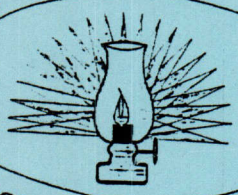
Venice Compliance

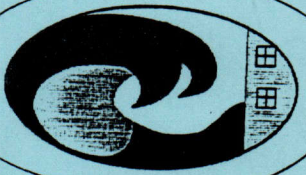
Program

Hurricane Damage



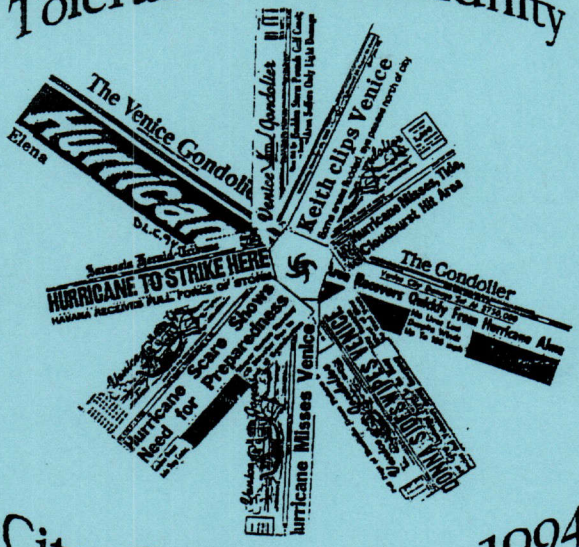
Prevention Project

Coastal Area



Redevelopment Plan

Creating A Hurricane Tolerant Community



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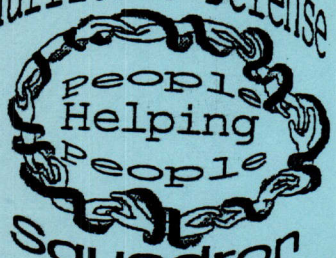
Hurricane Defense



Squadron

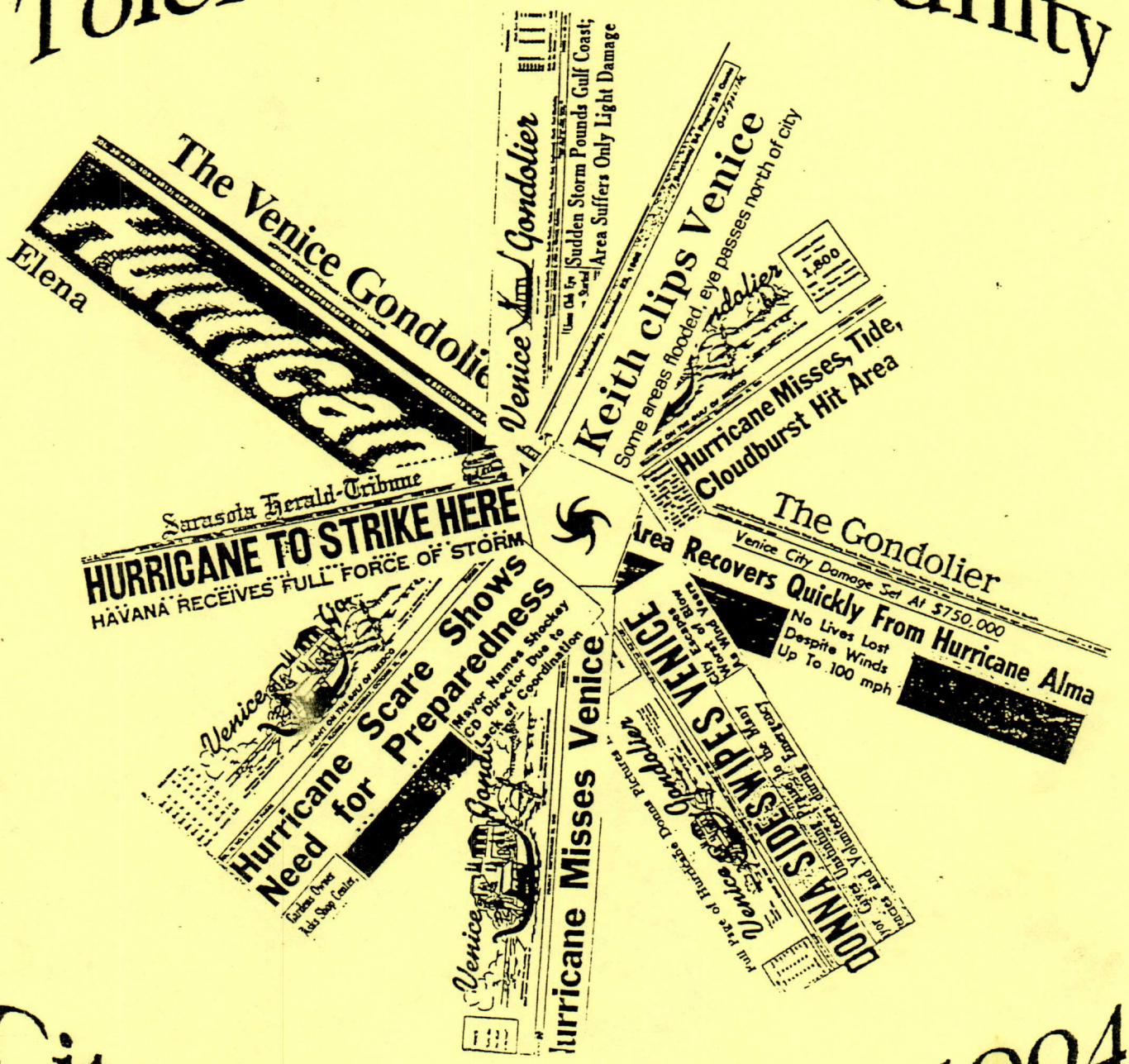
Growing Native

For Nature II

Developing A

Tolerant Building

Creating A Hurricane Tolerant Community



City Of Venice 1994

By: Donald Caillouette

PLANNING DEPARTMENT
City of Venice, Florida

CREATING A HURRICANE TOLERANT COMMUNITY

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A C K N O W L E D G E M E N T S

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MAYOR: MERLE L. GRASER

CITY COUNCIL: EARL MIDLAM, VICE MAYOR

CHERYL BATTEY

ALAN McEWEN

DEAN CALAMARAS

BRYAN HOLCOMB

MAGGIE TURNER

A study of this type requires time for the gathering of information from a variety of sources along with the assembling of these resources into a presentable format. Approximately six months were needed for the development of this study. The Venice Planning Department consisting of Chuck Place, Director, and Cyndy Powers need to be recognized for their encouragement and support of this document from the beginning to the end.

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Danger and Survival by McGeorge Bundy, Copyright 1988, published by Random House, Inc.

Hurricane by Ms. Marjory Stoneman Douglas, Copyright 1958, published by R. Bemis Publishing/Mockingbird Books

Hurricane Survival Guide by Leslie R. Crown, Copyright 1984, published by Lera Publishing

Hurricane Warnings by Charles Miller, Copyright 1992, published by The Taunton Press, Inc. in Fine Homebuilding magazine

A note of appreciation is extended to the following government agencies whose documents were used in the study:

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United States Virgin Islands Disaster Programs Office

National Hurricane Center

National Weather Center

AUTHOR'S NOTES

"AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE" is a saying which should be considered by governments preparing to address disaster issues. Since the mid-1980's the State of Florida's Local Government Comprehensive Planning and Land Development Regulation Act has required all coastal communities to develop a "Post-Disaster Redevelopment Plan (PDRP)".

Most communities have been questioning the "how to" in developing a PDRP. The concept of a PDRP is to address all hurricane disaster recovery issues in a plan before a disaster occurs. This plan would be implemented by the community after the disaster. In other words, the community would be prepared for the emergency by having a plan.

The "CREATING A HURRICANE TOLERANT COMMUNITY" (CHTC) program views disasters in a different manner. The concept of CHTC is to address the impacts and offer corrective solutions to hurricane disaster issues before having a disaster. Implementation of this idea should reduce damage or prevent a catastrophe from occurring.

This program is designed to develop a document to assist the City of Venice and its citizens to better understand the impacts of hurricanes in our community. The study also offers a variety of mitigation alternatives, in the form of programs and projects which address reduction or elimination of a hurricane disaster. This document is designed to be a functional tool which is positive, workable, and reasonable for not only Venice but for similar coastal cities and counties as well.

"Creating a Hurricane Tolerant Community" was not designed to address hurricane issues or concerns at a Regional, State or Federal level. Several sections of the study discuss mitigation funds which are available from the Federal and State governments. The plan does not review or list all funding that is available for hurricane issues. Additional information concerning hurricane mitigation funding is available from the State Department of Community Affairs and the Federal Emergency Management Agency. Each element was thoroughly researched and analyzed from a geographical and planning perspective.

This entire document reflects the opinions and attitudes of the author, not necessarily of the City of Venice. The author hopes that this study launches the genesis of developing a Hurricane Tolerant Community in Venice.

I N T R O D U C T I O N

CREATING A HURRICANE TOLERANT COMMUNITY

"MY PEOPLE ARE DESTROYED FROM LACK OF KNOWLEDGE...". These words from Hosea 4:6, in the Old Testament, could be a warning for those who have not experienced a hurricane disaster. Communities have the opportunity to avert the major impact of a hurricane by being prepared. This preparation needs to be developed by understanding the makeup of a disaster and properly applying that knowledge to the community.

Man has never been able to totally comprehend the forces of hurricanes, due to their complex nature. Each year coastal communities in the United States lie in harm's way throughout the hurricane season. Since the dawn of recorded history, people and their properties have been destroyed or lost because of these monstrous forces.

City developers of the early twentieth century became aware of the destruction brought by hurricanes following the disasters in Galveston, Texas and Okeechobee, Florida. In both cases, thousands of people died amid the destruction of their homes and properties. Some coastal communities which had been developed prior to World War II positioned land buffers between their properties and the ocean as safety barriers. Unfortunately, in the last thirty years, these same communities have allowed contractors to fill these buffers with high density residential developments.

The hurricane vulnerability of a community depends upon its geography, consisting of two components - cultural and physical. Physical composition addresses the geographic features of an area, while cultural composition reveals the way people relate to others and to their environment. A major geographical problem occurs when new settlers introduce new concepts or ideas without being aware of their environmental impact. Some important issues may include poorly designed structures, building below flood lines or construction occurring in non-buildable areas.

Rural and semi-rural areas tend to be more tolerant of climatic issues, because the communities are made up of families who are aware of the climatic history of the areas. This information is passed from one generation to the next.

People cannot prevent the destructive forces of hurricanes, but they can study the climatic impact as it relates to their environment and develop preventive measures or corrections. A community is impacted when hurricane forces, including coastal tidal surges, heavy rain and strong winds, apply undue pressures on man-made elements and nature.

Hurricanes present such strong forces that communities cannot create safeguards which will totally protect them from danger. However, a Hurricane Tolerant Community program can reduce the impacts of a disaster by identifying and addressing the destructive elements associated with an impending disaster. The word "tolerant" means "the ability to withstand or endure an adverse environmental condition".

The purpose of this study is to review the geography of Venice and develop programs to prevent or mitigate future hurricane disaster problems. Each program will have a series of options for the City to consider.

The following outlines the seven mitigation elements of the Hurricane Tolerant Community Plan:

1. <u>The Geography of Venice:</u>
   This section provides an overview of the City's geography and history, as well as a brief report on coastal mitigation projects in Venice.

2. <u>Coastal Area Redevelopment Plan:</u>
   This plan will investigate different types of land management tools to control the redevelopment of coastal areas. These controls will not necessarily address density but will focus on building setbacks and floor elevations. One method to be reviewed is the use of zoning overlay districts.

3. <u>Venice Compliance Program:</u>
   This program reviews construction compliance problems by bringing together contractors, homeowners and members of the Building Department. The objective is to develop procedures and materials to properly address code issues which are often misunderstood by the public or misinterpreted by Building and Zoning staff members.

4. <u>Developing a Tolerant Building:</u>
   This element reviews structural problems associated with building failures due to the forces of hurricanes. It will also develop helpful information for brochures to be implemented in educating building owners and developers.

5. <u>Hurricane Damage Prevention Project:</u>
   The purpose of this project is to develop educational information to assist residents in preparing for a hurricane

6. Growing Native for Nature II:
This program is designed to identify exotic trees which can create a danger to the community during hurricane force winds. The program will review options and costs involved in the removal of the exotic trees and replanting of native vegetation.

7. Hurricane Defense Squadron:
This element is designed to examine existing youth organizations and establish strategies which would encourage the development of a Hurricane Defense Squadron (HDS) program to educate and prepare teen cadets about emergency response. Upon completion of training, these cadets would assist the emergency management team in times of crisis.

In addition to the above, an inventory element will review and address the following:

A. Community analysis

B. Vulnerability analysis

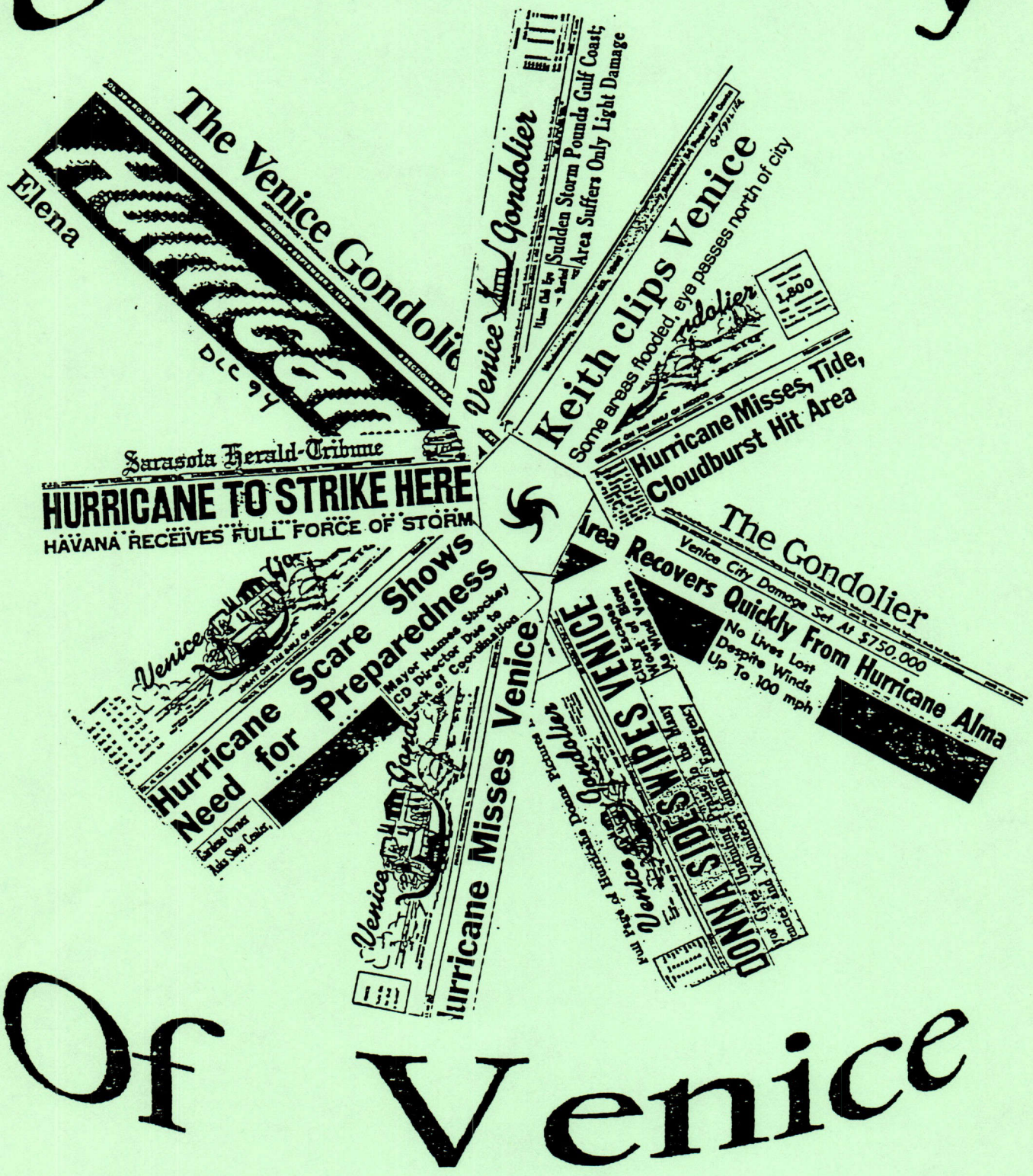
C. Community goals and objectives relative to their impacts on mitigation and reconstruction

D. Hazard mitigation

Creating a Hurricane Tolerant Community should become a project involving all residents. When a disaster destroys a community, it affects all of the people. The governing agency is limited in assisting the public in restoring the community to its pre-disaster condition. Once a disaster strikes, the community will always experience change. This change may be beneficial, but in most cases it is unfavorable.

The concept of a Hurricane Tolerant Community should not be limited to the programs and projects outlined in this study. This final product should have a positive impact on the community. The intent of this study is to develop the City of Venice as a coastal model for assisting other communities in dealing with hurricane issues.

Geography Of Venice



GEOGRAPHY OF VENICE

"WE CREATE OUR ENVIRONMENT; AFTER THAT OUR ENVIRONMENT CREATES US." Carl Abbott, Architect FAIA PA, made this statement in 1986. Venice is a city which was designed, planned and created in the mid-1920's. The city is very similar to other coastal communities in Florida; however, due to geography and history, Venice is unique. In order to understand Venice, one needs to know the geography of Venice.

Geography is the study of the earth and its features and of the distribution of life on the earth, including human life and the effects of human activity. The following information is designed to assemble all of the components that mold Venice.

Venice

Venice is located on Florida's west coast, on the Gulf of Mexico between Tampa and Fort Myers. Venice and Naples are the only two cities on the Gulf which are not protected by a barrier island. Venice is bounded by the Venice Inlet to the north and Stump Pass to the south. The City is divided almost in half by the Intracoastal Waterway, which creates an inland waterway along the west coast. Access to the island portion of Venice is provided by three bridges located in the north, middle and south areas of the City. Venice's total land area is approximately 8.25 square miles and is comprised of approximately 76% developed land, 17% vacant land and 7% water bodies and wetlands. Venice has approximately four linear miles of coastline along the Gulf and two linear miles of bay shores, which are part of a major estuary.

Beaches and Dunes

The beach and dune systems provide the coastal inhabitants with a multitude of coastal recreational activities. These systems also provide a buffer which offers protection to the coastal properties from the destructive elements of the Gulf. Dunes are developed by windblown sand from the Gulf. These sands create hilly mounds which become home for vegetation such as grasses, shrubs and trees. Once the vegetation is established, the plant coverage protects and stabilizes the sand and also allows nature to keep adding sand to the system.

Coastal Impact Area

The beach area along the Gulf consists of two groups of property owners, public and private. Most of the private property along the Gulf is developed. The private development along the coast consists of approximately 30 condominiums and several single family homes.

The area which comprises the narrow strip of land which fronts on the Gulf is referred to as the "Coastal Impact Area (CIA)". The CIA is so named because this area will receive the worst impacts of a hurricane. The CIA includes approximately 1,421 residential units. By using the average number of people per household in Venice (1.8), the number of residents within this area is approximately 2,558. When the CIA was developed the residents were unaware of the negative impacts which would occur in the future. As years passed, beach and dune areas, which buffered and separated houses from the Gulf, disappeared.

Approximately 75% of the development along Venice's coastline includes a dune or partial dune system. Unfortunately, the width of the buffer area has been reducing in size due to currents which displace the sand along the shore. From 1883 to 1974, the shoreline from Venice Inlet to Red Lake eroded 150 to 350 feet. The problem along the coast is aggravated at the Venice Jetties, which act as a substantial littoral barrier. Approximately 30% of the coastal development has a manmade buffer system consisting of chain-walls, sea-walls and rip rap. These systems are in place due to the absence of a dune system.

Elevations

Venice's lowest ground elevations are located adjacent to the gulf and bay areas. These low areas start with a contour of 1 to 3 feet and continue to elevate in height toward the middle of the City. The maximum elevation in the City is 20 feet. The City's contour map (elevations) can be found in the next chapter.

Soils

Venice has approximately 34 different types of soils within its boundaries. According to the 1991 Soil Survey by the United States Department of Agriculture, the City has three main groups:

1. **Canaveral-Beaches-Kesson:** Located along the shoreline, these soils are found in beaches and nearly level to gently sloping, moderately well drained, somewhat poorly drained and very poorly drained sandy soils which have shell fragments and which have a surface layer of muck in very poorly drained areas.

2. **Pomello-Myakka-Holopaw-Pineda:** These soils are located west of U.S. 41 Bypass in the City and consist of nearly level, moderately well drained and poorly drained sandy soils which in some areas are sandy in the upper part of the subsoil and loamy in the lower part.

3. **Eaugallie-Myakka-Holopaw-Pineda:** These soils are located east of U.S.41 Bypass in the City and consist of nearly level, poorly drained and very poorly drained soils which have a sandy surface layer and a sandy and loamy subsoil, are sandy throughout or have a sandy surface layer and a loamy subsoil.

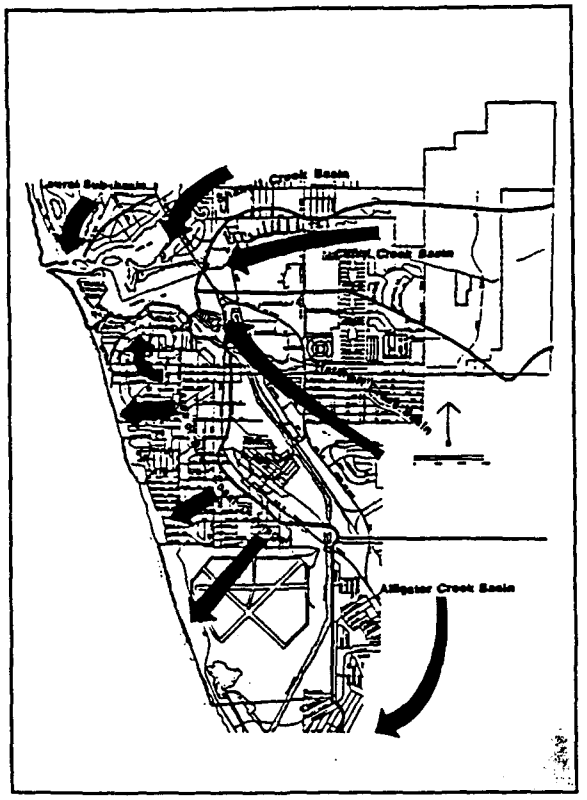


Fig. 1 - City's Drainage Systems

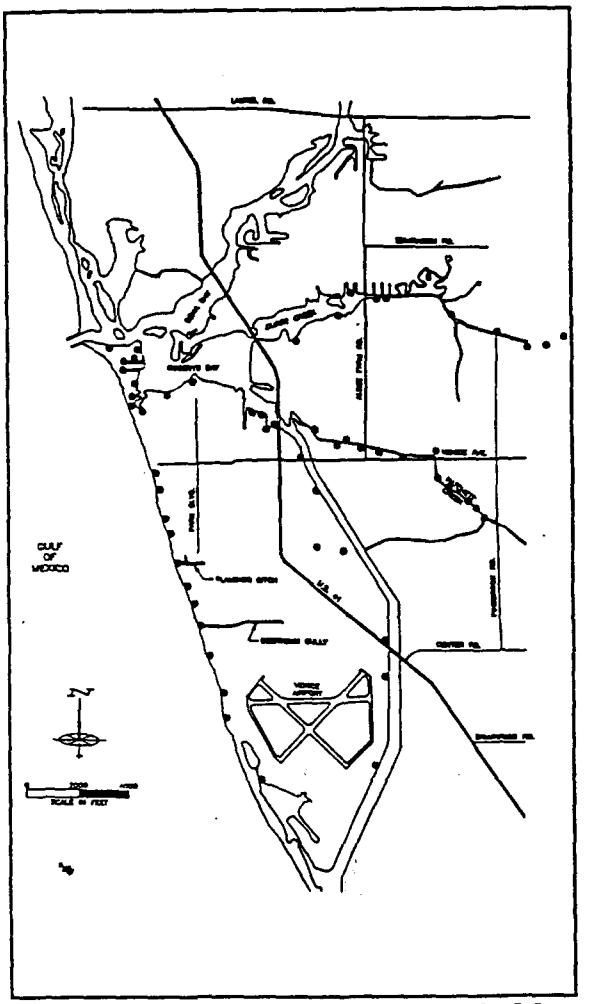


Fig. 2 - Stormwater Outfalls

Climate

Venice's climate is subtropical, characterized by high mean annual rainfall and temperature. The area experiences warm, humid summers and mild, relatively dry winters. The average annual temperature is 75 degrees Fahrenheit. The average annual rainfall is 50 inches. Approximately 60% of this average rainfall occurs during the summer months, between June and September.

Drainage

Venice's municipal stormwater system was originally constructed in 1926 and has been continually expanded to meet the City's needs. The stormwater is discharged through a number of outfalls into the gulf and inland water bodies. Figure 1 shows the City's drainage systems, and Figure 2 shows the stormwater outfalls within the City.

Utilities

The City of Venice provides municipal water to its residents by treating underground water drawn from two wellfields. The City also treats sanitary sewer at two

sewage treatment facilities. The Gulfside treatment facility is located on the island, directly on the Gulf. This facility's treatment capacity has been reduced since the new main eastside treatment facility was built east of Interstate 75 and became operational in 1991. Solid waste collection service is provided by the City. The refuse collected is disposed of at the County's landfill.

Venice's electric service is provided by Florida Power and Light Company.

Development Pattern

The 1988 Venice Comprehensive Plan states that the City is comprised of 5,282 acres with the following land uses:

	Acreage	% of Total
Residential	1,704	32.2
Commercial & office	311	5.9
Industrial	24	0.5
Recreation	595	11.3
Conservation	353	6.7
Community-Facilities	1,418	26.8
Vacant Land	877	16.6
Totals	5,282	100

The well planned variety of land uses is distributed throughout the City.

Transportation

Over the years the City has developed several transportation systems which offer people a variety of ways of travel in the City.

The road system in Venice consists of a good circulation pattern on the island and the mainland. These two areas were created when the Intracoastal Waterway was built in 1963. Three two-lane drawbridges connect the two areas of the City. U.S. 41 Business and U.S. 41 Bypass are the two main north-south arterial roads and Venice Avenue is the main west-east roadway, connecting the City to Interstate 75.

The Florida Department of Transportation is in the process of completing plans for the expansion of the north and south bridges on U.S. 41 Business. The expansion should be completed within the next ten years and will include the doubling of road lanes from 2 to 4 while increasing the height of the north bridge. The new height will require fewer bridge openings and also allow more boats access to safe harbor during a hurricane evacuation when the bridge is closed.

The Venice Municipal Airport was developed in 1941-1942 by the U.S. Government for use as an Army Air Base during World War II. The airport is located on the southern part of the island. Today the airport is being operated and maintained by the City. The airport is classified as a primary general aviation airport.

Venice is served by the SCAT (Sarasota County Area Transit) system, which provides bus service to areas in the City and within the County.

Venice has a rail line system which was originally constructed in 1911. The Seminole Gulf Railroad purchased the rail rights from

CSX Systems in 1987. The tracks and roadbed are in poor condition and are rarely in use today. Passenger service stopped in 1970.

Venice has one boat ramp, which is located on the island at Higel Marine Park. Several local restaurants also provide docking facilities for boat traffic.

Most of the streets on the island and some streets on the mainland have sidewalks. Bikeways are found on several major streets within the City.

Parks

Venice has 16 parks totaling approximately 179 acres. Most of these facilities are community and neighborhood parks. In addition, there are 10 acres of scenic areas which are part of the medians and parkways.

Venice Comprehensive Plan

The 1988 Venice Comprehensive Plan (VCP) consists of 13 elements which review the past history of the City and also establish goals, objectives and policies to improve the City's future. The Coastal Management Element (CME) reviews City policies related to coastal issues. The State required communities, as part of the development of the comprehensive plan, to identify the Coastal High Hazard Area (CHHA) in the CME. The CHHA is considered to be the area most vulnerable to hurricane forces. The CHHA for Venice is in the same location as the 1978 Coastal Construction Control Line. The CHHA prohibits any development within this zone. These coastal regulations are reviewed in the Venice Compliance Program section of this study. The CME indicates that the "Goals, Objectives and Policies" for that element need to "protect, preserve and enhance the coastal area while ensuring the protection of life and property from storms" in the City.

In developing a hurricane tolerant community for Venice, the VCP was used as the foundation in researching information about the City of Venice.

Urban History

The urban history of Venice started in 1925 when Dr. F.H. Albee purchased 2,916 acres of land from the Venice-Sarasota Company.

The following text consists of excerpts from "1990 Districts and Structures on the National Register".

Dr. Albee retained John Nolen, a world renowned city planner, to design a city on his land. This city was to be called Venice.

Dr. Albee did not have a chance to implement his development plan before he was approached with a proposal from the Brotherhood of Locomotive Engineers (BLE) to purchase his land. The BLE retained John Nolen to complete a plan for a city on the Gulf, Venice. Of the three towns Nolen planned in Florida, Venice had the most comprehensive plan. Nolen observed in writing about

Venice that "city planning... will contribute to the rapid, sound, and permanent development of Florida. It will do much to safeguard and protect property values of investors and stabilize the best interests of each community." Nolen, in his own words, stated that "Venice marks the beginning of a new day in city planning, not only for Florida, but also for all the country." He further noted that: "The city is being built with foresight running far into the future. The street and sidewalk system has been laid out and is being constructed in a manner to permit consistent and continuous expansion as the years roll on; the schools are placed in most convenient spots, from which, as a logical nucleus, the system of structures can be carried on in the future; the drainage system has been figured not only to take care of the heaviest demands of the present, but also to meet increased requirements for years to come; the park system has been planned for an indefinite future, as well as for present needs. In short, Venice is laid out to take care of at least two generations yet to come, as the need progressively arises.

The key feature of the Venice development was the plaza area along Venice Avenue. The original plan called for a 200-foot boulevard with a 100-foot parkway in the center, terminating in a plaza. It was the gateway to Venice Beach.

The Plan called for public facilities along the beach, such as a bathing casino, amphitheater, boardwalk, shelters and auto parking.

The bathing casino was constructed, but it was subsequently torn down due to hurricane damage. The Nolen plan indicates that the closest developable property was located approximately 300 feet from the shoreline.

Residential construction was started in 1926. By November of that year, 68 building permits had been issued for a total property value of $2,200,000. It was reported in January 1927 that 128,065 feet of sidewalks, 14,195 feet of 83,563 cubic feet of paving, five miles of electric lines, two miles of street lights and 21 miles of drainage ditches were completed.

The Florida boom created a decline in sales and development. By the early 1930's Venice was in the Depression with the rest of the country. In 1932, the Kentucky Military Institute rented the two hotels as a winter school for its cadets. They purchased the property on December 15, 1939.

Dr. Albee purchased the Park View Hotel in 1933 and established the Florida Medical Center in Venice. The Venice Army Air Base was established in 1942, during World War II.

Population Growth

The U. S. Bureau of Census first started recording Venice's population in 1940. At that time the small

community had a population of 507. Each decade since 1940 the Bureau has maintained records on Venice's growth.

Venice's Census Record
1940-1990

Year	Population
1940	507
1950	727
1960	3,444
1970	6,648
1980	12,153
1990	16,922

The above table reflects that Venice has had a high growth rate from the 1950's to the present.

Venice is considered a retirement community, with the median age of the population at 67.3 years. The bulk of the retirees are from the northern United States and are looking to retire in a warm climate.

Venice also has a seasonal population which resides in Venice during the winter months. These additional residents increase the City's population by approximately 6,000.

Observations

The City of Venice is distinguished from other communities because of the early comprehensive planning and development design details which were used in the creation of the City. The development of the community in 1926 was due primarily to the attraction of the Gulf environment.

In reviewing the geography of Venice, we find that the City has the following features:

* Low ground elevations ranging from sea level to a maximum of 20 feet.

* Soils are primarily very poor draining soils.

* Climate is subtropical with an average annual rainfall of 50 inches.

* Drainage of stormwater is accomplished by drains which empty water into the Gulf and inland water bodies. During high tide, the system becomes impacted and the water is restricted except for water draining under pressure.

* Water and sewer services are provided by the City, unlike several adjacent County communities which use septic tanks and wells.

* The City's land use is predominantly residential.

* Venice has a high growth rate, with the population at approximately 17,000, mostly retirees from northern states who may not be aware of the powers of hurricanes.

* Venice has a good transportation system, consisting of roadways, bus service, existing rail line, airport, boat ramp and pedestrian accessways.

* Venice has an abundance of park areas which are located either within or near each neighborhood in the City.

The above list reflects that Venice has physical elements which create a tolerance toward some of the forces of a hurricane. Other elements show

that problems may arise in the event of a hurricane. The history of hurricanes needs to be reviewed in order to determine if the City could be impacted by a hurricane in the future and to what degree.

HURRICANES OF THE PAST

Hurricanes impacting Florida and the tropical islands in the Atlantic Ocean were first recorded by the first explorers. Christopher Columbus encountered several hurricanes during his journeys from Spain to the New World. From that time period through the centuries which followed, hurricanes have plagued civilization.

Hurricanes are normal weather events which have always been present on the earth. Records from the sixteenth, seventeenth and eighteenth centuries reveal endless numbers of shipwrecks due to hurricanes, which created sunken treasures all around the waters of Florida. Ships were not the only victims; newly created colonies were also devastated during the early history of the states. The Hurricane Survival Guide by Leslie R. Crown gives sixty-one detailed accounts of hurricanes impacting man and history from 1493 to 1899. In order to describe the magnitude of the destructive forces of hurricanes, the following excerpts from Mr. Crown's book are presented:

1533 - A trio of hurricanes demolished Puerto Rico with over 2,000 dead.

1586 - Sir Francis Drake lost some ships during another hurricane at Roanoke and the colony he left there was never seen again.

1683 - An August hurricane caused flooding in New England. The Connecticut River was 26 feet above normal.

1766 - In October a Gulf storm hit the Florida coast with a 12 foot high tide at St. Marks and damage at Pensacola.

1775 - In September a devastating hurricane swept from North Carolina to Newfoundland. The town of Bar, North Carolina was completely destroyed. This storm killed more people on the coast than any previous storms. Over 4,000 seamen died in Newfoundland.

1780 - In October the "Great Hurricane" was the most devastating storm of the Eighteenth Century. It went through the West Indies: Barbados, Puerto Rico, Dominican Republic and Bermuda. This deadly storm killed 22,000 people, according to one estimate.

1788 - There were 6 hurricanes in the Caribbean during that year. In Jamaica over 15,000 lives were lost, due mostly to starvation and disease after the repeated strikes by hurricanes.

1835 - In September the first "documented" hurricane in Key West's history took place.

1841 - In September St. Jo, Florida was completely destroyed by a hurricane.

1846 - A hurricane hit Key West and destroyed 92 of 104

vessels in the harbour and damaged or destroyed every building in the town.

1870 - The United States Weather Service was organized this year.

1880 - Two major hurricanes did tremendous damage to Palm Beach, Florida and Brownsville, Texas. Brownsville was almost totally destroyed.

1886 - Four hurricanes in the Gulf this season. In June a major storm hit Apalachicola with extreme tides. Three storms hit Texas. The first in August destroyed Indianola, which had been hit in 1875 by a major hurricane. The second storm in September dropped 25.98 inches of rain near Brownsville. In October over 100 people were drowned by the storm surge in Sabine.

1893 - The hurricane season of this century produced 12 storms, with 10 of them affecting the United States. In late August a hurricane killed almost 2,000 people in South Carolina. In early October another storm killed between 1,000 and 2,000 people in Louisiana.

In 1986 the Federal Emergency Management Agency published the Coastal Construction Manual. Figure 3 is a map from the report which reflects the southeastern coastal areas which experienced hurricanes from 1886 to 1970. This map shows that Venice experienced four minor and two major hurricanes during that time period.

The U. S. Army Corps of Engineers prepared an Appraisal

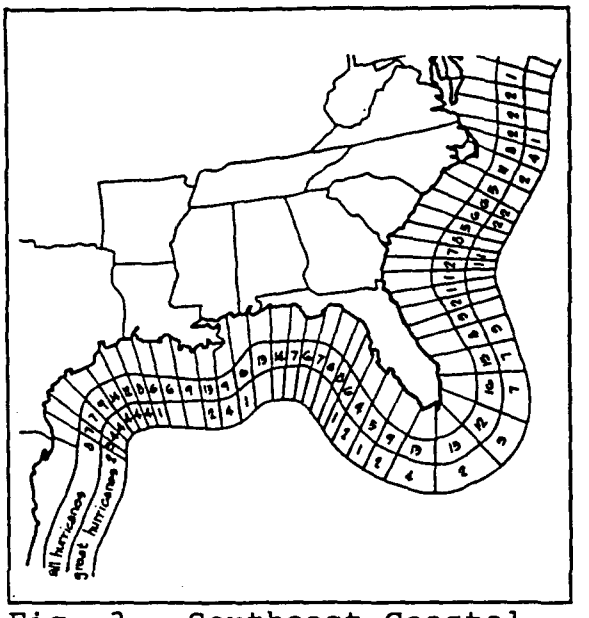


Fig. 3 - Southeast Coastal Areas Experiencing Hurricanes - 1886-1970

Report called "Hurricanes Affecting the Florida Coast" in 1956. This report reviewed hurricane activity from 1900 to 1955. Figure 4 is a map from the report that shows hurricane paths from 1830 to 1900. Figure 5 reflects the major hurricane paths from 1900 to 1955, and Figure 6 reflects the minor hurricane paths from 1900 to 1955. The report ended with a conclusion that listed four concerns:

a. Hurricanes affecting coastal areas of Florida occur with alarming frequency.

b. Development along the lower east and central west coasts of Florida has been and is increasing at a rapid rate.

c. Certain cities in the coastal areas have been and are subject to major hurricane damages from tidal flooding and

wave action.

d. Protective measures should be considered to provide possible means of preventing, or greatly minimizing, future loss of human lives and property damage.

Reviewing local newspapers from the 1940's to the present revealed that Venice has been very fortunate with hurricane problems. The following is a list of newspaper headings:

1941 - Venice Escapes Storm Damage.

1943 - Strong Winds Damage Homes in Venice Area.

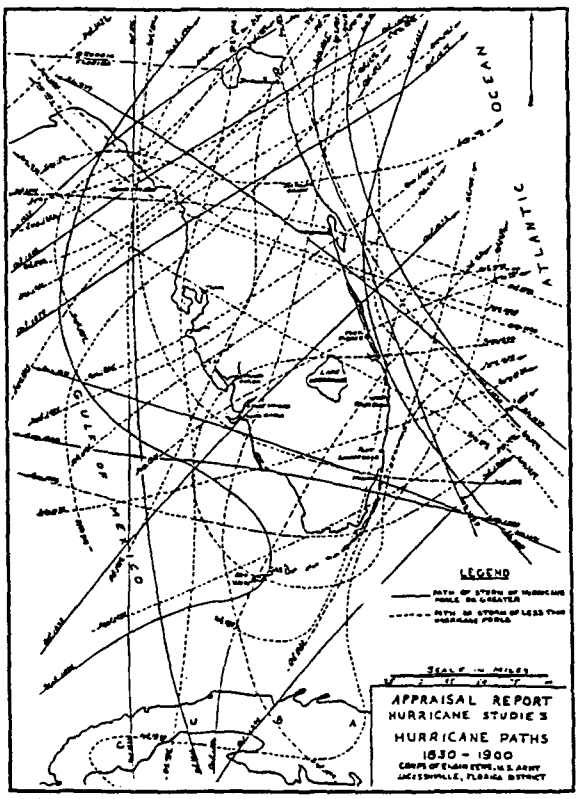


Fig. 4 - Southeast Coastal Areas - Hurricane Paths 1830-1900

1944 - Hurricane to Strike Here.

1946 - West Coast in Path of Storm.

1947 - Venice Escapes Full Force of Hurricane; Loss Relatively Small.

1948 - Hurricane Misses Venice.

1949 - Hurricane Gives Venice Disaster Crew a Tryout.

1950 - Venice Unscathed by Hurricane that Hit Beaches.

1951 - Storm Gouges Hole in Beach.

1953 - Hurricane Misses; Tide, Cloudburst Hit Area.

1954 - Cyclone Rakes City with Minor Damages.

1957 - Storm Washes Cottage Into the Gulf, Topples Bath House and Cuts Road.

1959 - Hurricane Scare Shows Need for Preparedness.

1960 - Donna Sideswipes Venice, City Escapes Worst of Blows as Wind Veers.

1960 - Mayor, Other Officials are Incensed by Articles on "Tidal Wave" Scare.

1963 - Sudden Storm Pounds Gulf Coast; Area Suffers Only Light Damage.

1964 - Dora's Calling Card: Wind, 2-Inch Rain, Slight Damage.

1966 - Area Recovers Quickly From Hurricane Alma, No Lives

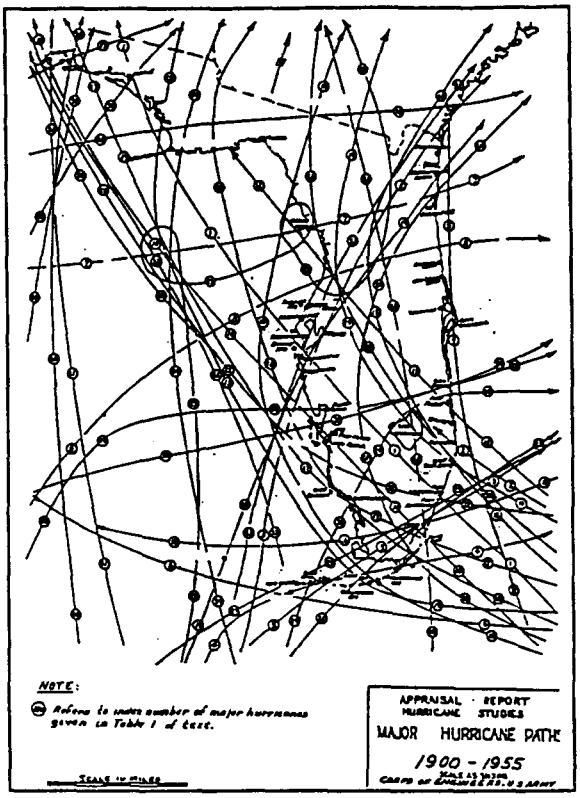


Fig. 5 - Major Hurricane Paths - 1900-1955

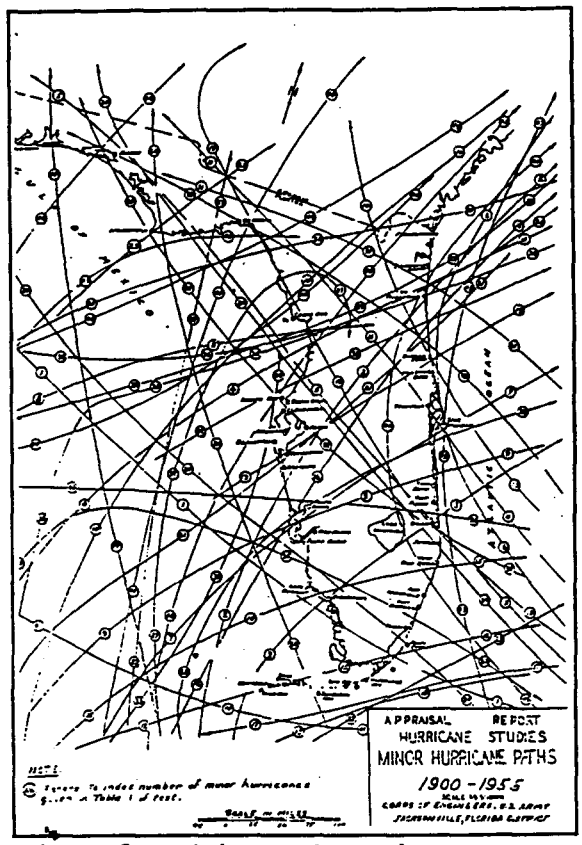


Fig. 6 - Minor Hurricane Paths - 1900-1955

Lost Despite Winds up to 100 mph.

1968 - Tired Abby Abdicates After Drenching Rain.

1968 - But Gladys Wasn't All Bad.

1969 - Wall of Wind Threatens Us (Hurricane Laurie).

1972 - Road Crumbled, Water Service Out as Agnes Leaves Mark on Venice Area.

1974 - High Tides, Winds Whip Venice, Beachfront Site of Major Damage.

1982 - Violent Storm Catches Sun Coast Sleeping (No-Name Storm), Aftershock: A Hard Hit Town Starts Picking Up the Pieces.

1985 - Hurricane Elena Taunts Coastline.

1985 - Area's Beaches Suffer Erosion, Storm Brings Rough Tidings (Hurricane Bob).

1988 - Keith Clips Venice, Some Areas Flooded, Eye Passes North of City.

The above headlines reveal that Venice has been impacted by several hurricanes through the years. The first major storm of this century took place on October 24, 1921. This storm

originated in the western Caribbean Sea, producing high tides (approx. 7 feet) and wave action which resulted in heavy damage throughout Sarasota County. Several years later, the area was impacted by the hurricane of September 19, 1926, which was one of the most destructive storms in the 20th century, resulting in flood damage in Sarasota County of more than $1 million.

Likewise, Hurricane Donna on September 10, 1960 resulted in considerable flooding throughout the County. Tidal heights of more than 3 feet above normal, coupled with an average precipitation of 5 to 7 inches and a pre-storm rainfall of almost 10 inches, made flooding even greater. Other storms also affected the Venice area, such as the October 1968 storm and Hurricane Agnes in June 1972. Both caused considerable flood damage to homes and roadways along the Sarasota County coastline.

COASTAL MITIGATION PROJECTS

In May of 1989 the City adopted the 1988 Venice Comprehensive Plan. The plan was required by the State to ensure that all Florida communities adequately plan for anticipated growth. Due to this document, several coastal projects are being implemented. The following is a brief report on the major coastal projects in Venice.

Stormwater Management Plan

In 1993 the City contracted with Applied Technology and Management, Inc. to develop a Comprehensive Stormwater Management Program. The program goals included:

1. Reduce potential for flooding.

2. Eliminate polluted run-off.

3. Convert Drainage Systems to "Water Management Systems".

The program objectives included:

1. Comply with the City's Comprehensive Plan.

2. Conform with Florida's new water policy.

3. Fulfill new EPA stormwater requirements.

4. Improve Federal Flood Insurance ranking.

5. Establish priorities for the City's Operations and Maintenance Programs.

6. Identify funding requirements and alternatives.

The final report (draft) was submitted to City Council in January of 1994.

Beach Renourishment Project

In 1984 the U.S. Army Corps of Engineers (COE) completed the "Beach Erosion Control Study for Sarasota County". This document outlined a study of beach erosion problems in

Sarasota County. A section of the study focused on the Venice Beach area. The study revealed that the federally maintained Venice Inlet had caused more erosion to the adjacent Venice Beach than what would be expected of a natural inlet.

The COE recommended a 50-year beach nourishment project for a 29,400-foot length of shoreline lying between the south Venice Jetty and Caspersen Beach. In June of 1984, the City adopted Resolution No. 830-84 endorsing the COE recommendations and authorizing the City to apply for State matching funds for the project.

In order to clarify responsibilities, the City and Sarasota County entered into an interlocal agreement in 1989. This agreement established the City and County as co-sponsors of the project, sharing the local costs.

The proposed project cost is approximately $16.3 million. The funding breakdown is as follows:

Federal Government	$11.4M
State of Florida	$ 2.5M
Sarasota County	$ 1.2M
City of Venice	$ 1.2M
Total	$16.3M

The renourishment is expected to commence in the spring of 1995. It is estimated that it will take ten months to dredge and place two million cubic yards of sand on the beach.

The project also includes the redevelopment of a berm which will reestablish the dune along the shoreline.

Venice Beach Access Park

Venice has very little undevelopable private land left along the Gulf. The Comprehensive Plan recommends that the City try to acquire available land for purchase for future public beach access areas.

The City's Land Acquisition Committee identified the Hanshaw property as a possible acquisition site for public access. This vacant lot consists of 29,185 square feet (.67 acres). It is located on The Esplanade across from Ormond Street. In 1978 the property was rezoned to RMF-4 (Residential, Multi-Family), which allows 18 units per acre. This property is located within the FEMA V16 and A12 Flood Hazard Zones, which require a first floor elevation of either 11 or 12 feet above mean sea level. The entire site is an established dune system that has a primary and a secondary dune.

On September 7, 1990, the State and City signed a project agreement to acquire the Hanshaw property under the Save Our Coast Beach Access Initiative Program (SOCBAIP). On May 10, 1993, the Boards of trustees of the Internal Improvement Trust Fund of the State of Florida acquired the property. The SOCBAIP created a partnership between the City and the State, establishing a cost-sharing association with

the State providing $250,000 and the City contributing $100,000 for the total acquisition price of $350,000. This program established the State as the owner with title to the property and the City as the recipient of a 99-year lease agreement with rights and stipulations.

The City has approved the development of the property for the new Venice Beach Access Park (VBAP) project. The VBAP project has one main objective, which is to provide public access to the beach through the dune area without causing a negative impact to the dune vegetation. This will be accomplished by creating public barriers and an accessway that will direct or funnel people from the front park entrance to the beach area. The total cost of the VBAP project is budgeted at $28,694.

The City has received approval for $14,000 in funds from the Florida Coastal Management program. The park should be developed by winter 1994.

Brohard Park Master Plan

On August 30, 1988 the City contracted with Florida Land Design & Engineering, Inc. (FLD&E) to develop a master plan for the Brohard Park area. The park area is located on the Venice Airport property in the southernmost part of the City.

The site contains approximately 84 acres and occupies more than 4,800 feet of shoreline along the Gulf of Mexico. Existing onsite land uses include the City's Municipal Fishing Pier, Sharky's Restaurant, the United States Coast Guard training center, Service Club Park, the municipal wastewater treatment plant, the existing public beach area, wetlands and several distinct vegetated upland communities.

The plan defined the park area into four separate parcels of land totaling approximately 84 acres. They included: the restaurant/fishing pier area, the south beach area, the Coast Guard property, and the wastewater treatment plant area.

Brohard Park's major attributes were the pristine setting provided by its Gulffront setting and the variety and abundance of wildlife and vegetation.

The Brohard Park Master Plan was approved by the City in January of 1990. The plan included input received from the public by way of user survey and public meetings.

FLD&E developed the following list of 11 design criteria which are part of the plan:

1. Impact to the site should be minimal; protect and enhance the natural setting.

2. Provide adequate parking and define vehicular movement.

3. Provide opportunities for picnicking.

4. Allow for a large open space area to be used for informal play and events.

5. Provide rest rooms and beach shower facilities.

6. Utilize a boardwalk system with dune walkovers to define pedestrian movement.

7. Provide landscaping using native plant materials.

8. Provide an 8' wide bike path along Harbor Drive.

9. Allow for an area to launch small sailboats.

10. Provide a location for a possible future amphitheater.

11. Reserve approximately an acre for a pelican/wild bird rescue station.

Element Conclusion

Venice has seen its share of hurricanes since 1926. There are no geographic factors which could or would determine whether a hurricane would pass through a partial area along the west coast of Florida.

Review of past hurricanes which landed on Florida's soil reveals that they have struck Florida throughout the hurricane season.

Living in a subtropical climate, the coastal residents need to understand that hurricanes are a part of life in Florida. The only protection communities have from hurricanes is through environmental education and the development of a hurricane tolerant community.

Review of the recent coastal projects shows that the City is aware of the past issues which have created today's problems. By implementing these projects and addressing other past issues, Venice is creating a better coastal community in Florida.

Coastal Area

Redevelopment Plan

COASTAL REDEVELOPMENT PLAN

"THERE IS ONLY ONE STORY, THAT OF THE SURVIVORS. MILLION-FOLD, ENDLESS, THERE IS NOT ANOTHER ONE LIKE IT. THERE IS NO HURRICANE BUT THE HURRICANE ONE HAD LIVED THROUGH." Marjory Stoneman Douglas wrote the above in her 1958 book entitled Hurricane. This statement is appropriate for Venice due to the large number of residents who have not experienced a hurricane.

This element will examine the potential hurricane impacts which may occur to the Venice coastal community. The three main hurricane forces are storm surge, rainfall and wind. Separately or together, these forces can create a disaster. Since Venice is on the Gulf, all three forces could affect the community. This study will present information from the National Hurricane Center(NHC) and past studies which relate to Venice. This study will also propose ways of addressing issues that impact may lives and property. Understanding what defines a hurricane is the first step in the process.

Hurricane Categories

Hurricanes develop in the tropical areas of the Atlantic Ocean when warm moist air is associated with tropical waters. Hurricanes normally approach Venice either from the Gulf (west side or land fall) or from the interior of Florida (east side or existing). The NHC uses the Saffir/Simpson Hurricane Scale(S/SHS) to rank and rate hurricanes according to their wind intensity. Tropical Storms are designated and named when winds reach velocities between 39 mph and 73 mph.

Storm Category	Wind(mph) Velocities	Storm Ranking
1	74 to 95	minimal
2	96 to 110	moderate
3	111 to 130	extensive
4	131 to 155	extreme
5	156 +	catastrophic

The S/SHS is also used as a gauge for defining the impacts of the hurricane forces. Hurricane evacuation maps also incorporate the S/SHS in order to determine what areas may be impacted. **Figure C-1** shows the evacuation area for Venice. This map reveals that the first areas which need to evacuate during the approach of any hurricane are the areas located closest to the Gulf and inland waters.

Wind

As a hurricane moves toward a community, the wind velocity will continue to increase until the hurricane eye (middle) passes over the area. The highest wind velocities are found around the eye. When the eye exits an area, the winds will continue to decrease in velocity except for wind gusts, which may exceed sustained winds by 25 to 50 percent.

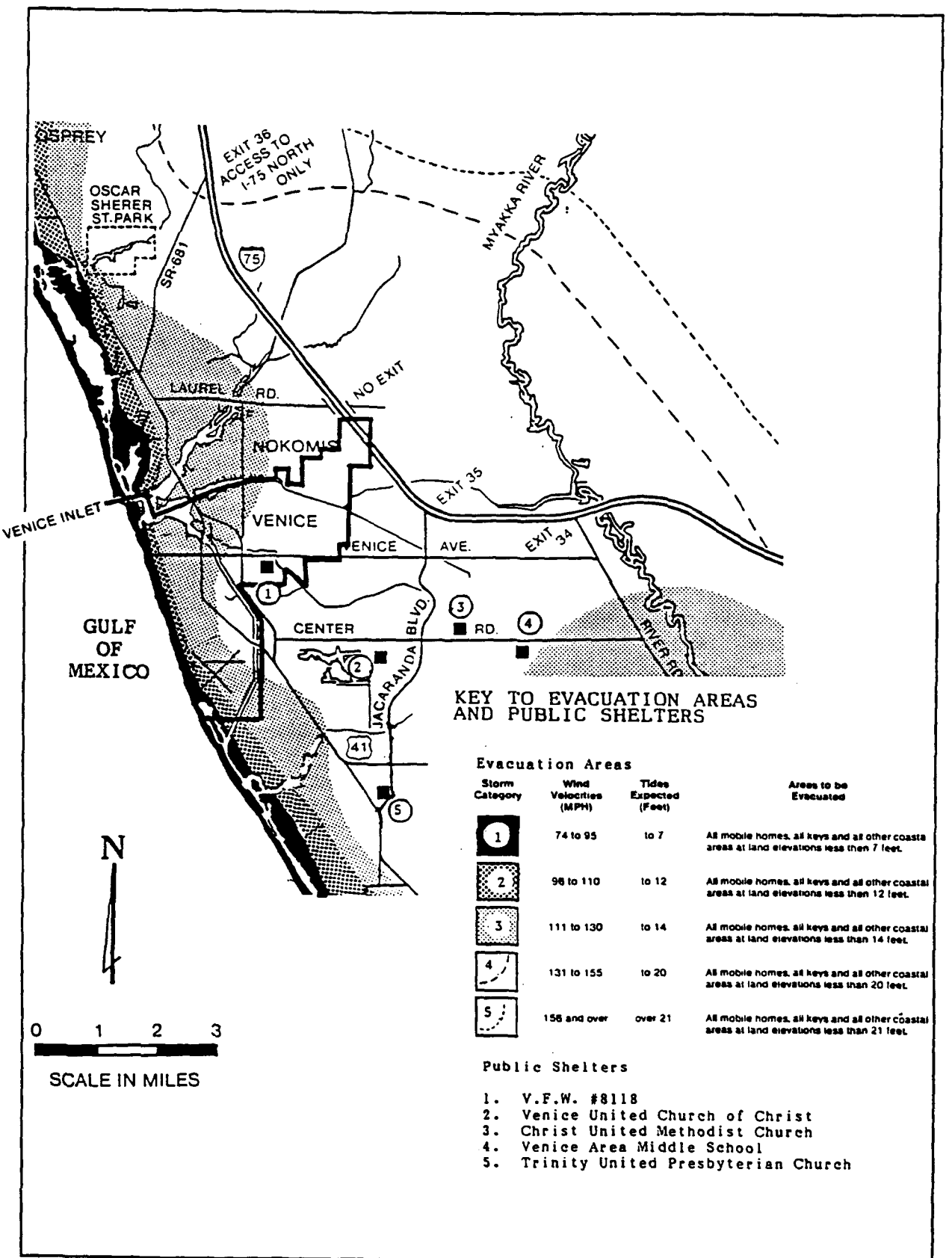


Figure C-1 EVACUATION AREA MAP

During a hurricane event, destructive tornadoes may develop in the right forward movement of the hurricane. Wind forces increase with the square of the wind speed. This means, for example, that when the speed doubles, four times more force is exerted on structures.

The National Weather Center (NWC) predicts the following wind damage to a hurricane hit community:

Category 1. Winds 74-95 mph. Damage primarily to shrubbery, trees, foliage, and unanchored mobile homes. No real damage to other structures. Some damage to poorly constructed signs.

Category 2. Winds 96-110 mph. Considerable damage to shrubbery and tree foliage; some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roofing materials of buildings; some window and door damage. No major damage to buildings.

Category 3. Winds 111-130 mph. Foliage torn from trees; large trees blown down. Practically all poorly constructed signs blown down. Some damage to roofing materials of buildings; some window and door damage. Some structural damage to small buildings. Mobile homes destroyed.

Category 4. Winds 131-155 mph. Shrubs and trees blown down; all signs down. Extensive damage to roofing materials, windows and doors. Complete failure of roofs on many small residences. Complete destruction of mobile homes.

Category 5. Winds 156 mph. and greater. Shrubs and trees blown down; considerable damage to roofs of buildings; all signs down. Very severe and extensive damage to windows and doors. Complete failure of roofs on many residences and industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings overturned or blown away. Complete destruction of mobile homes.

After all hurricane forces are examined in this section of the element, the rest of the element will review ways to protect lives and properties along the coastline in the future.

Rainfall

The size and category of a hurricane is a major factor in determining if a community may be inundated with rain, which may lead to flooding problems. During the "average" 24-hour period it takes a hurricane to pass through a community, as little as 5 to 10 inches or more than 12 to 30 inches of rainfall can occur. Drainage is a problem in Venice due to the following factors:

1. Poor draining soils
2. Low elevations
3. Drainage systems may become restricted by tidal action during a storm.

Hurricanes also create storm surges which may flood parts of the City when approaching

land. The Geography of Venice Element reviews the City's drainage system.

The 1994 Venice Stormwater Management Plan reviewed the storm event that occurred over the dates of June 23-26, 1992. During this four-day period, total rainfall in Venice was equal to 21.5 inches (Southwest Florida Water Management District, 93). The peak occurred on June 25 when total rainfall in the 24-hour period was equal to 11.82 inches.

The Federal Emergency Management Agency (FEMA) reported that approximately 35 flood insurance claims were filed within the City's limit. **Figure C-2** illustrates the distribution of FEMA claims. Additional properties in the City received flooding but were not listed due to the residents having no flood insurance or not filing a claim.

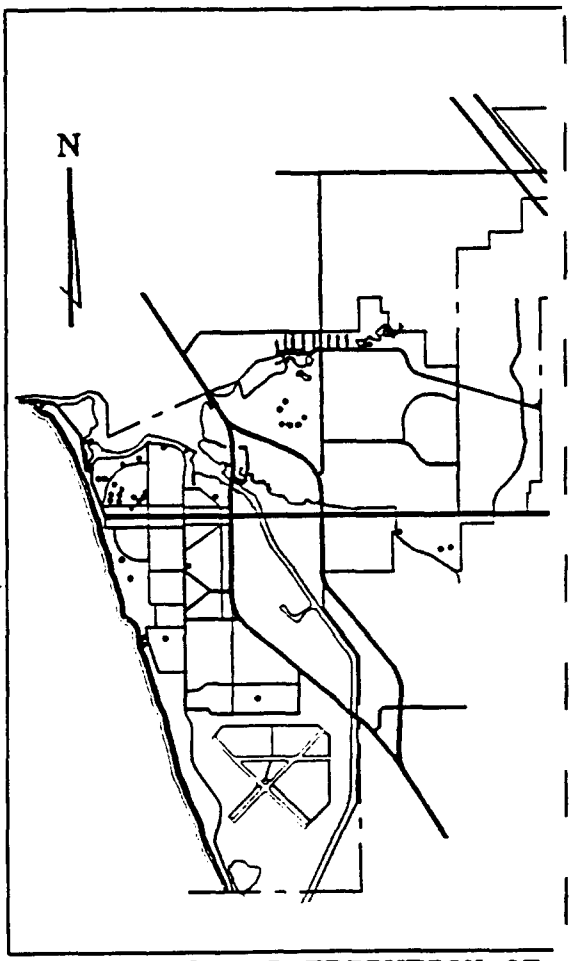


FIGURE C-2 DISTRIBUTION OF FEMA CLAIMS

Storm Surge

Of the three hurricane forces, storm surge is attributed with causing the most deaths and damage to a community. The U.S. Virgin Islands' Disaster Programs Office addressed storm surges in the publication "Surviving the Storm". The following is an excerpt from that report:

"The low pressure and strong winds around the hurricane's eye raise the ocean surface a foot or two higher than the surrounding ocean surface, forming a dome of water as much as 50 miles across. As the storm moves into shallow coastal waters, decreasing water depth transforms the dome into a storm surge which can rise 20 feet or more abov normal sea level and cause massive flooding and destruction along shorelines in its path. The rise may come rapidly and produce flash floods in coastal lowlands, o- it may come in the form of giant waves, sometimes mistakenly called tidal waves.

The highest and most dangerous portion of the storm surge usually extends from near the center of the hurricane some 50 miles along the coast in

the quadrant of the hurricane where winds are blowing toward shore. Hurricane damage is greatest in the northeast quadrant of the storm".

The report equates the forces into measurable terms with the following statement: "Breakers coming ashore in a hurricane travel at about one half the speed of wind in the storm. Relating this to pressure created by breakers, you have approximately 10,000 lbs. per square foot.

Just as storm surges are superimposed on the normal tides, the high wind-driven waves of the hurricane are superimposed on the storm surge. Consider a block of water 2 miles long, 12 feet deep and one mile wide, weighing more than 20 million tons. The result is an extremely effective battering wave, capable of smashing structures to rubble, eroding long stretches of beach and undermining poorly anchored buildings."

The NWC predicts the following storm surge damage to a hurricane hit community:

Category 1. Storm surge 4 to 5 feet above normal. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorages torn from moorings.

Category 2. Storm surge 6 to 8 feet above normal. Coastal roads and low-lying escape routes inland cut by rising water two to four hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying island areas required.

Category 3. Storm surge 9 to 12 feet above normal. Serious flooding at coast and many smaller structures near coast destroyed; larger structures near coast damaged by battering waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives. Flat terrain 5 feet or less above sea level flooded inland 8 miles or more. Evacuation of low-lying residences within several blocks of shoreline possibly required.

Category 4. Storm surge 13 to 18 feet above normal. Flat terrain 10 feet or less above sea level flooded inland as far as 6 miles. Major damage to lower floors of structures near shore due to flooding and battering by waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives. Major erosion of beaches. Massive evacuation of all residences within 500 yards of shore possibly required and of single-story residences on low ground within 2 miles of shore.

Category 5. Storm surge greater than 18 feet above normal. Major damage to lower floors of all structures less than 15 feet above sea level within 500 yards of shore. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives. Massive evacuation of

residential areas on low ground within 5 to 10 miles of shore possibly required.

The impacts indicated by the NHC using the S/SHS appear to be very general. There are several studies done on coastal communities which illustrate the potential forces that may be present during a hurricane.

SLOSH--MOM'S & MEOW'S

In 1991 the Southwest Florida Regional Planning Council and the Florida Department of Community Affairs prepared the "Hurricane Storm Tide Atlas for Sarasota County". The following text consists of excerpts from the document. The atlas contains maps which identify a landfalling scenario of hurricane storm surge inundation, the worst likely hurricane flooding condition. The flooding results account for astronomical high tide, pre-storm surge tide anomaly associated with hurricanes moving into the Gulf of Mexico, and sea level rise since 1929. These additions represent +2 feet above mean sea level. The data only reflects stillwater saltwater flooding and does not include freshwater flooding or the waves in the surge.

The atlas represents the surge height estimates made using the SLOSH (Sea, Lake, and Overland Surges from Hurricanes) model. The model was developed by Chester Jelesnianski of the National Weather Service. The storm surge computations and analysis were done by the National Hurricane Center. The SLOSH model was used to develop data for various combinations of hurricane strength, wind speed, direction and speed of movement. The SLOSH model uses a grid configuration for individual calculations per grid square of the storm surge heights within a mapped area.

Once surge heights have been determined for the appropriate grids, the maximum surge heights are plotted by storm track and hurricane category. These plots of maximum surge heights for a given hurricane category and storm track are referred to as Maximum Envelopes of Water (MEOW's). The surge inundation limits displayed on the maps in the atlas reflect a further compositing of the MEOW's into Maximums of the Maximums (MOM's). The MOM's represent the maximum surge expected to occur at any given location, regardless of the storm track or direction of the hurricane. It is important to note that even if the model is supplied accurate data on storm positions, intensities and sizes, the computed surge may contain errors of +/-20% of observed water levels. These primarily stem from three factors: (1) maps that are outdated which may result in inaccuracies of topography or bathymetry; (2) anomalous water heights which can affect the local sea level; and (3) local processes, such as waves, astronomical tides, rainfall and flooding from overflowing rivers. Review of the depth (bathymetry) of the Gulf reveals a long gently sloping shelf and shallower than normal water depths,

which create a higher surge but smaller waves. The reason this occurs is because a surge in deeper water can be dispersed down and out away from the hurricane. However, once that surge reaches a shallow gently sloping shelf it can no longer be dispersed away from the hurricane. Consequently, water "piles up" as it is driven ashore by the wind stresses of the hurricane.

VENICE'S SLOSH

Figure C-3 is the Venice Storm Surge Grid Map, which divides the City into designated squares. **Table 1** shows the City's SLOSH Surge Values Chart, which reflects the storm surge heights for each hurricane category. To determine the storm surge for a partial location, the user must locate an area within a square on the grid map and relate the appropriate alphabets and numbers to the square. Matching the same alphabets and numbers with Table 1 will reveal the storm surge for that location during a given hurricane. Land falling hurricanes are storms which approach Venice from the Gulf or the west side of the City. Exiting hurricanes are storms which approach Venice from the interior of Florida or east side of the City.

This study will use the square with the words "Venice Airport" as an example of how to use the SLOSH model. Locating this square on the map reflects that the location is within the designation of A2-B3. Table 1 shows that in a Category 4 or 5 hurricane this area will experience a storm surge of 18.9 feet. The storm surge elevations from the Values Chart can be compared with the topography (elevations) of Venice, as shown on **Figure C-4**. By relating the two elevations the user should be able to determine the storm surge for a partial area.

FEMA & FIRM

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program for most of the communities in the United States. In order for a community to participate in the insurance program, a Flood Insurance Rate Map (FIRM) is developed by FEMA for the community. The FIRM reflects areas which are prone to flooding within a 100-year period. These flood-prone areas are designated by flood zones. **Figure C-5** is a copy of the FIRM for Venice. In reviewing the FIRM, the entire City is located within one of the following flood zones: V16, A12, B or C. The following is an explanation of zone designations:

Zones A1-A30: Areas of 100-year flood; base flood elevations and flood hazard factors determined.

Zone B: Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

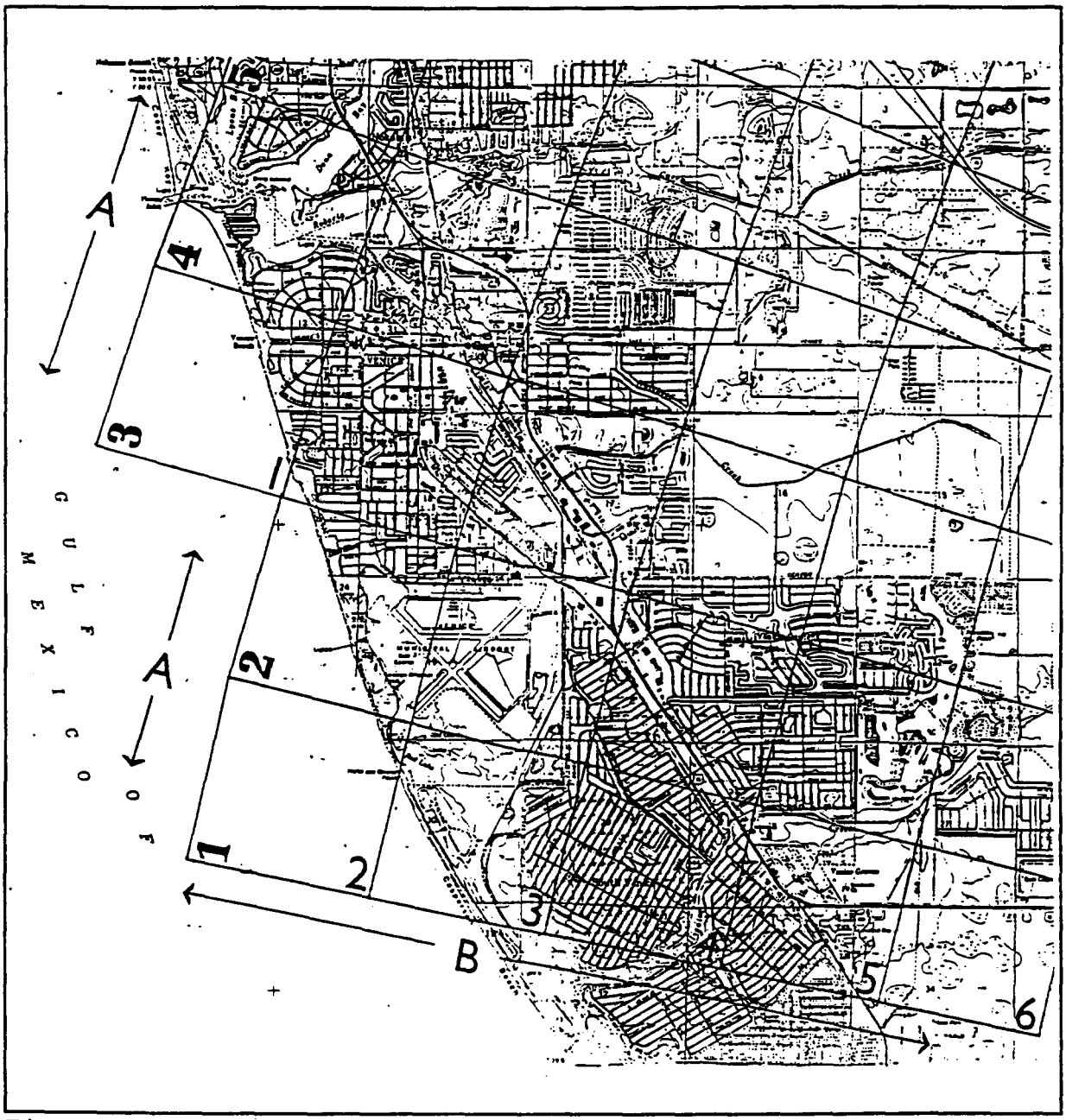


Figure C-3 STORM SURGE GRID MAP

CITY OF VENICE
SLOSH SURGE VALUES

TABLE 1

		********** LAND FALLING **********					******** EXITING ********			
A	B	TROPICAL STORM	CAT. 1	CAT. 2	CAT. 3	CAT. 4&5	CAT. 1	CAT. 2	CAT. 3	CAT. 4&5
1	2	4.6	5.5	9.0	12.2	18.8	2.8	3.8	5.8	8.2
1	3				12.3	18.9				
1	4					18.6				
1	5					18.9				
1	6					19.1				
2	2					18.8				
2	3					18.9				
2	4					18.2				
2	5					18.9				
2	6				12.0	19.4				
3	1	4.6	5.7	9.2	12.6	18.9	2.8	3.8	5.9	8.4
3	2					18.8				
3	3				10.4	18.5				
3	4					18.6				
3	5					18.9				
3	6				12.0	19.5				
4	1	5.0	6.0	9.8	12.8	19.2	2.9	3.9	6.7	8.9
4	2	4.9	6.0	10.1	12.8	19.1	2.9	3.9	6.1	9.0
4	3			10.0	11.3	19.0				
4	4					18.3				
4	5					19.0				
5	1	5.1	6.3	9.9	12.8	19.3	2.9	4.1	6.5	9.2
5	2			10.0	12.8	19.3				
5	3				10.6	19.1				
5	4					18.4				
5	5					19.1				

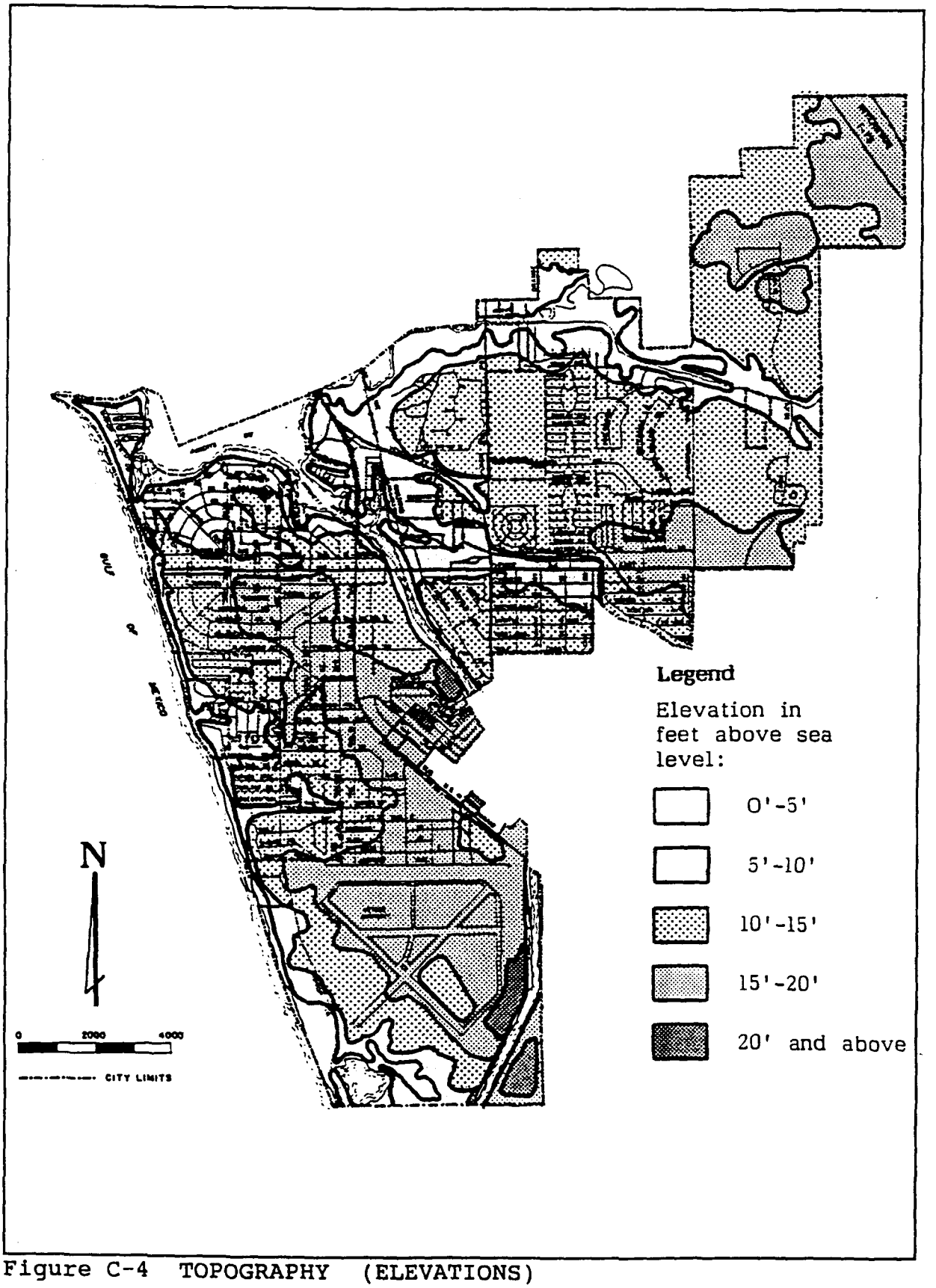


Figure C-4 TOPOGRAPHY (ELEVATIONS)

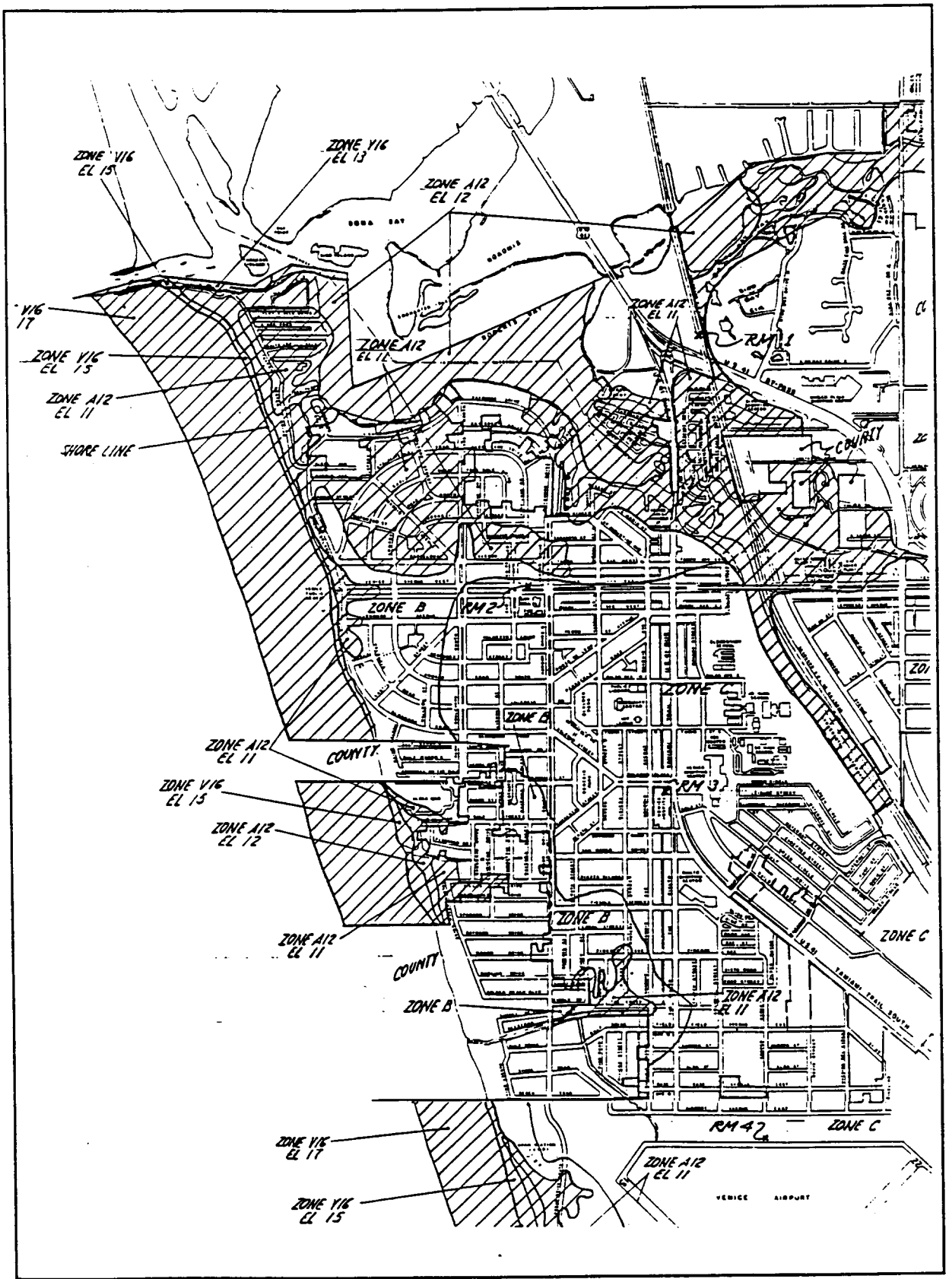


Figure C-5 FLOOD INSURANCE RATE MAP (FIRM) FOR VENICE, FLORIDA

Zone C: Areas of minimal flooding.

Zones V1-V30: Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

Some areas of the City are more inclined to flood than others.

In July 1983 FEMA published the "Flood Insurance Study Supplement-Wave Height Analysis for The City of Venice". This document (see support documents) studied the conditions along Venice's coastline. The report study concludes with the following results: "The wave height analysis for Venice indicates that waves with heights of approximately 8 feet and maximum wave crest elevations of 17 feet will be encountered at the Gulf of Mexico shoreline during a 100-year storm tide". The waves are diminished to heights of less than 3 feet within approximately 200 feet of the shoreline, primarily by rising ground elevations. Lower waves will propagate inland for an additional several hundred feet until completely dissipated by obstructions, such as buildings and vegetation, and by rising ground elevations".

Duke University Study

In August 1993 the Duke University Department of Geology released its preliminary analysis report of the three coastal risk communities in Florida. The report is called "Coastal Geologic Hazards and Mitigation Recommendations, Fernandina Beach, Venice Beach and Wakulla County, Florida: A Reconnaissance Evaluation. The report (see support documents) established 6 coastal hazard zones for Venice. In reviewing the report, it reveals that the extreme coastal hazard areas of Venice are similar to the V16 and A12 Zones on the FIRM.

Observations

After reviewing each hurricane category and the impacts, considering the storm surge impact areas and including the other hurricane studies, the element's conclusion is that the Venice coastline and the Roberts Bay area in Venice will be the most damaged areas after a major hurricane. Some structures will be repairable and other structures will need to be demolished and rebuilt.

The City will have to address redevelopment issues and also consider regulations which will protect people and their property from future disasters. In order to consider redevelopment issues, the element needs to review the areas which will be impacted.

Coastal Hazard Areas

Figure C-6 shows the Venice coastal development along the Gulf. The Coastal Impact Area (CIA), which is also addressed in the "Geography" element, consists of land located along the Gulf. The CIA is so named because this area will receive the worst impact from

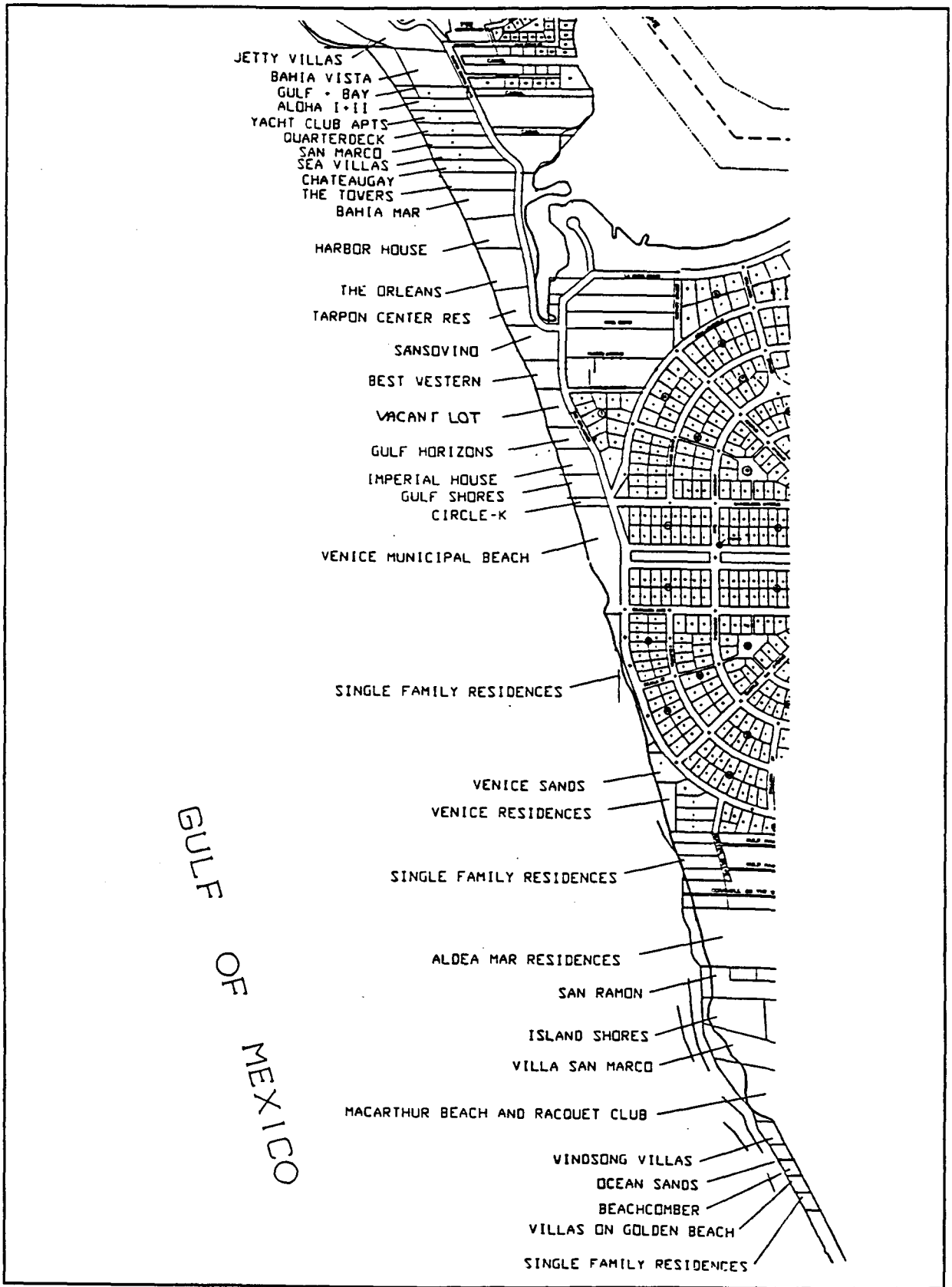


Figure C-6 VENICE COASTAL DEVELOPMENT ALONG THE GULF

hurricane forces.

The Venice Comprehensive Plan has designated the Coastal High Hazard Area (CHHA) as being located in the same place as the 1978 Coastal Construction Control Line (CCCL). The CHHA and the 1978 CCCL both divide coastal properties in some cases. This delineation gives the public the false impression that hazards occur only within that boundary. Hurricanes do not recognize CHHA or CCCL when attacking a community.

The CIA has approximately 2,558 people living in approximately 1,421 residential units. These units consist of approximately 30 condominiums (mostly high rises), several single family homes and municipal properties. Most of the residents are located in the City, with a few being enclaves. In the case of a hurricane category 2, 3, 4 or 5 directly attacking this area, a major disaster could occur.

The Roberts Bay area and Bayshore Estates Subdivision consist mostly of single family homes. The CIA will receive more damage by a hurricane than the Bayshore area because the coastal area will receive the full force of a hurricane's storm surge. The Bay area is buffered from the Gulf, but the area will still be affected by storm surge.

Structures located in the Bay area could be retrofitted to be more tolerant to the forces of hurricanes by implementing the improvements covered in the future elements.

The rest of this element will focus on the future redevelopment of the Venice coastline.

Redevelopment Solution

Webster's Dictionary defines the word "mitigate" as:

1. to cause to become less harsh or hostile.
2. to make less severe.
3. to lessen or try to lessen the seriousness or extent.

In the aftermath of a disaster, the governing body will need to examine how it might be able to mitigate the community's redevelopment in order to ensure that the community will be a safer place to live. When structures are not repairable and will need to be demolished and replaced, the City will need to consider new mitigating ways of addressing redevelopment. There are several possible solutions. One is the acquisition of destroyed properties and also the development of new codes that would regulate coastal redevelopment. Both answers needs lengthy reviews and studies to ensure success. This element will review both redevelopment proposals and develop recommendations for Venice.

Acquisition

The acquisition of coastal property by government should be a voluntary process that is developed and proposed prior to a disaster.

On July 12, 1988 the City of

Venice established the Land Acquisition Committee. This body is an advisory committee which works on projects assigned by the City Council and investigates land acquisition requested by the public. The Land Acquisition Committee has no power to contract or commit the City Council to any agreement. This five-member committee should be utilized from the beginning to acquire coastal properties. As stated earlier, the properties for acquisition would be properties which had been totally destroyed that may serve the public good as a beach access park.

The condominiums along the Venice coastline are priced from $1,000,000 to $12,000,000. The single family homes along the same coastline are priced from $100,000 to $200,000. If the community considered the acquisition of a condominium, the project would be faced with some of the following issues:

1. Obtaining large amounts of money to acquire the properties;

2. Trying to acquire the properties from a multitude of owners;

3. Reduction in revenues from property tax.

All of these issues would need to be addressed in the effort to acquire multi-family structures. If the community considered acquiring single family homes, the above issues would be more manageable.

FEMA has developed the 1362 program, which assists local governments in acquiring flood damage properties.

Brownwood Subdivision

Mr. Robert C. Freitag of the Seattle Regional Office of the Federal Emergency Management Agency wrote a position paper in 1984 titled " Hazard Mitigation in Brownwood Subdivision". The following text includes excerpts from his report.

On August 18, 1983 Hurricane Alicia made landfall over the western tip of Galveston Island. The next day, the President declared a federal disaster. Brownwood, a subdivision in the City of Baytown, Texas, was hit by a 13-foot storm surge. Almost all of the 300 homes in Brownwood were either totally destroyed or substantially damaged. Within ten days of the hurricane a buyout program presented to the residents of Brownwood was approved by the City of Baytown. The subdivision residents knew and accepted the high frequency of flooding. The site was only one or two feet above high tide. When built, the subdivision was as much as 12 feet above high tide, but through subsidence the land had become extremely flood-prone.

Burton, Michigan offers a similar example of an area which has a high frequency of flooding but experiences only minimal damage. Until these 15 homes were purchased through the Section 1362 program, they experienced

flooding two or three times a year but only to a depth of 16 inches.

The report also contained the components which comprised the buyout package which included:

* The availability of loans under the SBA Involuntary Relocation Package;

* Assistance to the City to clear the damaged homes from the site;

* Funds through the Section 1362 program which were dedicated and set aside to purchase all insured properties;

* Flood insurance claim assistance;

* Individual Family Grant funds to qualified applicants;

* The possibility of HUD, CPD&G and jobs bill funds to purchase uninsured property.

Concurrently with and in support of the City's effort to discourage reoccupation, the City residents were told that if the package was not accepted the following would occur:

* FEMA would deny all requests for permanent public assistance work targeted for the subdivision under an Executive Order 11988 no-action alternative;

* The City would inform all other federal funding sources of Executive Order 11988 and encourage a no-action alternative by other agencies;

* FEMA would limit eligibility to debris removal only, and only to that which was absolutely necessary to ensure health and safety;

* FEMA would ensure that the minimum NFIP requirements were adhered to for all substantially damaged structures; that is, structures would have to be elevated on site up to 16 feet above existing grade, and FEMA would use claim data as one index for substantial improvement;

* Onsite demolition cost and debris removal, estimated to be about $5,000 per property would be the responsibility of the property owner, and no direct or indirect involvement by the federal government would be forth-coming;

* EPA and other agencies would demand that new and substantially improved water and sewer lines located in the saturated soil zone be built to the same specifications as water crossings; i.e., encasement water lines, special joints, special bedding, etc. would be required.

The NFIP claims may total $20 million and will undoubtedly comprise the major source of funds used to purchase the homes. This is because all but a few of the homes were insured, and their replacement value was in excess of their fair market value.

In developing an acquisition package, incentives are needed to encourage all parties,

including the funding agencies and the property owners, to participate in the project. The funding agencies should consist of Federal agencies, such as FEMA, HUD, and SBA; State agencies, such as DEP and DCA, as well as County and City agencies.

New Redevelopment Concepts

Most of the condominiums are built with the first floor on the ground which is located on or near the dune area. This type of development puts the structure in a vulnerable position during a hurricane. Figure C-7 shows a typical coastal condominium,and C-8 shows a proposed redesigned coastal condominium which is tolerant to hurricanes. The following design issues should be required:

* Structures should be located as close as possible to the front property line, which should be located the furthest away from the Gulf.

* The first floor should be elevated to allow the storm surge to pass under the structure.

* The open area under the first floor should be utilized for parking.

* The swimming pool should be located within the structure.

* The dune area should be maintained by the property owner because it is nature's buffer to help protect the coastline from storm surges.

* Structures over three stories in height should be terraced from the front property line. This design should help alleviate the great wall facade appearance.

Proposed Regulations

There are several ways of developing regulations which would define the location or the design guild lines for the redevelopment of destroyed coastal structure. The two most common ways of administering regulations are by overlay zoning or via a corridor plan.

The 1976 Planning Advisory Service Report titled "The Administration of Flexible Zoning Techniques", by Michael J. Meshenberg, reviews the use of overlay zoning. The following excerpts are from this report.

"An overlay zone is a mapped zone that imposes a set of requirements in addition to those of the underlying zoning district. In an area where an overlay zone is established, property is placed simultaneously in the two zones, and the land may be developed only under the conditions and requirements of both zones.

Overlay zones typically are applied when there is a special public interest in a geographic area which does not coincide with the underlying zone boundaries. Some of the more common uses for such zones relate to special environmental features which restrain development.

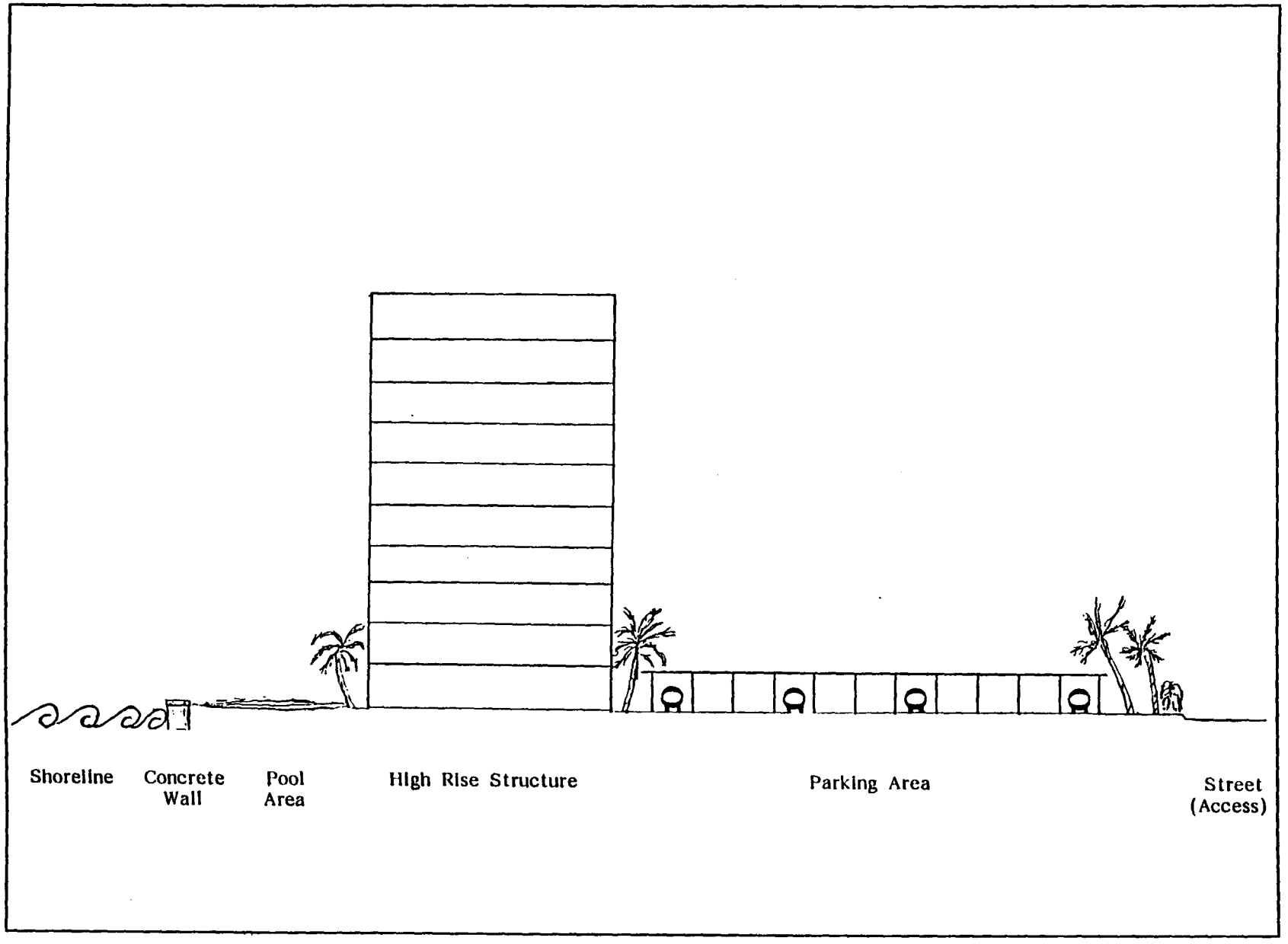


FIGURE C.1: TYPICAL CONDOMINIUM STRUCTURE

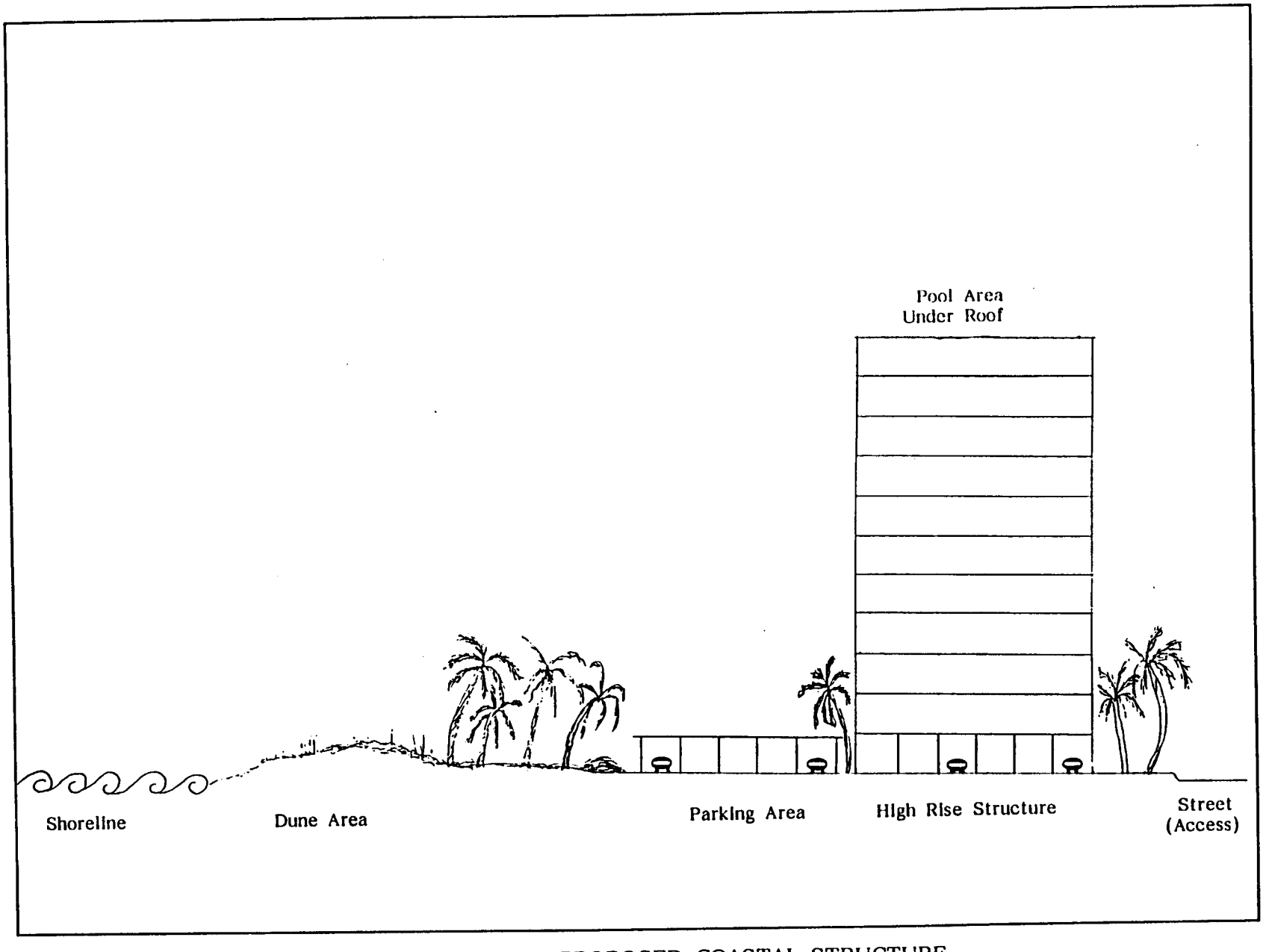


FIGURE C-8: PROPOSED COASTAL STRUCTURE

Floodplain zones and wet soils overlay zones are examples of such environmental features.

Other uses are to maintain the integrity of historic areas, to preserve views, to restrict areas to public uses and to limit building heights in certain portions of a city.

Venice has one overlay district in the Zoning Code called the Venetian Gateway District. This district regulates structures along East Venice Avenue. The overlay plan is proposed by conducting a study of an area and developing regulations for the district.

A corridor plan is similar to an overlay zoning district except that when the plan is approved it becomes an free standing Ordinance. Sarasota County has utilized the corridor plan system in regulating their land development.
The plan is developed from a detailed corridor study. Both zoning controls are similar with regard to public hearings and Planning Commission review.

Element Conclusion

The Venice coastline is one of the most important features of the community. In maintaining the stability of this area, the City needs to consider protective measures. This study recommends the following:

* Establish a policy directing the Land Acquisition Committee to develop a process which would allow the City to consider the acquisition of coastal properties that are destroyed after a disaster.

* Approve a study for the regulation of the coastal redevelopment in the event of a disaster.

* Develop programs that would promote community awareness of hurricane issues.

This study does not suggest or promote restricting the use of private property which would restrict or reduce density development. This study does propose the use of regulations which would create a better environment for the residents and the public.

SUPPORT

DOCUMENTATION

COASTAL GEOLOGIC HAZARDS AND MITIGATION RECOMMENDATIONS, FERNANDINA BEACH, VENICE BEACH AND WAKULLA COUNTY, FLORIDA: A RECONNAISSANCE EVALUATION

by

DUKE UNIVERSITY DEPARTMENT OF GEOLOGY
PROGRAM FOR THE STUDY OF DEVELOPED SHORELINES

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August 1993

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INTRODUCTION

This report presents a reconnaissance evaluation of the coastal hazard settings of the Fernandina Beach, Venice Beach, and the shoreline of Wakulla County, Florida (fig. 1). This work is part of the Duke University Department of Geology Program for Developed Shorelines (PSDS) Property Damage Mitigation and Multiple Geologic Hazards Projects supported by the Federal Emergency Management Agency (FEMA). Observations are based on a 10-day reconnaissance study of the above named locales which included field inspection and on-site conversations with local citizens, plus follow-up library research and telephone conversations with community officials. Hazard evaluation and mitigation recommendations presented herein must be considered preliminary, made without benefit of detailed information on planning, zoning, historical storm accounts, and so forth. More detailed hazard evaluation based on historical data, policy and planning history, plus further field investigations are suggested.

The main goal of the PSDS mitigation project is to recommend property damage mitigation techniques for barrier islands and coastal communities utilizing a geological point of view. Such an approach necessarily involves a knowledge of coastal physical processes and an understanding of how a particular developed coastline will respond to a storm. In that way, potential hazard areas can be identified and recommendations made of ways to mitigate potential damage.

To the fullest extent possible, "natural" of "soft" solutions to storm recovery are suggested. That is, methods specifically avoiding armoring of the shoreline or other massive engineering projects. Soft solutions involve taking active steps to repair damage to the natural setting brought about in the name of development. Such repairs will prepare individual buildings, as well as entire communities, for storms, will reduce damage during storms, and will speed recovery after storms.

COASTAL HAZARD MAPPING: A NEW APPROACH

A new method of mapping and evaluating coastal hazards is being developed at PSDS and is applied in this study area. It is called "Coastal Hazard Mapping" and delineates hazard zones across a barrier island or coastal community. Coastal Hazard Mapping is a technique employed to map the risks of coastal development by emphasizing coastal processes and coastal geomorphic characteristics. These characteristics as well as coastal engineering and development considerations are used to rate the overall risk of portions of communities to storm damage as "low", "moderate", "high" or "extreme". This rating system

allows a quick reconnaissance look at relative hazards of barrier islands, or along any coastal area.

To ascertain the likelihood of damage or destruction to a coastal area or to a particular building necessitates an understanding of storm-related physical processes, including wind, rising water, receding water, and wave attack. Certain storm-related physical processes (which cause the property damage) are closely associated with certain barrier island subenvironments. Identification of these subenvironments and associated processes is fundamental to risk assessment. For the coastal risk evaluation, the primary factors controlling damage potential include elevation above sea level, elevation above ground level, exposure (presence or absence of thick maritime forest; presence or absence of high, wide dune fields), and distance from the ocean or sound. In large measure, higher elevation and more densely forested portions of the coastal zone have generally lower potential for damage from storms.

The criteria considered in ranking the potential for damage from coastal storms are the factors which define an island's geology and geologic history, its development patterns, and its coastal engineering setting. Important factors include island width, island elevation, sand dune height, width and distribution, potential for inlet formation during storms, modern inlet dynamics, historic storm response, erosion rates, density and type of structures, maritime forest density and distribution, and human modification to the natural environment. Using these criteria it is possible to separate out portions of islands with similar risk or damage potential. Table 1 lists the relative hazard ranking of several major coastal environments; Table 2 lists descriptions of the low, moderate, high and extreme hazard zone criteria.

PROPERTY DAMAGE MITIGATION TECHNIQUES

Property damage mitigation refers to any of several methods employed to reduce the impact of storms on buildings, roads, and utilities. As with the hazard mapping, our geologic perspective takes into account coastal physical processes and the impact of storm processes on developed shoreline communities. To date, the typical reaction by the public to storm damage has been cleanup of debris and rebuilding of buildings and infrastructure damaged by the storm; little or no consideration has been given to reducing property damage in future storms or to recognizing the hazardous areas and avoiding them. Frequently, hazards risks are higher after a hurricane than before! Table 3 lists the basic steps we followed in our property damage mitigation studies to make mitigation recommendations.

Table 1. Relative hazard potential of barrier island environments, typical of S.E. U.S. barrier islands (listed from least hazardous to most hazardous).

Note: Some "safe" barrier island environments may be located on or near the open-ocean shoreline as in the case of a high-elevation maritime forest threatened by a rapidly retreating shoreline.

LOW HAZARD:

1. Mainland forest (high elevation)
2. Maritime forest (high elevation)

MODERATE HAZARD:

3. Maritime shrub thicket (high elevation)
4. Vegetated interior dunes (high elevation)
5. Active dune fields (high elevation)
6. Vegetated interior dunes (varying elevation)
7. Dune swales and blowouts

HIGH TO EXTREME HAZARD:

8. Overwash Apron (low elevation, no forest)
9. Washover fans (low elevation, no forest)
10. Frontal dunes
11. Ocean beaches

The following barrier island environments are either environmentally sensitive or are such dangerous zones that they should be considered off limits to development. Development in these areas should be considered for immediate relocation.

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12. Salt marsh
13. Tidal flats
14. Lagoonal/subtidal nearshore
15. Inlet migration or expansion zones
16. Ocean/subtidal nearshore

Table 2. A Hazard Ranking of Coastal Zone Environments.

EXTREME HAZARD

Areas rated as extreme hazard areas are of the lowest elevation, and have little vegetation except sparse growths of low beach grass or dune grasses. There is no maritime shrub thicket forest present, either never existing or having been removed for development. This is the zone of likely flooding from storm surge waters and from heavy rains. This also is the area likely to be overwashed during storms. Extreme hazard areas are most commonly ocean front areas, areas that will contain "V-zones" on the FEMA Flood Insurance Rate Maps, but they can also exist across the islands and on the sound side of islands.

HIGH HAZARD

High hazard zones are the lower elevation areas of the study area, but they contain good growths of dense maritime forest and/or shrub thicket. The low elevation of these areas means they are still potential flooding zones from storm surge waters and from heavy rains. There is less likelihood, however, of wind damage or of oceanfront erosion damage. The zone is susceptible to sound side erosion and flooding.

MODERATE HAZARD

Moderate hazard zones are high elevation areas that are not covered with maritime forest or dense shrub thicket. The high elevation means these areas are not generally subject to flooding and are not likely to suffer direct wave attack. Wind damage is the most likely hazard, as the development has a high degree of exposure without the presence of a protective forest.

LOW HAZARD

Low hazard zones are areas with high elevation that are well forested. These areas are not generally subject to flooding and are also not generally subject to wind hazards. These are the "safe" sites for development. A caveat is that removing forest for development obviously reduces the amount of protection and also leads to increased degradation of the exposed portions of the forest from salt spray.

EXEMPT OR NOT RATED

Exempt areas are State and Federal lands that are protected from development. These may include National Seashore, State Parks, wetlands, etc.

Table 3. Property Damage Mitigation Procedure.

- IDENTIFY HAZARD AREAS
  - →potential overwash zones
  - →historic and potential inlet locations
  - →modern inlet dynamics
  - →potential flooding problems
  - →high erosion rate areas
  - →future problem areas

- RECOMMEND METHODS TO REDUCE DAMAGE POTENTIAL
  - Repair damage already done to the natural environment
    - →rebuild excavated interior dunes
    - →plug dune gaps
    - →reestablish destroyed maritime forest
    - →rebuild roads over dunes not through them
    - →curve roads
  - Enhance the natural protective capabilities
    - →planting marsh grass to slow lagoonside erosion
    - →beach replenishment
    - →dune building
  - Zoning and land-use planning
    - →to avoid hazard areas
    - →do not rebuild structures destroyed by storms
    - →relocation of threatened structures

VENICE BEACH

Venice Beach is located approximately 100 kilometers south of Tampa Bay, facing the Gulf of Mexico (fig. 1). Venice is bounded by Venice Inlet (jettied) to the north and Stump Pass to the south (fig. 4).

Venice Beach Geologic Setting

The Venice Beach shoreline is composed primarily of undifferentiated Plio-Pleistocene deposits and Pleistocene terrace deposits. Elevation reaches as high as 12-15 meters above mean sea level, with a majority of land between 3-6 meters above mean sea level.

Venice Beach Development Setting

The entire Venice area is heavily developed with few areas remaining with dense vegetation. The first row of buildings can be described as follows: Buildings from the jetty (Tarpon Center Dr.) to just south of Whitecap Circle are 1-3 story, nonstilted apartments and condominiums; South of this area, to the public beach (The Esplanade), is a variety of high rise hotels and apartments, most ranging from four to eleven stories; Just south of the public beach there are a variety of private single family dwellings, bounded at the south by an eleven story high rise. The second row of buildings consist primarily of one to two story apartments and condominiums, with the exception of a three block area with low rise (3-6 story) apartment buildings. Most of the other development in Venice consists of one-to-two story single family dwellings or businesses, none of which are stilted. There are a handful of trailer parks about one mile inland. Just south of Venice lies the Venice municipal airport which occupies approximately one square mile.

Venice Beach Shoreline Engineering Setting

Shoreline engineering began in Venice in 1937 as two 200-meter-long jetties were constructed to stabilize Venice Inlet. In 1963, 14,500 cubic meters of sediment dredged from the inlet was used in a replenishment program (Dixon and Pilkey, 1991). Three finger canals were cut into the bayside of the northernmost tip of Venice and seawalls and rock revetments were constructed almost the entire length of the beach (dates unknown). Beaches were again replenished in the years 1971-75 as well as in 1979 and 1980 (Dixon and Pilkey, 1991).

Venice Beach Costal Hazard Mapping Evaluation

The coastal hazard zones for Venice Beach are shown on Figure 5.

Low Hazard Areas--include a few small high-elevation, forested pods well back from the shoreline.

Moderate Hazard Areas--dominate the community and comprise the

bulk of the developed areas.

High Hazard Areas--none rated in Venice Beach.

Extreme Hazard Areas--are confined basically to the oceanfront and the area around Roberts Bay in the northern part of the community.

Venice Beach Extreme Hazard Zones-- Description and Mitigation Recommendations

Venice Beach can be divided into six zones (A-F) based largely on development and engineering. Normally geology would also be considered, but it is very similar in all locations in this area so it has been disregarded.

Zone A:

Description--
Zone A development is distinguishable by similar structures. All buildings in this zone are 1-3 story, nonstilted apartments.

Coastal Hazards--
-jetty, seawall and revetment will lead to beach narrowing with time.
-dunes absent, no protection
-no vegetation, no protection
-finger canals and marina allow further inland incursion of storm waters
-buildings not stilted, so greater flood potential
-buildings located less than 60 meters from ocean
-roads perpendicular to shore allow overwash and storm-surge ebb

Mitigation Recommendations--
-add sand volume to dunes (frontal and interior)
-vegetate with native plants, encourage shrub and forest growth
-relocation will be a necessity at some point. Begin evaluating possibility of demolishing and rebuilding if economics of moving intact don't work out.
-block some shore-perpendicular roads with sand to inhibit overwash and storm-surge ebb

Zone B:

Description--
Zone B consists of high-rise apartments, condominiums, and hotels ranging in size from 4-11 stories. There is a seawall and rock revetment along the shore here.

Coastal Hazards--

-seawall, revetment will lead to long-term beach narrowing
-dunes absent, no protection
-no vegetation, no protection
-buildings located less than 60 meters from ocean
-roads perpendicular to shore allow overwash and storm-surge ebb
-large commercial high rise structures are more resistant to damage during storms, but damage to contents can be extensive

Mitigation Recommendations--

-devise long-term relocation plan
-adding sand for dunes and vegetating the dunes may help in small storms

Zone C:

Description--

Zone C is the Venice public beach and is not evaluated.

Coastal Hazards--

-roads perpendicular to shore allow overwash and storm-surge ebb
-low dunes offer little protection
-sparse vegetation offers little protection

Mitigation Recommendations--

-no action at this time, consider future replenishment to maintain recreation beach.

Zone D:

Description--

Zone D consists of 1-2 story, nonstilted, private homes. Here a seawall and revetment are absent.

Coastal Hazards--

-dunes absent, no protection
-sparse vegetation, no protection
-homes built less than 60 meters from ocean

Mitigation Recommendations--

-add sand volume to form dunes
-vegetate with native plants
-begin evaluating and implementing relocation plan.

Zone E:

Description--

Zone E has not been studied at this time.

Zone F:

Description--

Zone F is the location of the Venice Airport and is not evaluated.

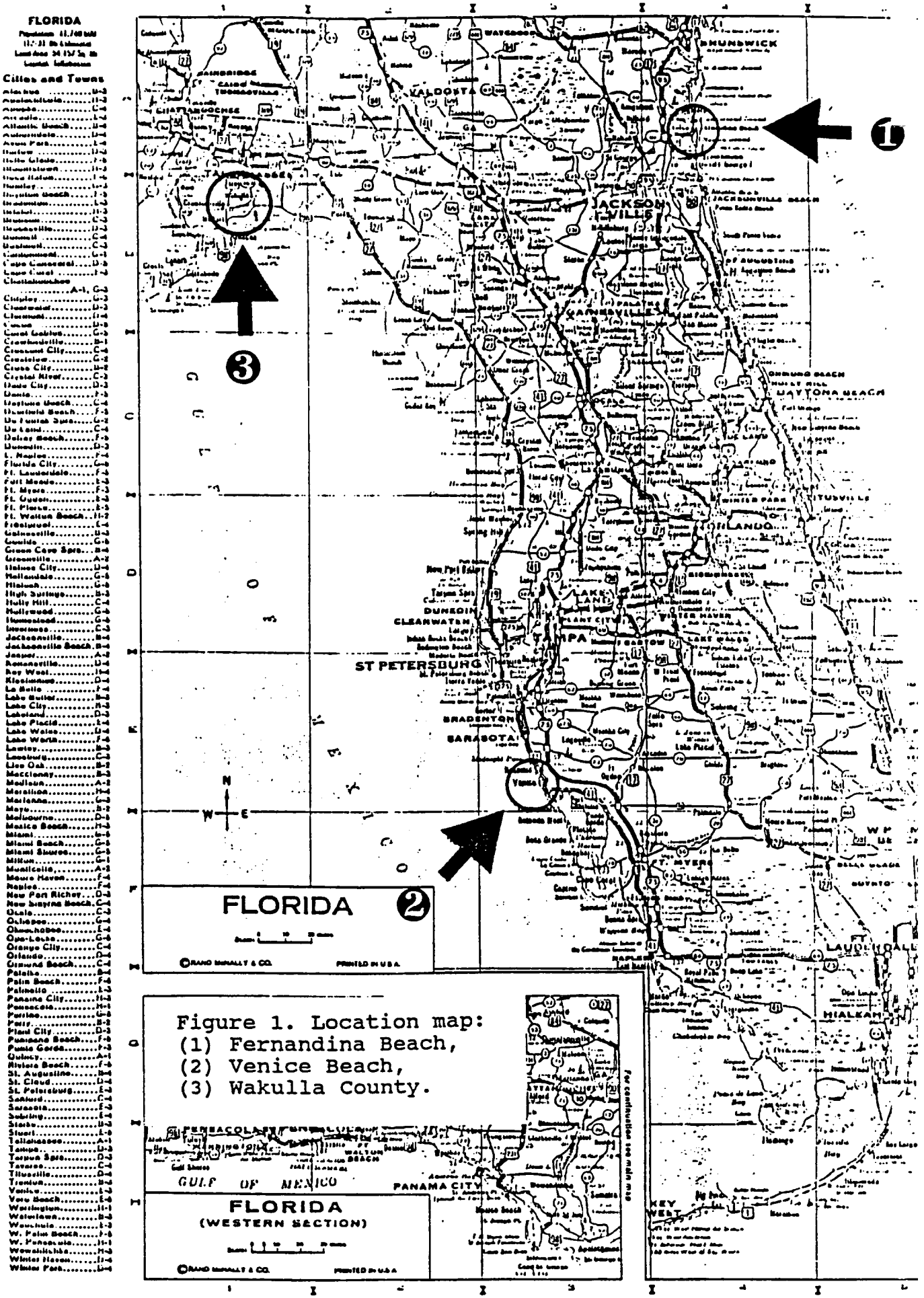


Figure 1. Location map:
(1) Fernandina Beach,
(2) Venice Beach,
(3) Wakulla County.

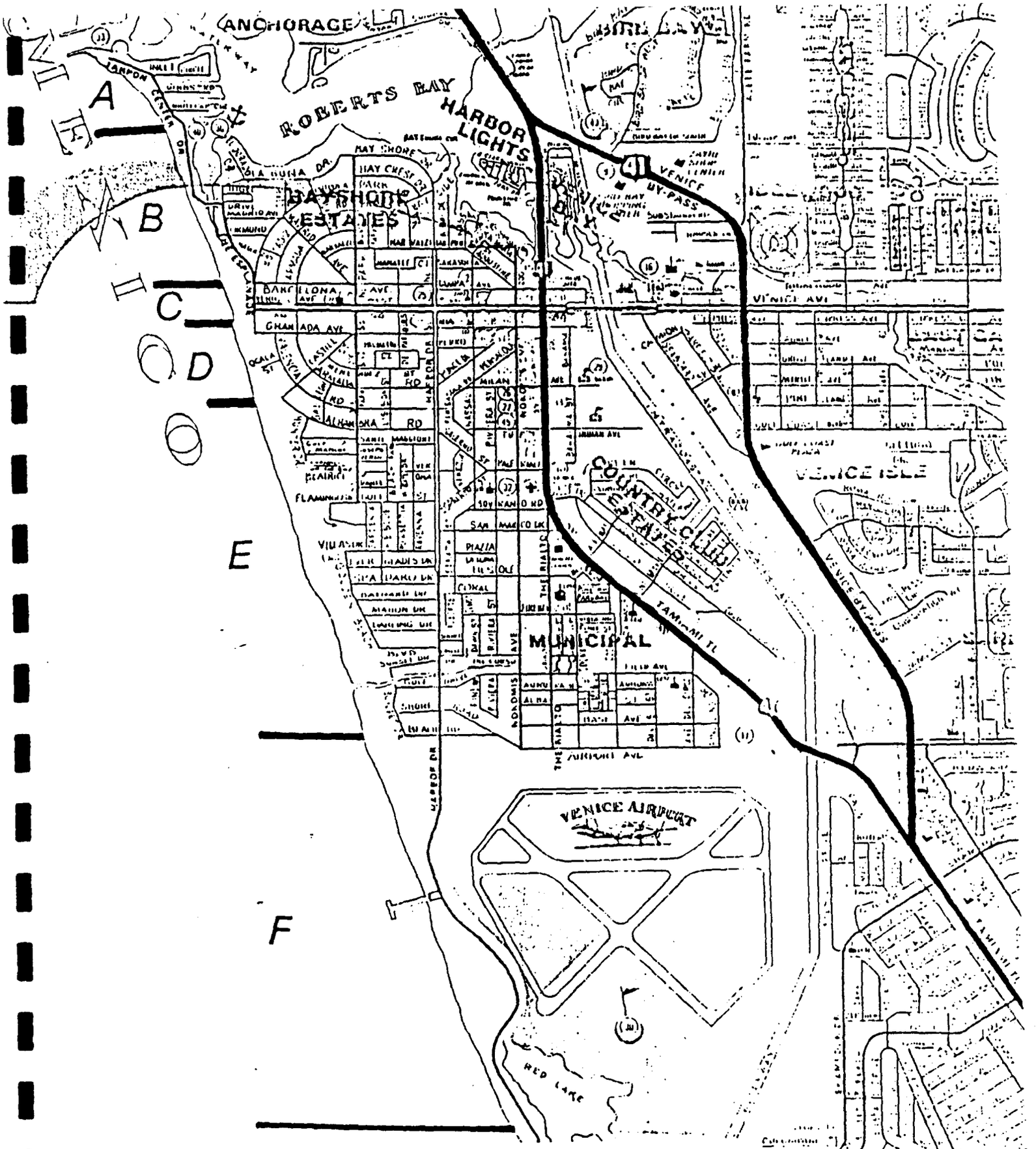


Figure 4. Venice Beach. A-F are extreme hazard zones discussed in text.

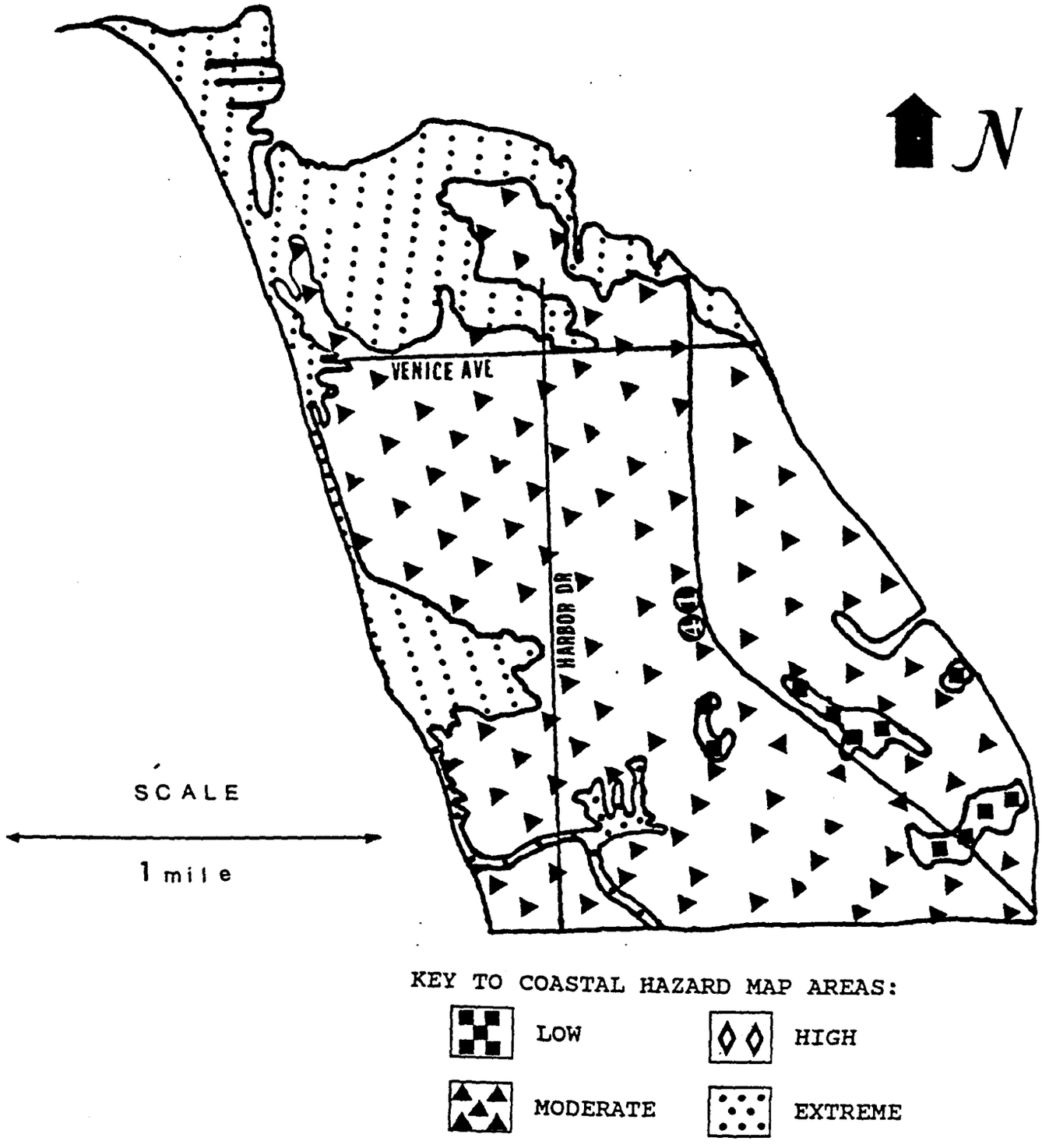


Figure 5. Venice Beach coastal hazard zones.

Venice Compliance Program

VENICE COMPLIANCE PROGRAM

"THOSE WHO CANNOT REMEMBER THE PAST ARE CONDEMNED TO REPEAT IT". These words by George Santayana were quoted in the introduction of the "Final Report of the Dade County Grand Jury On Hurricane Andrew". The following text is from that report.

A major failing of all Floridians has been our apparent inability to learn and retain the important lessons previous hurricanes should have taught us. Each of us has failed to be sufficiently responsible to ask the necessary questions of our government regulators, of our construction industry and of ourselves.

Collectively, we allowed the South Florida Building Code (SFBC) to become outdated; we allowed our builders to use questionable construction techniques and materials; we allowed our enforcement agencies to lessen their diligence in code enforcement; and we allowed ourselves the luxury of never asking questions about the structural integrity of our homes or the appropriateness of the materials used.

Andrew's most obvious lesson was that we were not prepared for this hurricane, as individuals or as a community. This mistake must not recur.

This report was filed on December 14, 1992, several months after Hurricane Andrew destroyed most of Dade County. Prior to Andrew, the emphasis of projecting major hurricane damage centered around the forces associated with water, such as flood damage from rainfall and storm surges. The destruction created by Andrew was primarily from the wind. This wind damage was the result of a variety of problems.

FEMA's "Building Performance: Hurricane Andrew in Florida" concluded with a statement concerning how to prevent the disaster from recurring: "Recommendations included areas of concern such as building materials, construction techniques, code compliance, quality of construction, plan review, inspection and reconstruction/retrofit efforts."

This study will review existing coastal codes in Venice and address some of the problems associated with compliance.

Coastal Regulations

Within the short time period of one decade (from 1980 to 1989), five governing laws were enacted which regulated the development within Venice's coastal area. Each law was designed to mitigate the effects of hurricane forces on the community. Table V-1 reviews the coastal development and redevelopment standards for Venice.

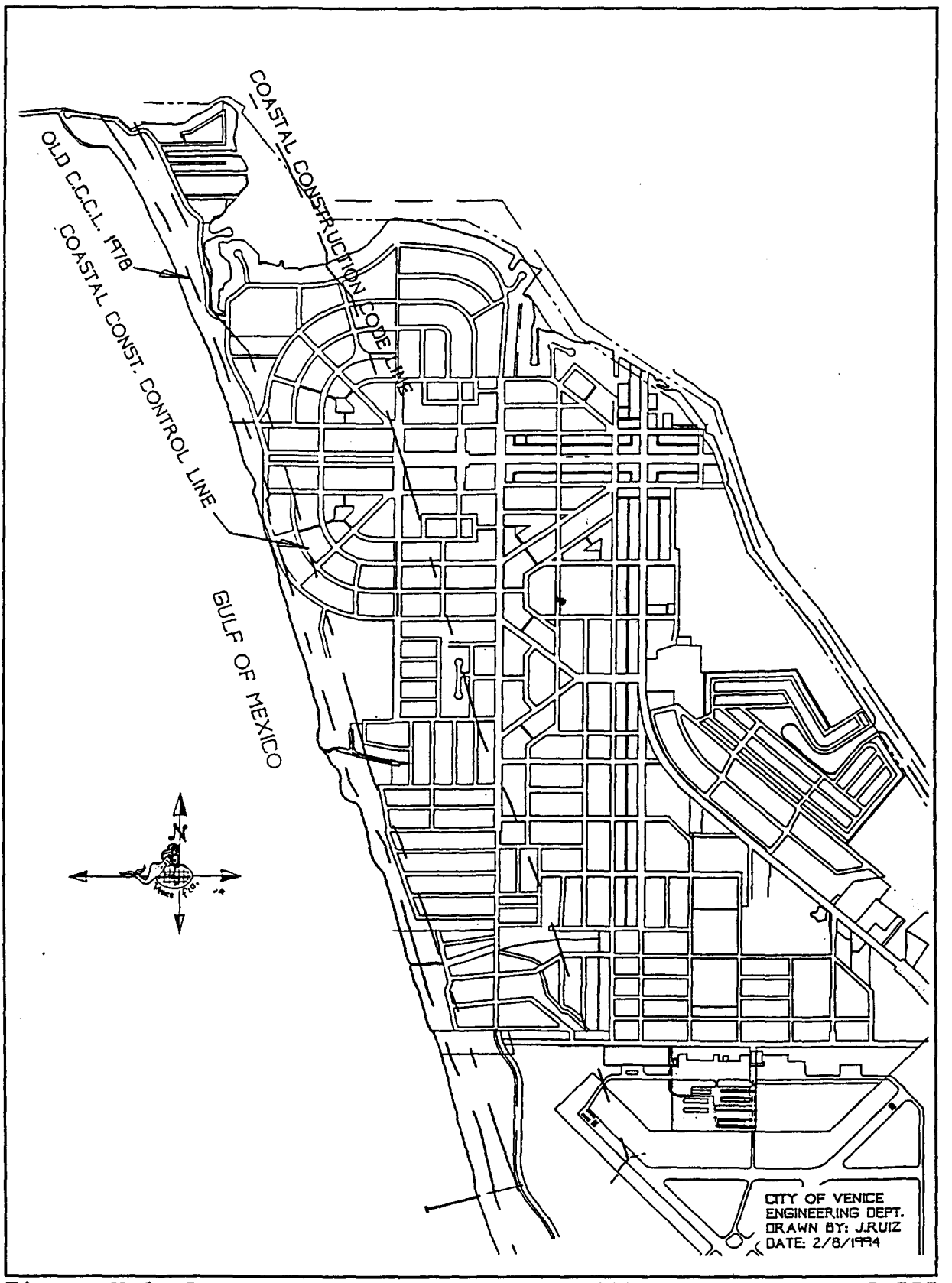


Figure V-1 LOCATION OF CCCL; OLD CCCL (1978); LOCATION OF CCC

REGULATION	ENFORCEMENT	AREA REGULATED	CONSTRUCTION ISSUES
Coastal Construction Control Line (CCCL)	State Department of Environmental Protection	Coastal Development Within Established Line	Coastal Excavation, Hydrodynamic Loads, Hydrostatic Loads, Storm Surge, Establish Non-Buildable area
Gulf Front Setback Line	City	Line Congruent to CCCL or 150 Ft. From Waterline	Establish Non-Buildable Area, Coastal Excavation
Flood Damage Prevention	City	FEMA's FIRM Entire City	Establish Floor Elevations, Anchoring Requirements, Foundation Requirements
Coastal Construction Code	City	1,500 Ft. Landward From CCCL.	Coastal Design Requirements, Wave Forces, Hydrostatic Loads, Hydrodynamic Loads
Section 1205 of the Venice Building Code	City	Entire City	Wind Load

Table V-1 COASTAL DEVELOPMENT AND REDEVELOPMENT STANDARDS IN VENICE

Coastal Construction Control Line

On November 18, 1980 the State implemented the Rules of the Department of Natural Resources, Division of Beaches and Shores, Chapter 16B-33, Rules and Procedures for Coastal Construction and Excavation. This legislation created the Coastal Construction Control Line (CCCL).

Figure V-1 shows the location of the CCCL in Venice. The CCCL regulates all development seaward of the line. The purpose of the CCCL is to reduce property damage caused from wind and storm surges. The CCCL promotes coastal mitigation through the following requirements:

* Promotion of beach-dune systems by establishing setback requirements and restricting some coastal excavations.

* Design of new structures must be designed to meet wind loads, wave loads and other structural forces, such as erosion.

The Department of Environmental Protection processes all CCCL permits which must be approved by the Executive Director or the Division Director and the Governor and Cabinet for the State.

Unfortunately, most of the coastal development in Venice occurred from the mid 1960's to the mid 1970's. Only a few buildings were found to be constructed after the CCCL was established.

Gulf Front Setback

On January 12, 1982 Venice established the Gulf Front Setback (GFS) Section (See support documents) in the Venice Zoning Code. The GSF line is congruent to the original CCCL established in 1978 or a distance of 150 feet from the mean high water line, whichever is greater.

Figure V-1 shows the old CCCL from 1978, which is used for the location of the GFS line. The GFS Ordinance states that the purpose of the law is to protect the coastal areas of the City directly exposed to the Gulf from erosion and flooding through the following:

* Minimize future public expenditures for flood and erosion control measures;

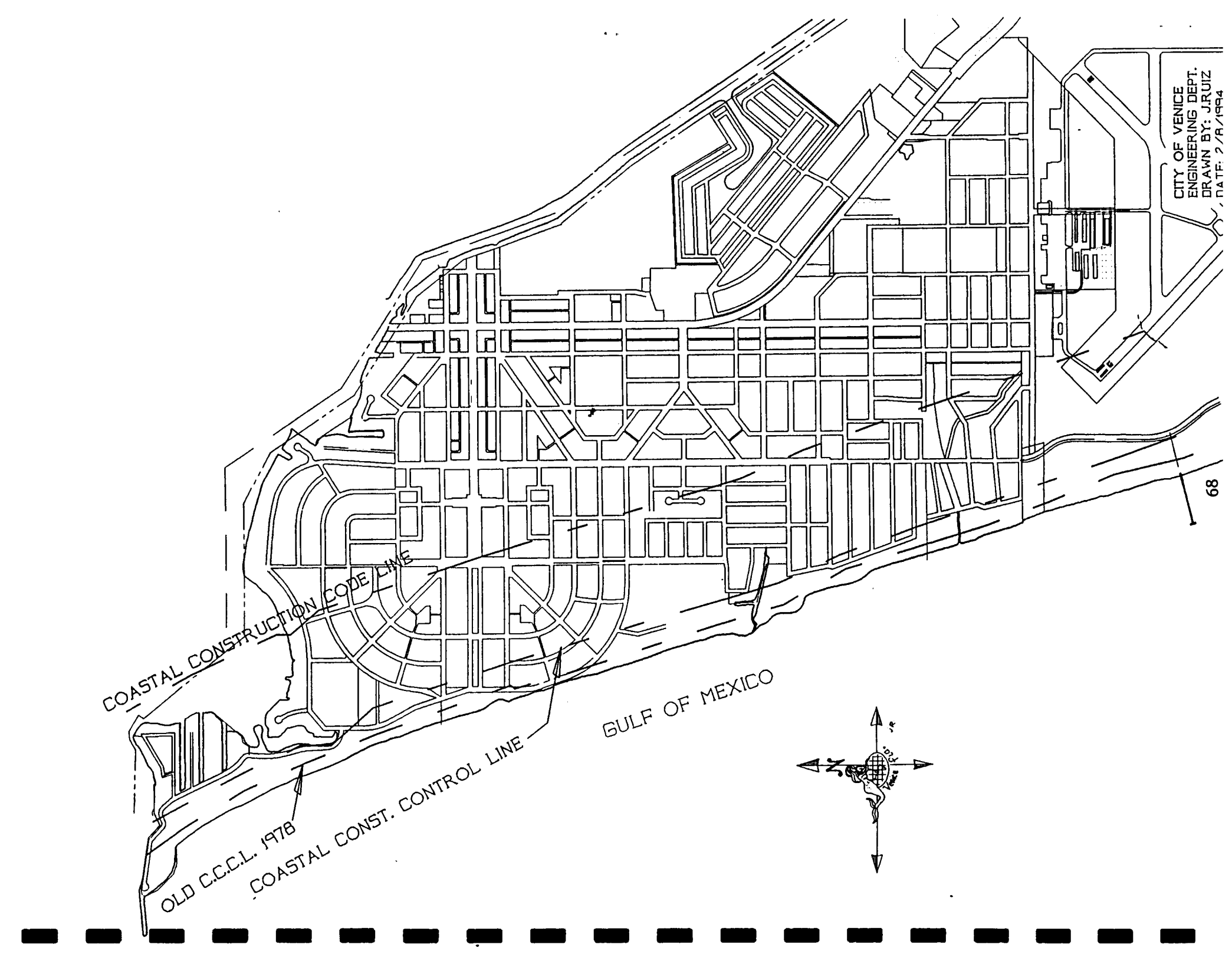
*Minimize future public expenditures for relief and/or restoration of projects following natural disasters or gradual erosion;

*Ensure public access along the public beaches of the Gulf;

*Minimize erosion damage to adjacent property resulting from man-made structures;

* Protect beaches, beachfront dunes, beachfront bluffs and beachfront vegetation necessary for maintaining shoreline stability;

* Ensure that coastal property and coastal waters retain


CITY OF VENICE
ENGINEERING DEPT.
DRAWN BY: J.RUIZ
DATE: 2/8/1994
68
COASTAL CONSTRUCTION CODE LINE
GULF OF MEXICO
OLD C.C.C.L. 1978
COASTAL CONST. CONTROL LINE

their economic, recreational and aesthetic value for coastal property owners and the general public;

* No construction or excavation shall be undertaken within the shoreline hazard area, which is defined as the area seaward of the gulf front setback line.

The GFS addresses redevelopment as follows:

"This prohibition on construction or excavation seaward of the gulf front setback line shall not apply to any modification, maintenance or repair of any existing structure; provided, however, that such modification, maintenance or repair is undertaken within the limits of the existing structure, and does not require, involve or include any additions to, or repair or modification of, the existing foundation of that structure."

Flood Damage Prevention

On January 10, 1984 Venice established the Flood Damage Prevention (FDP) Section (See support documents) in the Building, Housing and Structural Regulations (Chapter 6) of the Venice Code of Ordinances.

The purpose of the FDP Ordinance was to develop sound floodplain management for the City through the enforcement of the minimum standards established by FEMA's FIRM and flood insurance study.

The FDS addresses some of the following structural design issues:

* Elevation of structures;

* Floodproofing of particular structures;

* Expansion of the Coastal high hazard areas;

* Established construction standards: anchoring and foundation requirements.

Coastal Construction Code

On March 11, 1986 Venice established the Coastal Construction Code (CCC) Section (See support documents) of the Building, Housing and Structural Regulations (Chapter 16 of the Venice Code of Ordinances).

Figure V-1 shows the location of the CCC, which is 1,500 feet landward from the CCCL. The purpose of the coastal code is to provide minimum standards for the design and construction of buildings and structures. Implementation of improved standards should reduce the harmful effects of hurricanes and other severe storms occurring along the coastal area of the City.

The City's CCC requirements are very similar to the State's CCCL requirements. The CCC requires that the following design issues are addressed:

* Wind load design

* Foundation design

* Wave force design

* Hydrostatic loads

* Hydrodynamic loads

Section 1205-Venice Building Code

The Standard Building Code Congress International (SBCCI) is responsible for the development of regulations in the Standard Building Code (SBC). The State requires Municipalities and Counties to adopt one of the State's Minimum Building Codes. The SBC is the code most commonly used by local governments.

In 1985 the SBC was amended to include Section 1205, which addresses wind load design. The new Code required that structures would need to be designed by using formulas outlined in the Code to meet the wind load requirements. The Code does not require plans to be developed or approved by engineers or architects for building single family houses or duplexes. The enforcement of Section 1205 became a problem in all communities which were using the Code.

The Venice Building and Zoning Department issued a position paper entitled "Wind Load Building Code and its Meaning to Venice" (See support documents). This document addresses the problem associated with Section 1205 and suggests solutions.

On July 7, 1990 the SBCCI Board of Directors approved the Standard for Hurricane Resistant Residential Construction (HRRC). This document states that its purpose is to provide design and construction details for improving the structural performance of single and multifamily dwellings. The prescriptive requirements contained in the report are based on the latest engineering knowledge reflected in Section 1205 of the Standard Building Code. These standards are intended to provide minimum requirements to ensure structural integrity within the limitations in building geometry, materials and wind climate specified. Some local governments are in the process of adopting the HRRC. Some members of the building community object to the new HRRC because the cost of building a new home is expected to increase.

Lessons From Andrew

The aftermath of Hurricane Andrew created a training school for researchers to study why the destruction was so severe in South Florida. Numerous surveys, damage investigations, assessments and observation reports were developed from the disaster. Most of these reports list a variety of reasons for the destruction.

Reports indicate that the destruction was more man-made than the results of a super climatic event. The reports also reflect that structures built to code with proper materials and good workmanship had minimal damage.

The Florida Department of Community Affairs prepared a damage investigation and assessment of Hurricane Andrew called "Summary of Damages to

Conventional Residential Structures". Dated September 24, 1992, the report is summarized as follows:

From an overall functional perspective, most of the residential structures performed poorly due to the failure of roofing materials, doors and windows. These failures led to weather penetration of the structures which resulted in major interior damage and uninhabitable buildings. The loss of roof sheathing and collapse of gable-ends contributed to this damage in many structures. Building code requirements for all these items need immediate attention. From an overall structural perspective, residential structures designed and constructed according to code requirements performed favorably during Hurricane Andrew. If this were not the case, catastrophic structural failures of well constructed buildings would have been observed. In general, residential structures constructed of concrete block performed well. Frame construction performed well if sufficient attention was given to field installed connections between the individual components.

The December 1992/ January 1993 Fine Homebuilding Magazine (No. 78) contained a story called "Hurricane Warnings" by Charles Miller. The story reviewed why some houses survived and some didn't. The last two sentences of the story are quoted below:

"Hurricane Andrew has made it clear that the most important links that hold together the houses on our landscape don't come to the job site on a delivery truck. There's no substitute for an understanding of how the pieces should fit together and the pride and the vigilance that it takes to make sure the job is done right."

Observations

The coastal community is an important part of our community which needs to be preserved. The coastal residents assist the City's revenues by providing a higher than average income through property taxes. Due to their monetary resources, some of the residents assist the community by supporting non-profit organizations. The condominiums along the coast accommodate primarily retirees who offer Venice a world of knowledge, experience and talents which would be missed if these individuals were not residents.

The coastal community needs to understand that boundaries and controls are necessary to protect the City. These concerns are addressed through code requirements which are enforced through compliance. The word "compliance" means "An act of complying with a wish, request or demand; acquiescence."

In order to obtain compliance with the existing codes, the codes must be understandable and the public must be aware that these codes exist. In reviewing the Venice coastal

development regulations, one finds that every ordinance or code was prepared separately and at different time periods.

All of these laws try to address most of the problems associated with protecting the coastal area from hurricane forces. There are some overlapping requirements within these documents. When one code is updated, readjusted or amended, several other codes may also be affected by the change. These codes should be reviewed as a group or a coastal regulatory packet.

With Hurricane Andrew, the structural failures were due not to the Building Code but to non-compliance with the code. Building inspectors can only review and approve the work which is visible during the normal inspection, which in some cases may be considered a "spot check." This usually means three inspections for a single family home.

Compliance with the codes must be addressed in a broad manner. This could be accomplished through educating the public, including members of the building community, on proper construction techniques.

The State should consider a one-day certification program which reviews the impacts of poor construction as it related to Hurricane Andrew. This program should also review the proper ways to construct a tolerant house. Participation in the certification program should be required of all contractors and workers within six months of renewing their license or working on a construction project.

This study will address the issues involved in developing a tolerant house in the next element.

Element Conclusion

The City has, by its actions, shown its concern for the coastal area and endeavors to ensure that development will impact neither the environment nor the community.

In the interest of promoting a safer community, the study recommends the following:

* Establishment of a staff committee to review and propose updates to all coastal regulations to ensure conformity. This committee should also address how redevelopment should occur in the event of a disaster.

* Development of a coastal ordinance booklet which references the coastal codes impacting development and redevelopment along the Gulf. The purpose of this booklet would be to assist and educate the public.

* Coordination with the State and Sarasota County in developing compliance programs to educate the public.

The Venice coastal area could be developed into a hurricane tolerant community through redevelopment and education.

SUPPORT

DOCUMENTATION

WIND LOAD BUILDING CODES AND ITS MEANING TO VENICE

What have we learned from Andrew?

THE ISSUE

*The building codes have drastically changed through the years in the approach of design for high wind. For the average citizen is has become difficult to determine when a building will meet Code. The codes have evolved in this issue from a prescriptive (i.e. shown directly, demonstrated) to a performance (i.e. calculated) approach. The effect of this is that you must be able to derive from the formulas outlined in the codes, how the building will resist high winds. In Florida, single family houses and duplexes are exempt from the requirements for professional design by an architect or engineer. Without calculations, neither the inspectors, nor the contractors can judge if a building meets the Standard Building Code. Nor is the review and inspection process normally organized to insure that houses and other small structures will survive wind storms (although great strides are being made in the aftermath of Andrew). This means that a substantial portion of the construction in Florida, although built to standard practice, may in fact, not meet the building codes. The misleading part with this issue is that there does not **APPEAR** to be a problem. After all, houses are not falling down.*

HISTORY

The recent history of wind design in the Model Codes begins in 1972, with wind tunnel tests conducted by the University of Western Ontario for the Metal Building Manufacturers Association. These tests were among the first conducted on the envelope of a building as a system testing for winds coming from all directions. The information and requirements gained by those tests was recognized by the Standard Code in 1976. When it was recognized that there may have been a weakness in the code, an ad-hoc committee at Standard Building Code Congress International (SBCCI) was formed which led to major changes in the Standard Code in 1985. The ability of the main frame to resist wind could be demonstrated by calculations conforming to the Code (section 1205) or by conformance to ANSI A-58, NAFCS (Naval Construction Code), or individual wind tunnel tests. For houses usually a wind/wall standard produced by SBCCI and/or Appendix D to the Code was used. In 1986, the Florida Legislature under pressure from the National Hurricane Center in Coral Gables created the Coastal Construction Act. The Legislature recognized a need for non-engineered designs of single family homes and required the Department of Community Affairs to create a Florida "Deemed to Comply Document" (i.e. prescriptive) to be used in the coastal zones. It became apparent that there were still problems with the Code, especially with the sections used for single family buildings. Standard practice had not kept pace with the Code and it became evident by the draft Florida" Deemed to Comply", that such a document would be difficult to understand and in most places in the state so much more restrictive that the document could not be accepted. In 1987 the Standard Building Code appointed a committee to produce a "Deemed to Comply" for use throughout the southeast. The product of this committee is available and in use within some

jurisdictions. It is easier to use than the Florida attempt, but still is fairly restrictive in comparison with most areas common practice. Both the Standard Code Chapter 12 and the "Deemed to Comply" are under constant revision and evolution with, we hope, simplification always in mind. During the 1989 legislative session the Florida Home Builders Association was successful, to have inserted at two o'clock in the morning a rider on a bill that passed the next morning. This rider eliminated for one and two family dwellings (except for "coastal areas) 1205 from the code and specification standards promulgated by recognized code organizations. This was an attempt by the Homebuilders to gut efforts to solve the design issue in the state, by removal of the offensive section and eliminating the possibility of adopting the "Deemed to Comply". The Board of Code and Standards immediately issued an emergency rule to reinstate 1205. The Board of Directors of SBCCI has adopted a subsequent version of "Deemed to Comply" that is not as complicated and restrictive as the original version. It has been renamed the " Standard for Hurricane Resistant Construction (SSTD 10-93). The Board of Code and Standards, in response to pressures after Hurricane Andrew has now "approved" use of the SSTD 10-93. However the Board has not adopted the standard as "the" minimum code.

OPTIONS

Our options are somewhat limited; either ignore what the Code says or find some method of meeting code. The first option places us in violation of statute and could expose the city, the designers and contractors to unacceptable judgments for malfeasance or nonfeasance. This is becoming very clear to those caught up in the grand jury and civil court process in Dade County. The second option is costly for the home buyer.

The lesson of Andrew, so far, is that enforcement of the Code must consist of accurate plans review and thorough inspection procedures. At this time the insurance industry is developing a rating method similar to that used for code compliance for fire departments. A community would be rated on how well it enforces the Code. If the jurisdiction does well, then the insurance rates will be less. If a poor job is done, the rates will be high or even unavailable. The industry has testified (SBCCI code hearings), that they will have legislation implemented at the next meeting of the Florida legislature, regulations for insurance ratings with an effective date of July 1994.

This concept of design is difficult to understand (the issue is one of math) and the difference in wind design speeds used in the Code versus the reported wind speeds used by the media do not help to clarify this issue. (The Code uses fastest mile, a mile of wind past a point at a specific time, to develop the design speed whereas the media is reporting peak gust). This creates the illusion of having a speed reported by the press different from the "Code" design speed.

At this time we are left with questions on how to best protect the public. If we are to build structures to resist the wind it will be costly. We must either require all plans to be prepared by a design professional, mandate the use of SSTD 10-93, or train our plans reviewers to be capable of wind design. Either option will add cost either in fees or delays. To have a structure engineered will add several hundred dollars to the cost of a plan. To have staff decide how to meet code (by calculation) will require additional training, the addition of at least two hours of plan review time to the average structure (effectively tripling the plans review time) and

increasing the City's liability exposure. To ensure that the designs prepared by the design professional are correct will require training and the addition of one hours plan review time to the average structure. Beginning January 01, Sarasota County will implement SSTD 10-93.

We must have the time to make comprehensive inspections of the structures. In most jurisdictions building inspectors have been burdened by additional disciplines, and areas of concern. These include workers compensation, mechanics lien law, energy code, licensing requirements, handicap accessibility. At the same time all of the codes and ordinances have become more intricate and the expectation of performance has increased. There has not been a corresponding increase in the amounts of inspectors, or stages of inspection to view the work, and in most cases the training needed. The system fails to ensure that construction meets the code. Clearly this was a major lesson to be learned from Andrew.

COUNCIL ACTION

Direct staff to implement the following policy option:

1) Require that all plans have the structural portions prepared and certified by a licensed design professional.

AND/OR:

2) Require that with the submission of each plan, the applicant show how SBC 1205 is met.

AND/OR:

3) Require that with the submission of each plan, the applicant show how SSTD 10-93 is met.

AND/OR:

4) Require that with the submission of each plan, the Building department ensure by review that the designer has met the code (in conjunction with the above 1,2,3).

AND/OR:

5) Require that with the submission of each plan, the Building department determine how wind design is met.

AND:

6) Require that the inspection process be revised to ensure that the minimum required inspections are performed and the time given to perform them.

SUPPORT

DOCUMENTATION

ARTICLE XII. FLOOD DAMAGE PREVENTION*

Sec. 6-244. Determinations by city council.

The city council does hereby find and determine that:

(a) Pursuant to the National Flood Insurance Act of 1968, Public Law 90-448, 42 U.S.C. Section 4001 et seq., the Federal Emergency Management Agency thereby duly authorized, has caused federal regulations to become effective wherein certain criteria have been established whereby communities may become eligible for flood insurance under the National Flood Insurance Program;

(b) Floodplain management is an issue involving both the local economy and the health and welfare of the city, and that it is in the best public interest for the city to conform to said federal regulations in order that the citizens of the city may avail themselves of the flood insurance therein provided for;

(c) Certain minimum standards and requirements as to land management and use, building standards and control measures must be adopted to minimize flood damage to public and private property. (Ord. No. 1065-84, § 1, 1-10-84)

Sec. 6-245. Flood insurance rate map/flood insurance study adopted.

The flood insurance rate map (FIRM), Community Panel No. 1251540005C, dated January 18, 1984, for Venice, Florida, and flood insurance study supplement, dated July 18, 1983, as prepared by the Federal Emergency Management Agency, three (3) copies each of which

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*Editor's note—Ord. No. 1065-84, § 1, adopted Jan. 10, 1984, repealed Ch. 6, Art. XII, §§ 6-244—6-252, relative to flood damage prevention, and in lieu thereof enacted a new Art. XII, §§ 6-244—6-252, relative to similar provisions, to read as herein set out. The repealed sections derived from Code 1958, §§ 5-74—5-82 and Ord. No. 847-80, § 1, adopted Aug. 12, 1980.

Cross reference—Minimum storm water management improvements required in subdivisions, § 16-11.

are on file in the office of the building official of said city, and any revisions thereto, are hereby adopted by reference and are as fully a part of this article as if set forth herein. (Ord. No. 1065, § 1, 1-10-84)

Sec. 6-246. Definitions.

As used in this article:

(a) *Addition (to an existing building)* means any walled and roofed expansion to the perimeter of a building in which the addition is connected by a common load-bearing wall other than a fire wall. Any walled and roofed addition which is connected by a fire wall or is separated by independent perimeter load-bearing walls is new construction.

(b) *Appeal* means a request for a review of the building official's interpretation of any provision of this article or a request for a variance.

(c) *Area of special flood hazard* is the land in the floodplain within a community subject to a one per cent or greater chance of flooding in any given year. This includes all A and V zones on the FIRM.

(d) *Base flood* means the flood having a one per cent chance of being equalled or exceeded in any given year.

(e) *Basement* means that portion of a building having it floor subgrade (below ground level) on all sides.

(f) *Breakaway wall* means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces without causing damage to the elevated portion of the building or the supporting foundation system.

(g) *Building* means any structure built for support, shelter, or enclosure for any occupancy or storage.

(h) *Coastal high hazard area* means the area subject to high velocity waters caused by, but not limited to, hurricane wave wash. The area is designated on the FIRM as the V zones.

(i) *Development* means any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating, drilling operations, or permanent storage of materials.

(j) *Elevated building* means a nonbasement building built to have the lowest floor elevated above the ground level by means of fill, solid foundation perimeter walls, pilings, columns (posts and piers), shear walls, or breakaway walls.

(k) *Flood* or *flooding* means a general and temporary condition of partial or complete inundation of normally dry land areas from:

(1) The overflow of inland or tidal waters; or

(2) The unusual and rapid accumulation or runoff of surface waters from any source.

(l) *Floor* means the top surface of an enclosed area in a building (including basement), i.e., top of slab in concrete slab construction or top of wood flooring in wood frame construction. The term does not include the floor of a garage used solely for parking vehicles.

(m) *Functionally dependent facility* means a facility which cannot be used for its intended purpose unless it is located or carried out in close proximity to water, such as a docking or port facility necessary for the loading and unloading of cargo or passengers, shipbuilding, ship repair, or seafood processing facilities. The term does not include long-term storage, manufacture, sales, or service facilities.

(n) *Highest adjacent grade* means the highest natural elevation of the ground surface, prior to construction next to the proposed walls of a structure.

(o) *Mangrove stand* means an assemblage of mangrove trees which is mostly low trees noted for a copious development of interlacing adventitious roots above the ground and which contain one or more of the following species: Black mangrove (Avicennia nitida); red mangrove (Rhizophora mangle); white mangrove (Languncularia racemosa);and buttonwood (Conocarpus erecta).

(p) *Mean sea level* means the average height of the sea for all stages of the tide. It is used as a reference for establishing various elevations within the floodplain. For purposes of this article, the term is synonymous with National Geodetic Vertical Datum (NGVD).

(q) *Manufactured home* means a structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. It does not include park trailers, travel trailers, recreational vehicles and other similar vehicles unless they are placed on a site for one hundred eighty (180) consecutive days or longer and intended to be improved property.

(r) *National Geodetic Vertical Datum (NGVD)* as corrected in 1929 is a vertical control used as a reference for establishing varying elevations within the flood plain.

(s) *New construction* means structures for which the "start of construction" commenced on or after the effective date of this article.

(t) *Sand dunes* means naturally occurring accumulations of sand in ridges or mounds landward of the beach.

(u) *Start of construction* includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction or improvement was within one hundred eighty (180) days of the permit date. The actual start means the first placement of permanent construction of a structure (including a manufactured home) on a site, such as the pouring of slabs or footings, installation of piles, construction of columns, or any work beyond the state of excavation or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

(v) *Structure* means a walled and roofed building that is principally above ground, a manufactured home, a gas or liquid storage tank, or other man-made facilities or infrastructures.

(w) *Substantial improvement* means any combination of repairs, reconstruction, alteration, or improvements to a structure, taking place during the life of a structure, in which the cumulative cost equals or exceeds fifty per cent (50%) of the market value of the structure. The market value of the structure should be: (1) The appraised value of the structure prior to the start of the initial repair or improvement, or (2) in the case of damage, the value of the structure prior to the damage occurring. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either: (1) Any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions, or (2) any alteration of a structure listed on the National Register of Historic Places of a state inventory of historic places.

(x) *Variance* is a grant of relief from the requirements of this article which permits construction in a manner otherwise prohibited by this article where specific enforcement would result in unnecessary hardship. (Ord. No. 1065-84, § 1, 1-10-84; Ord. No. 1201-86, § 1, 3-25-86; Ord. No. 1260, § 1, 5-12-87)

Sec. 6-247. General provisions.

(a) *Lands to which this article applies.* This article shall apply to all areas of special flood hazard within the jurisdiction of the city. The areas of special flood hazard are shown as all A and V zones on the FIRM.

(b) *Establishment of development permit.* A development permit shall be required in conformance with the provisions of this article prior to the commencement of any development activities.

(c) *Compliance.* No structure or land shall hereafter be located, extended, converted or structurally altered without full compliance with the terms of this article and other applicable regulations.

(d) *Abrogation and greater restrictions.* This article is not intended to repeal, abrogate, or impair any existing easements, covenants, of deed restrictions. However, where this article and another provision, ordinance or regulation conflict or overlap, whichever imposes the more stringent restructions shall prevail.

(e) *Interpretation.* In the interpretation and application of this article all provisions shall be: (1) Considered as minimum requirements; (2) liberally construed in favor of the governing body; and (3) deemed neither to limit nor repeal any other powers granted under state statutes.

(f) *Warning and disclaimer of liability.* The degree of flood protection required by this article is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may

be increased by man-made or natural causes. This article does not imply that land outside the A or V flood zones or uses permitted within such areas will be free from flooding or flood damages. This article shall not create liability on the part of the city or by any officer or employee thereof for any flood damages that result from reliance on this article or any administrative decision lawfully made thereunder. (Ord. No. 1065-84, § 1, 1-10-84; Ord. No. 1260-87, § 2, 5-12-87)

Sec. 6-248. Administration.

(a) *Designation of city building official.* The city building official is hereby appointed to administer and implement the provisions of this article.

(b) *Permit procedures.* Application for a development permit shall be made to the city building official on forms furnished by him or her prior to any development activities, and may include, but not be limited to, the following plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing. Specifically, the following information is required:

(1) *Application stage.*

a. Elevation in relation to mean sea level of the proposed lowest floor (including basement) of all structures;
b. Elevation in relation to mean sea level to which any nonresidential structure will be floodproofed;
c. Certificate from a registered professional engineer or architect that the nonresidential floodproofed structure will meet the floodproofing criteria in section 6-249(b)(2);
d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development; and

(2) *Construction stage.* Provide a floor elevation or floodproofing certification after the lowest floor is completed, or in instances where the structure is subject to the regulations applicable to coastal high hazard areas (V zones), after placement of the horizontal structural members of the lowest floor. Upon placement of the lowest floor, or floodproofing by whatever construction means, or upon placement of the horizontal structural members of the lowest floor, whichever is applicable, it shall be the duty of the permit holder to submit to the city building official a certification of the elevation of the lowest floor, floodproofed elevation, or the elevation of the lowest portion of the horizontal structural members of the lowest floor, whichever is applicable, as built, in relation to the mean sea level. Said certification shall be prepared by or under the direct supervision of a registered land surveyor or professional engineer and certified by same. When floodproofing is utilized for a particular building, said certification shall be prepared by or under the direct supervision of a professional engineer or architect and certified by same. Any work undertaken prior to submission of the certification shall be at the permit holder's risk. The city building official shall review the floor elevation survey data submitted. Deficiencies detected by such

review shall be corrected by the permit holder immediately and prior to further progressive work being permitted to proceed. Failure to submit the survey of failure to make said corrections required hereby, shall be cause to issue a stop-work order for the project.

(c) *Duties and responsibilities of the city building official.* Duties of the city building official shall include, but not be limited to:

(1) Review all development permits to assure that the permit requirements of this article have been satisfied.

(2) Advise permittee that additional federal or state permits may be required, and if specific federal or state permit requirements are known, require that copies of such permits be provided and maintained on file with the development permit.

(3) Notify Sarasota County and the Florida Department of Community Affairs prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency.

(4) Assure that maintenance is provided within the altered or relocated portion of said watercourse so that the flood-carrying capacity is not diminished.

(5) Verify and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, in accordance with section 6-248(b)(2).

(6) Verify and record the actual elevation (in relation to mean sea level) to which the new or substantially improved structures have been floodproofed, in accordance with section 6-248(b)(2).

(7) In coastal high hazard areas (V zones), certification shall be obtained from a registered professional engineer or architect that the structure is designed to be securely anchored to adequately anchored pilings or columns in order to withstand velocity waters and hurricane wave wash.

(8) In coastal high hazard areas (V zones), the city building official shall review plans for adequacy of breakaway walls in accordance with section 6-249(b)(4)(h).

(9) When floodproofing is utilized for a particular structure, the city building official shall obtain certification from a registered professional engineer or architect, in accordance with section 6-249(b)(2).

(10) Where interpretation is needed as to the exact location of boundaries of the areas of special flood hazard (for example, where there appears to be a conflict between a mapped boundary and actual field conditions) the city building official shall make the necessary interpretation. The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in this article.

(11) When base flood elevation data or floodway data have not been established, then the city building official shall obtain, review and reasonably utilize any base flood

elevation and floodway data available from a federal, state or other source, in order to administer the provisions of section 6-249.

(12) All records pertaining to the provisions of this article shall be maintained in the office of the city building official and shall be open for public inspection.

(d) *Variances.*

(1) The city board of adjustments and appeals (board) is hereby authorized to grant variances from the requirements of this article. Variances shall normally be granted only for lots which are contiguous to, or substantially surrounded by, lots with existing structures below the base flood level. Unless exceptional circumstances are shown, variances shall not be granted for lots of greater than one-half acre in size.

(2) Variances, when otherwise permissible pursuant to this section, shall only be granted upon a determination by the board, based upon competent substantial evidence presented by the applicant, that:

a. The granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances; and

b. The lot in question is so small or has such unusual characteristics that the prescribed standards cannot be met without some relief so as to allow a reasonable use of the property.

(3) Only the minimum variance necessary shall be granted to afford relief, considering the flood hazard.

(4) A variance can be granted for a functionally dependent facility where a showing is made that the facility cannot be utilized if it is required to meet the minimum lowest floor elevation required in a specific flood hazard zone.

(5) The zoning administrator shall provide written notification to applicants for variances that:

a. The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as twenty-five dollars ($25.00) for one hundred dollars ($100.00) of insurance coverage; and

b. Such construction below the base flood level increases risks to life and property.

Such notification shall be maintained with a record of all variance actions.

(6) A variance granted under this article shall expire with one hundred eighty (180) days from the date of the document granting the variance unless a valid building permit is issued within said one hundred eighty-day period and construction is carried to completion under said building permit; provided, however, that the board may, for good cause shown, grant an extension of the one-hundred-eighty-day period not to exceed an additional one hundred eighty (180) days. (Ord. No. 1065-84, § 1, 1-10-84; Ord. No. 1260-87, § 3, 5-12-87)

Sec. 6-249. Provisions for flood hazard reduction.

(a) *General standards.* In all areas of special flood hazard (A and V zones) the following provisions are required:

(1) New construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure;

(2) Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable state requirements for resisting wind forces;

(3) New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage;

(4) New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage;

(5) Electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;

(6) New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;

(7) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters;

(8) On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding; and

(9) Any alteration, repair, reconstruction or improvements to a structure which is in compliance with the provisions of this article, shall meet the requirements of "new construction" as contained in this article.

(b) *Specific standards.* In all areas of special flood hazard (A and V zones) where base flood elevation data have been established, the following provisions are required:

(1) *Residential construction.* New construction or substantial improvement of any residential structure shall have the lowest floor, including basement, elevated no lower than the base flood elevation as shown on the FIRM. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate the unimpeded movements of flood waters shall be provided in accordance with standards of section 6-249(b)(3).

(2) *Nonresidential construction.* New construction or substantial improvement of any commercial, industrial, or nonresidential structure shall have the lowest floor, including basement, elevated no lower than the level of the base flood elevation as shown on the FIRM. Structures located in all A zones may be floodproofed in lieu of

being elevated provided that all areas of the structure below the required elevation are watertight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification shall be provided to the city building official as set forth in section 6-249(b)(3).

(3) *Elevated buildings.* New construction or substantial improvements of elevated buildings that include fully enclosed areas formed by foundation and other exterior walls below the base flood elevation shall be designed to preclude finished living space and designed to allow for the entry and exit of floodwaters to automatically equalize hydrostatic flood force on exterior walls.

a. Designs for complying with this requirement must either be certified by a professional engineer or architect or meet the following minimum criteria:
   1. Provide a minimum of two (2) openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
   2. The bottom of all openings shall be no higher than one foot above grade; and
   3. Openings may be equipped with screens, louvers, valves or other coverings or devices provided they permit the automatic flow of floodwaters in both directions.

b. Electrical, plumbing and other utility connections are prohibited below the base flood elevation;

c. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment used in connection with the premises (standard exterior door) or entry to the living area (stairway or elevator); and

d. The interior portion of such enclosed area shall not be partitioned or finished into separate rooms.

(4) *Coastal high hazard areas (V zones).* Located within the areas of special flood hazard established are areas designated as coastal high hazard areas. These areas have special flood hazards associated with wave wash, therefore, the following provisions shall apply:

a. All buildings or structures shall be located at least one hundred fifty (150) feet landward of the reach of the mean high tide or landward of the State Coastal Construction Control Line, whichever is further landward.

b. All buildings or structures shall be elevated so that the bottom of the lowest supporting horizontal member (excluding pilings) is located no lower than the base flood elevation level as shown on the FIRM, with all space below the lowest supporting member open so as not to impede the flow of water. Open lattice work or decorative screening may be permitted for aesthetic purposes only and must be designed to wash away in the event of abnormal wave action and in accordance with section 6-249(b)(4)(b).

c. All buildings or structures shall be securely anchored on pilings or columns.

d. All pilings and columns and the attached structures shall be anchored to resist flotation, collapse and lateral movement due to the effect of wind and water loads acting simultaneously on all buildings components. The anchoring and support system shall be designed with wind and water-loading values which equal or exceed the one hundred-year mean recurrence interval (one per cent annual chance flood).

e. A registered professional engineer or architect shall certify that the design, specifications and plans for construction are in compliance with the provisions contained in section 6-249(b)(4)(b), (c) and (d).

f. There shall be no fill used as structural support. Noncompacted fill may be used around the perimeter of a building for landscaping/aesthetic purposes provided the fill will wash out from storm surge, (thereby rendering the building free of obstruction) prior to generating excessive loading forces, ramping effects, or wave deflection. The city building official shall approve design plans for landscaping/aesthetic fill only after the applicant has provided an analysis by an engineer, architect, and/or soil scientist, which demonstrates that the following factors have been fully considered:
   1. Particle composition of fill material does not have a tendency for excessive natural compaction;
   2. Volume and distribution of fill will not cause wave deflection to adjacent properties; and
   3. Slope of fill will not cause wave run-up or ramping.

g. There shall be no alteration of sand dunes or mangrove stands which would increase potential flood damage.

h. Lattice work or decorative screening shall be allowed below the base flood elevation provided they are not part of the structural support of the building and are designed so as to breakaway, under abnormally high tides or wave action, without damage to the structural integrity of the building on which they are to be used and provided the following design specifications are met:
   1. No solid walls shall be allowed; and
   2. Material shall consist of lattice or mesh screening only.

i. If aesthetic lattice work or screening is utilized, such enclosed space shall not be designed to be used for human habitation, but shall be designed to be used only for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises.

j. Prior to construction, plans for any structures that will have lattice work or decorative screening must be submitted to the city building official for approval.

k. Any alteration, repair, reconstruction or improvement to a structure shall not enclose the space below the lowest floor except with lattice work or decorative screening, as provided for in section 6-249(b)(4)(h) and (i).

l. Prohibit the placement of manufactured homes except in an existing manufactured home park or subdivision. A replacement manufactured home may be placed on a lot in an existing manufactured home park or subdivision provided

the anchoring standards of section 6-249(a)(2) and the elevation standards of section 6-249(b)(1) are met.

(c) *Standards for subdivision proposals.*

(1) All subdivision proposals shall be consistent with the need to minimize flood damage;

(2) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;

(3) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards; and

(4) Base flood elevation data shall be provided for subdivision proposals and other proposed development (including manufactured home parks and subdivisions) which is greater than the lesser of fifty (50) lots or five (5) acres. (Ord. No. 1065-84, § 1, 1-10-84; Ord. No. 1260-87, § 4, 5-12-87)

Sec. 6-250. Amendments to federal regulations.

In the event there is a future amendment to the Federal FEMA Regulations that conflicts with the provisions of this article, then any such amended federal regulations shall supersede this article and the city building official and the city board of adjustment and appeals shall administer and enforce this article as amended by any such superseding federal regulations. (Ord. No. 1065-84, § 1, 1-10-84; Ord. No. 1260-87, § 5, 5-12-87)

Secs. 6-251, 6-252. Reserved.

Editor's note—Ord. No. 1260-87, § 6, adopted May 12, 1987, repealed § 6-251, conflicts with other laws, etc., and § 6-252, special exceptions, in their entirety. Former §§ 6-251 and 6-252 derived from Ord. No. 1065-84, § 1, adopted January 10, 1984.

Secs. 6-253—6-262. Reserved.

ARTICLE XIV. COASTAL CONSTRUCTION CODE*

Sec. 6-300. Title.

The provisions contained herein shall constitute the Coastal Construction Code for construction within the coastal building zone of the City of Venice and shall be referred to as the "coastal code". (Ord. No. 1248-87, § 1, 1-13-87)

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*Editor's note—Ord. No. 1248-87, § 1, adopted January 13, 1987, amended the Code by adding a new Art. XIV, §§ 6-300—6-306. Ord. No. 1220-86, § 1, adopted August 12, 1986, rescinded former Art. XIV, the coastal construction code, in its entirety. Former Art. XIV, §§ 6-300—6-317, derived from Ord. No. 1197-86, § 1, adopted March 11, 1986. Section 2 of Ord. No. 1197-86 had repealed the former Art. XIV, dangerous buildings, §§ 6-277—6-282, which derived from the Code of 1982.

Sec. 6-301. Generally.

The purpose of the coastal code is to provide minimum standards for the design and construction of buildings and structures to reduce the harmful effects of hurricanes and other severe storms occurring along the coastal area of the City of Venice which fronts on the Gulf of Mexico. These standards are intended to specifically address design features which affect the structural stability of the beach, dunes, and topography of adjacent properties. The coastal code only applies to the coastal building zone as defined herein. In the event of a conflict between the coastal code and other chapters of the City Code, the requirements resulting in the more restrictive design shall apply. No provisions in the coastal code shall be construed to permit any construction in any area otherwise prohibited by city, county, state or federal regulation. (Ord. No. 1248-87, § 1, 1-13-87)

Sec. 6-302. Scope.

(a) *Applicability.* The requirements of this coastal code shall apply to the following types of construction in the coastal building zone in the city:

(1) The new construction of, or substantial improvement to major structures, nonhabitable major structures, and minor structures as defined herein.

(2) Construction which would change or otherwise have the potential for substantial impact on coastal zone, including, but not limited to, excavation, grading and paving.

(3) For structures located partially within the coastal building zone the requirements of this coastal code shall apply to the entire structure.

(4) Reconstruction, redevelopment or repair of a damaged structure from any cause which meets the definition of substantial improvement as defined herein.

(b) *Exceptions.* The requirements of the coastal code shall not apply to the following:

(1) Minor work in the nature of normal beach cleaning and debris removal.

(2) Structures in existence prior to the effective date of the coastal code, except for substantial improvements as defined herein.

(3) Construction for which a valid and unexpired building permit was issued prior to the effective date of the coastal code.

(4) Construction extending seaward of the seasonal high-water line which is regulated by the provisions of Section 161.041, Florida Statutes, including, but not limited to, groins, jetties, moles, breakwaters, seawalls, piers, revetments, beach nourishment and inlet dredging.

(5) Construction of nonhabitable major structures as defined herein, except for the requirements of section 6-304(d).

(6) Construction of minor structures as defined herein, except for the requirements of section 6-304(e).

(7) Structures listed on the National Register of Historic Places or the State Inventory of Historic Places.

(8) Construction of improvements to a major structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions.

(c) *Application for permits.* Applications for building permits for construction in the coastal building zone shall be certified by an architect or professional engineer registered in the State of Florida. Such certifications shall state that the design plans and specifications for the construction are in compliance with the criteria established by this coastal code.

Sec. 6-303. Definitions.

The following terms are defined for general use in the coastal code:

(a) *Beach* means the zone of unconsolidated material that extends landward from the mean low water line to the place where there is marked change in material or physiographic form, or to the line of permanent vegetation, usually the effective limit of storm waves. "Beach" is alternatively termed "shore."

(b) *Breakaway wall* or *frangible wall* means a partition independent of supporting structural members that will withstand design wind forces, but which will fail under hydrodynamic, wave, and runup forces associated with the design storm surge. Under such conditions, the wall shall fail in the manner such that it breaks up into components which minimize the potential for damage to life or adjacent property. It shall be a characteristic of a breakaway or frangible wall that it shall have a horizontal design loading resistance of no less than ten (10) nor more than twenty (20) pounds per square foot.

(c) *Building support structure* means any structure which supports floor, wall or column loads, and transmits them to the foundation. The term shall include beams, grade beams, or joists, and includes the lowest horizontal structural member exclusive of piles, columns or footings.

(d) *Coastal building zone* means the land area between the seasonal high-water line of the Gulf of Mexico and a line one thousand five hundred (1,500) feet landward from the coastal construction control line.

(e) *Coastal construction control line* means the landward extent of that portion of the beach-dune system which is subject to severe fluctuations based upon a one hundred-year storm surge, storm waves, or other predictable weather conditions as established by the Department of Natural Resources in accordance with Section 161.053, Florida Statutes.

(f) *Construction* means the carrying out of any building, clearing, filling, excavation or substantial improvement in the size or use of any structure or the appearance of any land. When appropriate to the context, "construction" refers to the act of construction or the result of construction.

(g) *Dune* means a mound or ridge of loose sediments, usually sand-sized, deposited by natural or artificial means, which lies landward of the beach.

(h) *Major structure* includes but is not limited to, all residential buildings, including mobile homes; commercial, institutional and industrial buildings; and other construction having the potential for substantial impact on coastal zones.

(i) *Mean high-water line* means the intersection of the tidal plane of mean high water with the shore. Mean high water is the average height of high waters over a nineteen-year period.

(j) *Minor structure* includes but is not limited to pile-supported, elevated dune and beach walkover structures; beach access ramps and walkways; stairways; pile-supported elevated viewing platforms, gazebos, and boardwalks; lifeguard support stands; public and private bathhouses; sidewalks, driveways, parking areas, shuffleboard courts, tennis courts, handball courts, racquetball courts, and other uncovered paved areas; earth-retaining walls, sand fences, privacy fences, ornamental walls, ornamental garden structures, aviaries, and other ornamental construction. It shall be a characteristic of minor structures that they are considered to be expendable under design wind, wave, and storm forces.

(k) *Mobile home* means manufactured housing which conforms to the Federal Manufactured Housing Construction and Safety Standards or the Uniform Standards Code ANSI A-119.1 pursuant to Section 320.823, Florida Statutes.

(l) *Nonhabitable major structure* includes but is not limited to swimming pools; parking garages, utility sheds, pipelines; piers; canals, lakes, ditches, drainage structures, and other water retention structures; water and sewage treatment plants; electrical power plants, transmission and distribution lines, transformer pads, vaults, and substations; roads, bridges, streets, and highways; and underground storage tanks.

(m) *NGVD* means National Geodetic Vertical Datum, a geodetic datum, established by the National Ocean Service and frequently referred to as the 1929 Mean Sea Level Datum.

(n) *One-hundred-year storm* or *100-year storm* means a shore incident hurricane or any other storm with accompanying wind, wave, and storm surge intensity having a one per cent chance of being equaled or exceeded in any given year, during any one-hundred-year interval.

(o) *Seasonal high-water line* means the line formed by the intersection of the rising shore and the elevation of one hundred fifty per cent (150%) of the local mean tidal range above mean high water.

(p) *Substantial improvement* means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds a cumulative total of fifty per cent (50%) of the market value of the structure either:

(1) Before the repair or improvement is started; or

(2) If the structure has been damaged and is being restored, before the damage occurred.

For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either any project for improvement of a structure to comply with

existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions; or any alteration of a structure listed on the National Register of Historic Places or the State Inventory of Historic Places. (Ord. No. 1248-87, § 1, 1-13-87)

Sec. 6-304. Coastal construction requirements.

(a) *General.* Construction within the coastal building zone shall meet the requirements of this article. All structures shall be designed so as to minimize damage to life, property, and the natural environment. Assistance in determining the design parameters to minimize such damage may be found in the reference documents listed in section 6-305.

(b) *Structural requirements for major structures.*

(1) Design and construction: Major structures, except for mobile homes, shall be designed and constructed in accordance with Section 1205 of the 1986 revisions to the 1985 Standard Building Code using a fastest-mile wind velocity of one hundred ten (110) miles per hour. Major structures, except mobile homes, shall also comply with the applicable standards for construction found elsewhere in the adopted version of the Standard Building Code.

(2) Mobile homes: Mobiles homes shall conform to the Federal Mobile Home Construction and Safety Standards or the Uniform Standards Code ANSI A119.1, pursuant to Section 320.823, Florida Statutes, as well as the requirements of section 6-304(b)(3).

(3) Elevation, floodproofing, and siting: All major structures shall be designed, constructed and located in compliance with the National Flood Insurance program Regulations as found in 44 CFR, Parts 59 and 60 or Article XII of Chapter 6 of the City Code, whichever is more restrictive.

(c) *Design conditions.*

(1) Velocity pressure: Major structures, except mobile homes, shall be designed in accordance with the requirements of Section 1205 of the 1986 revisions to the 1985 Standard Building Code using a minimum fastest-mile wind velocity of one hundred ten (110) miles per hour. The minimum design pressures are as follows:

Building Height Sixty Feet or Less

Mean Roof Height (feet)	*Velocity Pressure (psf)*
0—15	25
20	28
40	34
60	38

Building Height Greater than Sixty Feet

Height (feet)	*Gust Velocity Pressure (psf)*
0— 30	35
31— 50	40
51—100	47
100—200	54
200—300	61
300—400	66
400—500	70

(2) Foundations: The elevation of the soil surface to be used in the design of foundations, calculation of pile reactions and bearing capacities shall not be greater than that which would result from the erosion reasonably anticipated as a result of design storm conditions. Foundation design and construction of a major structure shall consider all anticipated loads acting simultaneously with live and dead loads. Erosion computations for foundation design shall account for all vertical and lateral erosion and scour-producing forces, including localized scour due to the presence of structural components. Foundation design and construction shall provide for adequate bearing capacity taking into consideration the type of soil present and the anticipated loss of soil above the design grade as a result of localized scour. Erosion computations are not required landward of coastal construction control lines established or updated since June 30, 1980. Upon request, the Department of Natural resources may provide information as to those areas within coastal building zones where erosion and scour of a one-hundred-year storm event is applicable.

(3) Wave forces: Calculations for wave forces resulting from design storm conditions on building foundations and superstructures may be based upon the minimum criteria and methods prescribed in the "Naval Facilities Engineering Command Design Manual, NAVFAC DM-26, " U.S. Department of Navy; Shore Protection Manual, U.S. Department of the Army Corps of Engineers; U.S. Department of the Army Coastal Engineering Research Center Technical Papers and Reports; the Technical and Design memoranda of the Division of Beaches and Shores, Florida Department of Natural Resources; or other professionally recognized methodologies which produce equivalent design criteria. Breaking, broken, and nonbreaking waves shall be considered as applicable. Design wave-loading analysis shall consider vertical uplift pressures and all lateral pressures to include impact as well as dynamic loading and the harmonic intensification resulting from repetitive waves.

(4) Hydrostatic loads: Calculations for hydrostatic loads shall consider the maximum water pressure resulting from a fully peaked, breaking wave superimposed upon the design storm surge with dynamic wave setup. Both free and hydrostatic loads shall be considered. Hydrostatic loads which are confined shall be determined by using the maximum elevation to which the confined water would freely rise if unconfined.

Vertical hydrostatic loads shall be considered both upward and downward on horizontal or inclined surfaces of major structures (i.e., floors, slabs, roofs, walls). Lateral hydrostatic loads shall be considered as forces acting horizontally above and below grade on vertical or inclined surfaces. Hydrostatic loads on irregular or curved geometric surfaces shall be determined by considering the separate vertical and horizontal components acting simultaneously under the distribution of the hydrostatic pressures.

(5) Hydrodynamic loads: Hydrodynamic loads shall consider the maximum water pressures resulting from the motion of the water mass associated with the design storm. Full intensity loading shall be applied on all structural surfaces above the design grade which would affect the flow velocities.

(d) *Structural requirements for nonhabitable major structures.* Nonhabitable major structures need not meet the specific structural requirements of section 6-304(b), except that they shall be designed to produce the minimum adverse impact on the beach and dune system and shall comply with the applicable standards of construction found in the latest adopted version of the Standard Building Code. All sewage treatment and public water supply systems shall be floodproofed to prevent infiltration of surface water anticipated under design storm conditions. Underground utilities, excluding pad transformers and vaults, shall be floodproofed to prevent infiltration of surface water expected under sight storm conditions or shall otherwise be designed to function when submerged under such storm conditions.

(e) *Structural requirements for minor structures.* Minor structures need not meet the specific structural requirements of section 6-304(b), except that they shall be designed to produce the minimum adverse impact on the beach and dune system and shall comply with the applicable standards of construction found in the latest adopted version of the Standard Building Code.

(f) *Location of construction.* Construction, except for elevated walkways, lifeguard support stands, piers, beach access ramps, gazebos, and coastal or shore protection structures, shall be located a sufficient distance landward of the beach to permit natural shoreline fluctuations and to preserve dune stability. Construction, including excavation, may occur to the extent that the natural storm buffering and protection capability of the dune is not diminished.

(g) *Public access.* Where the public has established an access way through private lands to lands seaward of mean high tide or water line by prescription, prescriptive easement, or other legal means, development or construction shall not interfere with such right of access unless a comparable alternative access way is provided. The developer shall have the right to improve, consolidate, or relocate such public access ways so long as they are:

(1) Of substantially similar quality and convenience to the public;

(2) Approved by the city and approved by the Department of Natural Resources whenever improvements are involved seaward of the coastal construction control line; and

(3) Consistent with the coastal management element of the local comprehensive plan adopted pursuant to Section 163.3178, Florida Statutes. (Ord. No. 1248-87, § 1, 1-13-87)

Sec. 6-305. References.

Assistance in determining the design parameters and methodologies necessary to comply with the requirements of this article may be obtained from:

(1) Shore Protection Manual, U.S. Army Corps of Engineers, 4th edition, 1984.

(2) U.S. Department of the Army, Coastal Engineering Research Center's Technical Papers and Reports.

(3) Florida Department of Natural Resources, Division of Beaches and Shores Technical and Design Memoranda.

(4) Naval Facilities Engineering Command Design Manual, NAVFAC DM-26, U.S. Department of the Navy.

(5) Coastal Construction Manual, Federal Emergency Management Agency, February, 1986. (Please note that the wind design section is based upon the 1982 edition of the Standard Building Code with the 1984 accumulated amendments and not the 1985 edition of the Standard Building Code with the 1986 revisions as required by Section 161.55(1)(d), Florida Statutes.) (Ord. No. 1248-87, § 1, 1-13-87)

Sec. 6-306. Appeals.

(a) *Appeal procedure.* Decisions of the building official made in connection with the coastal code may be appealed to the board of adjustments and appeal. The board of adjustments and appeals shall have the same authority and shall follow the same procedures as set forth in the latest adopted version of the Standard Building Code. Notice of appeal shall be in writing and filed within ninety (90) days after the decision is rendered by the building official. The decision of the board of adjustments and appeals shall be final.

(b) *Coastal zone boundary disputes.* When there is a dispute concerning whether a structure is located within the coastal building zone, the determination by the building official shall be binding unless and until the property owner at his expense provides a survey by a duly registered surveyor showing that the structure in question is entirely outside the coastal building zone. (Ord. No. 1248-87, § 1, 1-13-87)

Secs. 6-307—6-329. Reserved.

d. *Gulf Front Setback.*

(1) *Shoreline Hazard Area.* To protect the coastal areas of the City directly exposed to the Gulf of Mexico from erosion and flooding; minimize future public expenditures for flood and erosion control measures; minimize future public expenditures for relief and/or restoration of projects following natural disasters or gradual erosion; ensure public access along the public beaches of the Gulf of Mexico; minimize erosion damage to adjacent property resulting from man-made structures; protect beaches, beachfront dunes, beachfront bluffs, and beachfront vegetation necessary for maintaining shoreline stability; and to ensure that coastal property and coastal waters retain their economic, recreational and aesthetic value for coastal property owners and the general public; no construction or excavation shall be undertaken within the shoreline hazard area which is defined as the area seaward of the gulf front setback line.

(2) *Definitions.* For the purpose of this section, the following definitions shall apply:

(a) *Gulf front setback line* means a line congruent to the 1978 coastal construction control line as depicted on the official zoning atlas or a distance of one hundred fifty (150) feet from the mean high waterline, whichever is greater.

(b) *Coastal construction control line* for the purposes of this zoning code, means the coastal construction control line as approved on July 18, 1978, by the head of the State of Florida Department of Natural Resources (Governor and Cabinet) under the provisions of Chapter 161.053, Florida Statutes, 1977,

and does not mean any subsequent revisions to that chapter affecting the location of said line.

(c) *Construction* means the placing, building, erection, extension, or material alteration of any structure the use of which requires a permanent or temporary location on the ground or attachment to a structure having a permanent or temporary location on the ground. "Construction" shall include the installation of parking lots, tennis courts, swimming pools, patios, or any similar hard-surfaced structures.

(d) *Excavation* means the removal, addition, or alteration of soil, sand or vegetation by digging, dredging, filling, drilling, cutting, scooping, or hollowing out with equipment generally used for the purpose of land development or construction.

(3) *Exceptions.*

(a) This prohibition on construction or excavation seaward of the gulf front setback line shall not apply to any modification, maintenance, or repair of any existing structure provided, however, that such modification, maintenance or repair is undertaken within the limits of the existing structure, and does not require, involve, or include any additions to, or repair or modification of, the existing foundation of that structure. The Building Official may authorize a modification or repair involving seawalls or additions and enclosures below the first dwelling floor or lowest deck of the existing structure upon receipt of an application from the owner of the property and upon the consideration of facts and circumstances, including adequate engineering data concerning shoreline stability and storm tides related to shoreline topography, design features of the proposed structures or activities, and potential impacts of the location of the structures, including effects upon the beach-dune system, which, in the opinion of the Building Official, clearly justify such a permit.

(b) Catwalks, stairs, footbridges, decks and other such similar structures designed to protect the dunes and beach vegetation while providing access to the beach may be constructed seaward of the gulf front setback line subject to all other applicable regulations.

(c) The provisions of this section may be temporarily waived by the City Manager where an emergency is declared to exist. In this instance, the City Manager may authorize fill, temporary construction, excavation, or any other action deemed necessary to protect life or property.

(Ord. No. 929-82, § 2, 1-12-82; Ord. No. 952-82, § 2, 7-27-82; Ord. No. 954-82, § 1, 6-25-82; Ord. No. 1071-84, § 2, 2-28-84; Ord. No. 1360-89, § 1, 4-11-89)

Developing A

Tolerant Building

DEVELOPING A TOLERANT BUILDING

Everyone is familiar with the story of "The Three Little Pigs". The three pigs built three houses: one of straw, another of twigs and one of bricks. The wolf did not have a problem with destroying the structures made out of straw and twigs. The last pig was able to outfox the wolf by being protected in a brick house. "Then I'll huff, and I'll puff, and I'll blow your house in", said the wolf. Well, the wolf huffed and he puffed, and he huffed and he puffed, and he puffed and he huffed; but he could not blow the house down. The moral of this folk tale is that one should never underestimate the importance of a well constructed building.

Hurricane winds are very similar to the wolf trying to blow down the pig's house. The time between the first rise in wind and rain squalls and a return to moderate winds after the storm is often about 24 hours. The integrity of the structure needs to be able to withstand wind forces for a long period of time. During Hurricane Andrew it was reported that brick structures performed relatively well, better than wood frame buildings. This study will review how structures fail during a hurricane and propose ways in which a homeowner can retrofit a structure in order to make it more tolerant to hurricane force winds.

In most cases, structures will receive damage after a hurricane, but it is the intent of this study to reduce that damage to a minimum.

Structural Impacts

Storm surge and wind are the two most powerful hurricane forces which impact structures. A storm surge creates wave actions that pound away at coastal structures. Beyond bracing elevated support beams and establishing a dune barrier, there is little that can be done to prevent structural damage.

Hurricane force winds are different in that existing structures can be retrofitted to withstand most of these powers. There are several different ways that wind impacts structures. These actions need to be reviewed in order to develop ways of securing structures from these forces.

In 1986 the Federal Emergency Management Agency published the Coastal Construction Manual, which reviews design guidelines and construction standards for coastal areas. The following text includes excerpts from this report.

Flowing wind exerts pressure on a structure and its component parts. The horizontal pressure on the front wall and a horizontal suction on the rear wall cause an overturning effect. Also, these wind pressures can slide the structure off its foundation. Since the wind speeds up as it flows over the roof, it tends to suck the roof upward and

off. Internal pressures also change, especially if wind enters the building through failed windows or doors. With an opening in the windward wall, internal pressure increases; if an opening occurs in a side or leeward wall, internal pressure decreases. A common myth about hurricane resistance is that windows should be left open to equalize internal and external pressures. In reality, if a wind enters a windward opening, the increased internal pressure on the roof and the walls is much more likely to cause damage than if the wind is acting only externally. The elevation above grade of the roof of the house is a particularly important parameter in determining wind uplift forces. As the roof height increases, there is an increased uplift force on the rafter connections and related components down through the foundations.

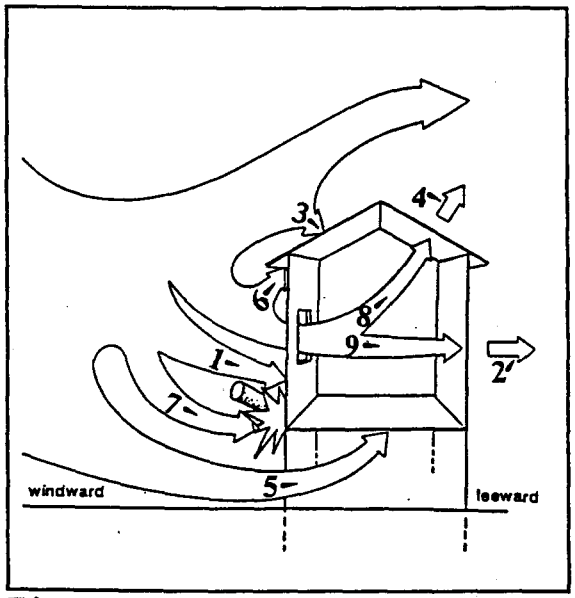


Figure D-1 WIND FORCES GENERATED BY HURRICANES

Figure D-1 shows the wind forces generated by a hurricane. The numbers relate to the following descriptions:

1. Direct lateral pressure against windward surfaces of the walls and piles;

2. Suction on leeward surface of walls and piles and on surface parallel to the wind direction;

3. Direct downward pressure on windward roof slope;*

4. Uplift suction on leeward roof slope;

5. Direct uplift pressure on floors and decks;

6. Direct uplift pressure on eaves;

7. Lateral impact pressure from debris;

8. Direct uplift pressure on interior roof surface;**

9. Direct lateral pressure on interior roof surface;**

* Depending on roof slope and building shape.

** If wind penetrates to interior of building, downward force would also affect floor.

The December 1992/January 1993 Fine Homebuilding Magazine (No. 78) relates in a realistic way the wind forces which were experienced during Hurricane Andrew in the story "Hurricane Warnings" by Charles Miller. The following excerpt is from that story. "In general, houses were destroyed in one of two ways: constant gnawing or sudden collapse. Constant gnawing begins with the

hurricane getting a finger into the house--usually at the roof. The roofing material peels away at the gable ends or eaves, exposing the edges of the roof sheathing. If it picks off a piece of sheathing, the wind shoves a torrent of rain down the attic 's throat. Saturated, the gypsum-board ceilings collapse. Then the wind is inside the house, and while the structure may survive, the interior and its contents are demolished. Sudden collapse occurs when the shell of the house is breached instantaneously. For example, a garage door facing the wind blows in, and the full force of the gale hits the interior. The wind has to go somewhere, and it may blow out windows, doors, walls or the roof. A smaller breach, like a roof tile bursting through a window, can have the same effect.

The most important factor in preventing major wind damage is ensuring that the building envelope is properly secured from wind entering the structure.

Single-Family and Multi-Family Structures

The Miami Herald listed the following hurricane losses concerning residential structures:

Single-Family Homes
* 8,373 destroyed
* 37,245 with major damage
* 40,632 with minor damage

Multi-Family Structures
* 10,719 destroyed
* 13,995 with major damage
* 13,889 with minor damage

These staggering numbers should not only represent structures but should also reflect the people and communities that were part of the destruction. The following questions need to answered:

* Why did it happened?

* What could have been done to prevent the disaster?

This study will try to address these issues.

Old versus New

Most of the Hurricane Andrew aftermath reports indicated that structures built prior to 1970 performed well during the hurricane and received minor damage.

The December 1992/January 1993 Fine Homebuilding Magazine (No. 78) reviewed the difference between structures which were in Hurricane Andrew in the article called "Hurricane Warnings" by Charles Miller. The following text is from the story.

Unless they were pelted with an unusual barrage of flying wreckage, the houses built during the 50's and 60's held up well. These homes have a lot in common with most of the houses built across the country at that time. They are one-story ranch houses but with some touches that make them unmistakably southern. The walls of these houses are made of concrete blocks set atop a reinforced slab which has been thickened at the edge to make a footing. Steel extends from the foundation to the tops of the walls at the corners and on

8-ft. centers, and the cells which contain the steel are filled with concrete. The tops of all the walls are bound together by a contiguous, poured-in-place concrete tie beam. If the house has a gable roof, it has a shallow slope, and the gable-end wall is all masonry. Steel straps cast into the tie beam anchor rafters, typically 4x6's made of Dade County pine, a strong, local rot-resistant conifer that is so hard that holes must be drilled for the nails. The roof decks are T&G planks secured to the rafters with two nails at each intersection.

The roofs on these houses range from inexpensive flat decks covered with tar and gravel to more costly shallow hip roofs (having a pitch of 3-in-12 or less) covered with clay barrel tiles. Both types did well in the hurricane.

The article also addressed structures which were built after the 1970's with the following comments:

"They started building one-story stick-framed houses with 2x4 roof trusses covered with plywood or OBS (oriented strand board) sheathing. To conserve land, more and more two-story houses popped up. They were framed in the same manner but built atop block walls for the first floor. In addition to the houses getting taller, the roofs started to get steeper, with more of what engineers call "gingerbread". Instead of hip roofs, a multitude of gable ends started showing up on houses. Gable roofs are cheaper to build than hip roofs; unfortunately, gable roofs also present a big target to the wind. Also, details such as tacked-on rake overhangs give the wind an extra handle to grab.

All of the Hurricane Andrew reports indicated that there were two types of structures: those which were built of quality materials having a good design, and well constructed, and the other structures, destroyed by the hurricane, which were completely opposite of the above descriptions. In both groups the owners did not become aware of the structural integrity of the houses until after the hurricane ordeal was over.

Home owners need to be aware of these issues, including what could be done to address the problems.

Structures in Venice

From 1926 to 1990 Venice has seen the development of approximately 12,449 housing units which consist of single-family units, multi-family units and mobile homes.

Mobile Homes:

Mobile homes first appeared in Venice in the 1960's, as reported by the 1970 U.S. Census which counted 772 units. By 1987 the City Building Department determined that City had a total of 2,456 mobile homes. The mobile homes in Venice are all located within the seven mobile home parks. In reviewing these parks, several park locations may experience more impacts by a hurricane than others. Harbor Lights Mobile Home Park is

located adjacent to Roberts Bay, and Venice Bay Mobile Home Park is located across from Harbor Lights and is next to the Intracoastal Waterway. Both parks are in areas which are low in elevations and next to waterways. These structures will be affected by storm surge in the event of a hurricane. Country Club Estates Mobile Home Park is located near the Intracoastal Waterway, but due to the high ground elevation a storm surge should not impact this area. Bay Indies Mobile Home Park is located near Curry Creek. The back section closest to the creek may be affected with high tides during a hurricane.
The September 24, 1992 Miami Herald newspaper listed the damages to mobile homes from Hurricane Andrew. The following impacts were reported:

* 8,974 destroyed
* 1,100 with major damage
* 519 with minor damage

Mobile homes are not designed for hurricane force winds. Residents of these structures need to know that they have to evacuate to a safe shelter whenever there is a potential hurricane threat. Until these structures are designed to withstand hurricane forces, the City should not encourage the placement of new mobile homes.

Retrofitting Existing Structures:

Older structures are normally considered sturdier due to some of the following reasons:

* Materials are of a better quality.
* Prior to plywood, tongue and groove boards were used for sheathing.
* Workmanship is better.

There are two problems which are associated with older structures. First, structures in some cases are not properly maintained; and second, most structures are always being modernized or retrofitted. Both problems may be related.

An example is the replacement of a wooden window that leaks. The owner may elect to remove the older wooden window that may have rotted and replace it with a newer aluminum window which may be larger and less sturdy. Older structures which were built prior to central air conditioning were later retrofitted to allow for the air system by the removal and rearranging of support beams in the attic. In some cases this type of work may endanger the soundness of the structure. Older structures need to be reviewed periodically to ensure that they are structurally sound.

On December 21, 1992 FEMA published a booklet titled "Building Performance: Hurricane Andrew in Florida". This report reviewed the issues related to the reasons why structures failed during Andrew and also listed structural recommendations for addressing these problems. This document is a useful tool in assisting homeowners who want to secure their homes from hurricane forces.

There are several improvements a homeowner can add to a house to increase its hurricane

tolerance and also increase its chances of surviving the forces of a hurricane.

Roofing:

There were several roofing problems which created damage from Andrew:

* Sheathing was not nailed properly. Nails and staples missed their mark and were not holding the sheathing to the roof.

* Roof framing was not properly braced or strapped with ties. This problem included the roof trusses.

* Gable roofs failed due to lack of bracing.

Homeowners could protect their property by preventing these problems from occurring.

The following suggestions are offered to assist a homeowner in retrofitting a roof:

* When re-roofing, have the roofer or contractor re-nail the sheathing. The corners are the most important areas on the roof; it is better to have too many nails than not enough.

* Review the framing of the roof from the attic with an architect or engineer. Request in writing the results of the review as it relates to hurricane tolerance and the building code.

* Check for hurricane straps and bracing patterns. If the structure is missing these supports, the owner should install them.

* If a homeowner has any questions or concerns about the integrity of the roof or any other part of the structure, he/she should contact the local Building Department for advice.

Garage Doors:

In most cases, the garage door area is the largest opening in a house. During Hurricane Andrew, it was reported that single-car garage doors performed better than two-car garage doors. The two main areas of the garage door which failed during the hurricane are the track support and the door panels.

Homeowners can reduce the damage to the house and the garage door by:

* Bracing the inside of the door with 2 x 4's or other materials which would strengthen the door.

* Reviewing the supports which hold the tracking and replace, if necessary, with better materials.

* If an owner is replacing a garage door, he/she should receive documentation from the manufacturer ensuring that the new door meets or exceeds the standard codes concerning wind loads and hurricane force winds. These documents should reflect that the door has specific design features which would withstand hurricane force winds of 110 miles per hour or better.

Windows and Doors:

For centuries, shutters have

been an important part of structures in Florida. Albert Manucy's book, The Houses of St. Augustine - 1565-1821, reveals that during that time period shutters were used on all structures. There were several different types of shutters.

Until 1763 inside shutters and rejas (wooden gratings) were used on windows. After 1763, outside shutters, rejas and bannistered and latticed windows were common. These fixtures provided ventilation, privacy, security and protection from the weather.

Through the years the role of shutters changed from functional to ornamental. This change evolved from attaching wooden shutters without hinges, making them non-functional, to replacing wooden shutters with plastic look-alike shutters. Venice still has several homes which were built during 1926 with shutters.

In place of shutters, there are several ways a homeowner can protect the windows from strong winds:

* Plywood attached to the wall in front of the window;

* Metal storm panels which slide into brackets attached to the structure;

* Metal shutters which roll up and down manually or by electrical means.

Hurricane Proofing:

Commercial products which claim to protect structures during a hurricane should supply documentation to the buyer which supports their claim. This documentation should be in the form of a certified drawing or an approved document from one of the following organizations:

* Underwriters Laboratories, Inc.

* Southern Building Code Congress

* The Dade County (Florida) Product Control Division

* The United States Testing Company, Inc.

* Construction Research Laboratories

* Wingerter Laboratories, Inc.

Homeowner's Inspection List:

The Sarasota County Department of Emergency Management has published a two page form entitled "Hurricane Wind Self Inspection" (see support documents) to assist homeowners in determining the hurricane tolerance of their structures.

Observations

"History always repeats itself" is a statement which seems to be true about hurricanes and disasters. Every year coastal communities in the United States are trying to prepare themselves and their properties for a hurricane. Preparation for hurricanes should be a year-round concern. Addressing the issues stated in this study is easier over a long period of time than within a day or during the hours prior to an

approaching hurricane.

Education is the key to creating a hurricane tolerant community. Without communicating the lessons learned from Hurricane Andrew to everyone who lives in a hurricane community (which includes most of Florida), history will be repeated.

Element Conclusion

It is unfortunate that coastal communities experience hurricane tragedies on a regular basis. These events should be an example for other communities to prepare as if the community was going to war.

Addressing issues for developing a tolerant community is similar to purchasing an insurance policy for the City of Venice.

The study recommends the following:

* Coordinate with the State and with Sarasota County to obtain funds for the development of a Hurricane Educational Program. This program could consist of the following:

A. Brochures to assist homeowners in retrofitting their structures. Much of the information in this study could be used and condensed to develop one or several brochures.

B. Promote hurricane awareness by conducting an annual Hurricane Seminar which encourages Venice to become a Hurricane Tolerant Community.

C. Develop educational displays which could be placed in public buildings and used at public events.

D. Develop videos which could be made available to residents through the public library system.

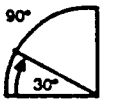
SUPPORT

DOCUMENTATION

HURRICANE WIND
HOME SELF INSPECTION

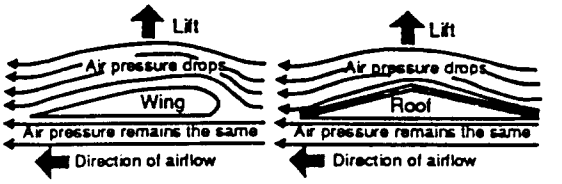
Will your house stand up to the forces of a catastrophic hurricane (Category 4 or greater)? Here is a check list that can help you decide whether you should stay in your home or leave due to high hurricane force winds. To answer some of these questions may require you to get up into your attic crawl space with a flashlight. You may feel more comfortable with an experienced engineer or contractor inspecting your home.

Whatever choice you make, take some time to do this well before the storm strikes.



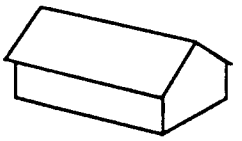
ROOF DESIGN

☐ Low pitched roofs are more vulnerable than steeper roofs because the same factors that make an airplane fly can help lift this roof type off the house.



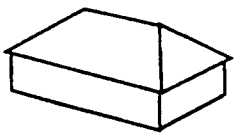
☐ Is your roof pitched less than 30 degrees from horizontal? ☐ Yes ☐ No

GABLE ROOF



Two Sloped Sides

HIP ROOF

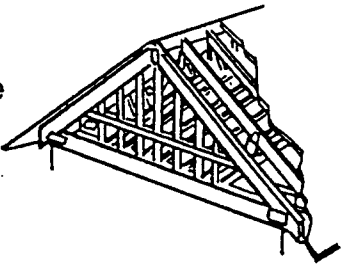


Four Sloped Sides

☐ Hip roofs seem to reflect winds better than gable designs. Is your roof hipped? ☐ Yes ☐ No

☐ Gables of masonry construction seem to perform better. If your roof is gabled, are the gabled ends of masonry construction? ☐ Yes ☐ No

☐ If your roof is gabled, are their braces behind the trusses at both ends, holding them in place? ☐ Yes ☐ No



☐ If your roof is gabled, are the ends of the trusses along the outside walls attached to the tops of the wall at all points with metal hurricane straps? ☐ Yes ☐ No

DID YOU KNOW?

☐ Steep roofs often experience structural failure at the ridges or gable ends where the wind's suction forces are high. Lower or gradually sloped roofs receive damage at roof corners.

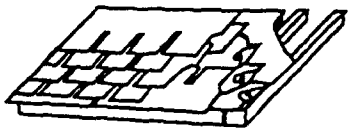
ROOF BRACING

☐ Are the roof trusses braced independently; that is, are their braces that connect the trusses together rather than the roof sheathing connecting the trusses together? ☐ Yes ☐ No

ROOF SURFACE

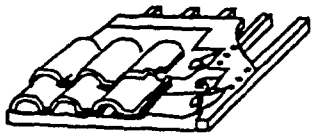
What kind of surface covers your roof?

☐ Asphalt or composite shingles



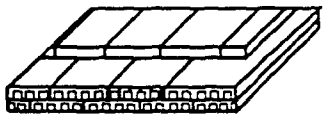
This common roof covering may start tearing off when winds reach 60 mph. Sometimes failure occurs due to installation damage (i.e., small tears left by staple guns or misplaced nails not allowing the next shingle layer to lay flat)

☐ Clay tiles



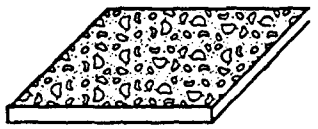
This roof covering is good but apt to shatter if hit by flying debris. Loose tiles can become projectiles and damage others.

☐ Concrete flat tiles



This roof covering also does well if it was well bonded to the mortar on the roof. Tiles that become loose can also become projectiles.

☐ Gravel



This roof does well if properly maintained. They should be recoated with asphalt and gravel periodically.

SUB ROOFING MATERIAL

☐ Is your subroof material plywood sheathing? ☐ Yes ☐ No

ROOFING CONNECTIONS

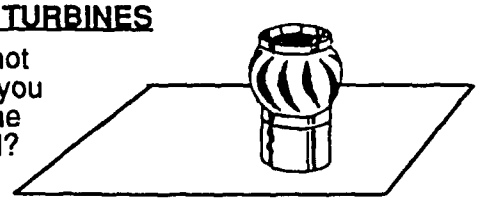
☐ Is the roofing material nailed or stapled? ☐ Nailed ☐ Stapled

☐ Do the nails or staples actually connect the sheathing to the roof trusses? ☐ Yes ☐ No

☐ Do hurricane straps or clips anchor the roof to the walls? ☐ Yes ☐ No

WIND TURBINES

☐ Wind turbines on roofs can be dangerous if not capped and secured during severe winds. If you have one of these on your roof can the turbine be removed, and can the opening be capped?



☐ Yes
☐ No

BLOCK AND FRAME HOME

☐ Is your home concrete block construction? ☐ Yes ☐ No

Concrete block homes are more forgiving of poor craftsmanship. They have more strength than wood framing.

WINDOWS AND DOORS

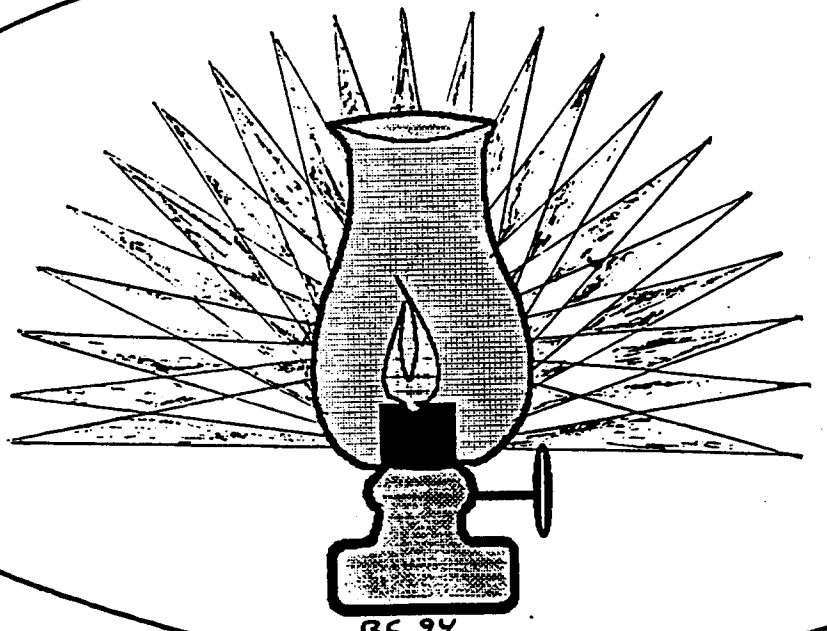
☐ Properly installed hurricane shutters or boards keep the winds out of the house, which in turn, places less uplift pressure on the roof. Do you have hurricane shutters installed on your windows or plan to board up your windows? ☐ Yes ☐ No

If you answered "No" to many of these questions, you should either: consider leaving your home and finding a safer place to stay when hurricane force winds are forecasted to reach 130 mph or greater.

OR

Strengthen your home to survive these winds. Consult a qualified contractor for further information.

Hurricane Damage Prevention Project



HURRICANE DAMAGE PREVENTION PROJECT

"IT'S A VERY DANGEROUS THING TO GO SO LONG BETWEEN HURRICANES. IT JUST CAUSES A LARGE NUMBER OF INCREDULOUS PEOPLE...NON-BELIEVERS." - Dr. Robert H. Simpson, Former Director at the National Hurricane Center in Miami, Florida. This epigraph was used in the beginning of the novel Condominium by John D. MacDonald. The story is based around a fictitious coastal community, the City of Athens, and the condominium owners/residents on the barrier island called Fiddler Key, located on the Gulf of Mexico.

The plot of the story centers around the community being destroyed by Hurricane Ella. Much of the story is based on sound facts as it relates to coastal development and the lack of knowledge that people have concerning hurricanes.

The City of Venice has a small part in the story in that the eye of Hurricane Ella passes over the City. The story and the people are fictitious, but the truth is that it is not far from being real. It is not uncommon for hurricane survivors to state that if they knew what it was going to be like during a hurricane they would have evacuated to a shelter.

During the hurricane season (June 1 to November 30), most coastal communities become somewhat aware of hurricane preparedness through educational brochures and media programs which address general questions concerning hurricanes.

There may be a false sense of security in the community concerning hurricane awareness. In order to determine the community's attitude toward hurricane issues, a hurricane survey was conducted within the City. This study will review the results of the survey and suggest ways to develop community awareness. Venice's population is changing daily due to the City being a retirement community and a coastal resort area. Hurricane awareness needs to play an important role in the community in order to reach the new residents.

As stated in the other elements of this study, education is the main tool in creating a Hurricane Tolerant Community. Hurricane information which is clear and understandable to all residents needs to be provided at a local level.

Venice's Hurricane Survey

On January 25, 1994 the Venice Planning Department mailed hurricane survey packs to 70 condominium associations which are members of the South County Condominium and Apartment Association of Venice. Each pack consisted of 20 copies of the survey. The mailings were sent only to areas located within the City limits. Surveys were also distributed to local organizations and City employees.

By February 28, 1994 the City received 206 survey responses. The following reflects the

survey results:

1. Did you ever experience the power of hurricane force winds (Category 3 hurricane or greater)?

YES: 72 NO: 134

The question was followed by asking: **"If yes, where and when?".**

Seventy-six people responded with the year and location. The replies included:

* 1 Venice 1926

* 1 Miami 1926

* 1 New York 1926

* 1 Miami & St. Pete 1932 1940's

* 1 Stratford, CT 1938

* 6 Massachusetts & Rhode Island - 1938, '56,' 92

* 5 Tampa 1944, New York 1944, Miami 1945, Okinawa '45 or '46, Long Island 40's & 50's

* 5 Long Island 1950, Palm Beach 1952, Panama City 1953, Maine 1955, Nova Scotia, Canada '54 or '55

* 1 1950's Hurricane Carol & 80's Hurricane Gloria

* 6 Venice 1960, Miami 1960, Donna 1960, Coast of Florida 1965, Nassau 1966, New Jersey 1960's

* 1 Texas 1961, '77, '80

* 1 Corpus Christi 1968, Kobe, Japan 1975, Iowa 1977

* 4 Venice 1970, Miami 1970, Panama City 1978, Miami 1979

* 14 Venice 1980 (Elena), Venice '85, '86, '87, '88 (Agnes), Longboat Key 1985, Long Island '86-87

* 1 Andrew '92

* 15 Keith, Venice 1991, March 1993 Storm in Venice

One comment stated:

* "Next time around, define what you mean by hurricane so a civilian can understand it."

There were four responses which listed places without specifying dates: Mississippi Gulf Coast, New Jersey, Long Island and South China Sea-Typhoon.

2. Do you now live in an area that needs to evacuate in a category 3 hurricane?

YES: 124 NO: 32

I DO NOT KNOW: 50

One comment was received concerning the locations of category 3 hurricane areas:

*"Why did you not specify what Category 3 is?"

3. Do you think that a hurricane will impact the Venice area in the next ten years?

YES: 69 NO: 22

I DO NOT KNOW: 111

NO RESPONSE: 4

Two comments were noted:

*"This is highly possible, we should be prepared."

*"Unknown, maybe never, maybe 2 in one year."

4. Do you know of any issue that could be addressed that would reduce the impact of a hurricane in the Venice community?

Forty-six responses related to more defined evacuation routes being identified as well as the availability of emergency vehicles and supplies for evacuation to shelters. More shelters need to be established to accommodate the growing population.

Sample Comments:

*"Could specific areas be given specific evacuation routes so that not everyone heads to the same place?"

*"Stress the necessity for TV and radio stations to have auxiliary power available for notifying the public, and the public for keeping battery operated radios ready to receive emergency instructions; the need for flashlights, batteries, gas in autos, emergency food, etc."

*"Recruit and train volunteers to assist the evacuation process and assist at the shelters."

*"Complacency is your worst enemy -- old people don't care. I ran a condo for 10 years and could never get anyone interested in a plan for a hurricane."

*"Practice evacuations, airport evacuations?"

*"Education and communication to the danger. Knowledge of what to do, where to go, how to secure."

*"Continue info on preparation and evacuation procedures."

*"Possible updating evacuation routes & shelters."

*"Evacuation of people in mobile homes to designated safe buildings in the event of a hurricane."

*"A good evacuating plan to avoid confusion in the event of a hurricane."

*"Designate safe buildings for the site to be evacuated."

*"Warnings---What is the evacuation route?"

*"Early warning as possible, early evacuation and info to safe locations."

*"Knowing where to go in any emergency when one's shelter is no longer habitable."

*"Permanent evacuation route and shelters."

*"Good warning system -early- educate area residents on "DO'S & DON'TS." Evacuation route if needed--places to go."

*"Evacuation routes & emergency vehicles (transport) locations, deployment & use."

Eighteen responses related to a

more accurate and advanced weather forecasting system to better prepare citizens for evacuation. Particular attention to the aged and the physically impaired should be a priority in the early warning phase.

*"Everyone should be made to evacuate if it becomes hurricane force."

*"Accurate weather forecast, and update information on the possibility of a hurricane to the public with information on the preparation for a hurricane. If one should occur."

*"Early warning!!!"

*"Advance warning--24+ hours!"

*"More shelters with transportation available, possibly to an area north of Bradenton, many people refuse to leave home because of pets and the thought of driving in bad weather."

*"Make sure that all islands residents evacuate before a situation becomes critical and puts rescuers lives in danger trying to save those who want to stay put because they underestimate their peril."

*"Evacuation drills."

*"Impress on the people the importance of being prepared."

*"Preparedness with regard to food, emergency lighting, and evacuation plans."

*"Post evacuation signs on streets and roads."

Twenty-one responses related to continuing education in all aspects of disaster preparedness on a regular basis. This includes emergency contact phone numbers and guides easily accessible to all citizens. Some suggested that drills be performed to aid in the preparedness in large condominiums and multi-family units, performed by either the Fire or Police Department or the Red Cross.

Sample Comments:

*"Not enough knowledge about hurricanes."

*"A comprehensive plan--pre-hurricane and post hurricane. See attached."

*"Awareness, both to full time and part time residents."

*"More awareness of the destruction."

*"Continue to create public awareness of preparedness, example: last night I attended a SCCAAV meeting at the Community Center & heard talks on insurance and Chief Slapp's preparedness info."

Fourteen responses related to sea walls and the need for the beach renourishment project in order to reduce the damage from a hurricane.

Sample Comments:

*"Along shore line put stones."
*"Extend the beach."

*"The planned renourishment of our beach!"

* "More beach to stop high waves."

*"Restore the beach, shorten curve jetties, high sea walls, build a break water off shore."
*"Renovation of the Venice Beach."

*"Renourishment of beach.

Eleven responses related to updating building codes, not only for new construction but for existing structures, including mobile homes.

Sample Comments:

*"Hurricane Andrew showed us some shortcomings in the building code. Maybe some of the changes that are being suggested should be incorporated in Venice."

*"Tie down the roof at the beach pavilion. Instruct people how to secure their home before evacuating, like proper boarding up and tying down."

*"Window protection/building protection re: roofing. More extensive evaluation of existing codes re: mobile home retrofit & tie down."

*"Make sure air-conditioning units on top of buildings are secured."

*"Reinforce roofs, install storm shutters."

*"Review of building codes to determine whether changes are needed."

*"No more high rise condos-- keep totally away from waterfront."

*"How resistant to hurricane winds are Venice concrete block built condominium?"

*"No more building within flood area-- renovate buildings to withstand 130 mph winds-- educate residents as to actions to take.

*"Proper anchorage of all mobile homes and all carports. I have personally experienced the need of interior pressures in building as a storm progresses."

Nine responses related to proposing barriers in the Gulf which would prevent greater damage; also, changing the present draw bridges to fixed bridges was suggested.

Sample Comments:

*"Create artificial reefs."

*"The construction of a barrier reef to reduce high surf which accompanies hurricane."

*"Expedite road widening projects, construct fixed bridges."

*"Be sure all drawbridges are down and serviceable."

*"The evacuation would certainly be facilitated by the construction of at least one high-level, four lane bridge."

*"Larger bridges so people can get out faster."

Four responses related to prayer.

Sample Comments:

*"Pray!"

*"Why not try prayer?"

Four responses related to restricting the heights of buildings on the coast line along with requiring shutters on all buildings.

Sample Comments:

*"Installation of storm shutters on beach properties."

*"Hurricane shields erected throughout Gulf area."

Four responses related to flood control and storm water drainage system.

Sample Comments:

*"Flood control--away from beaches--back to I-75."

*"Make sure flood control plans are of the latest technology."

*"Yes - make sure to consider tidal wave flooding during & after hurricane, and storm drains!"

*"Yes. Raising the street at the end of the bridges so that we who work down town & live there can get off if it also rains."

Four responses related to traffic problems and a need for a better road system to inland areas for evacuation purposes.

Comments:

*"Primary issue would be traffic problems in evacuation. Bridges off the island and over loaded highway system in immediate area. Traffic lights would need control."

*"Improve the means of leaving the City to avoid traffic jams."

*"More roads going across our State."

*"Traffic! But how can that be controlled in an emergency?"

Two general comments were received for question #4:

*"The City's attitude of don't worry."

*"No -- I wish I did."

5. If areas of the Venice coastline need to be redeveloped after a hurricane, what new improvements would you like to see incorporated?

Forty-one responses centered around beach renourishment, aesthetics and ways of controlling erosion.

Sample Comments:

*"Get the beach replenished NOW. The delays are appalling and the City is responsible for much of this delay. To allow this to continue is criminal -- to lose the grants would be unforgivable. After the replenishing, the City should extend the planting of sea oats and other beach plants. It's only a small help but there is little else that can be done."

*"Whatever will maintain or improve the aesthetics & ecology-Based on consultations with "experts" qualified to make such decisions."

*"I feel that the State and Federal Government owe Venice the re-sanding of the beaches

to partly compensate for the great damage done by the installation of the Jetties."
*"Other than the problem with re-placing sand along the beaches & the jetties all seems to be in good shape."

*"More sand on Venice Beach and reduce length of twin jetties."

*"Additional beach area to absorb some of the Gulfs tidal action."

*"Restore beach, build corrective artificial reefs to form a protective barrier for beach and buildings along waterfront."

*"Water barrier and beach area renewed."

*"Beaches rebuilt."

*"More revetments."

*"There is no end to redeveloping a beach."

Forty-four responses centered around curtailing coastline construction, regulation of re-development and limiting the height of buildings.

Sample Comments:

*"Allow no rebuilding of damaged condos on the water line and no new building of any kind closer than 1000 feet from the water--preferably farther."

*"No new development along the shore line. Emergency health service and police service based on the Island. Stricter building codes and rigid enforcement of such codes."

*"Have a minimum set back from the water, even for replacement. Use taxpayer money to compensate owners if necessary."

*"It's almost too late. We never should have allowed condos to be built right on the water's edge."

*"No one should build to near the beach."

*"No building of housing or condominiums in the beach area of the Gulf of Mexico."

*"It's too late now for the most important feature of the Gulf coastline--but if restrictions were put on the proximity of high rises and buildings in general--to the coastline. I really believe that there would be less erosion of the beaches. This was not a problem years ago and we had many bad hurricanes in the 30's and 40's."

*"No beach front redevelopment!"

*"See the high-rises razed and the shores accessible to us peasants."

*"Less development."

*"A required building setback from tide line."

*"Restriction in areas that are vulnerable to hurricane damage and/or requirements for structures that meet high standards of resistance to strong winds."

*"Buildings moved further from shoreline, no more than two stories and built to hurricane standards.

*"The State needs to act to forbid private manipulation (building, dredging, etc.) of its barrier islands and building too close to ocean or gulf front. People in complete ignorance, put themselves and their homes in jeopardy to have a "view." This works -- in good weather. When bad weather hits or their constant "tinkering" with naturally occurring phenomena gets them in big trouble, they expect the taxpayers to bail them out!"

*"Leave the barrier islands free (of condos).

*"Do not rebuild any buildings, move sewer lines way back."

*"None, let it go back to its natural state."

*"Do not rebuild."

*"No condos on beach that are hi-rises."

*"Limitations on the number of high rises."

*"No new improvements, redevelop as it is now."

*"No redevelopment west of The Esplanade."

*"No buildings above 3 stories."

*"Building set-back from coast line, public access to the beach."

*"Buildings moved back from water front."

*"Every thing must go back away from the water as a start."

*"Greater buffer zones--eliminate beach high rise--more public use areas w/o high rise building."

*"Forbid condominiums on the beach front."

*"No development- revert back to natural state for public use as a park or recreational area."

*"Better sea walls, set limits on building from shoreline."

*"Tear down ALL condominiums--They are gradually going "down hill" any way."

*"Less/no redevelopment at the coast line --i.e. no buildings, piers, etc. Better to leave natural and let nature take its course. Also open undeveloped coast line would open all of the shore to the public, rather than a privileged few. There should be more, better access to this National, natural treasure."

Sixteen responses centered around the development of more public beach parks and recreation areas.

Sample Comments:

*"Leisure park at the end of The Esplanade to be reconstructed to be bigger and better, excellent socialization area - beautiful, etc."

*"Large beach like it used to be in 1970."

*"Sewer line along coast moved farther inland."

*"Development of a park where sewer system on gulf is located."

*"Possibly a wider coastline and the large cement pipe removed at the south end of Venice beach. Also white sand added to beautify Venice Beach."

*"Some type of public park-something like Sarasota with trees and walk ways."

*"Wind breakers - sand dunes and trees not buildings."

*"More beaches and sand."

*"More public access to beach."

*"More public park-beach access to spread the use over more area."

*"Caspersen Beach area could be developed to accommodate more tourists."

*"Enlarge Venice Beach & parking area."

*"Expansion of beach area."

*"Nothing -- just restore nice beaches where needed."

*"More public entrances and parking for Venice residents or visitors who wish to use the beaches without intruding on private property."

Seventeen responses centered around more detailed and stricter building codes along with coastal setbacks.

Sample Comments:

*"Common sense setback requirements for homes and Condos on the Gulf and elimination of those buildings or parts of buildings which project out into the Gulf thus almost ruin the beaches for those who wish to walk and enjoy the beaches, for instance San Marco and others where no semblance of planning appears to have existed by the authorities in charge at that time. Also, more public entrances and parking for Venice residents or visitors who wish to use the beaches without intruding on private people and properties."

*"Better inspection of buildings then they do now. Everything here is hurry up and go. Too much cheap labor that don't know what their doing."

*"Coastal zone enforcement of existing codes would be a substantial improvement over most existing structures."

*"I believe the current codes will require all buildings to withstand future hurricane force winds of category 4 and 5.

*"Safety restrictions on future buildings on coast line."

*"All new construction required to withstand hurricane force winds. Federal aid withheld for repair of damage to new construction in violation of codes."

*"Re-establish set-back codes so building is not permitted so close to coast line."

*"Wider beaches/stricter codes on future construction of buildings on the coastline."

*"Beach set back be increased."

*"Keep the high rise condo development across the street from the beach -- leave the "road-to-gulf" open area &

beach."

*"Regulations set up not to allow any high rise buildings within 1,000 feet of beach. No concrete palaces as Island Shores, Bermuda Sunsets. Spoils the esthetics look of the area. Save always the park, (south of the pier) never let to developers. Re-develop Jetty area. Making a park like atmosphere."

*"No building west of Tarpon Center or Esplanade."

*"No re-building directly on beach if over 50% destroyed--if re-building & necessary to put walls, rocks, etc. for protection have public access across their property to get to other beach areas. Every block put in public access walk (similar to Naples area)".

Twelve responses centered around removing, replacing or re-aligning the jetties.

Sample Comments:

*"Reduce length of jetty's and curve the ends to reduce loss of sand."

*"Studies on effect of jetty on coastline with possible farther extension of jetty and secondary jetties. Renourishment of beach important!"

*"The majority of the jetties should be removed in fairness to the future generations of Venetians. I also feel that the vacant lot owned by the City on the Esplanade, and which is apparently seldom used, should be utilized, that with proper planning it could park quite a few autos and a good entrance for walkers, surfers, etc."

*"Remove the intracoastal jetty (don't wait for a hurricane)".

*"Beach re-nourishment and a closer look at the Venice Jetties!"

*"Leave as is in our area, realign the jetty so that the natural flow of the tide carrying the sand is not impeded."

*"Any barrier such as the jetties should be eliminated."

*"Close the jetties & re-sand the Venice Beaches."

*"Build jetties like New Jersey coastline."

*"Take out intercoastal--that's causing our problems on the beach--NOW--Renourish beach now and have checked for loss on an annual basis."

*"Solve the Intercoastal inlet north of Venice. Bad need of redesign--money was available to solve it but being held up."

*"Beach re-nourishment and a closer look at the Venice Jetties!"

Eight responses centered around the reconstruction of sea walls and roads.

Sample Comments:

*"Reconstruction of sea walls and roadways."

*"Higher capacity roads."

*"Water barrier."

*"Build corrective artificial reefs to form a protective barrier for beach and buildings along waterfront."

*"Elimination of low spots at north end of Esplanade and also at Alhambra Ave. one block east of Esplanade, to allow evacuation without these areas being flooded."

Four responses centered around fixed bridges in place of draw bridges.

Sample Comments:

*"Replace draw bridge with stationary ones."

*"Lack of dependence upon draw bridges for evacuation."

Twelve general comments were received for question #5:

*"A disaster is impossible to predict. I have lived near the Gulf for over 25 years and fortunately the Venice area has escaped serious problems. The St. Patrick's Day tornado was the worst--but there was no way to warn residents of its coming."

*"Correct education would be a safeguard."

*"Higher insurance rates for people living on the waterfront."

*"New beach pavilion design, architectural control on designs of high rises, hold harmless on City for those who choose to redevelop."

*"Evaluate the situation and start from there."

*"Leave this up to our elected officials."

*"Will leave that decision up to the engineers, city officials and local support."

*"All schools should be moved off the Island of Venice."

*"FEMA without the Red Tape!!!"

*"Haven't thought about it."

*"Have no knowledge in this area."

*"I have not resided in Venice long enough to know sufficient about existing coast line."

The survey included an area for any additional comments or suggestions. The following is a list of the responses:

*"P.S. I think the City of Venice, the Fire and Police Department have pretty well things under control--No one can predict a "No Name Storm."

*"Concerted effort to educate people to evacuate. More places to receive evacuees."

*"Since Venice has never experienced a direct hurricane hit it is conceivable that our location is blessed and will never endure a "Hurricane Andrew." This is the consensus of many residents and suggests the possibility of a real disaster sometime in the future but not "IMBY"."

*"After experiencing the anticipation of Hurricane Andrew in the Venice Area, it seemed most the community was

well prepared, and took the threat quite seriously."

*"There are so many people now-then when I was young-but back then-Red Cross trucks, buses and army trucks were used to transport people to places that opened their doors for evacuees-places like Bay Pines Veterans Hospital and schools, well built brick and concrete structures. There aren't enough buildings like this-away from the coastline-too hold the many people there."

*"I think its a crime Allstate Insurance can cancel people's insurance because of an act of God, even though people are paying them for years---That is a crime."

*"What should every household have on hand? Appropriate phone numbers?"

*"Improve the ways to leave the island."

*"Having had to evacuate two times since 1970. I feel that each time the provisions for shelter were improved. Everyone should follow the directions of the officials."

*"Prepare all Civil Defense Dept. and coordinate with Police, Sheriff,D.P.W.,Fire and Power Co., Tel Co., Cable Co., Hospital, etc."

*"Although I have never suffered the threat of a serious hurricane, I do fear the threat of one if should occur. I believe that a lot of the construction in Florida is "old construction and is not equipped to with stand a serious hurricane. We should improve this matter. Perhaps some kind of "newsletter" to individuals in a "Hurricane Predicted Area" that would keep the families updated on the locations of shelters and where they would be available to the public in threat of a hurricane. Also, improve the roadways and buildings as well as the sea walls at the individuals (docks, sea walls, home) of the public in threat of a possible hurricane. We can't have an occurrence and then wonder where to go and what to do to find the proper shelter, medical care or any other help we (the public) may need. It is important to know all of this before a hurricane occurs. A lot of people don't realize the danger of a hurricane. Keep them posted.

Being a Floridian and speaking for a majority of the "Floridians" the beaches play an important role in our lives (fishing, boating, swimming, etc.). Getting a forecast is very important in an area such as ours. It is really vital to have a forecast which is accurate."

*"Hurricane Issues -- a comprehensive plan for pre-hurricane and post-hurricane conditions should be considered:

A. Pre-hurricane
   1. Evacuation plan-(routes and notice to the public).

   2. Prepare instructions and advice for the general public to be given to the media for airing when a hurricane is eminent.

   3. Designate shelters for people who cannot evacuate.

4. Recruit and train volunteers to assist the evacuation process and assist at shelters.

5. Special training for police and firemen.

6. Provide security for abandoned homes and businesses.

B. Post-hurricane
1. Make plans for temporary housing.

2. Make plans to treat the injured (volunteer nurses, doctors, medics, etc.).

3. Make plans to clean up debris.

4. Restore damaged utilities.

5. Know the procedure for obtaining financial assistance for the City and the general public. Consider meeting with proper officials in Homestead or other cities ravaged by "Andrew" who might share experience in coping with a serious hurricane."

The Venice Planning Department is very pleased with the number of surveys that were returned and would like to thank all the citizens who participated in this project.

Observations

If the answers to the first three survey questions were converted to percentages, the results would be as follows:

1. Did you ever experience the power of hurricane force winds (Category 3 hurricane or greater)?

YES: 34% NO: 65%

Thirty-six percent of the survey participants reported the hurricanes and locations. Nineteen percent of those people listed Hurricane Keith in 1988 and the March 1993 storm in Venice. Keith was a tropical storm which passed south of Venice. There was minor wind and rainfall associated with Keith in Venice. The March 1993 storm was a winter storm which had a mean wind speed of 45 mph with gusts up to 60 mph.

In both cases these events do not measure to a category 3 hurricane with wind speeds between 111 to 130 mph. Category 3, 4 and 5 hurricanes are considered major hurricanes.

Most of the other responses were related to major hurricanes which occurred from 1926 to 1992.

2. Do you now live in an area that needs to evacuate in a category 3 hurricane?

YES: 60% NO: 15%

I DO NOT KNOW: 25%

Seventy-five percent of the people who completed the survey indicated that they were aware of the need to evacuate in a category 3 hurricane.

Twenty-five percent indicated that they need information concerning hurricane evacuation areas in order to answer the question.

3. Do you think that a hurricane will impact the Venice area in the next ten years?

YES: 33% NO: 10%

I DO NOT KNOW: 53%

NO RESPONSE: 4%

This question was difficult to analyze because a pattern did not exist between the people who experienced hurricanes and those who didn't. All three answers were received from both groups.

4. Do you know of any issue that could be addressed which would reduce the impact of a hurricane in the Venice community?

Issues included:

* More evacuation shelters.
* Better defined evacuation routes.
* More accurate and advanced weather forecasting system.
* More community education concerning hurricane and disaster preparedness.
* Support for the beach renourishment project.
* Updating building codes.
* Converting the existing draw bridges to fixed span bridges.
* Restrict heights of coastal development.
* Promote shutters on all buildings.
* Improve the storm water system.
* Better traffic control and upgraded road system.

5. If areas of the Venice coastline need to be redeveloped after a hurricane, what new improvements would you like to see incorporated?

Survey results indicate that the public would like more information concerning hurricanes.

Suggested Improvements:

* Renourish beach.
* Prohibit redevelopment within an established distance from the beach. Regulate the heights of coastal buildings.
* Develop more public beach parks and recreation areas.
* Establish more stringent building codes.
* Remove, replace or re-align the jetties.
* Reconstruct sea walls and roads.
* Convert draw bridges to fixed span bridges.

Some of the general comments centered around concerns that some residents have for their neighbors, fearing that they

may not be aware of the powerful forces of a hurricane.

A large number of comments also indicated that there is a strong public need for more information on hurricane preparedness.

VINES Program

It is apparent that the survey reflects a community concern about the need for an effective early warning hurricane system. The City is addressing this issue by proposing an early warning communication system called "Venice Integrated Neighborhood Emergency System" (VINES). This system is designed to allow a computer system to automatically send pre-made emergency warning messages to people living in impact areas and evacuation areas.

VINES will be operated from the Venice Police Department, which is also the headquarters of the Venice Emergency Operation Center. VINES will have the capacity to use twenty-four phone lines at one time and will be able to send a sixty-second message to approximately 1,440 residents per hour.

VINES will be able to reduce the burden on the Police and Fire Departments during an emergency by alleviating the manual phone calling and reducing the door to door response. VINES will allow the emergency team to quickly address all community needs during an evacuation.

Element Conclusion

The results of this survey reflect a strong community desire to create a Hurricane Tolerant Community.

A Hurricane Damage Prevention Project (HDPP) should be a comprehensive program providing residents with the educational tools which enable them to understand and prepare for hurricanes.

The study recommends the following:

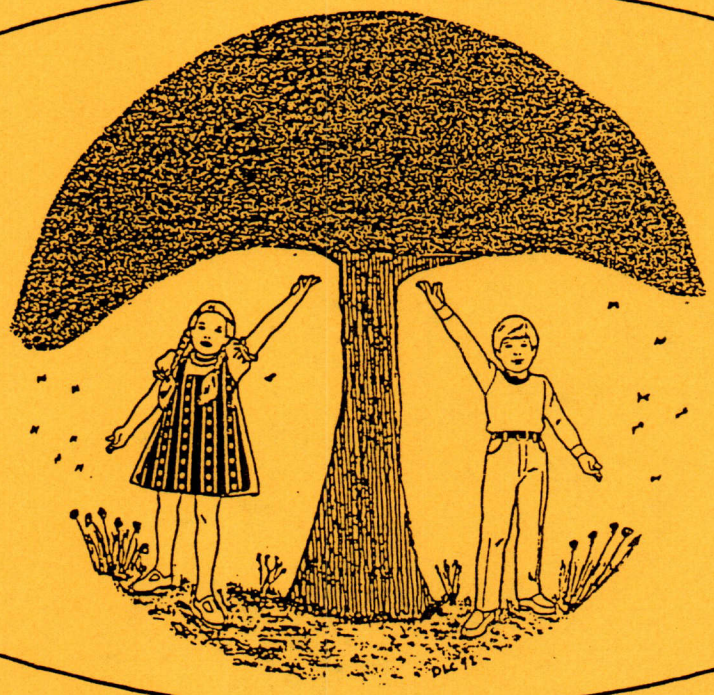
* Coordinate with the State in obtaining funds for the Venice Integrated Neighborhood Emergency System (VINES).

* Coordinate with the Venice Library to develop a Hurricane Information Center. The center would provide hurricane information by means of books, videos, displays and research materials. This facility could be funded through State and Federal grants.

* Coordinate with Sarasota County to develop a Hurricane Awareness Campaign. Activities could include brochures, seminars, and community lectures.

A community which is always prepared for hurricanes is a community which will endure the forces of nature and prevent many of the disastrous damages a hurricane can cause.

Growing Native



For Nature II

GROWING NATIVE FOR NATURE II

"THOSE THINGS ARE BETTER WHICH ARE PERFECTED BY NATURE THAN THOSE WHICH ARE FINISHED BY ART." Cicero: De Natura Deorum II. This quote may infer that when the balance of nature is changed by man, the interaction within nature will never be the same.

From the 1880's to the 1930's exotic trees and plants were imported and planted throughout Florida. The concept was to enhance the beauty of the existing native plants and to create different landscapes or themes within the state. Years later people became aware of some of the negative impacts that the exotic trees and plants had on the environment and the community. Communities which were affected by hurricanes learned that the trees which once enhanced their areas were also a large part of the problem that caused destruction.

The Australian Pine is an exotic tree which is found scattered throughout the island portion of Venice. This study will focus on the problems associated with exotic trees, particularly the Australian Pine, as these problems relate to hurricane disasters and will suggest ways of mitigating the problems.

Native Trees

Trees are just as important to a community as people and structures. Like people, trees contribute many amenities which enhance a community, such as:

A. Adding character and beauty;

B. Providing shade to reduce heat and glare;

C. Stabilization of soil;

D. Providing shelter and food for wildlife;

E. Controlling air pollution;

F. Buffering structures from the wind.

Most of the native trees are designed to provide all of the amenities listed above. Over long periods of time, trees and plants become native to an area because they develop a tolerance to the environment. The longevity of these trees is due to their adaptation to the climate and soil of the area.

The Venice area has several excellent native habitat areas throughout the City; however, there are other areas within the City where the exotic trees are taking over and are restricting the growth of native trees and plants. This study will later review the exotic tree survey that was conducted in Venice and suggest ways to address the exotic tree problem.

Introduction of Exotic Trees

In the 1920's and 30's, exotic trees and plants were promoted by nurseries in Florida. The Royal Palm Nurseries in Oneco, Florida published a booklet in the 1930's called the Tropical Planting Book.

The booklet stated: "This is the first catalog to be issued by the Royal Palm Nurseries since 1930. Yet even after so long a time we are still receiving innumerable requests for such a publication, indicating the real need for authentic information on the plants and
trees adapted to planting in Florida and the tropics, and for home and conservatory culture elsewhere".

The booklet listed numerous exotic tropical trees and plants from around the world including such places as India, Central America, Mexico, Brazil and the Philippines. The booklet described each tree which was available to the public to purchase. Brazilian peppers, Australian Pines and Melaleuca were all listed in the booklet, and today these trees are considered the three worst exotic trees that have invaded the Florida landscape.

The following is from the booklet:

Casuarina Species: Australian Pine. Beefwood or She-Oak. Tropical and Sub-tropical. Australia and Tropical Asia. The Casuarina is one of the best known and more widely used of all the ornamental trees in Florida; and by the use of the different varieties they may be grown in almost any section of the state. It may be used in hedges, as clipped specimens, for windbreaks, as shade trees and for street planting; and in fact may be used any place where a tree would be used. It thrives in practically any soil and is particularly rapid in growth and free of disease."

The above description promoted the Australian Pine as a wonder tree that would be an asset to any community in Florida. Communities learned too late that the Australian Pine and other exotic trees also posed some negative impacts to the community and environment.

Australian Pines

On December 8, 1925 John Nolen, Town and City Planner for Venice compiled a "Street and Park Planting List For Venice." This list catalogued the type and number of plantings for the Venice project for the B.L.E. Realty Corporation. The first tree on the list was the Casuarina Equisetifolia, Australian Pine. The paper also stated that 1,000 of these trees were planted in the street and park areas in Venice. Of the 4,770 trees planted in 1926, 20% of these trees were Australian Pines. Australian Pines are evergreen trees which grow to be between 100 to 150 feet in height. In Australia the tap roots of these trees will grow deep into the ground in order to find the water table. Along the Venice coastline, the ground water is only several feet below the surface. In order to adapt to the environment, the tree creates a system of surface roots which extend only to the water table and pan out in all directions from the trunk. This type of growth does not establish a good anchor system or a strong base for the tree.

The Florida Cooperative Extension Service published Circular 868 titled Exotic Woody Plant Control. This document reviews exotic trees

and plants in Florida. The following excerpt reviews the problems with Australian Pines from the study:

"Australian Pine was introduced into Florida in the late 1800's for use as windbreaks and to provide shade and lumber. It is a hardy, salt-tolerant species, which has become one of the three worst pest plants in South Florida. Because of its fast growth, it forms dense stands, which crowd out native vegetation. Litter produced under a stand of Australian Pines inhibits growth of other plants, and nitrogen fixing capability may give it an additional competitive advantages. Sensitivity to cold temperatures limits it to areas south of Orlando."

Farmers use these pines as windbreaks around groves to protect the orchids from the wind and climate. These trees are considered good barriers for protecting plants and structures from moderate winds but not from hurricane force winds. Australian Pines in coastal areas appear to be well rooted and very stable, but appearances are deceiving. It is noted by many people in the Forestry business that Australian Pines in coastal or wetland areas are prone to falling down and being uprooted during a hurricane.

Trees and Hurricanes

U.S. Department of Transportation Secretary Andrew Card, chairman of the Presidential Task Force Andrew, recapped the damage left by Hurricane Andrew in a press release on October 13, 1992:

"A recent newspaper article estimated that there is approximately 12 to 18 million cubic yards of debris to be collected." Much of the debris caused by a hurricane is either from falling trees or structural damage from trees or both.

The Florida Department of Agriculture and Consumer Services published a booklet called "Replanting the Urban Forest after Hurricane Andrew". Bob Crawford, Commissioner of Agriculture, provided the Foreword in the booklet. The following is an excerpt from his letter, which describes the devastation of trees and plants due to Andrew:

"Both aerial and ground examination of the tree damage revealed that poorly-formed and poorly-maintained native trees and numerous exotic tree and palm species broke apart or were uprooted by the storm. Although the evidence is not conclusive, it appears that pre-hurricane species composition and planting practice in urban and suburban areas resulted in extensive and unnecessary tree loss and associated property damage. This occurred as damage to structures and utilities, obstructed roadways and canals and posed a very real threat to human lives."

By understanding how hurricanes can impact structures and create debris, communities can learn how to prevent or eliminate some of the destruction.

There are four ways by which falling trees can impact a community during a hurricane:

1. Knocking down power lines and cutting off services;

2. Blocking roadways;

3. Damaging structures;

4. Blocking drainage systems.

All of these situations can be mitigated by developing ways of addressing the above problems.

Communities can regulate and alleviate these problems with the following methods:

1. Promote or regulate the distance that trees are placed from the above facilities.

2. Promote or regulate the types of trees (native, exotic) which are planted by the facilities.

3. Promote or regulate the removal of existing exotic trees located within a certain distance of the facility.

Tree Location and Tree Types

Communities should consider developing ways of educating the public and government agencies as to the appropriate tree types and locations for planting new trees. Small to medium maturing trees should be planted approximately 20 feet from all facilities, including power lines, houses, roads and drainage canals. Large maturing trees should be planted approximately 35 feet from the listed facilities. Trees being planted next to power lines should use the above distances and measure from the end of the easement.

Florida Power and Light has developed a booklet called Landscape Planning (see support documents), which lists the types of trees appropriate for planting near power lines and outlines the recommended distances from the power lines. The booklet also includes a section which reviews the trees people should avoid planting. Native trees should always be promoted within the community, and the exotic trees should always be discouraged and removed from the community.

Addressing Exotic Trees

On January 2, 1989 the Board of County Commissioners of Sarasota County, Florida passed an ordinance which prohibits the importation, transportation, sale, propagation or planting of the following plant species:

1. Melaleuca (Melaleuca quinquenerva);

2. Australian Pine (Casuarina spp.);

3. Brazilian Peppers (Schinus terebinthifolius).

Currently this ordinance is being enforced in all of Sarasota County, including local municipalities such as Venice. This type of regulation is a start in controlling the spread of exotic trees within Venice and the county. Other communities have developed stricter codes which require the removal of exotic trees when properties are being developed.

The Land Development Code for Collier County amended October 14, 1992 includes Division 3.9, "Vegetation Removal, Protection and Preservation".
Listed under that title is section 3.9.6.6 - Requirement for Removal of Prohibited Exotic Vegetation. The following reflects sections from the code:

3.9.6.6.3 - Prohibited exotic vegetation shall be removed:

1) From all rights-of-way, common area tracts not proposed for development and easements prior to preliminary acceptance of the phase of the required subdivision improvements;

2) From within the associated phase of the final Site Development Plan prior to the issuance of a Certificate of Occupancy.

3.9.6.6.5 - A maintenance plan shall be submitted to the Development Services Director for review on sites which require prohibited exotic vegetation removal prior to the issuance of the local development order.

This maintenance plan shall describe specific techniques to prevent reinvasion by prohibited exotic vegetation of the site in perpetuity. This maintenance plan shall be implemented on at least a yearly basis.

Issuance of the local development order shall be contingent upon approval of the maintenance plan. Non-compliance with this plan shall constitute violation of this Division. The Development Services Director's field representative shall inspect sites periodically after issuance of the certificate of occupancy, or other final acceptance, for compliance with this Division.

3.9.6.6.6. - In addition to the other requirements of this Division, the applicant shall be required to remove, on single family and two-family lots for all new principal dwelling units, all prohibited exotic vegetation before a Certificate of Occupancy is granted. The removal of prohibited exotic vegetation shall be required in perpetuity. Upon issuance of a Vegetation Removal Permit, prohibited exotic vegetation may be removed from lots zoned Residential Single Family(RSF), Estates (E), Village-Residential (VR), and Mobile Home (MH), prior to issuance of a building permit.

The Collier County Code lists seven different types of exotic trees (including Australian Pines) which require removal.

Venice has several areas with different exotic plants and trees. The Australian Pine is the only known exotic within Venice which would impact the City after a hurricane by creating the most destruction and debris. In order to develop suggestions on how to remove Australian Pines from the City, the study included an exotic tree survey in Venice to determine the locations of these exotic trees.

Venice's Australian Pine Survey

In early 1994, U. Lee Barnwell

III, County Forester with the Florida Department of Agriculture & Consumer Services, conducted a survey which identified the locations of Australian Pine clumps on the island area of Venice.

The survey revealed that there are approximately 63 clump sites scatted all over the island. Map G-1 shows the general locations of these trees. The survey indicated that the potential problems reviewed earlier in the element with regard to Australian Pines near power lines, roads, houses and drainage areas exist in Venice. The following data was noted:

* 14 sites near power lines.

* 27 sites near houses.

* 29 sites near roads.

* 1 site along drainage area (Deertown gully).

The survey also listed three public parks in the City with Australian Pines. The parks include:

* South Jetty Park

* Higel Marine Park

* Venezia Park

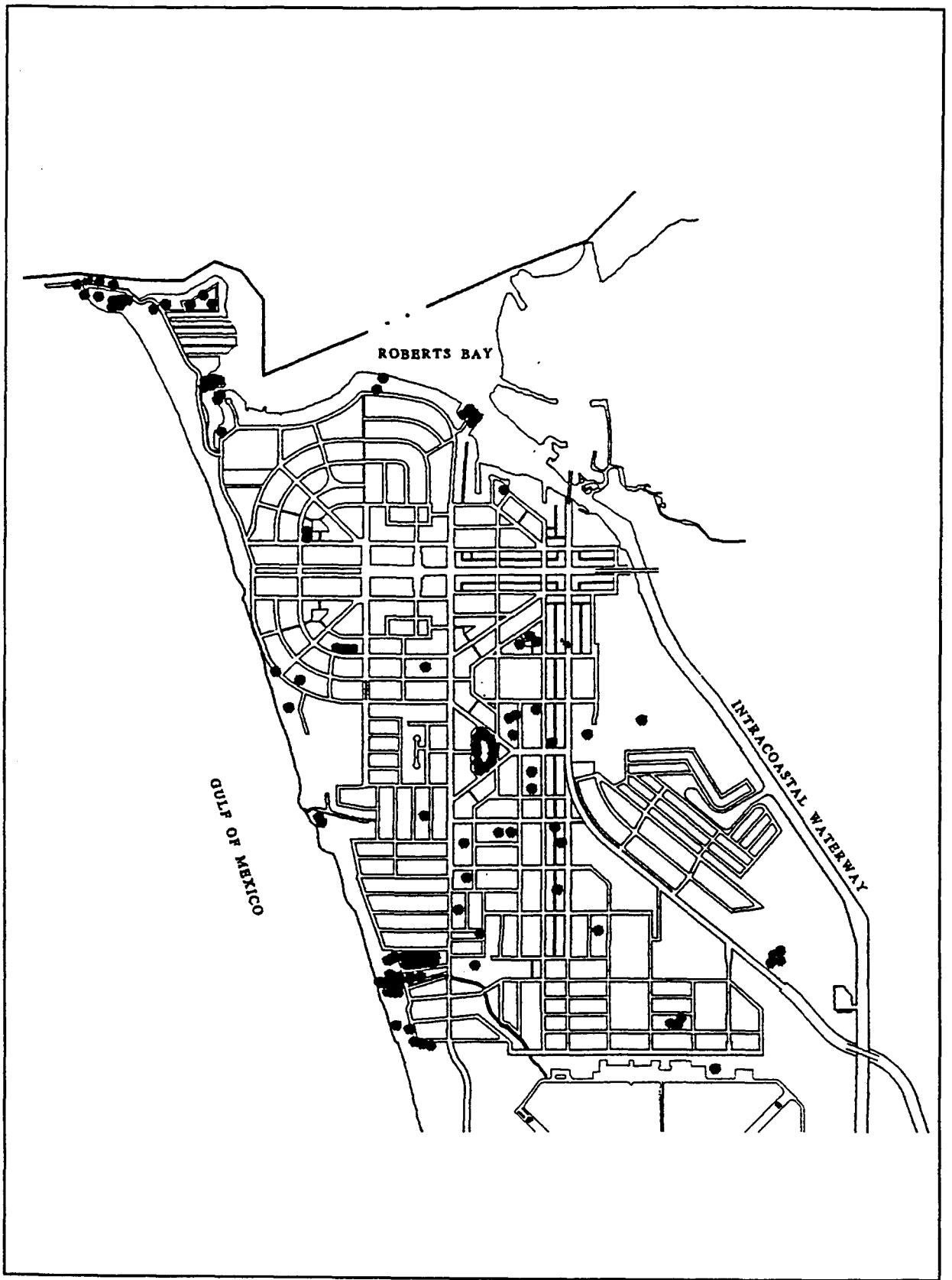
The pines located in all three parks could create a problem for the City in the event of a hurricane. Removing the pines from South Jetty Park and Higel Marine Park areas would not be a difficult task because the trees are accessible and would not impact the surrounding area if removed. The pines in Venezia Park do create a problem. These pines are probably related to some of the original trees which were planted in 1926. These pines have formed massive root systems which extend above the ground from 6 to 10 inches. The root system also extends under the ground and is growing around the concrete curb, the drainage system and under the streets. The drain lines within the park area are routed out regularly in order to keep the pipes free from the pine roots. There are several different ways of addressing the removal of these trees from Venezia Park.

Proposed Venezia Park Tree Removal and Replanting Project

There are approximately 178 Australian Pines and hundreds of seedlings which landscape the street areas along Venezia Park. This vegetation area extends into the park approximately 20 feet from the curb.

One method of addressing this issue is the total removal of these trees and root system. The cost involved in removing these trees and roots is the same, regardless of whether the work is done before or after a disaster. The damage to the infrastructure has been occurring over a long period of time and is an ongoing problem.

Mitigation funds are available through grants from the Federal and/or State Government. These funds could be used to defer some of the cost in implementing the proposed projects either before or after a hurricane disaster. The Public Works Department has



Map G-1 GENERAL LOCATIONS OF AUSTRALIAN PINES

estimated that the cost for removing these trees and roots would be approximately $345,397. This cost includes the removal of the trees and roots, re-curbing, installing new sub-surface drainage pipes, and repair and resurface of roadways.

An alternative plan could be the removal of only the tree trunks, even with the ground, and the grinding of trunk stubs below the ground surface. The remaining trunks and root systems would need to be treated with a herbicide that would kill the entire root system.

The estimated cost for the alternative plan would be approximately $46,928.40. This cost includes the cutting, hauling, equipment, fuel, and landfill tipping fees. This proposed plan would include the removal of the trees and the poisoning of the root system. This activity should not impact the infrastructure, which consists of the curbs, streets and drainage system. These infrastructure items are already impacted and may need to be repaired or replaced in the future.

There are other options available in addressing this type of project. Kenetech Resource Recovery, Inc.(KRRI) is a company located in Sarasota, Florida which specializes in recycling tree and yard waste. In past years they have assisted cities and counties in Florida by converting unwanted trees into mulch and organic soil. By using a tub grinder, the tree removal project could have a by-product component of mulch developed from the grinding of the tree parts. This mulch could be utilized by either the City or the residents or both. This activity would alleviate the hauling and landfill cost.

The Venezia Park tree removal project should also include the planting of appropriate native trees and plants to fill the vacancies left by the Australian Pines. A sidewalk could be another element to be included in the new design of the park. A sidewalk could be installed by cutting out only the sections of the dead roots needed to provide space for sidewalks.

Australian Pines on Private Property

Australian Pines will become a community problem when these trees are uprooted by a hurricane. The trees shown on the survey which are close to power lines, roads and drainage canals will impact the entire community. Education and incentives are important tools in correcting this problem. In order to reduce the impact to the community by Australian Pines after a hurricane, the City should consider an Australian Pine Community Tree Removal Program. This program would develop incentives for residents to encourage the removal of these trees. The program could include:

* Providing information to homeowners on the different removal methods for Australian Pines, including a list of agencies that could assist the homeowner.

* Promotion of community

involvement by requesting tree removal companies to participate in the project by offering reduced rates for removing Australian Pines during a given time period.

* Offering the public one month each year the service of picking up all the Australian Pines on the right-of-way of properties that were cut down, provided that the tree roots are treated with a herbicide to kill the root system.

* Requesting assistance from the County to participate in the program by eliminating or reducing the landfill tipping fees during a given time period for the disposal of Australian Pines.

* Providing mulch to residents by grinding the pines into mulch.

* Encouraging homeowners to replant appropriate native trees with proper distances from the stated facilities by providing tree planting information.

* Offering refunds or rebates for removing the pines and planting native trees.

All of the suggested items could possibly be funded through grants from either the Federal and/or State agencies.

Observations

The first "Growing Native for Nature" was a garden park project. The project was developed as an educational outreach tool to help the Venice Elementary School children to better understand the environment in which we all live. The $1,000 grant provided by the Sarasota Bay National Estuary Program allowed sixty children to create an 874-square foot native garden. The project was a success due to the involvement of nine agencies and approximately a dozen volunteers. The project created an environment which not only helped children understand nature but also created relationships between the volunteers and the children.

The cost of the project was small compared to the positive impacts it had on the community. Sometimes a simple program can open the community's eyes to understanding issues that were once considered complex.

The concept of this element is very simple:

1. Remove trees which can do damage due to a hurricane.

2. Replant with native trees which are tolerant to hurricanes and would be less likely to create damage.

Everyone wants to live in communities which have areas of beautiful trees and flowers. This feeling or attitude can still be expressed in developing a hurricane tolerant community by means of landscaping with the right trees and locations. The key to all of these types of projects is education.

Element Conclusion

The best way of protecting the integrity of a community is to ensure its future. Today, due to the FEMA funding system, it is easier for communities to address pre-disaster issues after a disaster. FEMA's Hazards Mitigation Grant funding is readily available to communities during the recovery phase of a disaster.

Currently FEMA does not have any additional funds available to communities for mitigation projects prior to a disaster.

The lack of funding is a major problem in promoting these mitigation plans. Due to Hurricane Andrew, some competitive funding programs were developed by the State for mitigation programs.

The study recommends the following:

* Coordinate with the State and Sarasota County in obtaining funds to develop an Australian Pine Community Tree Removal Program. The components of the program could include some of the suggestions which were covered in this study, such as:

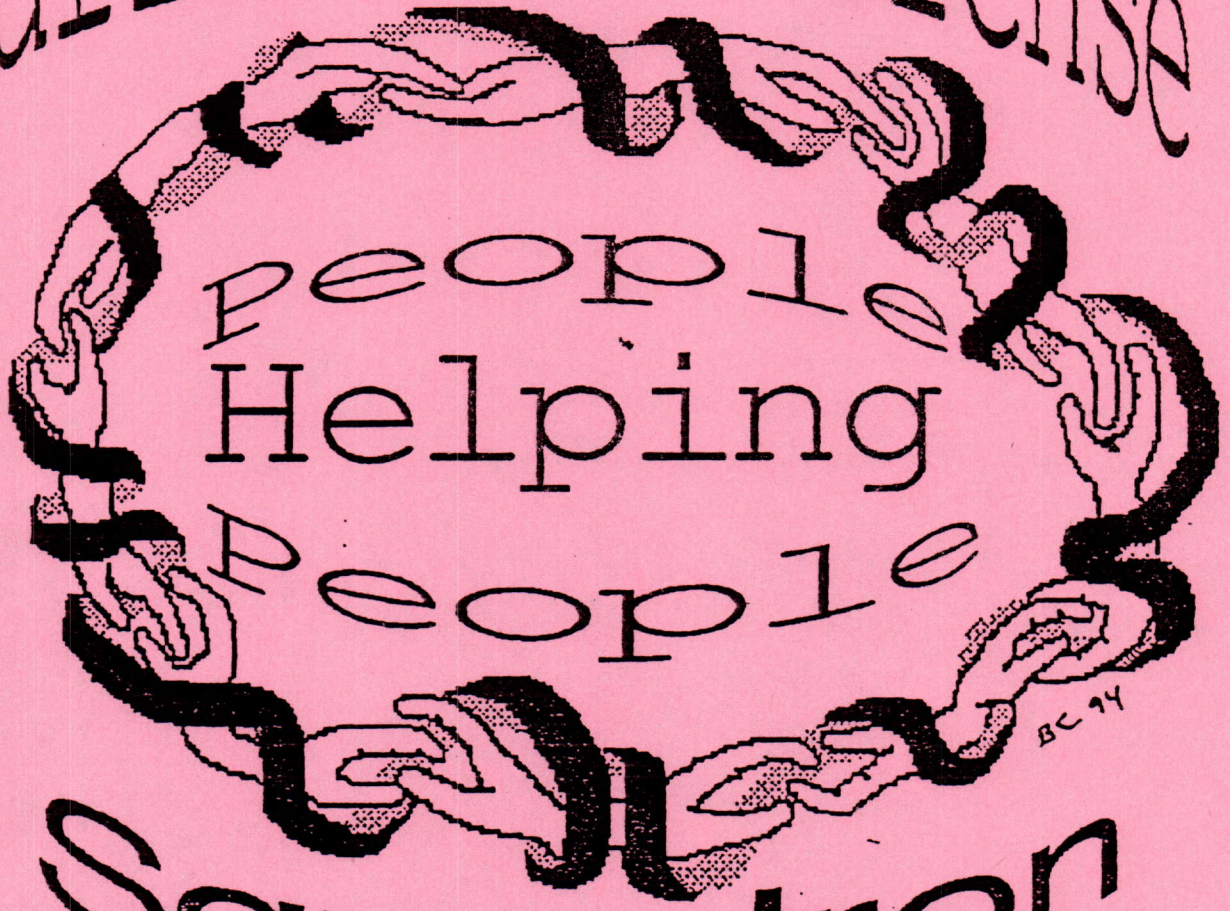
1. One month a year the City could provide an annual Australian Pine removal service to homeowners who cut down the pines and place the tree parts on the right of way.

2. Develop a phasing plan for the removal of the Australian Pines from all public parks and City properties.

3. Develop recycling uses of the pines by using the byproducts for firewood for homeowners or possibly by grinding the pines into mulch.

* Coordinate with Sarasota County and the Sarasota County Cooperative Extension Service to develop brochures to inform homeowners about the problems of hurricanes, trees and disaster.

Hurricane Defense



Squadron

"THESE MATTERS HAVE SOME RHYTHM. WHEN THE SKIES ARE CLEAR, NO ONE IS INTERESTED. SUDDENLY, THEN, WHEN THE CLOUDS COME...THEN EVERYONE WANTS TO FIND OUT WHY MORE HASN'T BEEN DONE ABOUT IT...I THINK THE TIME TO DO IT IS NOW."
Mr. Theodore Sorensen, Special Counsel to President John F. Kennedy, made this statement at a press conference on July 5, 1962 concerning the importance of the Civil Defense Program. The ending of World War II was the result of the development of the nuclear bomb. World peace only lasted for several years. The weapon that ended the war also created an era of fear that lasted several decades. The main concern which was on everyone's mind in the 50's and 60's was the possible attack by an enemy country using a nuclear bomb. The Civil Defense Program was developed by the federal government in order to prepare and organize the country for such an event. Mr. McGeorge Bundy reviewed the purpose of civil defense in his book, Danger and Survival. The following excerpt is from the book:

"Civil defense is not a reinforcement of deterrence; it is not a tool of crisis management; it certainly does not demonstrate will or confer superiority. But neither is it belligerent or provocative. It is what Kennedy called it--insurance, imperfect but relatively cheap--a way of mitigating a possible disaster, not a way of avoiding it or making it acceptable."

One of the main elements of the Civil Defense Program was the involvement of volunteers. This study will review the Civil Defense Program on a State and local level as it relates to community involvement and suggest ways of creating a volunteer service organization to assist the community during an emergency. Throughout history, volunteers have always played an important role in our country.

Florida Civil Defense Plan

On January 12, 1951 the Eighty-First Congress approved Public Law 920, which created the Civil Defense Plan. The Federal Civil Defense Administration was formed to be a permanent, independent agency in the Executive Branch of the government. The Federal Civil Defense Administration was responsible for coordinating the program in the nine regions which covered the United States. Florida was part of Region 3, which was comprised of the southeastern states.
The Florida Civil Defense Law (Chapter 252-- Florida Statutes 1951) was passed by the Florida State Legislature and became law on June 11, 1951. In 1952 the State of Florida published the Florida Civil Defense Plan (FCDP). The FCDP was an organizational manual which explained the components of creating a civil defense network in counties and cities.

A letter written by Florida Governor Fuller Warren was used in the introduction of the FCDP. The following are excerpts from that letter:

"Civil defense is a necessity from now on if we are to survive as a nation. Modern war, fought with modern war tools, makes civil defense the fourth arm of our national security. Civil defense is a responsibility of civil government at all levels, including that of the smallest community. Every citizen has a duty and responsibility in the program. I urge upon all citizens of Florida an enthusiastic and active participation in the discharge of these heavy responsibilities in this most grave period of the history of America."

The Civil Defense Plan was a comprehensive approach for protecting the country for any disaster. The main focus was addressing ways for communities to deal with a nuclear attack. The plan also addressed major natural disasters such as floods, hurricanes, tornadoes, winter storms and earthquakes. The main key to the plan was encouraging the public to take an active part in the program. The following is part of the "Foreword, General Statement" in the FCDP:

"Civil Defense is The People. It is The People organized to minimize the effects of enemy action. It is The People trained to care for themselves, their communities, plants, facilities and other installations when threatened or exposed to such action. It is The People organized to maintain and restore these essentials to civil life and to strike back with the material, production and morale needed for an effective war effort. It is because of this that our federal government looks upon Civil Defense as the fourth arm of our national security, ranking with the Army, Navy and Air Force.

Civil Defense not only united the country but also allowed every citizen to have a vital part in defending the nation.

Civil Defense Volunteers

On the State level, the FCDP required the establishment of three councils, the Advisory Council, the Agricultural Council, and the Food Council. Figure 1 shows the Functional Chart for Staff Organization which places the councils under the Director. The councils were comprised of a number of people who were experts in their own fields. The councils furnished technical information to the Director pertaining to the Civil Defense services. The plan listed each of the participating State Agencies as well as details of the responsibilities the departments would provide to the Civil Defense efforts. Included in the plan was the appeal for assistance from other participating agencies. The following is an excerpt from the FCDP:

"Civil Defense needs thousands of volunteer workers with many skills and aptitudes to make its plan workable and effective. They work under the authority of local Civil Defense officials and constitute the nucleus of the

broad, overall Civil Defense program. Many of these people are organized into non-governmental, civic groups. As such, they constitute a great, unified force and can be of tremendous assistance through aiding in recruiting personnel by a broad plan of impressing upon members and others the importance of participating in the program according to their individual abilities."

The FCDP encompassed thirteen services which were designed to protect the people and property. These services included:

A. Emergency Welfare
B. Engineering
C. Fire
D. Health Services and Special Weapons Defense
E. Police
F. Public Affairs
G. Rescue
H. Shelter
I. Supply
J. Transportation
K. Warden
L. Communications
M. Clergy

Each service had a plan that included a mission and organization which addressed how these services were to be provided. All of these services were considered the heart of Civil Defense.
Of the thirteen services, nine were listed to include a volunteer quota system that required a fixed number of volunteers for each 1,000 population. The Emergency Welfare Service section of Civil Defense required that fourteen volunteers were needed for every 1,000 population. The total number of volunteers needed for the nine services was 58.4 people per 1,000 population. By today's standards Venice, with a population of approximately 17,768 people, would require a volunteer force of 1,043 people.

Civil Defense Council

On March 28, 1961 the Venice City Council approved a resolution to establish Civil Defense in Venice. This action created the Venice Civil Defense Council, comprised of the Mayor and City Council. The City approved the Venice Civil Defense General Plan (VCDGP), which organized the community to deal with natural disasters or enemy-caused disasters. The mission of the VCDGP was to:

a. Maintain the public peace.

b. Protect the public health.

c. Preserve the lives and property of the residents of Venice.

d. Provide relief for refugees from disaster.

e. Support the State's survival program.

County of Sarasota Civil Defense Plan

The VCDGP also incorporated the County of Sarasota Civil Defense Plan (CSCDP). This was a comprehensive plan which had more organizational details than the VCDGP. The CSCDP closely mirrored the State's FCDP. The CSCDP established an Advisory Council which consisted of members from local

service clubs as well as local business leaders. The Council was designed to render consultation service to the County Commissioners and to the County Coordinator pertaining to Civil Defense matters. The CSCDP performed seven functions:

1. Planned the employment of Civil Defense auxiliary services when and where required.

2. Organized the people, facilities, skills and energies of the County to meet major emergencies.

3. Trained volunteers to augment existing county and municipal agencies for law and order, fire protection, communications, health, sanitation and welfare; and in rescue operations, evacuation and local defense.

4. Educated residents in self-help and Civil Defense principles.

5. Provided air and sea warning service and local defense.

6. Furnished mobile support units as required by State Disaster Coordinator.

The CSCDP listed nine services which would be provided in an emergency. These services would be provided by government employees and volunteers. The CSCDP did not include the following services: rescue, public affairs or shelter. The CSCDP did include four services which the State FCDP did not address: air raid warning, beach control, damage control and evacuation. The CSCDP representatives were able to use volunteers in every service because of the comprehensive training program.

Training For Service

The CSCDP stated that every Civil Defense Volunteer will be required to undergo certain orientation and training before becoming eligible to perform the specialized duties of service to which assigned. This preparation for performance of duties will have as its objectives the following:

(1) General orientation

(2) Cultivation of techniques

(3) Development of unit proficiency

(4) Habituating teams in dealing with issues under conditions to which in the normal course of events they would not become accustomed.

These objectives were achieved through instructions encompassing the following categories:

* Classroom presentation

* Demonstrations

* Exercises

* Home Study

* Tests

Each volunteer had to fulfill the set requirements and understand his or her role in

participating in the Civil Defense Program. The CSCDP listed the following information for volunteers:

"The following fundamental principles of Civil Defense training will be observed in the preparation of training programs and schedules.

(1) Each volunteer must know the mission, objectives and responsibilities of his unit and service.

(2) He must understand the functioning of the unit to which assigned.

(3) He must know to whom he reports and where; leaders must know who reports to them.

(4) Each exercise, demonstration, practice or test must answer the five questions "What, when, where, why and how" of any given situation."

Volunteers were trained by instructors who were certified in the particular field of service.

The Fading of Civil Defense

As the threat and fear of a nuclear attack became less of a concern and an issue to the U.S. in the late 70's and early 80's, so did the Civil Defense Plan. The post-World War II era created a strong patriotic attitude of serving the community, people and country. During the Civil Defense era, the volunteers were committed to the cause of protecting the people and land. When the daily and immediate threat disappeared and the focus was only on natural disasters which may occur in the future, volunteer dependability became a problem. The elimination of possible nuclear attack was replaced with addressing natural disasters by government agencies. Emergency management was developed to focus on providing services to address disaster issues. The role of volunteers in general was drastically reduced and some of their duties were fulfilled by government employees.

Some community operations, such as that of the Harrison County Civil Defense Office in Mississippi, still remind us of the Civil Defense era. Their office and operation are very similar to other emergency management agencies in the U.S. except for the fact that they still retain the Civil Defense name.

Personal Observation

"KNOWLEDGE REPLACES FEAR" was the motto used with the 101st Louisiana Defense Squadron which included the New Orleans Civil Defense. In the late 1960's and the early 1970's, the author served as a squadsman in this organization. In reflecting back to that period of time, I remember the positive impacts that this program had on my life and the lives of others. It was a win-win situation for the participants and the community. For the youth it gave them the following:

A. A sense of place in the community.

B. Civic pride.

C. Responsibility for others.

D. Direction in life.

E. Self esteem and a feeling of value.

F. An education which included leadership, first aid, organization and the ability to mitigate or solve issues.

The community received the following services:

A. A well organized volunteer group which was prepared for any emergency.

B. A First Aid Volunteer Group which provided medical services on weekends during the summer at the Lakefront recreation area, Mardi Gras events and community events.

C. Assistance provided to the local Police in directing traffic and crowd control.

D. Fulfillment of needed services during a hurricane at the Emergency Operation Center (EOC).

E. Dedicated citizens.

It is difficult to establish a cost/ benefit value to the services provided and received by both groups. I do know that some of my fellow squadsmen are now government employees serving as firemen, policemen, paramedics and planners.

Call For Volunteers

After a disaster, the impacted community would need an emergency management team to address community survival issues and recovery services.

Response and recovery are two of the main issues in addressing a post disaster crisis. Utilization of volunteers is one of the best ways of assisting the emergency management team in providing service to the community.

Communities which need volunteer help after a disaster may receive too much help. People from other areas will want to help in the cause, but their presence may create problems. Outside volunteers from other communities may require the same needs and services as the survivors. Some volunteers may bring their own shelter, food, clothing and medical needs. Others may arrive in busses or cars without the needed staples to survive.

Another problem that sometimes occurs is the arrival of volunteers who are not trained in emergency management. Volunteers who are not trained in emergency management issues and want to help may limit or prolong services that victims may desperately need.

Community Needs

In reviewing the definition of "COMMUNITY", the dictionary offers several answers: A unified body of individuals; people with common interests living in a particular area; an interacting population of various kinds of individuals in a common location, and/or a group of people with a common characteristic or interest living together within a larger society.

Most will agree that the residents of a given locale want the best of everything for their community. Comprised of people of all ages, the community has needs which should be addressed by all residents.

The Venice community has a great wealth of resources among its people. Every citizen needs to understand that he or she is important; each citizen can help by offering time or other types of contributions to the community.

There are several organizations which are designed to involve adults and youth in providing a particular service to the Venice community. The Venice High School ROTC, Venice Civil Air Patrol and the Venice Police Explorers all recruit volunteers for community service. These organizations offer people (particularly the youth) the same qualities that the Civil Defense Program instilled:

1. Direction

2. Self esteem

3. Sense of place

4. Responsibility

5. Education

6. Pride

One issue which creates a problem with developing local youth volunteer organizations is insurance liability. This insurance issue needs to be reviewed and addressed at the State level in order to fully address emergency needs through volunteers in time of crisis.

Florida VOAD

After 1969's Hurricane Camille, organizations which had been involved in providing resources and services to victims and communities affected by disasters shared their mutual concern about the frequent duplication of services. These organizations began meeting to share information with the goal of providing more efficient service delivery to disaster victims. From these meetings came the development of the "Voluntary Organizations Action in Disaster" (VOAD).

VOAD is a non-operational group which gives each of its members the privilege of independently-but cooperatively--providing and implementing its resources when responding to disasters. VOAD is committed to the philosophy that time to train, prepare and become acquainted with each other is best achieved prior to the time of actual disaster response.

In the State of Florida, FLVOAD is active state-wide as well as at district and county levels.

Developing a Volunteer Organization

The bonding of the community from the 50's to the 70's was the result of a rallying cry to address the potential attack against the country.

It would be hard to develop a similar community interest or support for addressing disaster issues without developing a comprehensive education program for the public. Coastal communities should consider the concept of developing a grass

roots organization which would address emergency services by volunteers through a coalition. The composition of the coalition should consist of the following agencies:

1. American Red Cross

2. County Emergency Management Department

3. Local Police and Fire Department

4. Local high school

5. Local service organizations

The Federal Emergency Management Agency and the Florida Division of Emergency Management have several programs which can assist a coalition in developing a volunteer organization. These programs would also assist the coalition in creating a training curriculum to be required for new members to finish before they can become certified as participants.

The premise of the organization would require all members to become certified in emergency management training prior to assisting in an emergency situation.

Element Conclusion

Coastal communities must be totally prepared for hurricanes in order to prevent these storms from destroying the foundations of their communities. Within several hours a hurricane can destroy and/or damage the elements of the community. Recovery from these damages may take years if the residents are unprepared.

Preparing for hurricanes should be the job of the entire community. The City has many non-profit organizations and support groups which are very supportive in the field of community service programs.

The following recommendations are made based on the research of the study:

* Encourage the development of a coalition through coordinating efforts with the State, Sarasota County, Red Cross and other organizations. The purpose of the coalition would be to establish a volunteer youth organization for assisting the community with emergency services during a crisis.

* Coordinate efforts with Sarasota County to promote and enhance the FLVOAD program within the County to ensure adequate volunteer assistance to the community after a disaster.

EXECUTIVE

SUMMARY

EXECUTIVE SUMMARY

E.1 INTRODUCTION

The "Creating a Hurricane Tolerant Community" project was authorized by the City of Venice and funded through the State by the Federal Emergency Management Agency. The study follows the criteria set forth in the Pilot Study for Pre-and Post-Hurricane Mitigation and Development Contract. The body of the study is made up of the following two parts:

Geography of Venice: Consists of one element which includes the community analysis and a brief history of hurricanes.

Hazard Mitigation Proposals: Contains six comprehensive elements, each of which addresses aspects of a major hurricane issue and includes corrective solutions to the problems.

E.2 FINDINGS

The two main tools of hurricane mitigation are education and communication. Throughout the study, each element repeats these import aspects which are needed in every community. Governments at all levels try to address community issues by using conventional means, which normally consist of regulations and enforcement. All Governments need to reassess their leadership role within the communities which impact the public. These impacts can be either positive or negative. Creativity should be developed and considered first in lieu of laws. Bureaucrats find that laws are easier to develop because in most cases the public is not involved and the law makers are not the law enforcers. Hurricane disasters are not just a government issue or a community problem or an insurance nightmare...it is everyone's problem because everyone is affected.

The survey in the "Hurricane Damage Prevention Project" reflects a hunger by the people for hurricane knowledge. We live in a governmental society which produces a profusion of books concerning how governments should address hurricane disasters. These books never reach or touch the public at their level. Sometimes governments have little faith in the people. Sometimes people have little faith in governments. Proper communication and education can open the doors to understanding between the two groups.

E.3 PROPOSAL IMPLEMENTATION

In most cases the element's recommendations do not include a cost breakdown or cost analysis. Implementation of these proposals can vary within a large array of focus and degrees. It is the intent of the study to offer mitigation projects with respect to developing scopes for projects.

In order to propose programs, it is necessary to understand the components needed to do a project. The two main elements in preparing and implementing a project are as follows:

Staff Involvement In developing any proposed recommendations, staff will need to schedule city time to develop the project. This work program may be in the form of grant writing, preparing studies or coordinating activities with other agencies.

Funding Financial resources may be needed in order to develop a project. Grants may be available from other governmental agencies or non-profit organizations. These types of benefactors may provide funding at 100% or they may require a match. A match normally requires additional funds, in-kind services or both.

The study has developed an Achievable Index (AI) that relates to the complexity of fulfilling the proposed recommendations. The AI is as follows:

1 Achievable...By means of a staff member's time along with support from other governmental agencies and/or organizations.

2 Achievable...By means of staff members' time for meetings to develop studies or program.

3 Achievable...By means of funding sources and staff members' time to develop studies or program.

4 Achievable...By means of funding sources and staff members' time and co-operation with other agencies to develop project.

The AI is reflected by the highlighted number behind each recommendation.

ELEMENT CONCLUSIONS:

ELEMENT 1: GEOGRAPHY OF VENICE

Venice has seen its share of hurricanes since 1926. There are no geographic factors which could or would determine whether a hurricane would pass through a partial area along the west coast of Florida.

Review of past hurricanes which landed on Florida's soil reveals that they have struck Florida throughout the hurricane season.

Living in a subtropical climate, coastal residents need to understand that hurricanes are a part of life in Florida. The only protection communities have from hurricanes is through environmental education and the developmental of a hurricane tolerant community.

Review of recent coastal projects confirms that the City is aware of the past issues which have created today's problems. By implementing these projects and addressing other past issues, Venice is creating a better coastal community in Florida.

ELEMENT 2: COASTAL REDEVELOPMENT PLAN

The Venice coastline is one of the most important features of the community. In maintaining the stability of this area, the City needs to consider protective measures. This study recommends the following:

* Establish a policy directing the Land Acquisition Committee to develop a process which would allow the City to consider the acquisition of coastal properties that are destroyed after a disaster.2

* Approve a study for the regulation of the coastal redevelopment in the event of a disaster.2

* Develop programs which would promote community awareness of hurricane issues.1

This study does not suggest or promote restricting the use of private property which would restrict or reduce density development. This study does propose the use of regulations which would create a better environment for the residents and the public.

ELEMENT 3: VENICE COMPLIANCE PROGRAM

The City has, by its actions, demonstrated its concern for the coastal area and endeavors to ensure that development will impact neither the environment nor the community.

In the interest of promoting a safer community, the study recommends the following:

* Establishment of a staff committee to review and propose updates to all coastal regulations to ensure conformity. This committee should also address how redevelopment should occur in the event of a disaster.2

* Development of a coastal ordinance booklet which references the coastal codes impacting development and redevelopment along the Gulf. The purpose of this booklet would be to assist and educate the public.3

* Coordination with the State and Sarasota County in developing compliance programs to educate the public.4

The Venice coastal area could be developed into a hurricane tolerant community through redevelopment and education.

ELEMENT 4: DEVELOPING A TOLERANT BUILDING

It is unfortunate that coastal communities experience hurricane tragedies on a regular basis. These events should be an example for other communities to prepare for a hurricane as if they were going to war.

Addressing issues for developing a tolerant community is similar to purchasing an insurance policy for the City of Venice.

The study recommends the following:

* Coordinate with the State and with Sarasota County to obtain funds for the development of a Hurricane Educational Program.4 This program could consist of the following:

A. Brochures to assist homeowners in retrofitting their structures. Much of the information in this study could be used and condensed to develop one or several brochures.

B. Promote hurricane awareness by conducting an annual Hurricane Seminar which encourages Venice to become a Hurricane Tolerant Community.

C. Develop educational displays which could be placed in public buildings and used at public events.

D. Develop videos which could be made available to residents through the public library system.

ELEMENT 5: HURRICANE DAMAGE PREVENTION PROJECT

The results of this survey reflect a strong community desire to create a Hurricane Tolerant Community.

A Hurricane Damage Prevention Project (HDPP) should be a comprehensive program providing residents with the educational tools which enable them to understand and prepare for hurricanes.

The study recommends the following:

* Coordinate with the State in obtaining funds for the Venice Integrated Neighborhood Emergency System (VINES).3

* Coordinate with the Venice Public Library to develop a Hurricane Information Center. The center would provide hurricane information by means of books, videos, displays and research materials. This facility could be funded through State and Federal grants.4

* Coordinate with Sarasota County to develop a Hurricane Awareness Campaign. Activities could include brochures, seminars and community lectures.4

A community which is always prepared for hurricanes is a community which will endure the forces of nature and prevent many of the disastrous damages a hurricane can cause.

ELEMENT 6: GROWING NATIVE FOR NATURE

The best way to protect the integrity of a community is to ensure its future. Today, due to the FEMA funding system, it is easier for communities to address pre-disaster issues after a disaster. FEMA's Hazards Mitigation Grant funding is readily available to communities during the recovery phase of a disaster.

Currently, FEMA does not have any additional funds available to communities for mitigation projects prior to a disaster. The lack of funding is a major problem in promoting these mitigation plans. Due to Hurricane Andrew, some competitive funding programs were developed by the State for mitigation programs.

The study recommends the following:

* Coordinate with the State and Sarasota County in obtaining funds to develop an Australian Pine Community Tree Removal Program.4 The components of the program could include some of the suggestions which were covered in this study, such as:

1. One month a year, the City could provide an annual Australian Pine removal service to homeowners who cut down the pines and place the tree parts on the right of way.

2. Develop a phasing plan for the removal of the Australian Pines from all public parks and City properties.

3. Develop recycling uses of the pines by using the byproducts for firewood for homeowners or possibly by grinding the pines into mulch.

* Coordinate with Sarasota County and the Sarasota County Cooperative Extension Service to develop brochures to inform homeowners about the problems of hurricanes, trees and disaster.

ELEMENT 7: HURRICANE DEFENSE SQUADRON

Coastal residents must be totally prepared for hurricanes in order to prevent these storms from destroying the foundations of their communities. Within several hours a hurricane can destroy and/or damage the elements of the community. Recovery from these damages may take years if the residents are unprepared.

Preparing for hurricanes should be the job of the entire community. The City has many non-profit organizations and support groups which are very supportive in the field of community service programs.

The following recommendations are made based on the research of the study:

* Encourage the development of a coalition through coordinating efforts with the State, Sarasota County, Red Cross and other organizations. The purpose of the coalition would be to establish a volunteer youth organization for assisting the community with emergency services during a crisis.[4]

* Coordinate efforts with Sarasota County to promote and enhance the FLVOAD program within the County to ensure adequate volunteer assistance to the community after a disaster.[4]