Lake Charles Woodworkers Club, Inc. February 2006

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JANUARY MEETING HIGHLIGHTS

The first of the year brought us to the shop of Leonard and Theresa Wilfret and they were the hosts. The Wilfert's shop is always one of the nicest we visit because it's so clean and well organized. They have done a very good job organizing the limited space they have available.

While we sometimes have a particular topic of interest, this month it was a general discussion of woodworking and techniques, suppliers and more.

As we always like to see, several members brought Show and Tell items and described a bit about each one.

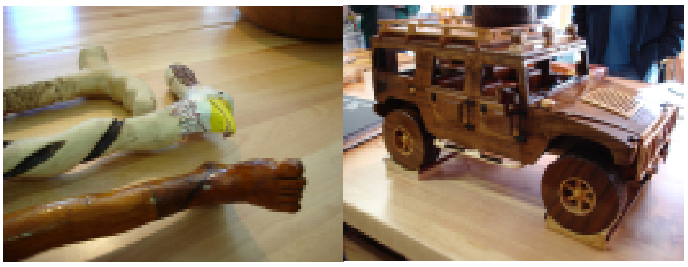
Pie Sonnier cannot possibly have the time to do what he does. He must have been building his cars for the past twenty-five years to come up with a

beatiful one nearly every month. This month's Hummer was a treat.

Mr. Thibodeaux showed off a wonderful carosel powered by a microwave turntable. I can only say what talent we have among our membership. Eltee also brought a new belt sander he likes.

Jimmy Everett keeps carving his wonderful canes and he brought a couple to show us.

Gary Rock also has lots of time to produce more bowels — five this time.



REALLY RITA-PROOF YOUR ROOF

When the strong winds of a hurricane strike a house, usually it is the roof that is first to go. Then, without the joists that hold the tops of the walls together, the walls blow down. Modern construction techniques try to solve this problem by brute force using special metal attachment devices (i.e., hurricane clips) to more securely connect the roof structure to the top of the walls to keep the roof from slipping off the top of the house or lifting up.

In pictures taken while a hurricane was in the process of hitting one of the Hawaiian islands, it was obvious that roofs do not slip sideways, but are lifted upwards from the walls. In effect the two slopes of a roof form an airfoil, which, while not as efficient in shape as that of an airplane wing, can be sufficient to lift the necessary tonnage needed to rip the roof and its attachments from the substructure. Clemson University determined that during a category four hurricane the lift could be 90 to 100 pounds per square foot. This, for a normal house, calculates to about 100 tons, and that is in all likelihood more than the house and its foundation weigh.

Aerial videos had been taken of the Hawaiian area both prior to and after the hurricane's passage. What was seen in the aftermath was that all of the steep roofed houses still had their roofs, while those that were much less steep were missing their roofs and usually their walls as well. Flat roofed buildings usually showed collapse, likely due to their inability to drain the rainwater away fast enough and the weight of the water caused the collapse. But the other observations supported the notion of lift. If the roof was steep, the "wing" stalled, but if it was shallow, then it was more nearly like an airplane's airfoil and provided sufficient lift to destroy the house, and those houses were indeed decapitated or worse.

The roofs of even modest homes approach or exceed the area of a Boeing 747's wings. Even with less than optimal aerodynamics, is it any wonder that roofs are lifted from houses? Indeed, even were the roofs perfectly attached to the substructure, it is not unbelievable that the lift during a hurricane could lift the whole house. You might think that a house is hugely massive, but consider how many trucks were used to deliver all the lumber, shingles, siding, etc. Those trucks could easily ride in a 747 cargo plane. This means that no amount of reinforcement of the structure would prevent the maximum damage. Thus

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Dues Reminder. To keep this newsletter coming and keep attending those great LCWW meetings, send your $20 dues to Dick Hopes at 1139 Green Road, Lake Charles, LA 70611.

Coming Up ... Saturday February 11, 9:00 a.m. at the shop of Leonard & Theresa Wilfret. Not a misprint. We're meeting there again in February.

the way to attack the 'cause' is to "foil the airfoil." This can be either done by proper design of a new house (e.g., steeper roof), or retrofitting an existing home in some way. (Do not misunderstand that the reinforcing methods are not necessary. These will protect the structure under less than maximum conditions. But for minimizing roof damage, nothing would be simpler and less costly than finding a way to defeat the lifting power of the wind on the roof's airfoil.)

Relatively few homes receive severe structural damage from hurricane and other severe winds. Those few which are severely structurally damaged, however, are often the subject of news coverage and dramatic photographs. These homes are mostly located in immediate beach front areas and represent a very small portion of the total homes damaged by hurricane wind. The vast majority of damaged homes are located inland from the immediate coast in towns, suburbs and cities.

The direct wind damage done to these homes mostly consists of the loss of shingles and other roof coverings. This is, in and of itself, minor damage. It results, however, in major losses due to the infiltration of rain water (both during and after the storm), which damages or destroys walls, floor coverings, ceilings, insulation, furniture, bedding, personal possessions and more.

Fortunately, steps can be taken to reduce the potential for this kind of damage to roofs and the resulting damage to building interiors. The steps can include, as mentioned before, having the roof designed so that it is not such an airfoil. But unless you are building a new home, this is out of the question.

If you are having to replace an asphalt roof, the best thing is to have your roofer use the Blue Sky Asphalt Shingle Roof System (which you or they can look up on the Internet). This roofing guideline was developed by Clemson University, the National Roofing Contractors Association Technical Services Department and the Certain Teed Corporation. Blue Sky Roof System guidelines are not found in current building codes. They are voluntary methods that are intended to complement local codes. These guidelines provide roofing contractors with the opportunity to offer their customers an enhanced level of protection from roof damage due to storm winds and rain.

Maintaining a watertight roofing system is critical to preventing damage in high wind and heavy rain events like hurricanes. The most common roofing material for houses is the "three-tab" or "architectual" asphalt shingle.

Even though winds in hurricanes are sometimes well below expected design speeds, shingle damage is widespread and frequently severe, resulting in interior water damage. Field investigations conclude that damage is mostly caused by inadequate workmanship, standards and design. Some shingles are not installed properly, according to the manufacturers recommendations. For example, often shingles are attached with too few and/or improperly positioned nails. Although some shingle roofs performed well, it is apparent from Hugo, Andrew, Rita and other hurricanes that adequate national standards to test and certify the wind resistance of roofing systems do not exist. Such standards, together with better quality assurance in the building process, are clearly needed.When high winds affect a building, it is well established that the highest forces occur along the building edges. On the roof, these locations are near the eaves, ridges, hips and rakes. Damage initiated on these edges can lead to progressive failure of the rest of the roofing. The Blue Sky Roof System guideline is intended to improve the shingle attachment in these high-load areas.

To stop the initiation of damage, it is critical to keep the exposed shingle tab sealed to the shingle below and to the rest of the roof deck. Applying roofing cement to the outer roof edges by hand, properly locating and applying nails in shingles and taking care to assure the shingle's self-sealing ad-hesive strip is properly secured will help keep the tabs from lifting. The guidelines include practices to reduce shingle blow-off and improve water resistance if some of the tabs are lifted.

Included in the guidelines is a recommendation to inspect the nailing of plywood roof deck to the rafters or trusses whenever roof coverings are stripped off by the roofer and inspection is simpler. Renailing of plywood roof decking may not always be standard practice as a part of reroofing, but the addition of nails according to the recommended nailing schedule is an option which you absolutely need to do and enforce with your contractor. Tables with recommended nail spacing are included in the guidelines.

If the recommended roof deck nailing is not feasible for the entire roof or is cost-prohibitive for you, a less effective alternative is to nail additional plywood panels closest to the roof edges and ridges where the forces are highest. In every case in which reroofing involves the replacement of old roof covering materials, the roof panels should be inspected and, at a minimum, nails added to meet the present building code standard. Otherwise, even well attached shingles will be lost when the roof panels are blown from or sucked off the roof by storm winds.

The real issue is using a roofing contractor who can follow local code and the Blue Sky instructions to the letter. Sometimes this is difficult as they may not be native speakers of English!

Another consideration is the roofing material. So-called 'architectural' asphalt roofing products (compared to so-called three-tab) have smaller tabs and thus are more resistant to lifting, especially in a mass.

Other excellent materials include metal, tile or concrete tile. With any of these, it is the installation that counts. For example, if you want a metal tile or ceramic/concrete tile roof, follow the guidelines found at www.tileroof.org. A modern tile roofing system that has holes through which screws into the underlayment are placed as well as adhesives and secure the tile better than most other systems. Metal roofs that use the same 'screw to the plywood' systems also work well.

If you are not having your Rita-damaged roof replaced or already have had it replaced, there are still ways to protect the structure. The best thing to use are so-called 'hurricane clips'. These attach the rafters of your home to the joists in the walls at the edges inside the attic. This means that they resist the lifting force of the airfoil created by your roof in a high wind,

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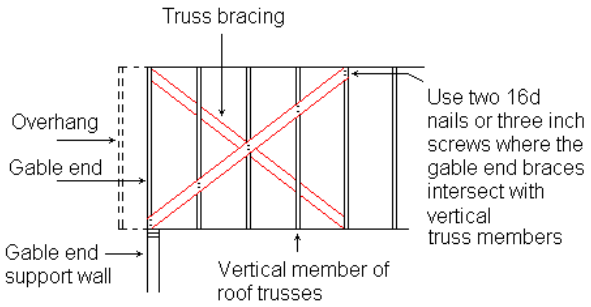
especially when the roof has a South exposure (where the wind will likely come from along the Gulf).

For example, I installed hurricane clips in my attic along the outside connection between the rafters and the joists of my home during the winter months after moving into my home. This was difficult as I had to crawl along the rafters with a hammer, nails and clips in the dark. Depending on the slop of the roof, this can be a difficult task. You can get a contactor to do this sort of work however, if you do it yourself, the Winter is the best time. As I have a carport that is intigrated with the home, I installed a 'clip' every other rafter in this area, though every third rafter will work on other parts of the attic. You need to do this on the North side of the home as the hurricane wind will switch directions as it moves through the area. I also installed gable end braces on both of my North facing gables.

If you have a gable on the South facing side of your



home, you need to do something else and the recommended method is to use a gable end brace. But rememebr that hurricane winds switch direction as they move through, so the North side could use this treatment as well.

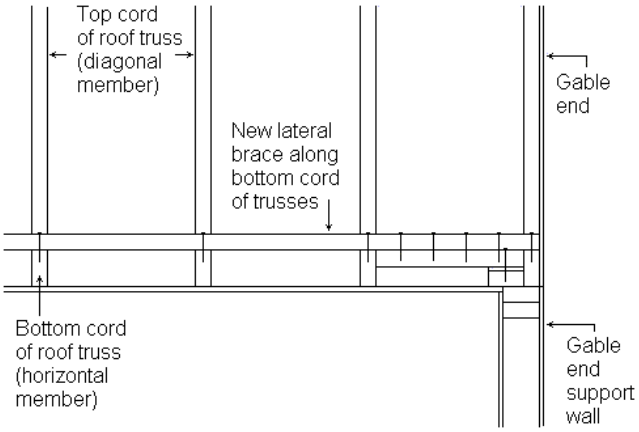
Pictured above is what is known as gable end bracing. As you can see from the picture you need to place two 2x4s in a "X" pattern running from the gable end to the fourth truss. This will help keep that gable end up in high winds, by transferring the pressure into all the trusses.

Spreading the pressure out over several structural members decreases the load and preventing any one member from failing. This is not strictly gable end bracing, as this helps brace the trusses as well. If an interior wall were located below the fourth truss, this would be great. If there is a wall located here it would help transfer the load to the foundation, which would be the best situation. So, to do this brace you need more of the 3" screws. Placing two in each truss/brace intersection. You need to have a good connection, with the screws, to the gable end. If you can't find a real good member to connect to, attach a small length of 2"x 4" say 10" or 12" long to the gable end then screw the long brace into the side of it.

This diagram is a little more difficult to follow but it's vital that you understand what's going on here. When hurricane force winds pound on your home, things start to shake rattle and roll. Because the gable end has a large surface area it really takes a beating.

If the contractor who built your home did a fine job, it would stand up to normal weather conditions, but 120-mph winds are not normal. Rita showed us that the gable ends pop loose, normally at the bottom and then collapses and I saw at least two examples in Heyd Park. Shortly after this the roof is blown away and the home is totally destroyed. What we are doing in this diagram is tying the bottom of the gable end to the to the rest of the trusses and the gable end support wall. The top of the gable end is also connected, but is not shown in this drawing.

The gable end is really just another roof truss except it is located on the end. In many ways it should match the adja-



cent roof trusses. Every situation may be a little different but this plan should work pretty well for most everyone.

What is done is a block of quality 2"x4" stock is cut to fit tightly between the gable end bottom cord and the bottom cord of the first roof truss. This block is called the support block. On the gable end side you should be able to connect it to the ceiling nailer. A 7/16 inch plywood block or shim may be needed here to keep all the parts level. On the truss side connect the support block on its end as shown. Once this is done you can connect your longer 2"x4" lateral brace to the gable end, the support block and on across the bottom cords of the roof trusses.

These support blocks need to be spaced every four feet on center or as close to this as possible. It is not necessary to run lateral bracing all the way across your attic spaced every four feet. However every support block must have a lateral bracing block nailed to it even if it is short. If this is done properly the wind will not be able to push the gable end into the attic or pull it out from the gable end support wall.

The gable end braces need to connect both the top and bottom cords of the trusses to the gable ends. It is very important that your gable ends are tied into the rest of the roofing system, make this a high priority item. *Barry Humphus*.