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## Garage Door Protection

Because garage doors are so big, usually the single biggest opening on your house, and because most old doors are so weak, the survival of your garage door is very important to the survival of your house. Experience has shown in older houses that when garage doors fail in hurricane winds a lot of additional damage follows. When you are evaluating your house for its vulnerability to hurricanes you need to look at your garage door as one of the first and most important vulnerabilities. Older garage doors and new ones that are not pressure rated are highly susceptible to wind damage, including buckling, twisting off the tracks and failure due to impact from windborne debris. Doors can be pushed in by winds blowing onto the door or pulled out as winds whip around the corner of the house where the door is located.



**Garage door pushed in by the wind**

(click image for larger version)



**Garage door pulled out by the wind**

(click image for larger version)

Failure of the garage door allows the full fury of the hurricane to act on interior walls, doors, ceiling or roof that form the barriers between the inside of the garage and the rest of the house. This frequently leads to failure of these surfaces and can lead to significant loss of roof sheathing or loss of a part of the roof.



**The failure of this garage door probably contributed to the loss of roof sheathing**

(click image for larger version)

Water intrusion around the perimeter of a garage door is not usually a big problem unless you have things that can be damaged by water sitting directly on the floor. Most garage floors are sloped towards the door so that water that blows in around the door will tend to drain out of the garage. However in a hurricane winds may blow water into the garage for some time so it is probably prudent to raise vulnerable contents off the floor and away from the door.

### Using Your Car

Backing your car against the door provides little additional bracing. It may help brace the bottom panel from positive (inward acting) pressure; but, it will do nothing to help with negative (outward acting) pressures. It just puts the car closer to possible debris impact damage.



**Garage door blown in on top of car**

(click image for larger version)

## Inspecting Your Garage Door. Is it Strong Enough?

1. Is your door **wind rated**? If you don't know then most likely it is not. If it is wind rated there will be sticker on the door indicating the Design Pressure for the door.
2. Is your door **rated for debris** impact resistance? If you don't know then most likely it is not. Again, if the door is debris impact rated there will be a label on the door indicating the rating.

If you don't see a sticker but still want to further evaluate the door, look for the following. They are all indications of a door that will perform poorly when a hurricane strikes.

1. Does your garage door only have **one bar** across each of the four panels or maybe only one or two panels have bars?
2. Is your garage door made of wood?
3. Are some of the door panels rusted or rotted?
4. Are some of the door panels dented rather badly?
5. Are the **brackets** that hold the track to the wall are loose, broken, or missing bolts or nuts.
6. When the garage door is closed, do the brackets supporting the track line up with the rollers?
7. Are the hinges between panels loose, broken, or missing bolts or nuts or screws?

## Protecting Your Garage Door Opening:

One of the simplest solutions is to **replace the door and its tracks** with a door that is code approved for both wind pressure and impact protection (about \$1,500 for a door wide enough for two cars). When you install a wind and debris rated door your worries are over. The door is always there to provide the needed protection. When you are selecting a door there are two primary considerations. One is to be sure the door is rated for the correct wind pressure for the design wind speed of the area in which you live. The other is to select a door, at additional cost, that is also debris rated. Such a door will give you the ultimate in protection and is NOT an indulgence, but instead a prudent choice.

Another solution is to protect the garage door with a shutter or screen

product that is **rated for both wind pressure and debris impact**. Storm panels are a very effective and easy way to protect a garage door because they are effective and are relatively easy to deploy. If your door is relatively new then storm panels may be the best route. On the other hand if the door is deteriorated and is or will be in need of replacement then replacing the door will be most cost effective in the long term. You can check out shuttering options in [HRG\\_Shutter\\_Matrix.pdf](#). Usually the only effective way to shutter a garage door is to install panels or a system that attaches along the top and bottom of the door opening.

**Vertical bracing:** Vertical bracing systems can be effective for supporting the door against wind pressure loading and at least one company makes a retrofit kit, with vertical members, that has Florida Building Code approval. Details are available at the [Florida Department of Community Affairs Product Approval](#) website. The example we are aware of from this web site is listed below. There may be others.

#### **Examples: Secure Enterprises, LLC FL# 6420**

**Horizontal bracing:** Horizontal bracing with wood members is rarely very effective and usually not a good idea. Sixteen foot and wider garage doors are big structural elements. They are so wide that it is not easy to make them strong. If you have looked at wind rated doors you may have noticed that the manufacturers have usually installed several bars across each panel and they may have provided posts to further strengthen the door. It takes really hefty wood members to span the width of a two car wide garage door and make it much stronger. Permanently installing wood members to the garage doors will change the balance of the door and can make it so heavy that the garage door operator does not have the power to lift the door (human or motor power).



**Garage door springs can be very dangerous, and even lethal! For this reason springs should be adjusted or replaced only by professional garage door installers.**

**Garage door springs are sized or adjusted at time of initial installation to balance the weight of the door. If you add much weight to a door, then the door may not open as easily. In fact a garage door operator may not have the strength to open the door or the motor of the operator may burn out because of the extra work it has to do to lift the door.**





Can you imagine turning your garage door so that it is suspended over a hole and parking your car on top of the door? At 130 mph, a 16' by 7' door would have to support a typical family car and at 150 mph it would have to support a large SUV.

Door size	Pounds of force applied by wind		
	100 mph	130 mph	150 mph
8' wide by 7' high	1120	1920	2560
16' wide by 7' high	2095	3540	4715
18' wide by 7' high	2355	3980	5310

If your house faces a big open area, these forces are likely to increase by 30 percent.

**Do it yourself:** The only do-it-yourself options that seem to make sense are to add vertical support posts. You can buy one of the kits for bracing the door as suggested above or install your own wood columns. You can install the posts at the center of the door (this will cut the forces on the tracks in half but the supports will have to carry half of the forces on the door) or possibly 1/3rd of the way in from each edge of the door (this will reduce the loads on the tracks by 2/3rds and the loads on the supports will be 2/3rds of what they would be with a single center post). You will need to add pairs of supports, one on the inside and one on the outside at each location where you choose to brace the door. The Tables below can be used to choose the size of the wood columns you would need to install and the strength of the anchors you will need at each end of the column. You will have to look at your particular garage door situation and then be creative in selecting the appropriate hardware to anchor the columns to the floor and to the header over the garage door. Simpson Strong-Tie and USP both make hardware that has the kinds of capacities you will need to anchor the ends of the columns. The first table lists column sizes and forces for homes located in a normal suburban area where you are surrounded by houses and trees. If your home is located on the edge of a large field, lake or golf course, you should use the second table to identify the size and type of wood to use in the columns. All wood for the columns is assumed to be Number 2 grade (something that is commonly available at lumber yards and some home improvement stores). Southern Yellow Pine (SYP) wood is stronger than Spruce Pine Fir (SPF) wood. The red squares indicate that SYP lumber must be used. The black squares indicate that none of the common lumber is strong enough for the required bracing strength.

Keep in mind that even if you brace the garage door, you are not protecting it from damage from windborne debris. If you have a wooden garage door with panels, debris may knock out the panels and create a large opening for wind and rain.

Two Pairs of Columns (inside and outside of door at each location) at 1/2nd Distance from Each End						
Door Width (feet)	Design Wind Speed (mph)	Force on Ends of Columns (lb/ft²)	Force on Traces on (lb/ft²)	Column Member Number, Size, and Type		
				4"x4"	2"x6"	2"x2"x6"
8	110	452	131			
10	110	480	241			
10	110	542	271			
8	120	313	190			
10	120	574	267			
10	120	648	323			
8	130	366	183			
10	130	674	337			
10	130	738	359			
8	140	425	272			
10	140	710	391			
10	140	881	443			
8	150	487	244			
10	150	898	449			
10	150	1010	505			

■ = Not enough capacity for common wood members  
■ = Southern Yellow Pine No. 2 or better wood members  
■ = Spruce-Pine-Fir No. 2 or better wood members

Two Pairs of Columns (inside and outside of door at each location) at 1/2nd Distance from Each End						
Door Width (feet)	Design Wind Speed (mph)	Force on Ends of Columns (lb/ft²)	Force on Traces on (lb/ft²)	Column Member Number, Size, and Type		
				4"x4"	2"x6"	2"x2"x6"
8	110	367	94			
10	110	675	337			
10	110	759	380			
8	120	438	279			
10	120	800	432			
10	120	904	452			
8	130	612	256			
10	130	944	472			
10	130	995	531			
8	140	594	297			
10	140	1036	540			
10	140	1230	637			
8	150	682	341			
10	150	1257	639			
10	150	1415	707			

■ = Not enough capacity for common wood members  
■ = Southern Yellow Pine No. 2 or better wood members  
■ = Spruce-Pine-Fir No. 2 or better wood members

Single Pair of Columns (inside and outside of door) at Middle of Door						
Door Width (feet)	Design Wind Speed (mph)	Force on Ends of Columns (lb/ft²)	Force on Traces on (lb/ft²)	Column Member Number, Size, and Type		
				4"x4"	2"x6"	2"x2"x6"
8	110	394	151			
10	110	723	362			
10	110	814	407			
8	120	469	234			
10	120	861	430			
10	120	968	454			
8	130	543	274			
10	130	1011	506			
10	130	1136	569			
8	140	637	279			
10	140	1174	527			
10	140	1321	587			
8	150	721	386			
10	150	1347	674			
10	150	1516	750			

Single Pair of Columns (inside and outside of door) at Middle of Door						
Door Width (feet)	Design Wind Speed (mph)	Force on Ends of Columns (lb/ft²)	Force on Traces on (lb/ft²)	Column Member Number, Size, and Type		
				4"x4"	2"x6"	2"x2"x6"
8	110	351	276			
10	110	702	636			
10	110	739	670			
8	120	498	328			
10	120	1005	603			
10	120	1102	670			
8	130	768	384			
10	130	1416	736			
10	130	1550	795			
8	140	692	449			
10	140	1244	822			
10	140	1390	905			
8	150	924	513			
10	150	1668	943			
10	150	1822	1033			

**Table 1. Sizes of Wood Columns for DIY Bracing of Garage Doors in Suburban Setting with no Large (600-ft wide) Open Areas Next to House**  
(click image for larger version)

**Table 2. Sizes of Wood Columns for DIY Bracing of Garage Doors for Houses with Large (600-ft wide) Open Areas (fields, parking lots, water, golf course) Next to House**  
(click image for larger version)

**Conclusions About Garage Doors:**

If you have an old style garage door (i.e. not one especially designed for wind applications) you should seriously consider replacing the door or protecting it with a shuttering system. Shuttering will cost less than replacing the doors, however if the door is old or deteriorated it may well make more sense to bite the bullet for the long term advantage of having a new door sooner and not having to pay for storm panels only have no use for them when you are forced to replace the door. Using retrofit kits and posts has the disadvantage of not taking into account the particular design of your garage door and its strengths and weaknesses.

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