

Hurricane Katrina: Implications for the Construction Industry

By size and scope, Hurricane Katrina ranks as the costliest natural disaster in U.S. history. The total cost of the devastation is expected to be \$125 billion or more, substantially greater than the damage caused by 1992's Hurricane Andrew, estimated to be \$37 billion (adjusted to 2005 dollars).

The Federal Emergency Management Agency (FEMA) indicates that as many as one million people were displaced by Hurricane Katrina. Prior to the hurricane, 484,000 people lived in the city of New Orleans (making it the nation's 35th largest city). The evacuation virtually emptied the city, except for several thousand holdouts and the small number of volunteers and military personnel who remained to deal with the crisis. In Mississippi, the combined population of Gulfport and Biloxi was about 125,000 prior to the hurricane. The population of Harrison County (the county that connects these two cities dotting the Mississippi coast) was 185,000. Whole towns within this county were completely leveled by wind and water damage. Harrison County officials estimate that a quarter to a third of the county's population were made homeless, and that as many as 30,000 jobs dependent on the gambling and related industries have been lost. Another indeterminate number of jobs dependent on the area's fishing and cargo industries have been lost.

In both Louisiana and Mississippi, people's homes and livelihoods were completely demolished. The state of Texas has taken in more than 230,000 people left homeless by Katrina. Other evacuees have been sent to nearby states such as Georgia and Arkansas, and evacuees have been relocated across the nation as far away as Cape Cod, MA and San Francisco, CA. Closer to the impacted area, the city of Baton Rouge quickly doubled in size from its pre-Katrina population of 250,000 to about one-half million people.

Assessing the effects from Katrina is a complex process – new information becomes available each day, leading to a re-evaluation of prior assessments. In a broad sense, it's helpful to look at Katrina from two vantage points – the impacted area on the Gulf of Mexico, and then the broader implications for the U.S. economy and construction industry. Briefly, here are some of the main points to be derived from a mid-September assessment:

- The loss of life will be less than initially feared. As of September 15, the death toll from Katrina stood at 700. This number will of course rise in coming weeks, but should remain well below the 10,000 deaths estimated in the first days after the hurricane.
- Cleanup work in the impacted area is progressing, including repairs to the levees in New Orleans. Repairs to essential infrastructure, such as roads, bridges, sewers and water systems will be the priority in coming weeks. The criticism directed at the slow response by local, state, and federal officials in the first week after the hurricane may turn out to be a near term plus for construction, as government officials strive for even greater effectiveness in dealing with the cleanup process and rebuilding. The address by President Bush on September 15 gave further emphasis to the federal role in the rebuilding process, as he stated explicitly, "Our goal is to get the work done quickly."

- The broader aspects of reconstruction in the Gulf region, including rebuilding housing and commercial structures, will be spread out over the next several years. Political debate over the direction and control of the rebuilding will be a critical factor in how fast the work progresses.
- The U.S. economy will see growth dampened by 0.5% to 1.0% during the latter half of 2005, discernible but not enough to tip the economy into recession. Reconstruction efforts will be a net positive to GDP growth in 2006.
- Energy prices spiked immediately after Katrina, and are now receding. At the same time, it's expected that overall price levels going into 2006 will be higher due to Katrina, offsetting some of the benefits to economic growth arising from reconstruction efforts.
- Building materials will see continued upward pressure on prices, as well as constraints on availability.

The Impacted Region on the Gulf of Mexico

The area impacted by Katrina in the Gulf of Mexico was defined by the U.S. Census Bureau in a September 6 release to include 31 parishes in Louisiana, 15 counties in Mississippi, and 3 counties in Alabama.

With regard to construction, some perspective is gained by looking at the size of the impacted area relative to the U.S. During 2004, total construction in the impacted area was reported at \$7.1 billion, or 1.2% of last year's national total of \$589.2 billion. Of this 49-county region, the heaviest damage was experienced in five counties – Orleans Parish, LA; St. Bernard Parish, LA; Jefferson Parish LA; Harrison County, MS; and Hancock County, MS. In 2004, these five counties reported \$1.7 billion in new construction starts, or 0.3% of the national total. The necessity for cleanup work over the next few months means that most new construction in the nonresidential and residential sectors will be deferred for the time being. This will be a negative to the overall level of U.S. construction starts, but only to a very modest degree.

	Billions of Dollars			As Share of U.S.	
	Total Impacted	Five Most Severely	U.S.	Total	Severely
	Region in LA, MS, AL	Impacted Counties		Impacted Region	Impacted Counties
Nonresidential	2.05	0.62	162.94	1.3%	0.4%
Residential	3.91	0.80	332.26	1.2%	0.2%
Public Works & Util.	1.16	0.28	94.04	1.2%	0.3%
Total Construction	7.12	1.70	589.24	1.2%	0.3%

As for the extent of the destruction, the three parishes in Louisiana not only received the wind damage typical of most hurricanes, but they were also hit by flooding due to breaches in the flood walls of three major canals: the Industrial Canal (which borders Orleans and St. Bernard Parish), the 17th Street Canal (which borders Orleans Parish and Jefferson Parish) and the London Avenue Canal. The areas surrounding these canals suffered extensive damage.

Most of the flooding occurred in primarily residential areas. These three parishes alone contain nearly 431,000 housing units; recent estimates suggest that over 60% of Orleans Parish and nearly 100% of St. Bernard's housing stock will have to be rebuilt. While Jefferson Parish, particularly the area close to the Orleans Parish border, also suffered flooding damage, most of the area's homes are largely intact. Nearly

80% of Orleans Parish and almost 100% of St. Bernard Parish were flooded; in contrast, only about 15% of Jefferson suffered the same fate.

The devastation wrought by the hurricane is likely to increase housing construction substantially in these Louisiana areas over the next few years. The poorly growing economy of New Orleans was hampering housing construction in the first eight months of 2005. The pre-hurricane estimate for 2005 called for a 9% decline in single-family housing starts for these three parishes combined. In the post-hurricane period, the emphasis on cleanup work means not much new construction is anticipated through the end of this year. In 2006, homebuilding will begin to accelerate and should stay at elevated levels for the foreseeable future. Overall, flood damage will require the rebuilding of an estimated 184,000 housing units in just these three parishes alone, nearly seven times the number of homes destroyed by Hurricane Andrew in 1992.

In Orleans Parish, about 60% of the housing stock are apartments or two family units, compared to 35% in Jefferson and 23% in St. Bernard. Whether this higher ratio of multifamily units continues after the rebuilding effort is an open question. Prior to the hurricane, multifamily apartment construction was on the upswing, in sharp comparison to the weaker single-family housing market. One of the largest multifamily projects to begin in 2005 was the \$10 million Guste Redevelopment. On the drawing board and scheduled to start in November was the Poydras Condominium project, a 500-unit apartment complex that would be the tallest in New Orleans. This project's immediate prospects are uncertain.

On the nonresidential side, the damage is less intense. As previously mentioned, most of the damage occurred in residential areas, with the downtown/tourist areas of Orleans Parish having missed most of the major flooding. Some downtown attractions will undergo major renovation work. Estimates for an overhaul of the Superdome are at \$400 million, while the \$250 million planned expansion of the Ernest Morial Convention Center has been shelved for now. On the plus side, reports suggest that most of the area's hotels have been relatively spared, with damage mostly to windows and ground floor levels. Already, the Royal Sonesta Hotel in the historic French Quarter has reopened for business. Marriott International also reported that all fourteen of its New Orleans hotels have no structural damage.

With the total devastation of St. Bernard Parish, reconstruction is likely to occur in both the residential and nonresidential sectors. All state offices have been damaged, and the Louisiana Department of Education reports that all of the K-12 schools in the parish may have to be completely rebuilt. This mostly rural, marshy area however is primarily residential; 75% of the total building stock is residential, compared to 67% for the state of Louisiana.

While the parishes of Orleans, Jefferson and St. Bernard sustained the most damage, the city of Slidell in St. Tammany Parish also faces reconstruction needs. This city with a population of 27,000 sits across from Orleans Parish and was hit with storm surges from Lake Pontchartrain. According to the Wall Street Journal, 50% of this city's 10,133 homes were completely destroyed and will have to be rebuilt. The rest of St. Tammany was relatively unscathed and the floodwaters have now completely receded. The K-12 schools in the parish were also in relatively good shape; only five of the 51 schools were deemed unusable and the 2,500 displaced students will be easily absorbed into other districts.

As for Harrison and Hancock counties in Mississippi, there's concern about the Katrina's impact to that state's gambling sector. Estimates of damage to Biloxi's all important casinos have begun to surface -- the storm may have put at least eight of the casinos out of business permanently and caused millions of dollars in damage to the other four. The Biloxi Hard Rock Café hotel and casino, which was set to open

September 8, has sustained damage to 50% of its structure. No date has been set as to when the new casino will officially open. The casino barge for Harrah's Grand Casino Biloxi was pushed onshore by the hurricane and washed across US Highway 90. Meanwhile, the president of the Treasure Bay Casino in Biloxi estimates that his casino is a "total loss", with a cost of at least \$100 million to replace it.

The damage to the housing stock along Mississippi's Gulf coast is considerable. With the major employers located along the coast, the areas near the Gulf were the most densely populated of the counties. It's been estimated that possibly one-quarter of the housing stock in Harrison County will need to be rebuilt. That would translate into 20,000 new housing units. Additionally, estimates from the city of Biloxi are that at least 20% of all structures in the area will have to be reconstructed.

Of the 95,000 housing units in Hancock and Harrison counties, 76% were single family. While multifamily represents a smaller percentage of the total stock, the lure of waterside condos and the booming casino market engendered a rise in new apartment and condo projects, the viability of which are now uncertain for the present. Large condo projects that were in the pipeline included the \$20 million Portofino in Biloxi and the \$20 million Hathaway Condos in Gulfport.

Fortunately, while a large part of the state experienced hurricane force winds, the damage outside the Gulf Coast is less devastating. Early FEMA estimates peg the number of homes in Mississippi (excluding the Gulf Coast) with major damage or totally destroyed at 3,261, far less than originally feared.

Rebuilding the Infrastructure

Turning now to infrastructure in the impacted region, reconstruction work has been estimated to cost \$3.5 billion. That would cover shoreline protection, repair to roads and bridges, cleanup and repairs to drinking water and waste water systems, and repair to power stations and communications lines.

The big ticket items for transportation infrastructure will cost about \$1.5 billion. They include the rebuilding of US Route 90, which once ran for more than thirty miles along the coast of Mississippi next to the Gulf of Mexico, the replacement of the twin spans of US Route 10 that cross Lake Ponchartrain from New Orleans to Slidell, and the rebuilding or selected repair of major bridges along US Route 10 in Mississippi, and across Mobile Bay.

In addition, there will be significant costs for repairing environmental projects, with an estimated cost of \$500 million required for cleaning up drinking water systems in New Orleans, rehabilitating the flood water pumping systems, and repairing the levees and dams that gave way in the city. Finally, there are general cleanup costs for removing debris and related materials, for which the U.S. Corps of Engineers has already allocated \$1.5 billion.

That money is really just a down payment, a marker for funding coastline restoration, the construction of additional levees and dams, and the relocation of residential and commercial areas from some parts of the city. The existing facilities at New Orleans, and along the Gulf Coast in general, were designed to protect people and property from fast-moving Category 3 hurricanes. That proved inadequate with Katrina, and it's expected that new construction will enhance the capability of the region to withstand stronger storms.

For Louisiana specifically, there is storm-related destruction along northeastern Lake Pontchartrain near Slidell, flooding related to levee breaks in New Orleans proper – Lakeview, Gentilly, Mid-City and Uptown, and flooding related to the overtopping of levees in East New Orleans and St Bernard Parish.

It's estimated that 40% of the twin spans of US Route 10 crossing Lake Ponchartrain were destroyed by the storm surge. The Louisiana State Department of Transportation and Development awarded a \$31 million contract to Boh Brothers Construction to repair the bridge, although it will be accomplished by shifting undamaged spans from one bridge to the other and then using temporary spans on the more damaged bridge. The description suggests that more work will be needed. During first quarter 2006, the state of Louisiana will take bids for a new double span.

Much of the damage, both in Slidell and on the south side of Lake Ponchartrain, was due to the 15 to 20 foot storm surge that raised lake levels and breached levees. Near term construction will focus on rebuilding the levee system. Other proposals have been made to limit the storm surge into the lake with mechanical doors or dikes, which would require construction of levees and reconfiguration of outlets from the lake into the Gulf of Mexico. This would presumably be a multi-billion dollar project, but could lessen the need to raise the levels of dikes and levees along the Lake Ponchartrain shoreline.

With regard to New Orleans, sections of major highways, bridges, and local roads were flooded, but damage was not caused by the storm surge and should be repairable at reasonable cost. Damage to water and waste water systems is likely more serious. New Orleans was in the middle of efforts to increase the capacity and integrity of its waste water system, as a result of a 1998 consent decree with the EPA. Construction had been completed on underground pipelines, and design work had been completed for upgrading or replacing 50 of the city's 83 pumping stations. The waste water pumping stations alone will now cost \$150 million more.

The Port of New Orleans survived in fairly good shape, benefiting from being on higher land near the Mississippi. Its main problems have been blockages to the river and lack of electricity, which should be fully corrected over the next few weeks.

As for Mississippi, long sections of Route 90 extending along the coast will need to be completely rebuilt. Also along the coast there appears to be washouts and some damage to railroad lines. The coast of Mississippi is exceptionally vulnerable to hurricanes and other storms, as development has taken place nearly up to the beaches. In Biloxi, significant public structures, including hospitals and convention centers, are near the Gulf waters. Reconstruction and redesign at the current site will need to be part of a more extensive coastline protection plan.

The Federal Response to Hurricane Katrina

In the immediate aftermath of Katrina, Congress passed two relief packages. There was the initial \$10.5 billion to assist FEMA in meeting the needs of the local area, and then a second package of \$51.8 billion that pushed the total amount of federal money to more than \$62 billion.

Of the money authorized so far, \$23.2 billion is designated for temporary housing and other financial assistance to individuals. Another \$11 billion will be directed to FEMA for "mission assignments" such as debris removal. FEMA search and rescue operations will consume another \$4.7 billion, and the Army Corps of Engineers has been allotted \$3 billion for repairs to broken levees.

The federal government hired five private contractors to begin the process of rebuilding homes in devastated areas. Bechtel National, Fluor Corp, Shaw Group, CH2M Hill, and Dewberry Technologies were the first recipients of what is expected to be a long list of federal rebuilding contracts awarded in the

wake of Hurricane Katrina. Given the enormous scope of damage, this effort is expected to be the largest U.S. rebuilding effort ever launched after a natural disaster. Shaw, Bechtel, and Fluor reported that their contracts were valued at as much as \$100 million and are primarily designed to create temporary housing for displaced families and individuals.

In his address on September 15 to the nation, President Bush gave added emphasis to the federal role in the reconstruction efforts. At the outset, he emphasized that New Orleans would be rebuilt, stating that “there is no way to imagine America without New Orleans.” He called for the creation of a Gulf Opportunity Zone, covering the impacted region in Louisiana, Mississippi, and Alabama, that would provide tax incentives and loans for small businesses. He requested that Congress pass an Urban Homesteading Act, which would provide building sites on federal land through a lottery to low-income citizens.

With such proposals, it’s expected the federal aid that already totals \$62 billion may well end up exceeding \$200 billion. The federal budget deficit will be much higher than the \$333 billion the Bush Administration estimates for the current fiscal year ending September 30 and the \$340 billion for fiscal 2006. How this plays out with Congress remains to be seen – some members of Congress have pointed out that increased spending for reconstruction in the Gulf must be offset to some extent by reduced spending from other accounts. One area to watch in coming months is whether there will be any impact on the increased spending in the new federal transportation bill, enacted in August. That bill offered funding increases to all states – it’s possible that some of the increases for states outside the Gulf region may be reduced to help pay for reconstruction efforts.

The Implications to the U.S. Economy

In the two weeks since Katrina, the general view is that economic growth for the U.S. economy will be reduced during the second half of 2005, but the first half of 2006 will see a net gain for the economy. The Congressional Budget Office in early September estimated that economic growth for the U.S. economy will be reduced 0.5% to 1.0% during the second half of 2005, relative to expected growth of 3% to 4% prior to Katrina.

There’s not been much in the way of negative information to change this view – in fact, restoration of oil refining capacity and shipping lanes have taken place somewhat more quickly than initially thought. For the month of August, payroll employment growth was reported at 169,000 new jobs, a clip suggesting that the economy had decent forward momentum prior to Katrina. The employment numbers will take a hit for September and much of the fourth quarter, but job growth for the year as a whole is still expected to remain positive. In short, the slowdown will be discernible, but not enough to tip cause the U.S. economy to slide into recession. For all of 2005, real GDP growth is still anticipated to be around 3.5%. In 2006, it had been expected that economic growth would settle back closer to 3%, but activity related to Katrina reconstruction should help GDP stay around the 3.5% mark.

Crude oil prices spiked immediately after Katrina, reaching \$70 per barrel. With refining capacity coming back on line, the price of oil retreated over the next two weeks to the range of \$60 to \$65 per barrel. Gasoline prices appear to have peaked and are beginning to recede slightly. The disruption to shipping has eased, helped by the greater use of alternate shipping routes. There will be upward pressure on prices, although not to the full extent feared at the start of September. The consumer price index for August, reflecting pre-Katrina conditions, showed overall prices up 3.6% on a year-over-year basis, the

highest reading so far this year due to rising energy costs. At the same time, the core rate of inflation (excluding food and energy) was up a still manageable 2.1% (year-over-year), indicating that rising energy prices had yet to feed through to the broader price structure. It's expected that in coming months some of the higher energy costs will feed through to the core rate, placing pressure on the Federal Reserve to continue its regimen of monetary tightening.

At its September 20 meeting, the Fed raised the federal funds another quarter point to 3.75%. In its accompanying statement, the Fed acknowledged that there would be near term disruption to the economy as a result of Katrina, but this was not viewed as being a "persistent threat." Of greater importance to the Fed, "higher energy and other costs have the potential to add to inflation pressures." Once again, the Fed stated its belief that "policy accommodation can be removed at a pace that is likely to be measured," meaning additional rate hikes are coming that will bring the federal funds rate up to the 4% to 5% range.

At the same time, long-term interest rates have stayed low for the present. The 30-year fixed mortgage rate had edged up to 5.9% in mid-August, but has since receded to 5.7%, providing continued support to the robust homebuilding market. The pickup in inflation is expected to cause long-term rates to eventually see some upward movement, most likely to take place during the first half of 2006. The greater federal budget deficit will also place upward pressure on long-term rates over a period of several years. There's not expected to be much negative impact on homebuyer demand in the near term, and in 2006 the residential sector will derive some benefit from additional homebuilding related to post-Katrina reconstruction. However, the pickup in both price levels and mortgage rates over the next year is expected to cause homebuilding at the end of 2006 and into 2007 to see a steeper decline than what was anticipated prior to the hurricane.

The Impact on Building Materials

As rebuilding efforts get underway, construction should increase in the local Gulf area – with activity well above pre-Katrina forecast scenarios. The fear, however, is that this very concentration of activity could raise prices and diminish availability of construction materials and skilled labor – and not only in the affected area, but across the entire United States.

The reason for this fear is that many construction materials and many types of skilled construction labor are currently in short supply, due in part to the robust expansion for housing that is now reaching its peak.

On the positive side, wholesale prices (as measured by the Bureau of Labor Statistics' producer price index) rose more moderately than expected in August, gaining 0.6% for the month after a 1.0% increase in July. The index of construction materials actually peaked in February then declined 2.8% through August. And while many complain that the BLS statistics do not capture "spot" prices or the true price paid by the construction industry, these spot prices are much more volatile and will likely return to more "normal" levels once panic buying subsides. Thus, a look at longer-term wholesale prices might be more telling about what to expect in the months to come.

Some wholesale prices, such as those for steel mill products, peaked in February of this year and have declined 13.2% in the months since (through August). Steel product prices shocked the construction industry with their 2004 increases, but have shown much more restraint (and actually eased back) since

the beginning of 2005. Unfortunately, the Gulf of Mexico is a major port of entry for steel imports, and thus the still-reduced capacity of the port may have a negative impact on steel prices over the next few months. Steel-related imports through the port totaled 15 million metric tons last year, including scrap iron and coke. Even if steel prices do rise once again in the near term, it's expected that the upward movement will be temporary, with prices then stabilizing or slightly declining.

The prices of several other construction materials, by contrast, have continued to rise steadily in 2005. The price of gypsum, for example, has climbed 9.9% since February, cement is up 5.6%, and construction machinery prices are up a more modest 3.5%. Over the year (August through August), price gains were slightly higher: gypsum up 12.4%, cement up 12.7%, and machinery up 7.0%.

According to the Portland Cement Association (PCA), cement remained in short supply in 32 states and the District of Columbia – even before the advent of Katrina. The disruption to transportation systems and loss of power to cement plants in the Gulf region further cut into supplies, while the need to rebuild roads, buildings, and other infrastructure will increase demand. That adds up to continued increases in cement prices during 2005 and 2006 – unless, as urged by the AGC, the Commerce Department and the Southern Tier Cement Committee reach an agreement to allow Mexican cement into the Gulf states without the 55% duty now in place.

Softwood lumber and plywood prices have fluctuated widely over the past two years, but through August, both remained well below their mid-2004 peaks. In fact, overcapacity drove prices down sharply over the past year: softwood lumber prices in August 2005 were 15.5% below their year-earlier levels, while plywood prices were 13.0% lower. In the week following Katrina, however, wholesale prices spiked due to the fact that 22 lumber mills were shuttered because of storm and flood damage.

Assuming most of those mills return to operation within the next few months, the overall price of lumber is not expected to rise dramatically thanks to those plentiful supplies. At the same time, the price of Southern yellow pine, dominant in the Gulf area, could rise over the next few months since existing stocks – at both local lumber mills and building materials retailers – were largely washed away.

Overall, a greater risk to lumber prices may reside less with the impact of Katrina than with NAFTA negotiations between the U.S. and Canada over softwood lumber tariffs. A NAFTA panel determined that the U.S. should remove tariffs on imports from Canada, but the Bush Administration has ignored that ruling. In response, Canada has threatened to discontinue its exports to the U.S., although that position is likely to soften over time given how important the U.S. market is to Canadian lumber.

Despite individual differences in the availability of construction materials, the strong demand from the fast-growing Chinese construction economy has been and will continue to be a significant drain on available stocks of construction materials. Multiple industry analysts have forecast that construction in China will grow at a double-digit pace over the next several years. This dynamic rate of growth suggests that China will continue to consume an ever-growing share of the world's construction materials – shrinking availability and placing upward pressure on prices.

Moreover, the very real issue of skilled labor shortages could dwarf concerns over materials prices. A rule of thumb holds that construction labor is virtually half of the total cost of a building. That share could rise unless labor shortages can be ameliorated. Because subcontractors are quick to relocate to where the demand is greatest, some analysts fear that if labor converges on the Gulf region, shortages of skilled workers will develop in other areas of the U.S.

The Broad Impact on Construction Starts

For the U.S. construction industry, the higher cost of building materials contributed to a sluggish performance for nonresidential building during the early months of 2005. Nonresidential building appeared to be regaining some momentum at mid-2005, but a jump in materials prices has the potential to extend the pause experienced by this sector. At the very least, the heightened demand for materials and skilled labor arising from rebuilding efforts in the Gulf region means reduced availability, which will be a constraint on further growth for construction activity.

The post-Katrina environment has both positives and negatives for U.S. construction activity. The major positive is that the U.S. economy appears capable of absorbing the shock from Katrina, without slipping into recession. Continued employment growth will help the market fundamentals for such income property types as offices, hotels, and multifamily housing over the long-term. The continuation of low mortgage rates supports single family housing this year, and total construction starts for the U.S. are still expected to rise 6% to 7% in 2005, even with the loss of new construction start activity in the Gulf region.

A major plus for next year will relate to reconstruction efforts, and the near term estimates for infrastructure work are substantial. Furthermore, there is now added emphasis that the cleanup and reconstruction process will be efficiently carried out. Rebuilding the housing stock in the impacted area will follow the start of infrastructure work, while reconstruction involving nonresidential structures will take longer as patterns of development are debated by local and state groups. The major uncertainty for the overall U.S. construction industry in the post-Katrina environment remains the price and availability of building materials, meaning that the industry as a whole will continue to adjust to a higher cost structure.

McGraw-Hill Construction Research and Analytics
24 Hartwell Avenue
Lexington, MA 02421

September 20, 2005

**©2005 McGraw-Hill Construction
All Rights Reserved**