



**A Faster
Way to Build**

Sprung Structures

HURRICANE REPORT

2004 - 2021



Hurricane Katrina — the eye of the storm

“The vast majority of New Orleans, Louisiana is under water. Tens of thousands of homes and businesses are damaged beyond repair. Much of the Mississippi Gulf Coast has been completely destroyed. Mobile, Alabama is flooded. We are dealing with one of the worst natural disasters in our nation’s history.”

President George W. Bush, August 31, 2005





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HURRICANE REPORT

Hurricane Irma
Hurricane Michael

Hurricane Charley
Hurricane Katrina
Cyclone Pam

Hurricane Jeanne
Hurricane Ivan
Hurricane Frances



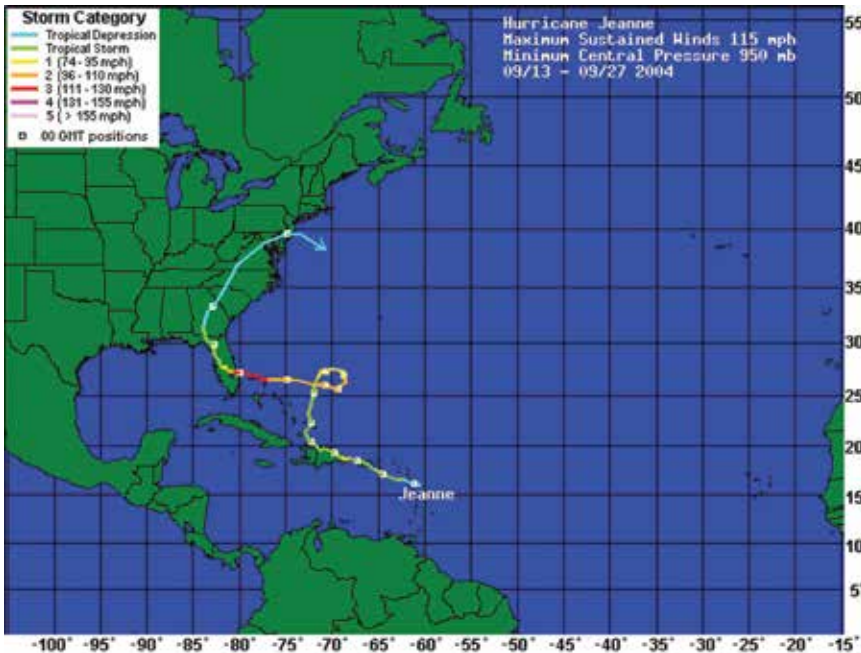
“...These are storms that have taken lives, storms that have created severe flooding, storms that caused major power outages, and storms that damaged farms and homes and hospitals and roads. It’s been a devastating period for the state of Florida. It is the first time in nearly 120 years that four hurricanes have hit the same state in a single season. People of Florida have met historic challenges with extraordinary strength and generosity...”

President George W. Bush, September 29, 2004



A Faster
Way to Build

HURRICANE JEANNE



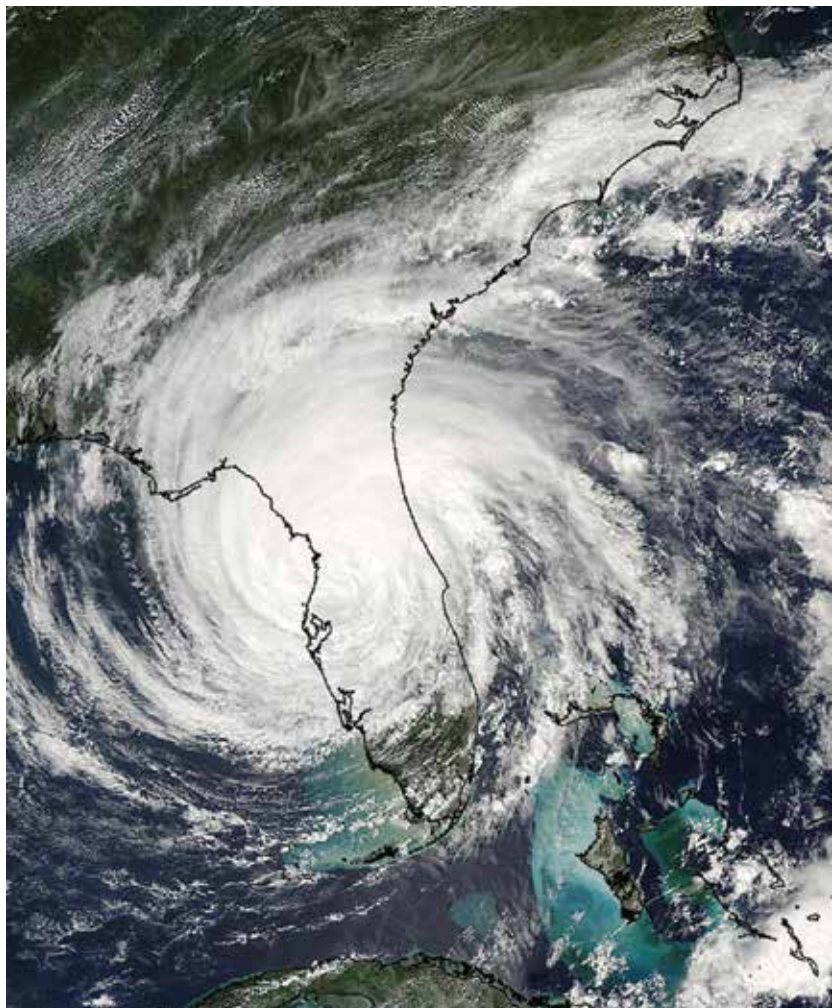
THE QUICK FACTS:

September 13 - 27, 2004

Maximum Sustained Winds: 115 mph

Minimum Central Pressure: 950 mb

The large eye made landfall on the East Coast of Florida near Stuart as a Category 3. It is notable that hurricane Frances made landfall near this same location just 20 days earlier and also moved over the same islands in the northwestern Bahamas. Jeanne weakened to a tropical storm over Central and Northwestern Florida while turning Northward. Jeanne weakened to a depression over Georgia and recurred over the mid-Atlantic coastal states on the 28th and 29th accompanied by heavy rain.





Faith Covenant Church - Hobe Sound, Florida 5,400 sq. ft.
(photos from after the hurricane)

"We took two direct eye-wall hits from hurricane Frances and Jeanne (with winds over 125 mph) with no damage, outside or inside to both Sprung buildings. The surrounding neighborhood was heavily damaged. Thank God for His protection, and the wisdom and insight when we chose Sprung."

Dr. Jerry W. Wilkes, Senior Pastor
Faith Covenant Church, www.fcm.cc

**ENGINEERED TO MEET THE FLORIDA BUILDING
CODE - HOBE SOUND, FLORIDA
140 MPH**



Jubilee Shores - Fairhope, Alabama 6,000 sq. ft.

**ENGINEERED TO MEET THE SOUTHERN
BUILDING CODE - FAIRHOPE, ALABAMA
110 MPH**

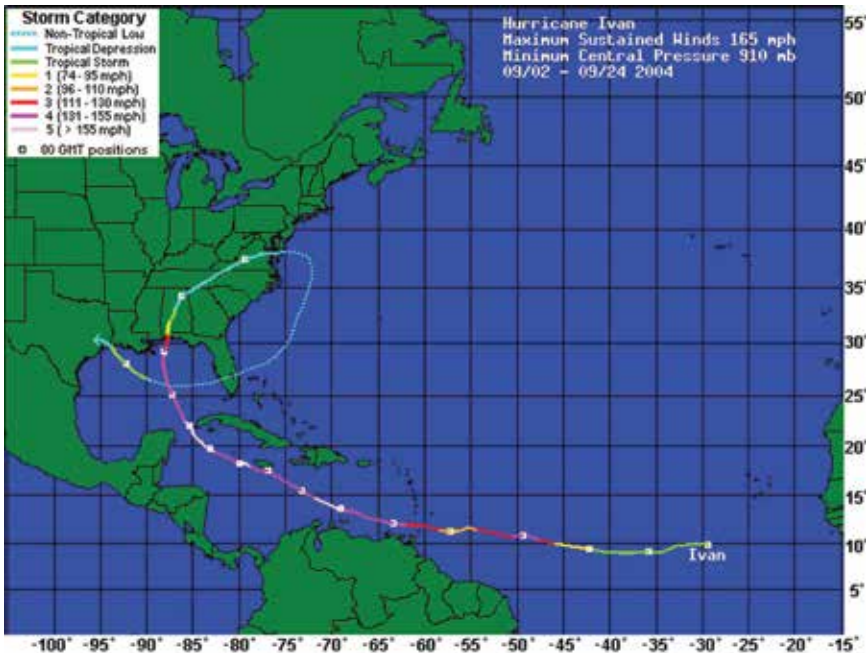


Heritage Baptist - Cantonment, Florida 6,000 sq. ft.

Hurricane Jeanne struck numerous other Sprung Structures in the area including Jubilee Shores Church and Heritage Baptist Church both of which survived the high winds and rain without damage.

**ENGINEERED TO MEET THE FLORIDA BUILDING
CODE - CANTONMENT, FLORIDA
120 MPH**

HURRICANE IVAN



THE QUICK FACTS:

September 2 - 24, 2004

Maximum Sustained Winds: 165 mph

Minimum Central Pressure: 910 mb

Ivan moved northwestward over the Gulf of Mexico and slowly weakened until it made its first U.S. landfall near gulf shores Alabama as a Category 3 hurricane early on 16 Sept. After landfall...Ivan gradually weakened over the next week while making a large clockwise loop. Ivan moved Northeastward over the Southeastern U.S. and emerged off the Delmarva Peninsula on 19 September as an extratropical low. The remnant circulation of Ivan then moved Southwestward just off the Southeastern U.S. coast and passed over South Florida and into the Gulf of Mexico on 21 Sept. Ivan became a tropical storm again on the 23rd and made its 2nd landfall over extreme Southwestern Louisiana on the 24th. Ivan finally dissipated inland over East Texas later that day.





Faith Temple Ministry - Buras, Louisiana 6300 sq. ft.



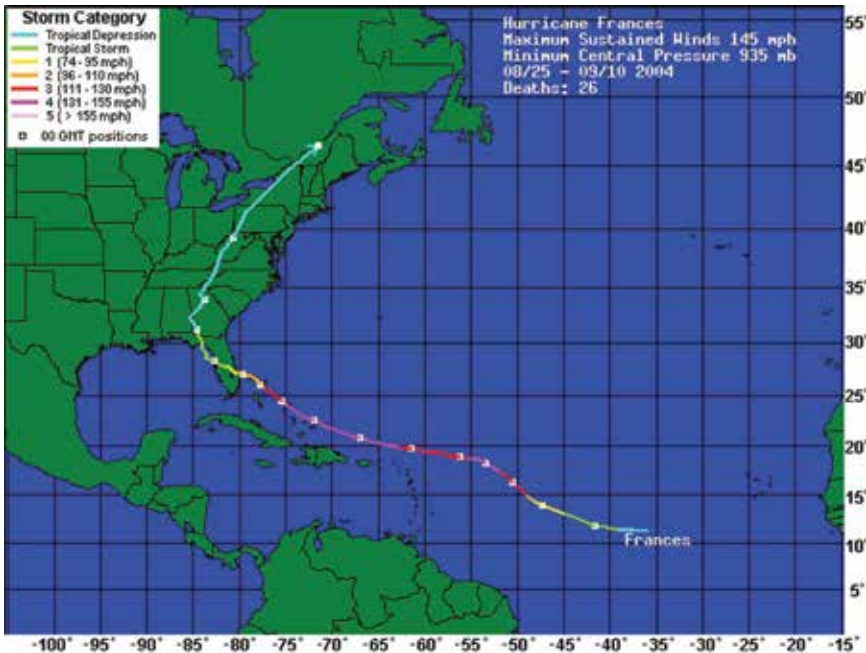
"Wow! The storm is over, and now it's time to cleanup and make repairs. After returning home from evacuating for Hurricane Ivan we began to clean up and evaluate property damage, of course we started checking our newest building the Sprung structure. After an extensive look over the entire building we were very pleased to report to our congregation that there was no damage at all. The next part of our property we looked at was the church house which is 75 feet from the Sprung structure and at first look we knew it had sustained damages. We have now learned that those damages are estimated between 20 and 25 thousand dollars. As we continued our clean up and began our repairs people from our community began stopping by to check on how everything did through the storm. One of those that stopped by was Lt. Steve Zegura of the Plaquemines Parish Sheriffs Office he asked 'how was everything?' I said we had some damage on the church house but everything else was fine. Lt. Steve said 'Really because I was on duty during the storm and passed by your property and I wondered how your new building would handle such a hard wind. Pastor Jesse it blew over 100 mph for 2 to 3 hours. I did not think it would hold up.' I said let me show it to you. And as we looked at the building he said, 'Pastor this is a strong building I am impressed.'

To the Sprung Family Thanks."

Pastor Jesse Morris
Faith Temple Ministry"

**ENGINEERED TO MEET INTERNATIONAL
BUILDING CODE - BURAS, LOUISIANA
130 MPH**

HURRICANE FRANCES



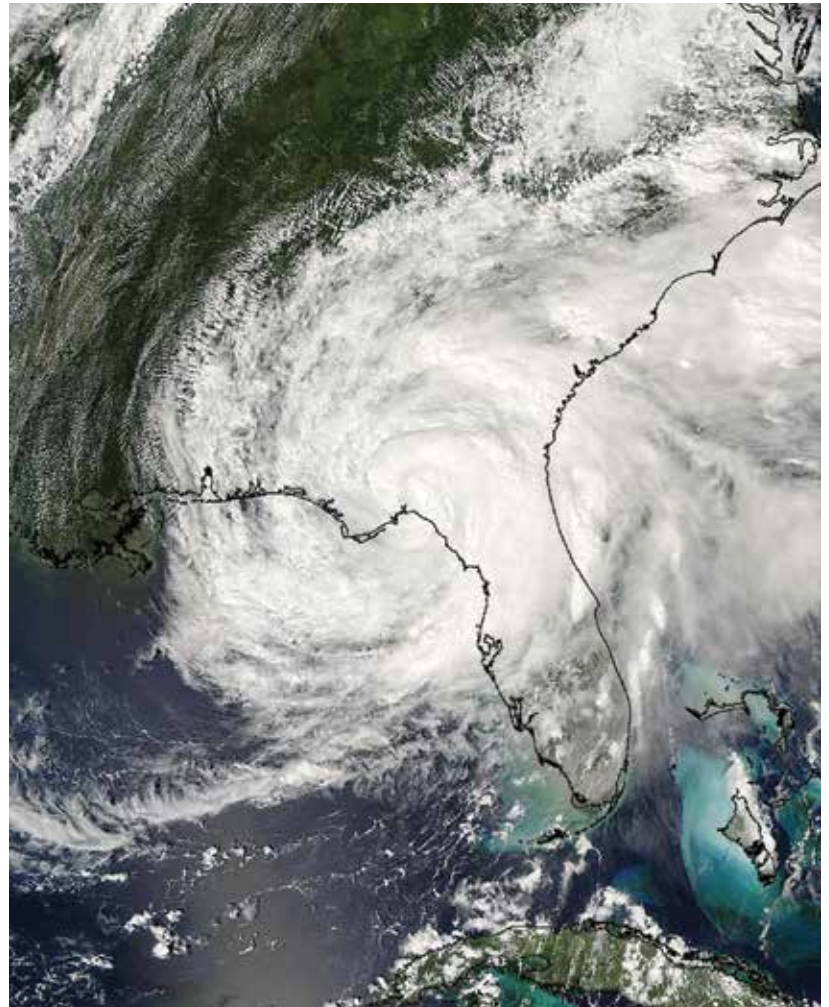
THE QUICK FACTS:

August 25 - September 10, 2004

Maximum Sustained Winds: 145 mph

Minimum Central Pressure: 935 mb

The center of Frances reached the Florida East Coast near Sewall's Point early on 5 September...then continued West-Northwestward across the Central Florida Peninsula to the Northeastern Gulf of Mexico by early on 6 September. Frances weakened to a tropical storm over Florida...and it was still a tropical storm when it made a final landfall near St. Marks Florida later that day. Frances moved generally Northward across the Eastern United States...finally dissipating over Southeastern Canada on 9 September. So far Frances is believed to be responsible for 23 deaths. It left a broad trail of damage through the Bahamas and Florida into the Southeastern United States.





Radisson Resort at the Port - Cape Canaveral, Florida
12,000 sq. ft.

*"As you know Florida has endured four major storms this hurricane season. Two of these storms, **Frances** and **Jeanne**, made landfall very close (within 50 to 75 miles) of our property with winds in excess of 100 mph. While numerous buildings in our area suffered significant damage, our Sprung Structure came through both of these category three storms without a blemish..."*

We could not be happier with the quality of our Sprung structure, the way it handles the hurricane conditions, and our track record with Sprung Instant Structures."

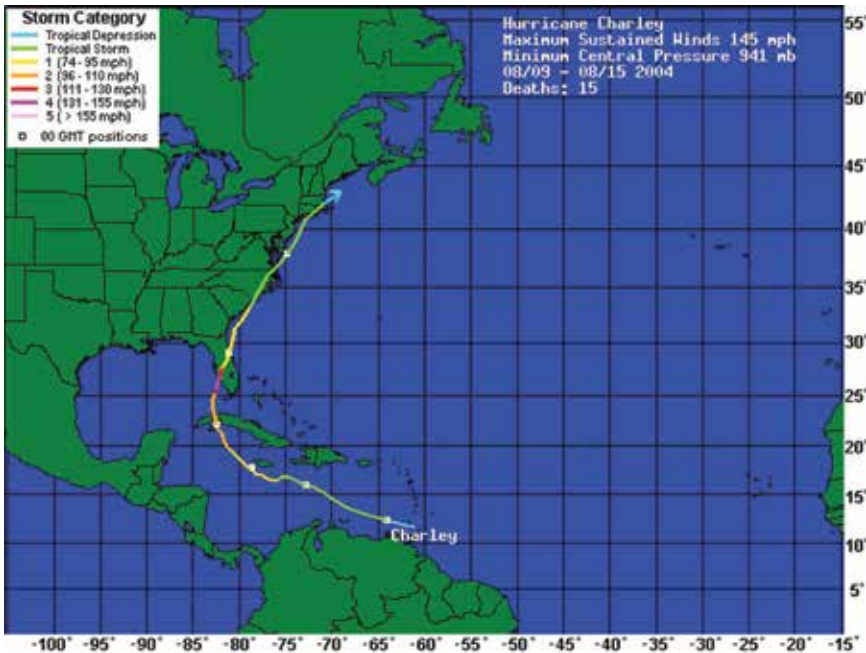
Robert A. Baugher
Owner/President
Radisson Resort at the Port



ENGINEERED TO MEET THE FLORIDA BUILDING
CODE - CAPE CANAVERAL, FLORIDA
130 MPH



HURRICANE CHARLEY



THE QUICK FACTS:

August 9-15, 2004

Maximum Sustained Winds: 145 mph

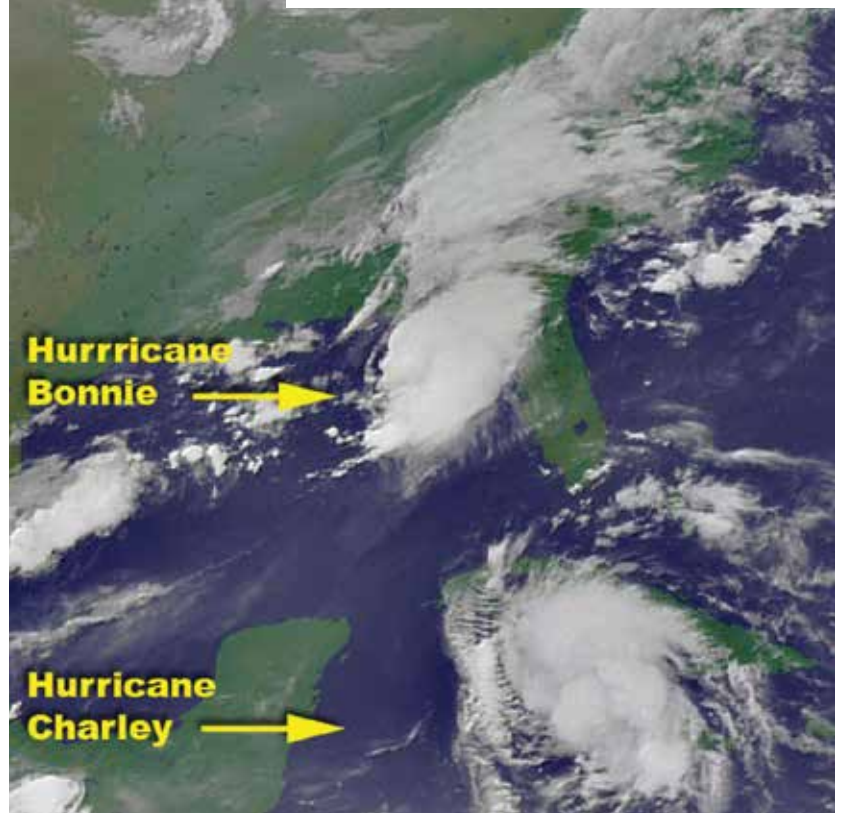
Minimum Central Pressure: 941 mb

Charley made landfall on the Southwest Coast of Florida near Cayo Costa...just North of Captiva during the evening of 13 August with maximum sustained winds tentatively estimated at 145 mph. Shortly thereafter the eyewall impacted Punta Gorda and neighboring Port Charlotte with devastating results. The hurricane traversed the Central Florida Peninsula resulting in a swath of destruction across the state. The center passed near Kissimmee and Orlando early on 14 August...by which time the maximum sustained winds had decreased to around 85 mph.

The insurance information institute reports an estimated total of 7.4 billion dollars in insured losses. The preliminary estimates of the damage total range from 13 to 15 billion dollars. This would make Charley the second costliest tropical cyclone in U.S. history.



ES Project NASA-GSFC
2 August 2004





Lee County Correction Facility - Lee County, Florida
Eight 6,650 sq. ft. structures

"Although stunned and saddened at the level of destruction through our state, we were no less grateful to report that all eight Sprung Instant Structure Inmate housing units built six years ago to house 512 inmates; passed the hurricane wind load test and survived the destructive forces from this major hurricane with no damage or disruption in service, even though there was extensive damage and loss of power to thousands of buildings in the surrounding areas."

John J McDougall,
Sheriff of Lee County Florida (Ret)

**ENGINEERED TO MEET THE FLORIDA BUILDING
CODE - LEE COUNTY, FLORIDA
130 MPH**

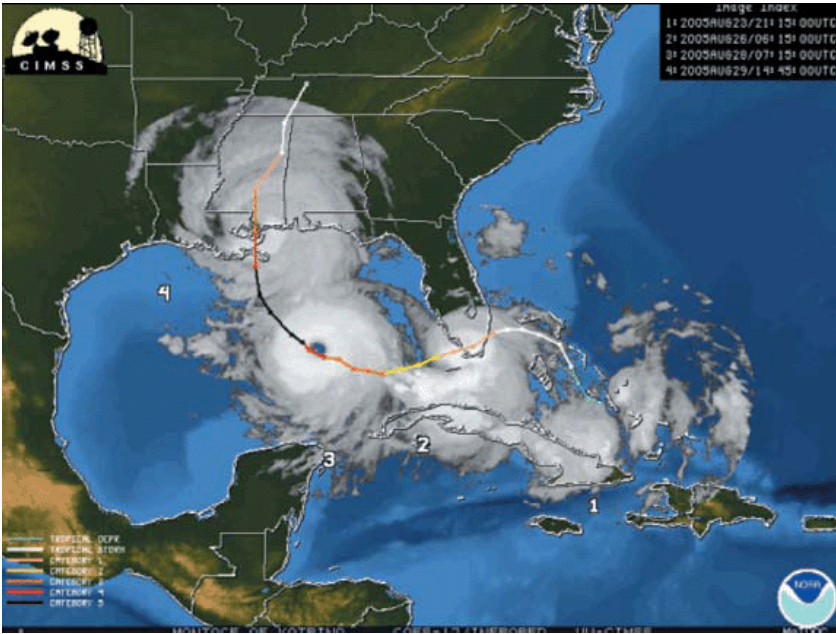


THE QUICK FACTS: HURRICANE CHARLEY

With an estimated 25 billion dollars in damage from four major hurricanes in 2004, it would not be a stretch to say that Florida had more than its fair share of destruction and devastation for one year. Some meteorologists have called this a climatological anomaly, while others call it a global disaster. Whatever the real assessment, we know one thing for sure, ocean weather - tropical marine surface analysis for the Gulf of Mexico and Western Atlantic is unpredictable. After having been directly ravaged by the fierce winds of **Hurricane Charlie** (clocked by reconnaissance aircraft, to be in excess of 145 miles per hour) this category four-hurricane, took an unexpected right turn from it's northerly predicted course in the Gulf of Mexico with little time for anyone to prepare for its immediate landfall. In a matter of minutes we went from 'Hurricane Watch' to 'Hurricane Survival'. South West Florida was the epi-center for this massive landfall of **Hurricane Charlie**.



HURRICANE KATRINA



THE QUICK FACTS:

August 23-30, 2005

Maximum Sustained Winds: 175 mph

Minimum Central Pressure: 902 mb

Fatalities 1,836 total

Damage \$125 billion (2005 USD)

Areas affected

Bahamas, South Florida, Central Florida and the Florida Panhandle, Cuba, Louisiana, Mississippi, Alabama most of the Eastern United States, Eastern Canada

It formed over the Bahamas on August 23, 2005, and crossed southern Florida as a moderate Category 1 hurricane, causing some deaths and flooding there, before strengthening rapidly in the Gulf of Mexico and becoming one of the strongest hurricanes on record while at sea. The storm weakened before making its second and third landfalls as a Category 3 storm on the morning of August 29 in southeast Louisiana and at the Louisiana/Mississippi state line, respectively. The storm surge caused severe damage along the Gulf Coast, devastating the Mississippi cities of Waveland, Bay St. Louis, Pass Christian, Long Beach, Gulfport, Biloxi, Ocean Springs, and Pascagoula. In Louisiana, the federal flood protection system in New Orleans failed in more than 50 places. Nearly every levee in metro New Orleans breached as Hurricane Katrina passed east of the city, subsequently flooding 80% of the city and many areas of neighboring parishes for weeks.





Tulane University, New Orleans, LA. 20,000 sq. ft.

"Sprung designed the structure to withstand 100 mph winds. Hurricane Katrina far exceeded 100 mph, yet the Sprung structure sustained only minor damages. We are so pleased with its performance and versatility, that we exercised the option to purchase. We know it will help us in our growing need for more space. It is my pleasure to recommend Sprung to anyone in need of an 'instant' structure."

Peter J. Baricev, Jr., Director,
Real Estate Tulane University

**ENGINEERED TO MEET THE SOUTHERN BUILDING
CODE - NEW ORLEANS, LOUISIANA 100 MPH**



Faith Temple Ministries – Buras, LA

Buras-Triumph has become famous as the location where, on August 29, 2005, at 6:10 AM CDT, the eye of Hurricane Katrina, by far the costliest natural disaster (and one of the deadliest) ever to strike the United States, made its strongest landfall. However, the storm surge and high winds began on the previous day, August 28, 2005. During those 2 days, the area was obliterated as a result. The Sprung



Exterior membrane replaced after Hurricane Katrina.

**ENGINEERED TO MEET THE INTERNATIONAL
BUILDING CODE - BURAS, LOUISIANA 130 MPH**

structure (pictured above left) was one of the only buildings left standing with minimal damage due to large waves and being totally submerged under water. As a result, the exterior membrane and insulation package was replaced in a few short weeks. (Pictured above right)

THE QUICK FACTS: HURRICANE KATRINA

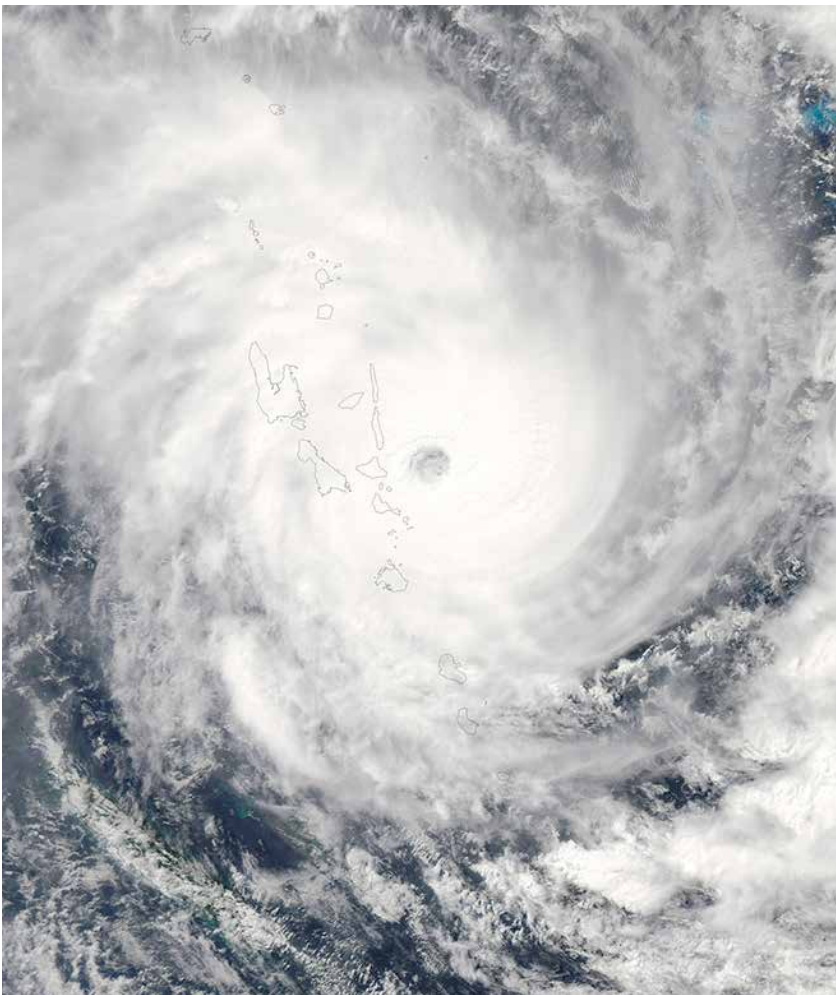
Hurricane Katrina was the costliest and one of the five deadliest hurricanes in the history of the United States. It was the sixth-strongest Atlantic hurricane ever recorded and the third-strongest hurricane on record that made landfall in the United States. Katrina formed on August 23 during the 2005 Atlantic hurricane season and caused devastation along much of the north-central Gulf Coast. The most severe loss of life and property damage occurred in New Orleans, Louisiana, which flooded as the levee system catastrophically failed, in many cases hours after the storm had moved inland. The hurricane caused severe destruction across the entire Mississippi coast and into Alabama, as far as 100 miles (160 km) from the storm's center. Katrina was the eleventh tropical storm, fifth hurricane, third major hurricane, and second Category 5 hurricane of the 2005 Atlantic season. At least 1,836 people lost their lives in Hurricane Katrina and in the subsequent floods, making it the deadliest U.S. hurricane since the 1928 Okeechobee Hurricane. The storm is estimated to have been responsible for \$81.2 billion (2005 U.S. dollars) in damage, making it the costliest natural disaster in U.S. history.



CYCLONE PAM



Map plotting the track and intensity of the storm according to the Saffir-Simpson hurricane wind scale



THE QUICK FACTS:

March 6-22, 2015

Maximum Sustained Winds: 250 km/h
(155 mph)

1 minute sustained - 270 km/h
(165 mph)

Minimum Central Pressure: 896 mbar
26.46 inHg

Damage: Major

Areas affected:

Fiji, Kiribati, Solomon Islands, Tuvalu,
Vanuatu, New Caledonia, New Zealand

Pam formed on March 6 east of the Solomon Islands and tracked slowly in a generally southward direction, slowly intensifying as it did so. Two days later, the disturbance reached tropical cyclone intensity and, over subsequent days, Pam gradually strengthened before reaching Category 5 cyclone status on both the Australian and Saffir-Simpson scales on March 12. The next day, Pam's sustained winds peaked at 250 km/h (155 mph) as the storm moved through Vanuatu, passing near several constituent islands and making direct hits on others. On March 14, Pam's winds began to slowly weaken, but its pressure dropped further to a minimum of 896 mbar (hPa; 26.46 inHg) before rising shortly afterwards. Over the next few days, the cyclone's weakening accelerated as it moved pole ward. On March 15, Pam passed northeast of New Zealand before transitioning into an extratropical cyclone that same day.



Warwick Le Lagon Convention Center was used as a shelter throughout the category 5 cyclone.

"The Sprung Structure that you set up at Warwick Le Lagon Resort has been working fine until last night when Vanuatu experienced a category 5 Cyclone Pam. All the guests were housed in the Convention Centre when the cyclone hit but while it withstood the destructive wind, the structure has minor damage."

Tammie Tam
Senior Vice President / Executive Director-Pacific
Warwick International Hotels

**ENGINEERED TO MEET
136 MPH - 227 KPH**



HURRICANE IRMA



THE QUICK FACTS:

August 30, 2017

To September 16, 2017

Maximum Sustained Winds:

1 minute sustained - 295 km/h
(185 mph)

Minimum Central Pressure: 914 mbr
26:99 inHg

Damage: \$64.66 billion (2017 USD)
(Unofficially fourth-costliest)

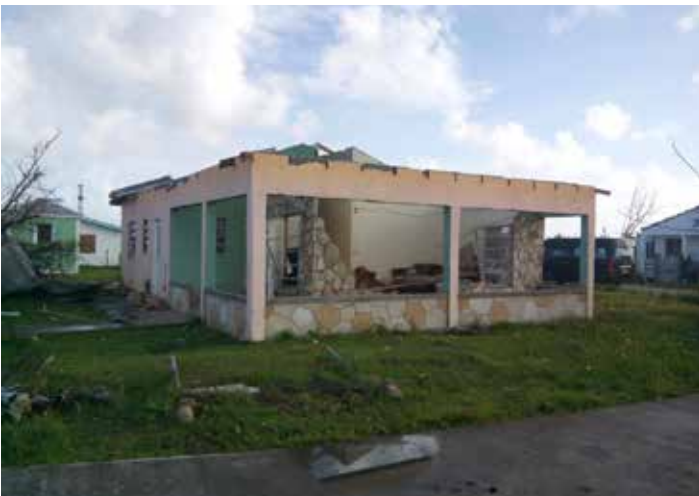
Areas affected:

Cape Verde, Leeward Islands (especially Barbuda, Saint Barthelemy, Anguilla, Saint Martin and the Virgin Islands), Greater Antilles (Cuba and Puerto Rico), Turks and Caicos Islands, The Bahamas, Eastern United States (especially Florida)



Category 4 Hurricane Irma captured Sunday morning as its eye approached the southwestern coast of Florida. Hurricane Jose is seen (right) near the Leeward Islands. Credit NASA/NOAA GOES Project

Hurricane season of 2017 brought the very powerful Hurricane Irma to the lower part of Florida in mid September. Forecast to hit land as a Category 5 hurricane (sustained winds in excess of 157 mph), it was very lucky for the residents of Florida that the storm skirted the coast only bringing gusts of about 120mph to parts of the Keys and south Florida. Many Sprung structures are located in the affected areas. Below is a list of measured wind gusts at Sprung structure locations and the summation of how the Sprung structures performed.





King's Court Key Jai Alai 100' x 160' – located in Florida City, Florida next to Homestead South Miami Dade County – Wind gust of 90mph – Only erected in June of 2017, this structure was the closest to the highest winds sustained by the Sprung buildings. Only minor architectural cap damage happened and was quickly remedied with Sprung support.

"Our recent decision to build the Sprung structure in Florida City, Florida was tested during Hurricane Irma. Our building is standing tall only 100 miles away from where the storm made landfall in the Florida Keys with minimal damage that was quickly remedied with Sprung support."

Dennis Testa



Doral KIA 40' x 75' and 30' x 30' Canopy (Located in Doral, FL, just West of Miami) 85 mph wind gusts – recently erected in June of 2016, these 2 Sprungs met the rigid NOA for Miami-Dade Product Approval, and performed without issue. Sustained no damage.

"Our location received gusts of almost 90mph and our Sprung buildings received no damage. The Sprung structures are well suited for extreme environments."

Alex Falcon

Lehman Autoworld



Seminole Coconut Creek Casino 110' x 160' 86 mph gusts – Erected in 2010, again this 100' wide Sprung structure received no hurricane damage whatsoever!



Lee County Correctional

Eight - 70' x 90' inmate pods

Gusts 89mph in Fort Myers, minor existing cuts leaked – Classic Series inmate housing structures from the late 90's again sustained no damage. The inmates were moved into main population and quickly returned to the pods after the storm passed.

Miccosukee 110' x 215' Entertainment Facility - South Miami Dade County gusts up to 90 mph

A 20 year old non-insulated single skin structure only sustained a cut in one membrane panel when a canopy flew into it. Otherwise no damage.

HURRICANE MICHAEL



THE QUICK FACTS:

October 7-16, 2018

Maximum Sustained Winds: 155 mph

Minimum Central Pressure: 919 mb

Damage \$15 Billion (USD)

Areas affected: Central America, Yucatán Peninsula, Cayman Islands, Cuba, Southeastern United States (especially the Florida Panhandle), East Coast of the United States, Atlantic Canada, Iberian Peninsula

Hurricane Michael was the first Category 5 hurricane to strike the contiguous United States since Andrew in 1992. In addition, it was the third-most intense Atlantic hurricane to make landfall in the contiguous United States in terms of pressure, behind the 1935 Labor Day hurricane and Hurricane Camille of 1969. It was the first Category 5 hurricane on record to impact the Florida Panhandle, and was the fourth-strongest landfalling hurricane in the contiguous United States, in terms of wind speed.





Northstar Church in Panama City Beach 80' x 125'

Even though Hurricane Michael's real impact was just to the East of this Church location, there was still a good bit of damage to the surrounding area and they had to have had winds in excess of 100 mph. The pastor was thrilled that the Sprung Structure which was constructed in 2007, not only survived the Hurricane, but only had one small tear on a panel.



Tyndall AFB, in the panhandle of Florida was nearly completely destroyed during Hurricane Michael last October. Most of the traditional buildings on base were either completely destroyed or needed a complete overhaul. A series of 18 Sprung structures have been utilized to begin the re-build, sizes ranging from 30' wide x 60' long all the way up to 50' wide x 120' long, both single skin and insulated structures. Warehouses, maintenance facilities, offices and even a bowling alley for the troops.

All structures are Berry Amendment Compliant and meet all of the required high wind loads in the area.



**ENGINEERED TO MEET
IBC 2012 CAT 2 - 135MPH**

HURRICANE LAURA

THE QUICK FACTS:

August 20 - 29, 2020

Maximum Sustained Winds: 150 mph

Minimum Central Pressure: 937 mbar

Damage \$16.1 billion (2020 USD)

Areas affected: Lesser Antilles, Greater Antilles, The Bahamas, Gulf Coast of the United States, Midwestern United States, Eastern United States

Hurricane Laura was a deadly and destructive Category 4 hurricane that tied with the 1856 Last Island hurricane as the strongest hurricane on record to make landfall in the U.S. state of Louisiana, as measured by maximum sustained winds. The twelfth named storm, fourth hurricane, and first major hurricane of the record-breaking 2020 Atlantic hurricane season, Laura originated from a large tropical wave that moved off the West African coast on August 16 and became a tropical depression on August 20. Laura intensified into a tropical storm a day later, becoming the earliest twelfth named storm on record in the North Atlantic basin, forming eight days earlier than 1995's Hurricane Luis.

Laura first hit the Lesser Antilles and brushed Puerto Rico as a tropical storm, then moved across the island of Hispaniola, killing 31 people in Haiti and four in the Dominican Republic. The storm then moved across the length of Cuba, prompting tropical storm warnings and the evacuation of more than 260,000 people there. Subsequently, the outer rain bands extended into the Florida Keys and South Florida. Laura then moved across the Gulf of Mexico, strengthening slowly at first, before a period of rapid intensification on August 26. That day, Laura became a major hurricane, and later attained peak 1-minute sustained winds of 150 mph (240 km/h), making it a Category 4 hurricane. The approaching storm prompted the issuing of many warnings and watches for Louisiana, as well as the evacuation of plenty of people. Early on August 27, Laura made landfall near peak intensity on Cameron, Louisiana. This was the tenth-strongest U.S. hurricane landfall by wind speed on record. The effects





of Laura across Louisiana were devastating. Nearly 10 foot high storm surge was recorded in Cameron Parish. Numerous parishes had severe flooding and extreme damage to houses. Several roads had to be closed, and drivers were advised to use different routes. The storm caused the deaths of 33 people in the state alone. Texas and Arkansas were struck notably hard as well. The storm caused the deaths of at least 42 people in the U.S. and inflicted an estimated \$16 billion in damages on southwestern Louisiana and southeastern Texas near the Gulf of Mexico.[1] After landfall, Laura weakened as it moved inland, becoming a tropical storm later that day, and weakening further to a tropical depression over Arkansas the next day. On August 29, Laura degenerated into a remnant low over Kentucky, before being absorbed into another extratropical storm near the East Coast of the U.S. shortly afterward. Overall, Laura caused more than \$16.1 billion in damage and 77 deaths. Areas that were affected by Laura, namely the Gulf Coast, were affected again six weeks later by Hurricane Delta.



Morris-Shea Bridge Company is a specialty foundation contractor. After Hurricane Laura, Sprung Structures received an email.

"No problems at all. They came through with no damage. There were some very high winds in the area that sent 6 travel trailers rolling through the park behind us, but the buildings stood strong. Kudos to you guys for a great design. Feel free to use that info in a marketing promotion."

*Good stuff!
Richard Shea*

**ENGINEERED TO MEET
IBC 2012 CAT 2 - 131MPH**



Hurricane Katrina — the eye of the storm



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