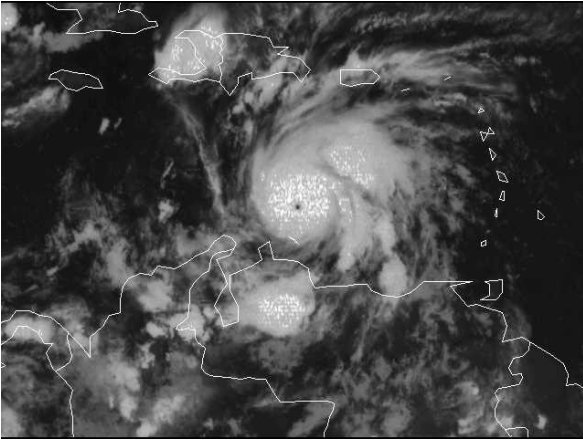


Recommended Physical Plant Improvements to Existing Nursing Homes for Disaster Preparedness



**Report to the Governor
and to the Legislature**

1999



Recommended Physical Plant Improvements to Existing Nursing Homes for Disaster Preparedness

INTRODUCTION:

Following the catastrophic devastation caused by Hurricane Andrew in August of 1992, new research and study were given to the subject of improving hurricane protection strategies for the built environment. In 1993, the Governor's Disaster Planning and Response Review Committee, a special study commission appointed by the Governor and chaired by Philip D. Lewis, published one of these studies. This study, which became known as "The Lewis Report," was a series of recommended actions the state should undertake to mitigate such extensive storm event damage in the future. Some of these recommendations concerned improving the extent to which health care facilities should be constructed to withstand storm damage and be self-supporting during and immediately following disasters.

Although no lives were lost in health care facilities as a direct result of Hurricane Andrew, there was a negative impact on the health and safety of the residents and patients in these facilities due to structural damages and the resultant loss of many health care facility beds and services. In "The Lewis Report," it was recommended that the care of these residents with special medical needs could best be met by the respective health care providers instead of the local county emergency management authorities.

To ensure that the health care providers could meet these needs, the 1993 Legislature passed into law revisions to sections 400.23 and 395.1055, Florida Statutes (F.S.). These revisions directed the Agency of Health Care Administration (AHCA) to write rules that would require all nursing homes and hospitals to become structurally capable of serving as shelters and be equipped to be self-supporting during and immediately following disasters. During 1994-1996 work groups were established to develop these rules. These workgroups were composed of emergency management experts from the state; consultant architects, engineers, and contractors; health care provider representatives, and Agency personnel. These workgroups reviewed many of the available architectural and engineering reports analyzing the damage caused by Hurricane Andrew, conducted on-site surveys of existing facilities, and listened to eyewitness reports from health care professionals who had direct experience with the devastation of Hurricane Andrew. A draft rule and economic impact statement were developed and distributed to the health care providers for comment.

Because the economic impact to implement these changes to all of the new and existing health care facilities throughout the state was very costly, the health care providers were resistant to the promulgation of this rule and began to encourage the Legislature to revise these statutes. In 1998 the Legislature revised sections 400.23 and 395.1055, F.S., exempting existing facilities from any required construction improvements. Additionally, the nursing home rule section 400.23, F.S., was revised to direct the Agency, in consultation with the licensed nursing home facilities, to recommend cost effective renovation standards to improve the structural and self-supporting capabilities of all existing nursing homes.

GENERAL DESIGN STRATEGY

The following construction improvement recommendations are a result of this statutory mandate. Because they are not extensive renovations to the entire facility, they are not intended to create structural shelters in which residents, staff, and families of residents and staff can remain with assured impunity from damage caused by

hurricane force winds or flooding from surge inundation. They are instead recommendations for construction improvements which, if undertaken, can improve the structural capability of the facility to the extent that it may sustain less extensive storm event damage and be better able to support the care of the residents during and immediately following a disaster. This report contains no recommendations for a structural or utility analysis of the existing building to determine the extent to which it conforms to present codes and standards to be considered a shelter. To analyze and reconstruct an existing structure in this way would not be cost effective.

The concept utilized in these recommendations is one which provides improvement to the protection of the exterior envelope and the support services and utilities of the occupied resident areas. To reduce the amount of reconstruction required to meet these recommendations, an area within the structure of the building should be designated where residents and support services can be located. If this is done, then the entire facility will not have to undergo renovation.

If the existing facility is located in a zone or area, which will be under mandatory evacuation orders, then the receiving facility to which the residents are to be evacuated should meet these recommended construction improvements. Even when a facility is required to be evacuated, if the structural improvements contained in these recommendations are applied, they will help mitigate extensive damage to the facility so that it will be ready to be reoccupied immediately following the storm event.

All improvements, renovations, reconstruction, or refurbishment to the physical plant of the facility as a result of these recommendations must be submitted to the Office of Plans and Construction, Agency for Health Care Administration for determination of further review requirements.

RECOMMENDED IMPROVEMENTS

I. RECOMMENDED SPACE STANDARDS

- a. For planning purposes, there should be a minimum of 30 net square feet (excluding cabinetry and fixed equipment) provided for each resident served in the occupied resident area(s).
- b. Space for administrative and support activities should be provided for use by facility staff to allow for care of residents in the occupied resident area(s).
- c. Space should be provided for all staff and family members of residents and staff.

II. RECOMMENDED SITE STANDARDS

- a. If the floor elevation of the existing occupied resident area(s), resident support area(s) or resident support utilities, including mechanical, electrical, food services, clean and soiled utility areas, and other areas as determined by the facility are located below the 100-year flood plain or below the hurricane Category 3 (Saffir-Simpson scale) hurricane surge inundation elevation, they either should be relocated above such zones or renovated to be in compliance with the current standards of the National Flood Insurance Program of the Federal Emergency Management Agency. Information on this program is available from the Federal Emergency Management Agency, Federal Insurance Administration, Attn. Publications, P.O. Box 70274, Washington, D.C. 20024.

Existing landscaping elements should be surveyed to ensure that if damaged they will not block the on-site access route to the facility.

III. RECOMMENDED ROOF IMPROVEMENT STANDARDS

All existing roof appendages such as ducts, tanks, ventilators, receivers, dx condensing units and decorative mansard roofs and their attachment systems should be secured directly to the underlying roof structure or roof support structure.

IV. RECOMMENDED EXTERIOR UNIT STANDARDS

a. All exterior window units, skylights, exterior louvers and exterior door units including vision panels and their anchoring systems in the occupied resident area(s) should be protected to resist the wind load requirements of the building code and the debris impact requirements as specified by Section 2315 of the South Florida Building Code, Dade edition 1994, available from Metropolitan Dade County Building Code Compliance Department, 140 West Flager Street, Suite 1603, Miami, Florida 33130. This can be achieved by adding permanently attached protective systems such as shutters and baffling or removable protective systems designed to intricately fit with the wall/window system of the facility and stored on-site at the facility.

b. All of the exterior impact protective systems should be designed and installed so that they do not come in contact with the glazing under uniform impact or cyclic pressure loading.

c. When not being utilized to protect the windows, the protective system shall not restrict the operability of the windows in the occupied resident bedrooms.

d. When not being utilized to protect the windows, the protective systems shall not reduce the clear window opening below 8% of the gross square footage of the resident bedrooms.

V. RECOMMENDED HEATING, VENTILATION AND AIR CONDITIONING (HVAC) STANDARDS

a. Air moving equipment, dx condensing units, through-wall units and other HVAC equipment located outside of or on the roof of the facility should be either relocated inside a structure designed to meet the wind load requirements of the applicable building code, or protected from impact as specified by Section 2315 of the South Florida Building Code, Dade edition 1994.

b. All occupied resident areas and resident support areas should be supplied with sufficient HVAC or mechanical ventilation as determined by the facility to ensure the health, safety and well-being of all residents and staff during and immediately following a disaster.

c. As determined by the facility, these selected HVAC systems and their associated support equipment such as a control air compressor essential to the maintenance of the occupied resident and resident support area(s) should receive their power from the emergency power supply system(s).

d. If the facility chooses not to connect the air conditioning systems to the emergency generator then the ventilation air change rates in occupied resident areas should be maintained as specified in Chapter 59A-4, Florida Administrative Code (F.A.C.).

e. Auxiliary equipment and specialties such as hydronic supply piping and pneumatic control piping should be relocated, rerouted, or protected in such a manner as to ensure the equipment receiving the services will not be interrupted.

VI. RECOMMENDED PLUMBING STANDARDS

a. There should be an independent on-site supply or on-site storage capability of potable water at a minimum quantity of 3 gallons per resident served per day for a period of 72 hours following utility interruption.

b. There should be an independent on-site supply or storage capability of potable water at a minimum quantity of 1 gallon per facility staff, and other personnel as determined by the facility per day for 72 hours following utility interruption.

c. There should be an independent on-site supply or on-site storage capability of sufficient amount as determined by the facility of water or other methods as determined by the facility to provide for resident services.

d. When utilized to meet these recommendations, selected system appurtenances such as water pressure maintenance house pumps, and emergency water supply well pumps should take power from the emergency power supply system(s).

VII. RECOMMENDED MEDICAL GAS SYSTEMS STANDARDS

a. The storage, distribution piping system and appurtenances to the occupied resident area should be contained within a protected area(s) designed and constructed to meet the structural and debris impact requirements as specified by Section 2315 of the South Florida Building Code, Dade edition 1994.

VIII. RECOMMENDED EMERGENCY ELECTRICAL GENERATOR AND ESSENTIAL ELECTRICAL SYSTEM STANDARDS

a. There should be an on-site Level I emergency electrical generator system designed to support the occupied resident area (s) and resident support area (s) with at least the following support services: Ice making equipment to produce ice for the residents served, or freezer storage equipment for the storage of ice for the residents served; Refrigerator unit(s) and food service equipment if required by the emergency food plan; Life safety and critical branch lighting and systems as required by Chapter 59A-4, F.A.C.; Selected HVAC systems as determined by the facility.

b. The emergency generator system should be fueled by a fuel supply stored on-site sized to fuel the generator for 100 percent load for 64 hours, or 72 hours for actual demand load of the occupied resident area (s) and resident support area(s) and resident support utilities during and immediately following a disaster, whichever is greater.

c. The fuel supply should either be located below ground or contained within a protected area that is designed and constructed to meet the structural and debris impact requirements as specified by Section 2315 of

the South Florida Building Code, Dade edition 1994. If an underground system is utilized, it should be designed so as to exclude the entrance of any foreign solids or liquids.

d. All fuel lines supporting the generator system(s) should be protected with a method designed and constructed to meet the debris impact requirements as specified by Section 2315 of the South Florida Building Code, Dade edition 1994.

e. All panel boards, transfer switches, disconnect switches, enclosed circuit breakers or emergency system raceway systems required to support the occupied resident area(s), resident support area(s) or support utilities should be protected to meet the debris impact requirements as specified by Section 2315 of the South Florida Building Code, Dade edition 1994.

f. The emergency generator(s) should be air or self-contained liquid cooled and it and other essential electrical equipment should be protected by a structure designed and constructed to meet the structural and debris impact requirements as specified by Section 2315 of the South Florida Building Code, Dade edition 1994.

IX. RECOMMENDED FIRE PROTECTION STANDARDS

a. If the facility requires fire sprinklers as part of its fire protection, and this sprinkler coverage is interrupted, the facility should plan to provide a Fire Watch as approved by the Office of Plans and Construction for all areas of the facility that are without sprinkler coverage due to interrupted water flow. One 4-A type fire extinguisher or equivalent should be provided for every 3 or less 2-A fire extinguishers required by NFPA 10 for the area served. These additional extinguishers should be equally distributed throughout the area they are protecting.

X. RECOMMENDED EXTERNAL EMERGENCY COMMUNICATIONS STANDARDS

a. Each facility should provide for external electronic communication not dependent on terrestrial telephone lines, cellular, radio or microwave towers such as on-site radio transmitter, satellite communication systems or a written agreement with an amateur radio operator volunteer group(s). This agreement should provide for a volunteer operator and communication equipment to be re-located into the facility in the event of a disaster until communications are restored.