Mayor Holden discussed the current state of affairs within East Baton Rouge Parish and the City of Baton Rouge. He mentioned several economic development opportunities coming to the area and briefly covered a few upcoming possibilities that he was working on. He went over a short update on the two major projects ongoing in the Parish, and provided some insight into the status of the Green Light and SSO Programs.

In June, Baton Rouge played host to the first State of the Coast Conference. This conference was a joint effort between the Coalition to Restore Coastal Louisiana, the Coastal Restoration and Protection Authority and the US Army Corps of Engineers. Several members of the ASCE Baton Rouge Board sat on the steering and planning committees in order to ensure that the engineering community was well represented in the planning of the conference. We are pleased to report that the conference was a great success. During the three day conference approximately 700 registrants were able to attend presentations and participate in discussions highlighting the unique attributes and challenges facing coastal Louisiana. It is our hopes that this will become a bi-annual conference that will grow in both magnitude and interest.

Our regular monthly branch luncheon in June was our annual past president's recognition and branch awards luncheon.

Recipients for the 2010 ASCE Baton Rouge Branch Awards were as follows:

Educator of the Year – Ahyman Okeil, PhD, PE
Lifetime Achievement – Ara Arman, PE
Wall of Fame – Charlie Hair, PE
Outstanding Civil Engineer – Bob Jacobsen, PE
Outstanding Young Civil Engineer – Geoff Wilson, PE
Outstanding Government Civil Engineer – Bijan Sharafkhani, PE
Outreach – Joey Coco, PE

We'd like to again congratulate these recipients and wish them luck on the Section level.

Louisiana Section President Chris Knotts was on hand to present several membership certificates to some very deserving members of the Baton Rouge Branch.

Fellow Member certificates were presented to Ron Rodi, PE and Ken Perret, PE.

Left to right: Ron Rodi and Ken Perret

Bill Monroe, PE and William Mead, PE were on hand to receive their Life Member certificates.

Left to right: William Mead and Bill Monroe

Of special interest were the past branch presidents that were in attendance. All were recognized and appreciation for their past leadership was extended to each of them. In attendance were Billy Wall ('08-'09), Bob Jacobsen ('07-'08), Brant Richard ('06-'07), Roy Waggenspack ('01-'02), Christopher Knotts ('99-'00), Jerry Klier ('97-'98), Charles Eustis ('96-'97), Patrick Broderick ('92-'93), Tom Willis ('91-'92), James Aronstein ('79-'80), *continued on next page*

Left to right: Dr. Ahyman Okeil, Bijan Sharafkhani, Ara Arman, Geoff Wilson, Joey Coco, George Hudson accepting for Charlie Hair, and Bob Jacobsen

Left to right front row: Jim Porter, Bob Jacobsean, Charles Eustis, Gerald Dyson, Billy Wall, and Chris Knotts. Left to right back row: Tom Willis, James Aronstein, Jerry Klier, Roy Waggenspack, Brant Richard, Pat Broderick and Larry McKee

BATON ROUGE BRANCH *continued*

Jim Porter ('77-'78), Larry McKee ('74-'75) and Gerald Dyson ('64-'65). I would again like to thank each of these gentlemen, and those that were unable to attend, for their leadership and dedication to the society and the branch.

The Baton Rouge Branch Board took off the month of July to gear up for the final leg of our terms as we head into the fall. August will be another joint meeting with LES and should be a great luncheon. August will also be our presentation of proposed branch officers for the 2010-2011 session, and September will be our installation of those selected to serve our membership over the course of next year. Please make arrangements to attend these last two meetings of our term so that you can meet your officers for next year and be present for their installation.

In conclusion, I want to thank all of the Baton Rouge membership for attending our monthly luncheons. Your interest and interaction is greatly appreciated. As a Board, we have strived to build upon the past years to provide you with topics of interest. We have several meetings left before we complete the 2009-2010 year, and the Board would like to encourage everyone to get involved and participate in the activities we have planned and to become active in the engineering community.

NEW ORLEANS BRANCH
By Benjamin M. Cody, PE, Branch President

The New Orleans Branch has been busy over the past few months, hosting three Branch luncheon meetings. Our April lunch meeting took place on April 29th, and our members were treated to a presentation on the "Construction and Testing of the Drilled Shaft Foundations for the Huey P. Long Mississippi River Bridge Expansion," delivered by Dr. Dan Brown of Dan Brown and Associates. The event was held at Five Happiness Restaurant, and was very well attended. Our May lunch meeting took place on May 26th, at Zea's Restaurant in downtown New Orleans. Our technical presentation was provided by Mr. Jon Guidroz of Free Flow Energy, Inc. Free flow power is a new technology that utilizes turbines in moving waterways to collect renewable energy. Mr. Guidroz presentation included the civil engineering challenges inherent with the application of this technology in a resource like the Mississippi River.

Our July luncheon meeting was our Branch Awards luncheon. At this event, held on July 21st at Ralph's on the Park, we recognized the following who were selected as award winners for our Branch:

- Outstanding Civil Engineer -
  - Anthony Goodgion, PE
- Outstanding Government Civil Engineer -
  - Joseph R. Buller, Jr., PE
- Outstanding Young Civil Engineer -
  - Nathan J. Junius, PE
- Educator of the Year -
  - Mysore S. Nataraj, PhD, PE
- Lifetime Achievement -
  - Frank J. Dalia, PhD, PE
- Outreach - Meg Adams, PE

In Addition to these awards recipients, we also selected Joseph Sullivan, PE, former superintendent of the New Orleans Sewerage and Water Board, as our Branch selection for the Louisiana Section Wall of Fame.

Also recognized were our Branch Members that have achieved Life member status:

- Om P. Dixit, PE
- Engin A. Egeseli, PhD
- Larry E. Busch, PE
- William B. Cromartie, PE
- David Allen Wagner, PE

TDI-LA hosted an evening seminar on "Linking Rail Systems in Southeast Louisiana" at the UNO campus on June 23. This seminar covered light rail systems between New Orleans and Baton Rouge as well as rail projects in the New Orleans area.

Our Younger Members have been busy as well. The group hosted a happy hour gathering at the Bulldog Bar and Grill in April, and a group event to attend a Zephyrs baseball game in June.

In addition to these events, the New Orleans Branch and the SEI – New Orleans Chapter each donated $500 (for a total donation of $1,000) to the Louisiana Engineering Foundation as part of a joint effort for the entire ASCE Louisiana Section to help defray the organizations building costs.

Please visit www.asceneworleans.org for upcoming events and news.

David Wagner, Life Member & Ben Cody

Om Dixit, Life Member & Ben Cody

Frank Dalia, Lifetime Achievement & Ben Cody

ACADIANA BRANCH

By Joshua P. Stutes, MS, PE, Branch President

Our Branch recently had an overwhelming April 28th crawfish boil that was a massive success! There were well over 200+ in attendance, and we had to get additional crawfish to accommodate everyone. In the future, we may have to plan for an even bigger showing. Three organizations (ASCE, LES, and IEEE) contributed to the function and our portion was approximately $1,164.

Recently, our board wanted to try and offer a small early summer seminar for the membership. We held this on June 9th, 2010 at ULL in the afternoon and worth a total of 4 PDH's. The topics of the three sessions were:

- ***Are You Fighting Fires Instead of Managing Your Employees?***
- ***Personal Time Management: Achieving a Work/Life Balance***
- ***60 Minutes to Becoming a More Successful Engineer***

We were very happy to be able to offer this to the membership. We made it completely FREE to members and only $20 to Non-Members.

Also, we have received nomination application forms for the 2010 ASCE Section Awards from the following nominees:

Outstanding Civil Engineer Award - E. Ray DesOrmeaux, PE, FASCE
Lifetime Achievement Award - David Huval, Sr, PE
Educator of the Year Award - Don Hayes, PhD, PE
Outstanding Young Government Civil Engineer Award - Chris Carroll, PhD, PE
Wall of Fame Award - Gene Sellers, PE
Outstanding Young Civil Engineer - Shaun Simon, PE

We plan on holding a luncheon at the Branch level tentatively in mid-August (August 17th-18th) to elect our new officers and award the Branch level awards. This is inclusive of 2-3 awards for University senior graduates from various universities. We have also secured our reservation at A La Carte for the State Section meeting to be held on September 17th, 2010.

We are very gracious to have had such a wonderful and productive year with our Branch and ASCE. We plan on using this momentum into next year's term full steam ahead as we begin planning our ASCE Spring Conference. Thanks to everyone who helped make our year very enjoyable and successful!

SHREVEPORT BRANCH

By Matt Redmon, EI, Incoming Branch President

The Shreveport Branch had a busy and successful 2009-2010 year! The Branch hosted its annual Spring Classic Golf Tournament at The Golf Club at Stonebridge on May 3rd. We took a break from our technical sessions and had an enjoyable time socializing and playing golf. The winners this year included BBC (first place), Ardaman and Associates (second place), and Aillet, Fenner, Jolly and McClelland (third place). Special thanks go to Scott Hughes for planning and organizing a successful tournament. On behalf of the Branch, I would like to thank all those who sponsored and participated in this year's tournament. Thanks to this support, the Branch is able to continue awarding annual scholarships to Louisiana Tech students. Thank you for your continued support in our endeavors.

Currently, we are taking a break for the summer, and our technical sessions will resume in September. I would like to thank our Past President Daniel Thompson, as well as, Patrick Furlong and Scott Hughes for their hard work throughout the year. The Branch is looking forward to another exciting year. If you have any suggestions for technical speakers please email Matt Redmon at matt.redmon@psiusa.com.

Student Chapter News

LOUISIANA TECH UNIVERSITY

By Eric Veuleman, Student Chapter President

Although the summer usually serves as a break from school related activities for most students, this summer has been very busy for the members of the Louisiana Tech ASCE Student Chapter. After a strong performance at the Deep South Regional Conference in March, this year's Steel Bridge and Concrete Canoe teams qualified for their respective national competitions for in the same year for the second time in school history.

Although they performed very well at the regional competition, the Steel Bridge team knew that their bridge had to be better in order to compete at the National Student Steel Bridge Competition (NSSBC). During the two months between the regional and national competitions, the team rebuilt almost half of their bridge in order to improve their scores for nationals. At the NSSBC, which was hosted by Purdue University in late May, the improvements paid off; Louisiana Tech placed 26th overall out of 46 bridges that were allowed to compete at the national level.

Because the Concrete Canoe Team was not allowed to make any changes to their canoe in preparation for the National Competition, they decided to spend the remainder of the school year improving their design paper and perfecting their paddling techniques. The National Concrete Canoe Competition was held in mid June, and was hosted by Cal Poly, San Luis Obispo. Louisiana Tech was the only representative from the Deep South Conference at this competition, and placed 22nd.

Louisiana Tech's ASCE Student Chapter is very proud of their accomplishments at the 2010 national competitions for both the Steel Bridge and Concrete Canoe projects. All of the students are excited about returning to school in the fall to continue planning for another successful year in 2010-2011.

ASCE-T&DI Louisiana Chapter News

By Karen Holden, PE

The ASCE-T&DI Louisiana Chapter held its most recent seminar on June 23, 2010 at the University of New Orleans. The seminar was titled "**Linking Rail Systems in SE Louisiana**" and included a series of presentations. The seminar was very well attended by both engineers and planners and included over 40 attendees.

The first presentation was on the feasibility study and environmental assessment findings for the proposed Baton Rouge to New Orleans Commuter Rail evaluation conducted for the Southern High Speed Rail Commission and the Louisiana Department of Transportation and Development. This presentation was given by Randy Carmichael, AICP, Burk-Kleinpeter, Inc., and Kevin Keller, PG, CGWP, Vice President, HDR Engineering.

Stefan Marks, AICP, Director of Planning and Scheduling, New Orleans Regional Transit Authority gave the second presentation on the approved TIGER grant to fund the Loyola Streetcar loop between the New Orleans CBD and the New Orleans Union Passenger Terminal.

The final presentation of the evening included a discussion on the methods to refine Transit Oriented Development (TOD) methodology and land use policy to successfully plan for passenger rail and land use at station stops. This presentation was given by John L. Renne, PhD, AICP, Early Research Professor of Planning and Urban Studies, Associate Director, UNO Transportation Institute Director, Transportation Studies.

Our next seminar is scheduled for Wednesday July 21st and will be held at UNO. The topic for this seminar is "**Accelerated Construction Project Delivery Methods**" and will include a discussion of the pros and cons of various innovative contracting methods. The speaker will be Jeff Lewis, Project Management Engineer with the FHWA Resource Center in Sacramento, California.

ASCE T&DI Louisiana Chapter is planning the following future seminars:

• Huey P Long Bridge Superstructure Construction
• Roundabout Design for Busy Intersections
• Hurricane Evacuation

The intent of the institute is to provide training and networking opportunities for all professionals involved in transportation projects. If you would like a seminar on any special topic, please contact anyone on the Executive Committee and they will try to get it arranged

More information can be found on the ASCE Louisiana Section Web site at www.lasce.org and ASCE New Orleans Branch Web site www.asceneworleans.org. To add your name to our mailing list and/or to join the Executive committee, e-mail Om P. Dixit at om@fenstermaker.com.

ASCE-SEI New Orleans Chapter News

By Om Dixit, PE, FASCE

Since our report in May 2010 issue of this magazine, ASCE SEI New Orleans Chapter hosted one seminar and has planned the following future seminars in New Orleans:

April 08, 2010 - Controversial Issues Surrounding Sustainability of Concrete*, (Annual David Hunter Lecture) Richard Stehly (*President ACI, Minneapolis, Minnesota) presented the Annual David Hunter Lecture for 2010. Mr. Stehly gave a brief history of sustainablity of infrastructures which was followed by the facts about using concrete as a green material. He also pointed out the roadblocks for concrete usage and needed actions to make it more environmental friendly and sustainable material. Ralph Junius of Linfield Hunter & Junius presented a plaque to Mr Stehly for making the presentation.

Ralph Junius (right) presenting the plaque to the speaker. Richard Stehly (left), ACI President, following the presentation of David Hunter Annual Lecture 2010

Future Seminars:

The following dates are the projected seminar dates for 2010. The exact dates may change due to the availability of the speakers and UNO Lecture room.

- August 26 - Timber Design Seminar (Title to be decided) Dr. V.J.Gopu, LSU.
- October 14 - Marine Design Seminar (Speaker and Title to be decided)

More details about these seminars will be posted on the ASCE New Orleans Branch website as soon as they are finalized. The committee is looking for good topics and speakers for future presentations. Members with expertise in above areas would be welcome to join the Executive Committee. For any suggestion and information on joining the Executive Committee, contact Chairman William Rushing, Jr., PE, at Bill.Rushing@wsnelson.com.

All seminars are held at the University of New Orleans. Seminar dates, pertinent information, and registration can be found on the New Orleans Branch website at www.asceneworleans.org. To add your name to our mailing list, e-mail Om P. Dixit at om@fenstermaker.com.

The Importance of Public Participation

Editorial By Risa Mueller, PMP

When the phrase "Public Participation" comes up in project descriptions, it can be interpreted in a host of different ways. Some managers see public participation as a requirement to print public notices about a project. Others see it as an opportunity to work hand-in-hand with the public to generate a project result that effectively meets the project purpose and need while incorporating interests of the public in corridor developments, design specifics and the like.

As with most things in life, the majority of people probably fall in the middle of the spectrum. The question for most of us who work on projects involving NEPA requirements, and even on those which do not, is whether we truly believe there is a need for "civilian" input into project development. In pre-NEPA days public participation was virtually nonexistent, and in the years since, has evolved into varying degrees of participation.

The public's involvement on a given project can run a wide gamut, depending on the community and the information sought. Participation should be relevant across the socio-economic spectrum, effective in reaching audiences, and appropriate for engaging all audiences. An example would be a grassroots efforts combined with email networking. The use of surveys, public meetings, individual interviews, and stakeholder committees are among the most common ways most firms involve area residents. The timing of the involvement is also an area of discussion, as some projects offer input opportunities prior to development of potential designs, while others offer feedback opportunities on proposed designs only.

Risa Mueller, PMP

As a case study for insight into the impact of well-rounded public participation efforts, we can look at a current project on which we (Franklin) are engaged, the I-49 Inner City Connector feasibility study within Shreveport. Twenty years ago, this project was literally shut down by community activists and residents who not only felt left out of the process but also felt the process as a whole was wrong. Some of those who objected to the project had either personally or through family members been negatively impacted by interstate projects of the past. Many felt they had no opportunity to voice their opinions, and that any opinions voiced were ignored by those in charge. Ironically it was through the project processes that these voices brought the project to a halt, and only recently were the questions about the connector received in a way that allowed the feasibility study to even begin again.

A very different result was seen when the project was rebirthed with a feasibility study last year. Initial stakeholder interviews, resident-friendly public opinion surveys and interactive mapping exercises were all employed to promote reciprocal learning and communication while gathering human data on opinions, preferences, anticipated benefits, and concerns from the beginning in this study. With a total of 10 community meeting opportunities for residents to provide input both on suggesting potential corridors, then later to provide feedback on the refined corridors, active participation occurred from the outset and potential corridors were developed in a collaborative manner. The project appears ready to move past its Stage 0 status soon.

Overall the lesson for projects is this: If a project has the time and budget to effectively engage the public, the final design and ultimate implementation can be not only feasible on paper, but feasible to and appropriate for the affected communities.

Risa Mueller, PMP, is Senior Projects Manager at Franklin Industries, a Baton Rouge-based firm specializing in public affairs, governmental affairs and environmental affairs. With more than 20 years of experience in the communications, marketing, and project management fields, Ms. Mueller provides management direction and oversight for all firm projects. Her recent direct experience includes: I-49 Inner City Connector project in Shreveport, Shreveport and East Baton Rouge Comprehensive Plan efforts, and the CDBG-funded Road Home recovery program.

— Calendar of Events —

AUGUST 2010	
August 27, 2010	Louisiana Section Report Card Planning Meeting; TJ Ribs in Baton Rouge; 11:00 am
SEPTEMBER 2010	
September 16, 2010	Baton Rouge Branch Meeting; Drusilla's; 11:30 am; Speaker: TBD
September 17, 2010	Louisiana Section Installation of Officers and Section Awards Meeting; A La Carte Restaurant; Lafayette; 11:30 am
September 22-23, 2010	Louisiana Civil Engineering Conference; Ponchartrain Center; Kenner, La.
OCTOBER 2010	
October 21-23, 2010	ASCE National Convention; Las Vegas, Nevada
October 29-30, 2010	Professional and Fundamentals of Engineering exams (Contact LAPELS at www.lapels.com for more info)

http://www.lasce.org/calendar.aspx

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