



## Structural Inspection

July 17, 2017

For: Glenda & Dave Schmidt  
59344 Lacombe Harbor Road  
Lacombe La.

Re: Inspection of Home at 59344 Lacombe Harbor Road  
July 10, 2017

### Construction:

One-story, wood frame, wood veneer, with a composition shingle roof on a conventional foundation that has been elevated. The home is located in flood zone AO.

### Scope:

This inspection is limited to a visual inspection of the shell of the home, including the interior and exterior foundation of the home. No inspection of the mechanical or electrical systems was performed. This report is as outlined by the National Academy of Building Inspection Engineers and is not an explanation of cause, effect, or engineering.

### History:

Dammon Engineering was contacted to request a structural inspection of the referenced home due to the owners concerns of home being raised and materials used in construction.

### Findings:

The home was elevated as part as a federal grant and in doing so new stairs and stair supports had to be added to give access to the home. The new stairway support is constructed of concrete masonry units (CMU) also known as cinder blocks. The emergency generator, exterior air condition unit, water storage tank, and hot water heater have also been elevated to the main floor level and placed on new wooden platforms secured on one side to the main floor foundation. Wooden stairs have been added to each platform for maintenance access except for the hot water heater platform. It is recommended that access stairs are added to the platform for heater maintenance. The number of supporting wooden columns, placed under the AC/generator platform is sufficient to support the axial load (weight) on it during normal operating conditions.

This inspection is limited to the apparent visual conditions of the structural components of this building. It does not cover, nor attempts to cover, any components, items, and/or conditions which, by their nature or location, are concealed or are difficult or hazardous to inspect, or which require the moving of furniture, flooring materials, rugs, fixtures, appliances, or any component-part nailed, bolted, or screwed down or shut. No opinions are expressed regarding conditions which could be discovered only by the disassembly of any component parts, special testing, or removal of any concealing objects.

Inspections are made under normal weather conditions, and are not opinions of the conditions of the property and/or structure which may exist under unusual weather conditions, such as, but not limited to floods, heavy rains or snows, high winds, temperature extremes, or any act of God. Specific hazardous wastes, toxic substances, toxic mold, air and water quality, communicable diseases, asbestos, soil, environmental, radon, carbon monoxide, formaldehyde, building code and termite conditions are not included in this report unless otherwise stipulated.

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The equipment platforms and stairways are wood construction. It appears most of the structure fasteners used for this are nails. Being in a humid and outdoors environment some of the boards are warping up and separating the structure. Proper fasteners (screws) are required and recommended to maintain the stairway and platform integrity to insure safe access for all equipment maintenance.

The main home foundation rests on an enclosed CMU wall and CMU pillars. The new support wall of 2907 sq. ft. has 34 Cooke Vents (engineered to open upon rising water) and 4 Decorative Vents (non-engineered) to allow rising flood water to enter and exit from under the house. The vents are well distributed on all walls and meets requirements for *FEMA Technical Bulletin 1 / August 2008 "Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas in accordance with the National Flood Insurance Program"*.

Design and performance criteria for engineered openings (vents) is specified in the American Society of Civil Engineers (ASCE) Chapter 24, Section 2.6.2.2 . Based on a worst case scenario flood water surge with a rate of rise and fall of a of 1 foot in 6 minutes the enclosed CMU wall would require 25 engineered Cooke vents. The current 34 engineered Cooke vents are more than adequate. Replacing the 8 Cooke vents along the front of the house with Decorative vents is acceptable as the total remaining number of Cooke Vents (26) would still meet the FEMA/ASCE requirements.

There is no requirement for any specific number of Decorative Vents (Fixed Vents) to be mixed with engineered Vents (Cooke type vents). Calculations are based solely on the total net openings of the type of vents used that allow flood water to enter and exit the enclosed area.

The garage building, which is elevated, has an enclosed perimeter CMU wall underneath. The enclosed wall has 12 Cooke Vents and 4 Decorative Vents. The vents are well distributed and meet *FEMA Technical Bulletin 1 / August 2008*. The ASCE requirements for the garage vents necessitates 7 engineered Cooke vents. The garage/storage area has an adequate number of engineered Cooke vents (12) for the enclosed square footage area (841 sq ft).

The moderate vent requirement based on flood waters rising 1 foot in 12 minutes would require 13 Cooke Vents for the house foundation enclosure and 4 Cooke Vents for the garage foundation enclosure. The number of vents in both cases is adequate.

It appears that during the inspection that the Cooke Vents (home and garage) could not be opened. The manufacturer has indicated that the vents should easily lift and be removed by hand. They appear to be held in the closed position (and immovable) due to one or more of the following reasons:

- 1) The mortar around the frame of the vent is interfering with vent door movement.
- 2) The glue holding the vent frame in place is interfering with vent door movement.
- 3) The vent frames are bent primarily at the top which interferes with vent door movement.

These vents essentially are functionally inoperable and it appears this is due to improper installation.

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The front entrance concrete stair support has no vents and the owner stated that no dowels are installed to connect the concrete stairs to the home. Without vents, the stairway support could collapse during a flood.

Conclusion:

It is important to have some type of relief of flood water pressure in the new enclosed area below the home, garage/storage, and front stairway areas. This will allow storm water to enter and exit the enclosed areas without causing a collapse of the CMU wall. The area below the home and garage has two types of vents installed. The home foundation and the garage foundation has an adequate number of vents for each enclosed area.

During the inspection it was noted that the concrete foundation is sweating underneath the home. The buildup of moisture requires addressing.

Recommendations:

Items to be addressed are as follows:

- 1) Remove all non-functioning Cooke Vents (engineered vents) and replace with working/operable Cooke Vents or Decorative vents. This should be done for both the home and garage.
- 2) Install new Decorative type vents or Cooke vents in the concrete stair support enclosure. A minimum of 2 vents is required.
- 3) The front stair foundation should be tied to the home foundation with steel pins.
- 4) Remove warped boards on the stairs and platforms and replace using properly sized screw fasteners. In addition, screws should be added in questionable areas to prevent future warping/separating in other areas.
- 5) The water tank platform is sufficient to support the axial load (+/- 3800#); however, it is recommended that cross bracing be placed on the supporting columns.
- 6) Improve the ventilation and air flow under the house and garage in the enclosed areas. This can be accomplished by using more decorative vents, grated or screened open vents, or installing a grated access door. For better air flow, vents specifically for ventilation are typically located at the top of the enclosed walls. These vents will not count toward the FEMA requirements; however, it will relieve moisture buildup that can contribute to mold growth and other unhealthy conditions.

Should you have any questions or if further information is required, please feel free to contact me.

Respectfully,

Brian Mistich, P.E.

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