A Huff and Puff Called Hugo

EIFS Demonstrates Superiority in Charleston as Only System Not Shredded By 135+ Winds; Hurricane Cawed Widespread Damage to Buildings and Facilities

By Raymond T. Lynch

Hurricane Hugo swept over Puerto Rico and the Virgin Islands last September 18, 1989, leveling homes, downing power and telephone lines. Torrential rains and 150 mile an hour winds cut a path of destruction through these islands as it made its' way toward the mainland.

The experts knew what to expect; they just weren’t sure who should expect it. Jacksonville was the first choice, but as Hugo neared, it was a toss up between Savannah/Hilton Head, and Charleston. Charleston lost the toss but not the battle.

At just after midnight on September 21st, Hugo interrupted television coverage and gave Charleston its own rendition of “Prime Time.” It began with the tidal surge of from 12 to 20 foot high waves washing completely over the barrier islands. (See Photo “A”) And the wind from the west, then the south, then the calm as the eye passed directly over the city, then the wind again, from the east, from the north. Gusts recorded up to 175 mph with sustained forces of 135 mph. It’s hard to imagine just now powerful this hurricane was. I suppose it would be like trying to hang on to the back of Mario Andretti’s race car for a few hours during the Indy 500. You can’t fall that fast if you jump out of a plane. Air borne sand is capable of stripping our skin off. Small pieces of debris become lethal projectiles. Larger debris, whole houses, roofs, and shattered walls offered as much hope for survival as a 747 hitting you in the face. But survive the city did, with slightly more deaths than can be attributed to natural causes.

When I arrived downtown early in November, I expected to see a city in mourning, blank faced refugees, boarded up businesses, soup lines. I anticipated feeling the pain of shattered dreams, the slump from losses too great to be consoled. Instead I found a city “open for business,” people walking with a bounce and a pride you only get when you’ve faced death and lived to talk about it. Fear was a common denominator while Hugo had Charleston under siege, but Hugo’s dead, and Charleston is alive and well, Thank-You!

(See Photo “B”) There was no particular path of destruction. Buildings that should have fallen down long before Hugo, were left standing. A huge container cargo crane awaited the next freighter, while just 50 yards away on another dock an identical crane was a heap of scrap metal. (See Photo “C”) Most of the hotels were open. Those closed had not sustained major damage. Roofs and glass got the worst of it, with one and two story block buildings taking a close third. Telephone, power and water had been restored.

For the next day and a half I inspected buildings of all types and interviewed contractors and technical representatives. I make my living as a consultant in the exterior insulation and finish system industry, so I concentrated
on buildings clad with these products, using them as comparisons with buildings clad featuring other types of exteriors. Here’s what I saw:

(See Photo “D”)
1. Brick walls torn apart.
2. Wood frame under construction-leveled
3. Block-broken up
4. Asbestos siding-shredded
5. Porcelain panels-torn off
6. Vinyl siding-ripped off

Even the famous university, “The Citadel” (which means fortress), did not escape damage. Although they may be hard to identify, huge overhead lights at the football stadium were toppled. They were left lying across the bleachers.

A 40 foot hemlock (See Photo “E”) supports all the evidence accumulated, of the hurricane’s destruction—“Bend with the wind or be broken.”

I met up with Walter Williams, Technical Advisor with Parex. He suggested we ride to the “Isle of Palms” to check out one of his projects. Damage on this barrier island was far greater than in the city, with few buildings escaping major repairs. Many were destroyed completely. On a coastal road we came across a no parking sign which had been placed in a hole created by back wash from the tidal surge. Debris was everywhere. We had to go around whole houses that were in the
middle of the road. One house, some 80 feet from its foundation, had the following painted on the side: ‘Contractor found jewelry—Central H.S. 1980.’ The house was a total loss, as were many near by, yet the contractor felt one high school ring, still intact, was worth being reunited with its owner.

We finally reached Wild Dunes, only to be confronted with a private security check point at the entrance. We were not getting in without authorization—period! We tried the captain of security, the developer, another gate, and guard, and were turned away. Fortunately, Walter had the presence of mind to go back to the first check point and ask for a real estate salesman. “No problem,” said the guard and 5 minutes later a John M. Gantt, Jr., of Wild Dunes Real Estate pulled up in his Mercedes. It didn’t take long for him to figure out he wasn’t going to sell us anything.

He escorted us to the job site and asked, “You want a picture of this?” One house was still standing, while others on both sides were leaning on it for support. (See Photo “F”.) This was the first of many buildings I observed with unscathed Parex type exteriors (EIFS), surrounded by buildings which had sustained terminal exterior damages. Said Gantt, “We’re rebuilding and open for business, so come on down and bring your golf clubs.”

It will soon enough be a beautiful vacation community again.

On our return to Charleston, I noticed the S.C. Dept of Security Administration building, obviously a Dryvit’s EIFS. I went for a closer look. The building faces (See Photo “G”) the Ashley River, which separates the barrier islands from Charleston. I couldn’t find a scratch on it, yet right next door a crew was busy repairing the stucco panels, cracked in several places, of the Hilton Hotel. There was also some major roof repair work under way. Besides the unique design, the Dept. of Security building is an excellent example of quality application.

Next stop was the Holiday Inn, back on the other side of the Ashley River. Blue board was visible on one section of the hat of the building, near the Inn’s lettering. Thus I had at least found some EIFS damage. I got into the parking lot and could see someone on a platform inspecting the damage. As the crane lowered the platform, I was able to recognize Don Peterson, Vice President, Technical Service, Insulcrete. “Don, I get paid to do that sort of thing, what’s your excuse?” I asked him.

It turned out he was inspecting each of the Insulcrete projects, assisting owners with damage assessments for insurance estimates. I expected to hear horror stories of extensive damage to EIFS, but Don just didn’t have any. The damage to the Holiday Inn occurred when the windows to the restaurant on the top floor were shattered by wind (see Photo “H”) and another about 90 degrees to the right were ripped off. There was no other damage to the building.

Nor was there any to the Condos, or Schooner II in Downtown Charleston, (See Photo “I”) nor to the North Carolina National Bank. Some minor damage occurred on one elevation of an office building where air born debris impacted with the building. (See Photo “J”) Peterson has already been there to work out repair procedures. Exhausted though he was, Don couldn’t help becoming animated when he said: “I kept expecting to find one of my jobs in total ruin, but it never happened.” The other EIFS manufacturers’ products performed equally as well. Insulcrete is a PM (polymer modified) wall system. To prove his point, he directed me to a Simplex PB (polymer based) project, the Hampton Inn, just across a marsh from the Holiday Inn.

The Inn is on an inland water-way adjacent to a large metal building boat storage warehouse. The gable, one side wall, and a
Photo H: Holiday Inn shows tiny bit of blue board at top near logo where storm ripped away some of EIFS finish.

Photo I: Downtown buildings, finished with EIFS, were also undamaged.
large section of roof had been ripped off the metal building, yet the Hampton Inn looked undamaged except for a half dozen patches under repair. I found Victor Hunter, the project manager, for the general contractor, Tricon, in the hotel lobby. After introductions, I learned that he had just completed his own survey of EIFS, post Hugo. It was beginning to sound like a broken record, “The systems (EIFS) out performed any other wall systems by a huge margin.” (See photo “K”) The patching underway at the Hampton was the result of flying debris damage. Bather than fracturing the wall or causing structural damage, he explained, the debris simply stuck where it hit, resulting in isolated damage easily repaired.

It was obvious I wasn’t digging up any scoops with my interviewing techniques, so I decided I’d do the rest of the interviews by telephone and spend my remaining time going up and down the streets of Charleston, inspecting. I was looking for a particular project I had worked on with Dan Sheehan’s crew several years ago (1984). Late in the day, after many failed attempts to locate anything but minor damage to EIFS, I stumbled on the Bank Building that Dan Sheehan had retrofitted. The Bank had changed names, but the Thermwall foam shapes around the windows, and the control joints, were the reason I had been summoned to the job, on my first visit to Charleston. About a dozen windows were cracked, so the building hadn’t escaped Hugo’s winds, but that was the only damage, except for two pieces of roof shingle stuck into the EIFS on the end wall. I’d say Dan’s work passed the ultimate wind load test with “flying” colors.

The performance of EIFS, both P.B. and P.M., was obvious. But why? What’s so special about this material that Hugo couldn’t beat it, when it was able to destroy almost anything it wanted to? My comment on Hugo’s ultimate wind load test, was the key. After returning to Maryland, I recalled the first time I had been involved in wind load tests. It had been in Dade County, Florida, in 1976, seeking approval for Dryvit Systems with Building Inspection Department.

Consequently, I now called the Product Control Section of Dade County Building and Zoning, run by Gil Diamond, PE and spoke with Sandy Mitchell, PE. Sandy is a graduate of the University of South Carolina and grew up in Charleston. I told him about the EIFS performance during Hugo and asked him if, since Dade County was the first code authority to require wind load tests, the wind load requirement had anything to do with the EIFS performance.

Sandy said “We’ve had that requirement since the 1920’s so we probably have more experience than most areas of the country.
The EIFS industry improved their application procedures and had to beef up their assemblies to meet our wind load standards, so we’d expect them to perform well. Hurricanes are nothing new to us.”

Sandy’s department consists of four PEs and a registered architect, all of whom have completed code administration certification. I asked him to translate for me actual wind speeds of Hug-sustained winds of 135 mph with gusts of 175 mph.

His response: “The 175 mph was probably from the top of a building at the University, about 100 ft. up, which could be about right for ground readings of 135 mph. Actual pressure from 135 mph winds is 42 lb/sq. ft. Design pressure, however, must take into account negative or transverse pressure which, generally is 50 percent greater, so design criteria would be 63 lb/sq. ft. We would require a margin from the test result, so the product would have to pass a test pressure of 72 lb/sq. ft.”

Thanking Sandy for his comments, I offered a silent prayer that the three model code agencies (BOCA, ICBO, SBCC) some day will either fall off the face of the earth or develop the professional attitude of Dade County. It is still a wonder to me why this country needs three competing code associations.

My conclusion: EIFS out performed everything, in the face of a devastating disaster. These wall systems flex when they have to, just like the mighty hemlock must. They have successfully passed wind load tests which equal 200 mph sustained winds, absorbed awesome impact, yet remained easy to fix. In short, they are the best buy in town.

EIFS, quite simply, is one of the great ideas of our time. Manufacturers should consider Charleston for their next convention site, they have a lot in common with the people.