

Hazard Mitigation Technical Assistance Program
Contract No. EMW-2000-CO-0247
Task Order 326
Hurricane Charley Rapid Response
Coastal High Water Mark (CHWM) Collection
FEMA-1539-DR-FL

Final Report
November 4, 2004

Submitted to:



Federal Emergency Management Agency
Region IV
Atlanta, GA

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Introduction

On August 10, 2004, Hurricane Charley developed from a tropical depression to a named tropical storm. Charley was upgraded from a tropical storm to a hurricane on August 11, and tracked west-northwest across the Caribbean, impacting the Cayman Islands, Jamaica, Puerto Rico, and Cuba.

Hurricane Charley made landfall on the Gulf Coast of Florida on Friday, August 13, 2004, just before 4:00 pm (Eastern Daylight Time, EDT). According to draft reports from the National Weather Service (NWS), the center of Charley crossed the barrier islands of Cayo Costa and Gasparilla at 3:45 p.m. as a Category 4 hurricane with estimated winds of 145 miles per hour (mph, 1-minute sustained). After crossing the barrier islands, Charley moved up Charlotte Harbor before making landfall at Mangrove Point, just southwest of Punta Gorda, at 4:35 p.m. By 5:30 p.m., the center was 5 miles west of Arcadia (Desoto County) and, at 7:30 p.m., was 4 miles west of Lake Wales (Polk County). At approximately 9:15 p.m., the storm slammed into Orlando International Airport. By 11:30 p.m., the hurricane was back over open water, having exited the Florida peninsula near Daytona Beach. By 2:00 a.m. EDT, the center was over the Atlantic about 45 miles north-northeast of Daytona Beach, with maximum sustained winds reported to be 85 mph (1-minute sustained). Figure 1 is a radar image of Hurricane Charley just prior to landfall.

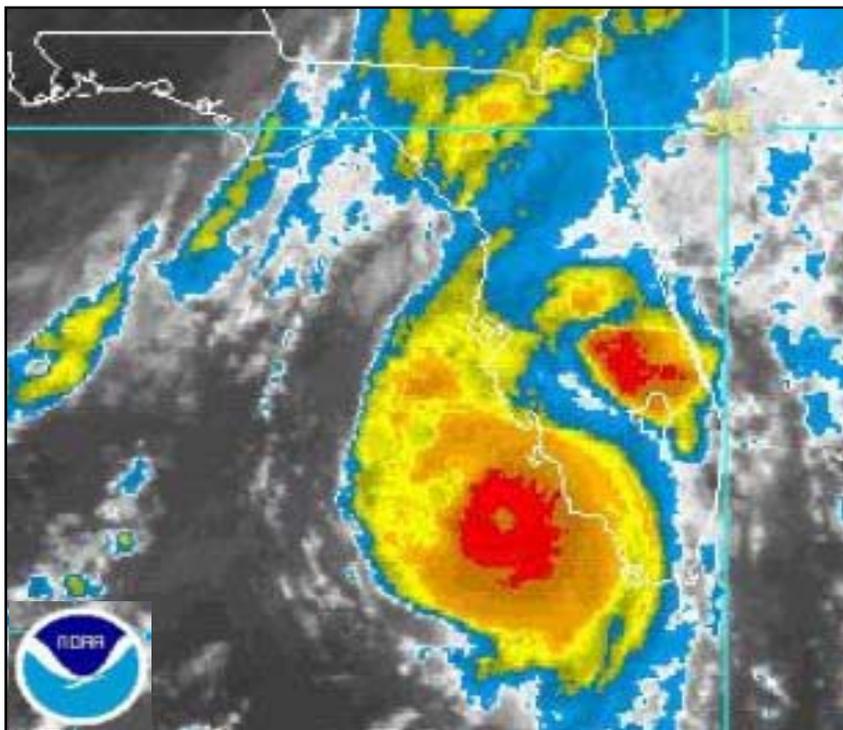


Figure 1. Hurricane Charley makes landfall.

The NWS and the National Hurricane Center reported that Hurricane Charley made landfall as a Category 4 hurricane with winds of up to 145 mph (sustained) and a minimum central pressure of 941 millibars. At the time of this report, the maximum wind speed obtained for the storm at landfall from NWS weather stations was a 2-minute sustained wind in Punta Gorda of 87 mph (at station PGD) and a 112-mph, 3-second gust wind speed (before failing) was also recorded at PGD; the associated pressure measured at the time of the recorded wind gust was approximately 964 millibars.

Other notable wind speeds from Hurricane Charley were recorded at the following locations:

- 90 mph (1-minute sustained) at the Cape Coral Airport – Florida Coastal Monitoring Project (FCMP)
- 105 mph (3-second gust) at the Orlando International Airport – NWS
- 92 mph (3-second gust) at the Sanford Airport just northeast of Orlando – NWS
- 69 mph (1-minute sustained) at the Daytona Beach Airport (with an 83-mph gust) – NWS

Hurricane Charley made landfall having very compact limits. The hurricane had an estimated radius of 6 miles and a diameter of 12 miles. Hurricane force winds extended outward up to 25 miles from the center, and tropical storm force winds extended outward up to 85 miles. As a result of the compact size of the storm and the northeastward turn the storm made prior to landfall, the storm surge was not as high as originally predicted. Reported wind gusts of 150 mph in Arcadia and 180 mph in Charlotte County at the Emergency Operations Center (EOC) could not be verified by measured data, and damage consistent with such wind speeds was not observed. Although it was reported that the storm was very compact and had some Category 4-level winds, the hurricane did not appear to generate water levels typical of a Category 4 hurricane, which are often in the range of 10 to 14 feet.

As the hurricane moved through Florida, wind and wave action disrupted utilities, caused damage, and created localized flooding.

A disaster declaration in response to Hurricane Charley was authorized by the Federal Emergency Management Agency (FEMA) for areas in Florida on August 13, 2004 (FEMA-1539-DR, Florida; <http://www.fema.gov/news/eventcounties.fema?id=3455>). The declaration provides the necessary assistance to meet immediate needs and to help Florida recover as quickly as possible. The following counties in Florida were designated for disaster declaration (see Figure 2): Brevard, Charlotte, Collier, DeSoto, Dixie, Duval, Flagler, Glades, Hardee, Hendry, Highlands, Indian River, Lake, Lee, Levy, Manatee, Monroe, Okeechobee, Orange, Osceola, Pasco, Polk, St. Johns, Sarasota, Seminole, and Volusia Counties. These declared counties were provided with Individual Assistance. Public Assistance (PA) Categories A&B have been provided to all Florida Counties. PA Categories C&G have only been provided to some counties.

URS Group, Inc. was contracted by FEMA under the Hazard Mitigation Technical Assistance Program (HMTAP) to assist in the disaster recovery. Assistance provided by this Task Order includes collection and survey of Coastal High Water Marks (CHWMs). This report summarizes the methodologies used to flag the CHWM locations and survey the elevations established during the Hurricane. This is an important step in assisting communities in establishing flood hazard areas and in preventing future loss of life and property damage.

Figure 2: Disaster Declaration Map



Source: <http://www.fema.gov/news/event.fema?id=3455>

As noted in Legend of Designated Counties, Public Assistance (PA) Categories A&B have been provided to all Florida counties. PA Categories C&G have only been provided to some counties.

Hurricane Charley caused both coastal and riverine flooding. The resulting high water marks were flagged and surveyed along coastal locations. The purpose of this report is to document the flagging and surveying of the CHWMs, estimate the storm surge at each location, and discriminate between storm surge and wave action.

The data collected is invaluable to federal, state, and local recovery efforts. The data assists in identifying areas of significant damage in order to target resources needed for disaster recovery. It also helps to establish the magnitude and recurrence interval of the flood and erosion events caused by the hurricane along various areas of the coast. This data collection is also beneficial for future use in (a) accurately assessing the benefits to be expected from flood mitigation efforts and (b) prioritizing the flood mitigation efforts pursued following the hurricane. The purpose of CHWM data collection is for use in calibrating the SLOSH model used to evaluate evacuation zones and notification times. Wave and surge data are also used in making Hazard Mitigation Grant Program (HMGP) decisions.

Area of Study

The area identified by FEMA to be covered by the Coastal High Water Study Team lay between Marco Island on the south and a location somewhat south of the town of Venice on the north. The observations were taken at discrete points distributed along the open Gulf coast, within Charlotte Harbor, and on the shores of several small embayments including the lower tidal sections of the Myakka, Peace, and Caloosahatchee Rivers. The majority of the shorelines not exposed to the open Gulf are lined with dense stands of mangroves, protected by low sea walls, or far from any road access. These limitations, combined with the general broad pattern of a low-to-insignificant surge within the Charlotte Harbor estuary near Punta Gorda and Port Charlotte, made the spacing of the observations irregular. Most of the data were taken in and around the most impacted locations where the storm crossed the island and mainland shores. There were significant spatial gradients in the observed heights in these zones. These are most probably related to the small radius of the storm and rapidly changing wind directions. Outside of the most impacted areas, the maximum surge height changed slowly with distance along the coast. This allowed the data points to be taken at wider spacings.

The study area was set by first conducting a coastal reconnaissance by URS personnel. This led to discussions with Todd Davidson and Sal Bucolo of FEMA at the Orlando, Florida Disaster Field Office (DFO) on August 19, 2004. At this meeting, using aerial photos of Florida's southwest Gulf coast and the information gathered during the field reconnaissance, it was determined the storm surge went from Naples in the south to just south of Venice in the north. Todd Davidson indicated a need to include the area south of Naples to Marco Island. This was agreed upon and the flagging was undertaken. The work was limited to collection of CHWMs in Charlotte, Collier, and Lee counties. Most of the observed CHWMs in Charlotte County were similar to each other and of low magnitude. There was much more variability in the Lee County observations. It was for these reasons that the most points were taken in Lee County. The least number of points were in Collier County where the spatial gradients between the CHWMs were relatively small. Table 1 shows the relative distribution of the points.

Table 1: Number of CHWMs Surveyed by County

County	Number of CHWMs Surveyed
Charlotte	11
Collier	9
Lee	39

The NOAA tide gauges that were operating in the area during the time of the hurricane and their Peak Elevation during the Hurricane are shown on Table 2. The value for the Ft. Myers gage is only slightly higher than the mean range of the tide, which is 0.95 foot.

Table 2: NOAA NWS Gage Stations During Hurricane Charley

Station ID	Name	Longitude (West)	Latitude (North)	Hurricane Charley Peak Elevation (Ft) MLLW
872511	Naples, FL	81° 48.4'	26° 7.8'	Gauge malfunctioned
8725520	Ft. Myers, FL	81° 52.3'	26° 38.8'	1.3
8726384	Port Manatee, FL	82° 33.8'	27° 38.2'	None above normal

MLLW – Mean Lower Low Water Tidal Datum

Marking and Survey Methodology

Field and survey crews from URS and URS Team subconsultants, Dewberry and PBS&J, were deployed to conduct resident interviews, find evidence of coastal high water levels, take digital photos, and to survey CHWMs from Hurricane Charley. Figures 3a and 3b show an example of both the flaggers' form and the surveyor's form used to record field information. During the flagging, field crews entered estimates of surge heights in the comments field found on the flagger forms. These were visual estimates and were referenced to the normal range of the tides as best estimated by the observers. The purpose of these observations was to get an initial estimate well in advance of time that the surveyors' work would be completed. The CHWM flagging crews were deployed on Monday, August 16, 2004, shortly followed by the survey crews. A brief meeting was held with Dr. Shabbar Saiffee, FEMA Region IV Project Monitor, and Todd Davidson and Sal Bucolo, also of FEMA, on August 19, 2004 at the FEMA Orlando Disaster Field Office and the coverage area was discussed.

GPS survey crews followed the field crews and used static GPS methods to determine an accurate elevation for each CHWM. Since static GPS requires an area with no tree cover to return an accurate result, in some cases it was necessary to perform a short level loop survey from the GPS point to the CHWM. Wherever possible, the finished floor elevation of structures adjacent to the CHWM was collected. This information may be used at a later date for possible damage assessments or Hazard Mitigation Grant Program applications. CHWM locations were surveyed horizontally in NAD 83 (90), State Plane feet, and vertically in NAVD 88 US survey feet. CHWM locations have been surveyed to within accuracies of 0.25 feet vertically and 10 feet horizontally with a 95% confidence level.

Figure 3a: Sample CHWM Flagger Form

HIGH WATER MARK (HWM) REPORT - FLAGGERS

Page 1	
HWM ID	
Stream Name	
Unit Number	
Name of Crew / Interviewer	
Company	
Date of flagging / Interview	
Date of flood event	
Name of storm event	
Address of HWM	
Location / Description of Mark	

Vertical Distance from set point & description of set point	
HWM Object	
Type of Mark	
Type of HWM	
HWM Quality	
Flood Type	
City	
County	
State	
Witness Information:	Name: Address: Telephone Number How long lived there: Obtained permission to survey?

Page 2	
HWM ID (from first page)	
Photo ID	
Photo Location / Orientation	
Photo Description / Subject	
Flagger HWM Latitude	
Flagger HWM Longitude	
Comments	

Figure 3b: High Water Mark (HWM) Report - Surveyor

HWM ID	
ADDRESS OF HWM	
Survey Date	
Surveyors	
Company	
Survey Accuracy (1)	
Projection	
Vertical Datum	NAVD 88
Horizontal Datum	NAD 83
Easting	
Northing	
HWM Elevation (2)	
First Floor Elevation (based on measurement from HWM)	

(1) Indicate survey method / equipment (since different equipment / methods have different accuracy)

(2) Note that the HWM is the line at the bottom of the tape or paint

Field crews noted CHWM characteristics such as surge, wave runup, and wave height. These designations on the survey sheets in the appendices represent the flaggers' estimates of these characteristics based on a combination of physical flood evidence and interviews with witnesses at the time of collection. Surge represents the rise in the normal water level, wave runup indicates the height of water rise above the still-water level due to water rush up from a breaking wave, and wave height indicates CHWM elevation due to more direct wave action. Typically, Surge CHWMs are associated with a slow rising flood that causes more water damage than structural damage. Wave height usually corresponds to a higher flood elevation. All attempts were made to flag storm surge elevations, but in areas where surge characteristics were not obvious, wave runup or wave height were flagged. In some cases, witnesses claimed the flooding was associated with a storm surge, when in fact the flooding was from wave runup or riverine flooding.

Several locations along the coast and bays experienced no rise in water levels, while others saw an actual decline during the storm. At these locations, water levels did not exceed the height of the bulkheads and seawalls enclosing the water body. The tops of these structures were surveyed to obtain a conservative estimate of surge heights. The rationale was that if the water level did not exceed these heights, then the storm surge was contained within these structures. An open black circle seen on the accompanying maps designates these points.

Elevation Conversion from NAVD88 to NGVD29 Using VERTCON

The elevations shown in the 1929 NGVD were derived from the VERTCON program and the existing 1988 (NAVD) elevation. The VERTCON software was developed by the National Geodetic Survey (NGS) Office to allow the conversion of data between different vertical data scales. VERTCON is available as an element of the NGS Geodetic Toolkit and can be downloaded at the NGS website: <http://www.ngs.noaa.gov/TOOLS/Vertcon/vertcon.html>.

VERTCON allows the user to compute the modeled difference in orthometric height for a given location specified by its latitude and longitude. Applying the VERTCON datum difference value to a specific elevation allows you to convert from one datum to another.

For example, the NAVD88 elevation is 5.33 feet at UNIT 1-3. Using the latitude and longitude, VERTCON computes a datum shift of (-)1.171 feet; to convert to the NGVD29, SUBTRACT the datum shift from the NAVD88 height. NAVD EL=5.33' minus (-)1.171 feet equals NGVD elevation of 6.502 feet.

Findings and Observations

Figure 4 (Appendix A) is a map of the area annotated with the CHWM unit ID's and surveyed elevations from coastal high water levels. Figure 5 (Appendix A) shows selected inset areas which were enlarged on subsequent figures to show greater detail in distinguishing between high water mark locations on the coast and those found in embayments, bays and estuaries. These surveyed observations for the surge levels do include both surge height and wave run-up elevations relative to the North American Vertical Datum (NAVD) 88 vertical datum and the North American Datum (NAD) 83 horizontal datum.

Figure 4 and Figure 6, inset A (Appendix A) show that the overall pattern begins with high water elevations along the open coast at Marco Island of 4½ feet and those on inland coasts of between 1 and 1½ feet increasing to 4 to 6 feet at Naples. The height increases to 6 to 8 feet northward along the open Gulf coast at Estero Island (Fort Myers Beach) (see Figure 6, inset B). Heights of up to 6 feet were found along the causeway to Sanibel Island across the mouth of San Carlos Bay (Figure 7, inset C, Appendix A).

The coastal high water levels along the south-facing Sanibel Island shore were in the estimated range of 5 to 7 feet (Figure 7, inset D). Coastal levels increased to a maximum of about 7 to 8 feet on the west-facing shore of Captiva Island (Figure 8, inset E, Appendix A). Ralph Clark, a coastal engineer with the Florida Bureau of Beaches and Coastal Systems who visited the island, estimates that a breach across this island is on the order of 1,800 feet wide.

Gasparilla Island is just north of Cayo Costa Island. There appears to have been no significant surge on the open Gulf shoreline of Gasparilla Island.

Pine Island Sound lies between Captiva Island and Pine Island and it is north of Sanibel Island. The coastal high water levels along the sound-facing sides of Captiva and Sanibel Island were estimated between 2 and 3 feet. The coastal high water levels along the corresponding northwest shoreline of Pine Island were about 4 to 5 feet (Figure 2). For the southern shoreline of Pine Island, no flooding was observed.

Matlacha Pass is a relatively narrow waterway between the mainland and both Pine and Little Pine Island. This pass connects San Carlos Bay on the south to Charlotte Harbor at the north. Maximum coastal water levels along the Pine Island side of this pass observed were on the order of 4 feet. The eastern shore of this pass is entirely covered with a dense stand of mangroves and thus it is inaccessible.

The mile-wide Caloosahatchee River enters San Carlos Bay from the east. The high coastal water level opposite Cape Coral, which is on the north shore 3 to 9 miles upstream of the mouth, was about 3 feet. Further up this tributary estuary, in the eastern portion of Ft. Myers the high water level appeared to be on the order of 1½ to 2 feet. A point (unit2_32) taken approximately 25 miles up from the mouth of the river returned a surveyed elevation of 4.14 feet.

Charlotte Harbor is the name given to the portion of this estuary that is north of Pine Island south of the area of Port Charlotte. The Myakka River mouth enters from the west and the Peace River mouth from the east. These are about 1 to 1½ mile wide respectively. Punta Gorda lies on the east shore where the Peace River enters the Charlotte Harbor estuary. Observations along the Port Charlotte shoreline and up the lower Peace River showed that there was no significant storm surge. Water levels appear to have remained within the normal range of the tide and possibly even below this level. Along Charlotte Harbor

south of Punta Gorda to the Charlotte-Lee County line, water levels appear to have gone as high as about 3 to 4 feet (Figure 8, inset F).

Finally, Gasparilla Sound lies behind the Gasparilla Island and the coastal high water level on the bay side of this island was about 2½ to 3 feet. Lemon Bay is behind Manasota Island about 10 miles south of Venice, Florida. This sound appeared to have witnessed no significantly increased water level elevation during the storm.

In summary, crews for surveying flagged 59 CHWM locations. The overall range of water level elevations on the open coast vary from 4½ feet NAVD on Marco Island in the south, to 8¼ feet NAVD on the north end of Estero Island, to 2½ feet NAVD on Cayo Costa Island. In the lower reaches of the Peace River and in the area of the mouth of the Myakka River, water levels did not reach normal high tide elevations. The geographic extent of these sites runs from Marco Island in the south, to just south of the town of Venice in the north. Out of the 59 surveyed CHWMs, 18 were clear maximum still water surge elevations and 25 were high quality marks designated as wave runup events. Of the remaining CHWMs, six are fair quality surge values, nine are fair quality wave runup values, and one is designated as a fair quality wave height event.

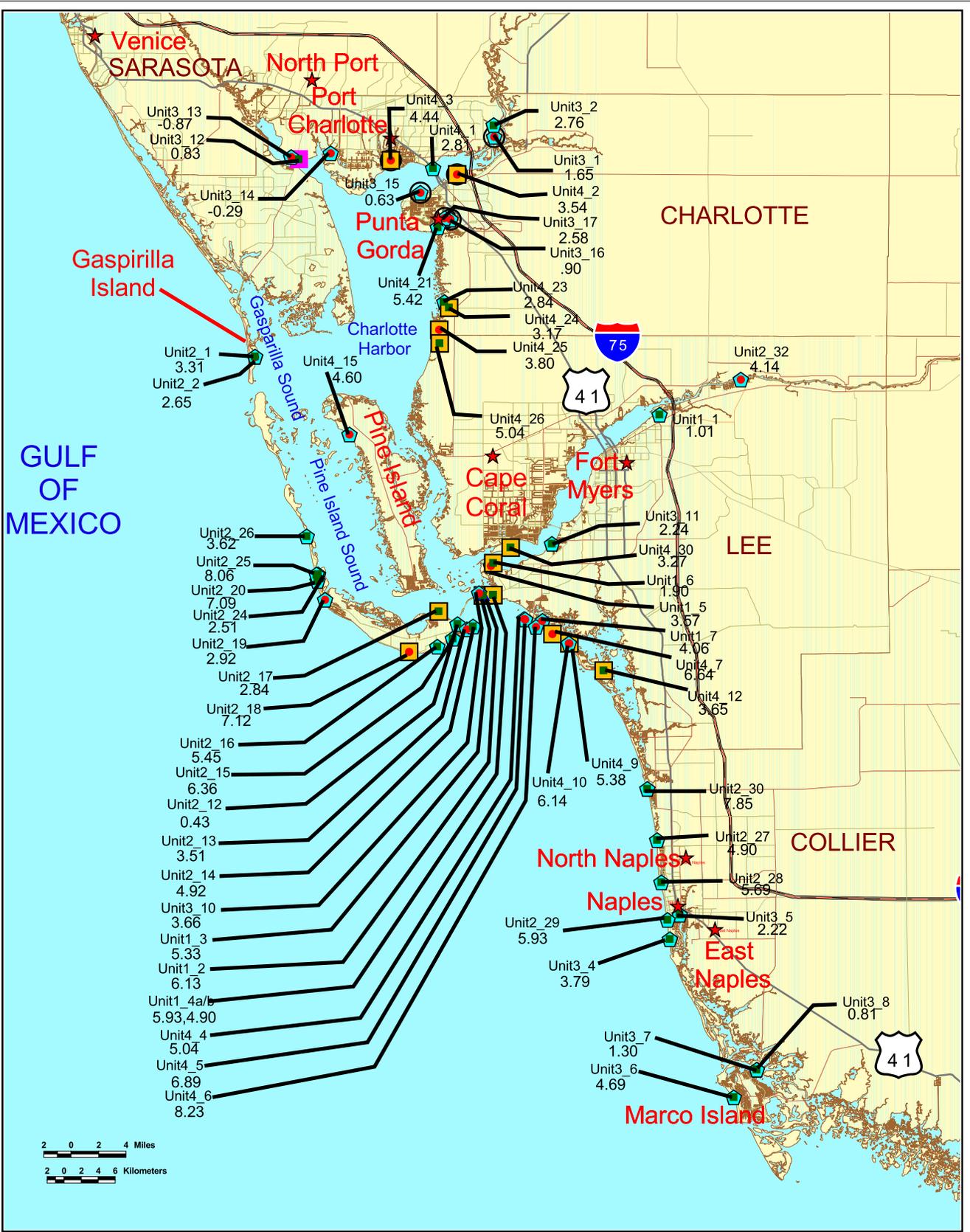
Recommendations

The following recommendations discuss how FEMA can utilize the CHWM information to assist in the recovery effort from Hurricane Charley:

- Compare the Charley CHWMs to the flood elevation data on the effective or preliminary Flood Insurance Rate Maps. These comparisons can help FEMA make determinations on where the updated flood hazard data was supported by the flooding that occurred or where new detailed studies should be performed to update the maps, and can help illustrate deficiencies on the existing maps.
- Compare the Charley CHWMs to HWMs from other significant flood events. This will identify areas of repetitive flooding that can assist FEMA in determining locations that would make good flood mitigation projects.
- Complete detail engineering analysis to determine flood elevations in the areas where deficiencies have been identified on the existing FEMA maps, or on areas where property loss occurred where no previous studies have been prepared.
- The locations and severity of the Charley CHWMs can help FEMA identify areas of concern for future mitigation projects when funding for such projects becomes available.
- Use these CHWMs to evaluate the success of completed mitigation projects. The flood depths that occurred during Charley can be used to estimate potential damage that could have occurred to structures that have been bought out and removed as part of mitigation projects already completed. Documentation of the “damages avoided” can be used as success stories to further support the mitigation efforts.
- The CHWMs can be used to create inundation mapping for Hurricane Charley. The inundation maps would provide a plan view look at the extent of flooding from Hurricane Charley and can assist in determining the accuracy of existing FEMA flood maps. The inundation mapping would be a spatially correct GIS coverage that can be provided to community officials to assist in disaster recovery.
- Provide this report on the Internet to aid public officials and the community in general in the recovery effort.

Appendices

Appendix A: Figures

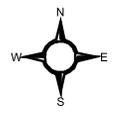


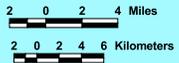
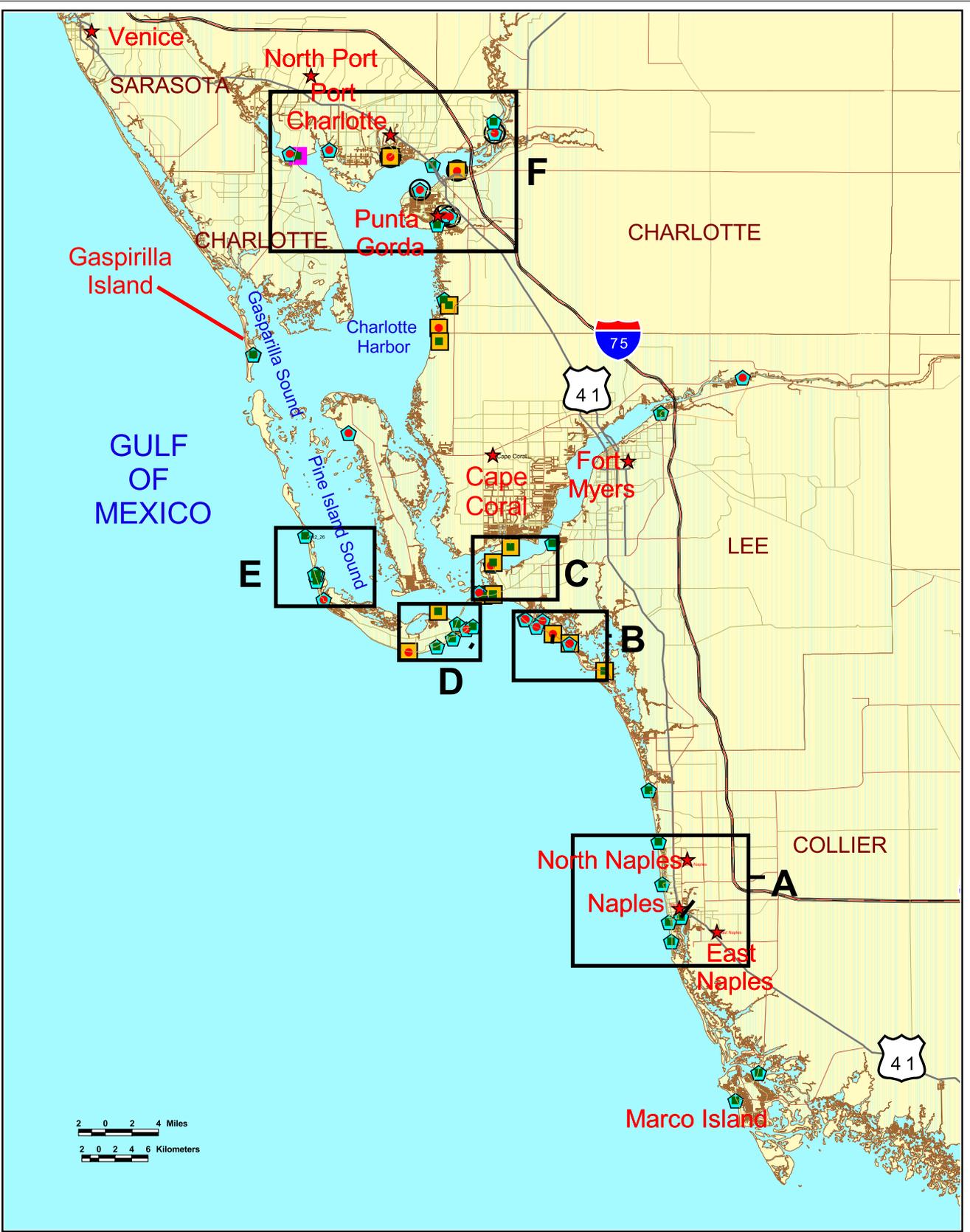
LEGEND:

Florida Counties	not over seawall	fair
Cities / Municipalities	runup	good
County Road	surge	poor
Interstate	wave height	Unit3_2 = High Water Mark ID
State Road	wave runup	3.31 = surveyed elevation (NAD 83, NAVD 88)
U.S. Road	did not exceed seawall elevation	

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Figure 4
Hurricane Charley:
CHWM Unit ID's and
Surveyed Elevations

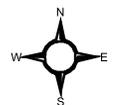




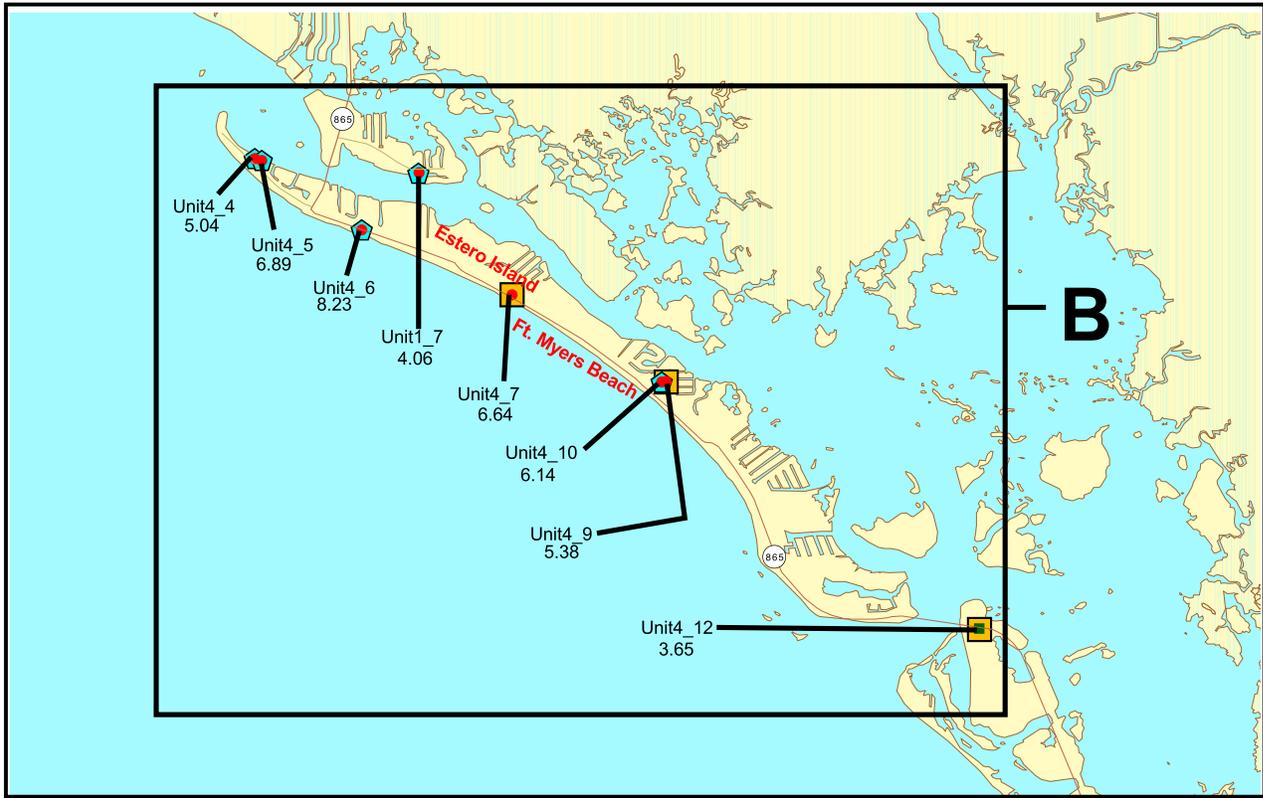
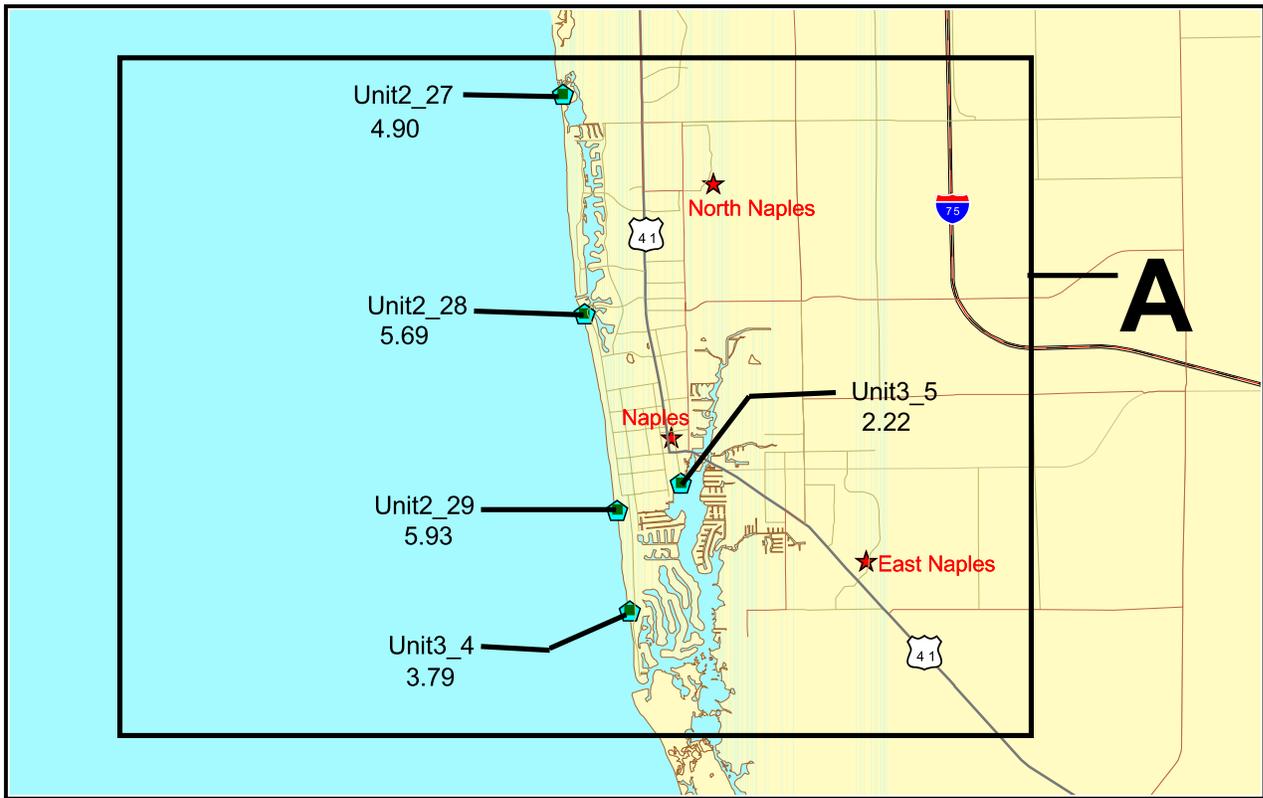
LEGEND:

Florida Counties	not over seawall	fair
Cities / Municipalities	runup	good
County Road	surge	poor
Interstate	wave height	Unit3_2 = High Water
State Road	wave runup	Mark ID
U.S. Road	did not exceed seawall elevation	3.31 = surveyed elevation (NAD 83, NAVD 88)

Figure 5
Hurricane Charley:
CHWM Unit ID's and
Surveyed Elevations
Inset Locations



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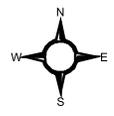


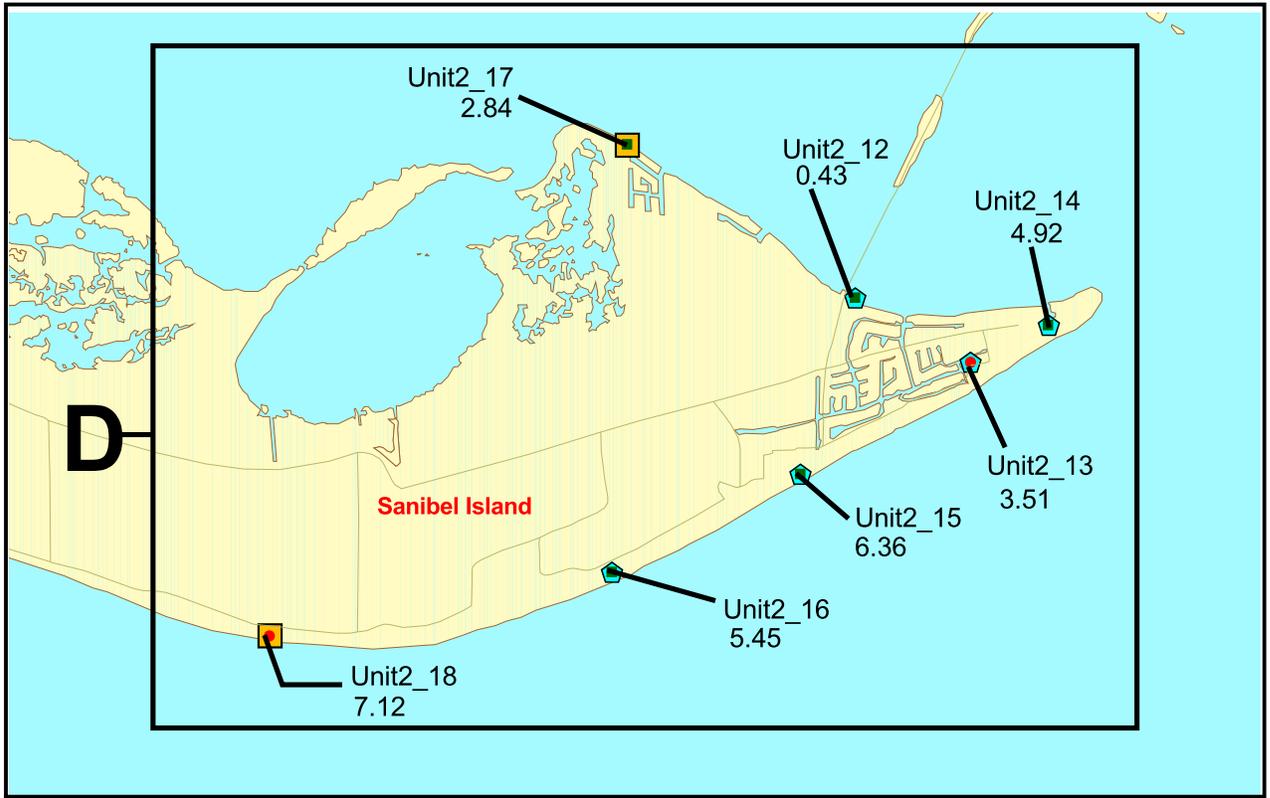
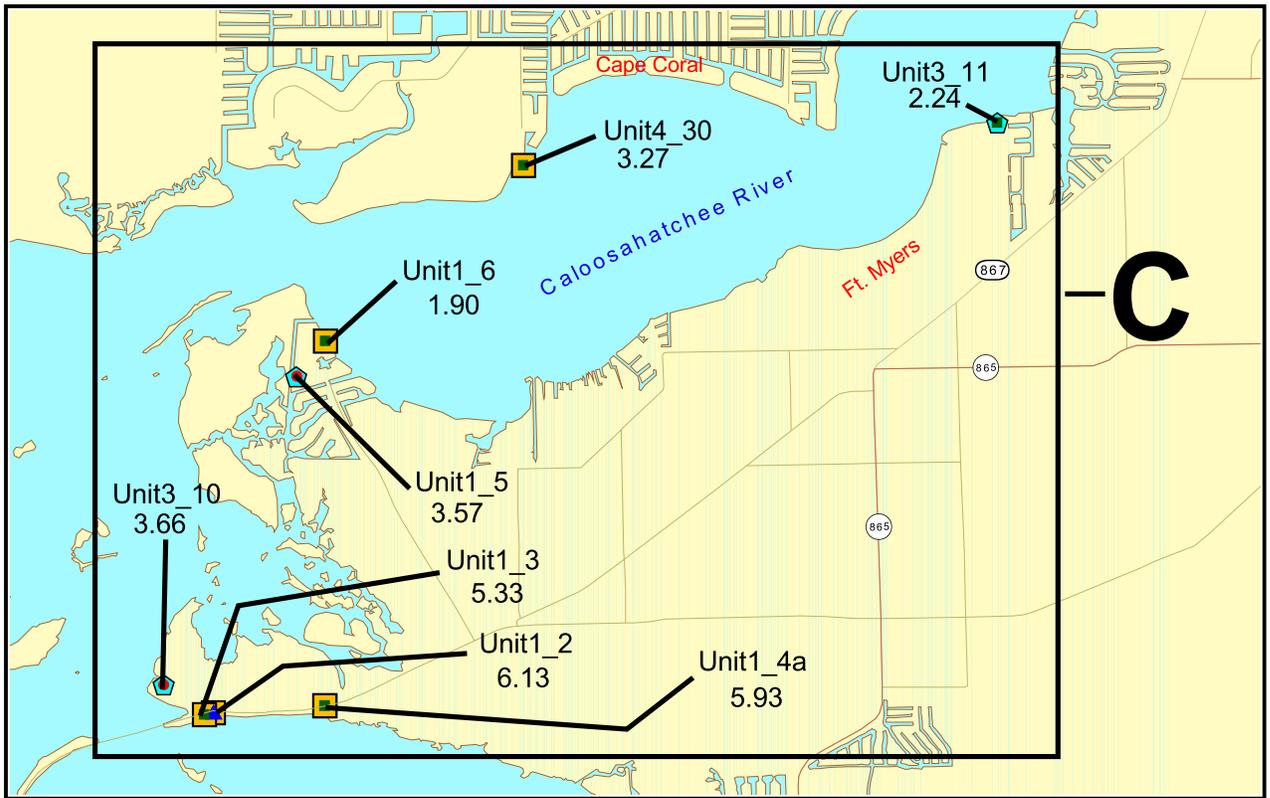
LEGEND:

Florida Counties	not over seawall	fair
Cities / Municipalities	runup	good
County Road	surge	poor
Interstate	wave height	Unit3_2 = High Water
State Road	wave runup	3.31 = surveyed elevation
U.S. Road	did not exceed seawall elevation	(NAD 83, NAVD 88)

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Figure 6
Hurricane Charley:
CHWM Unit ID's and
Surveyed Elevations
Insets A & B



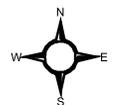


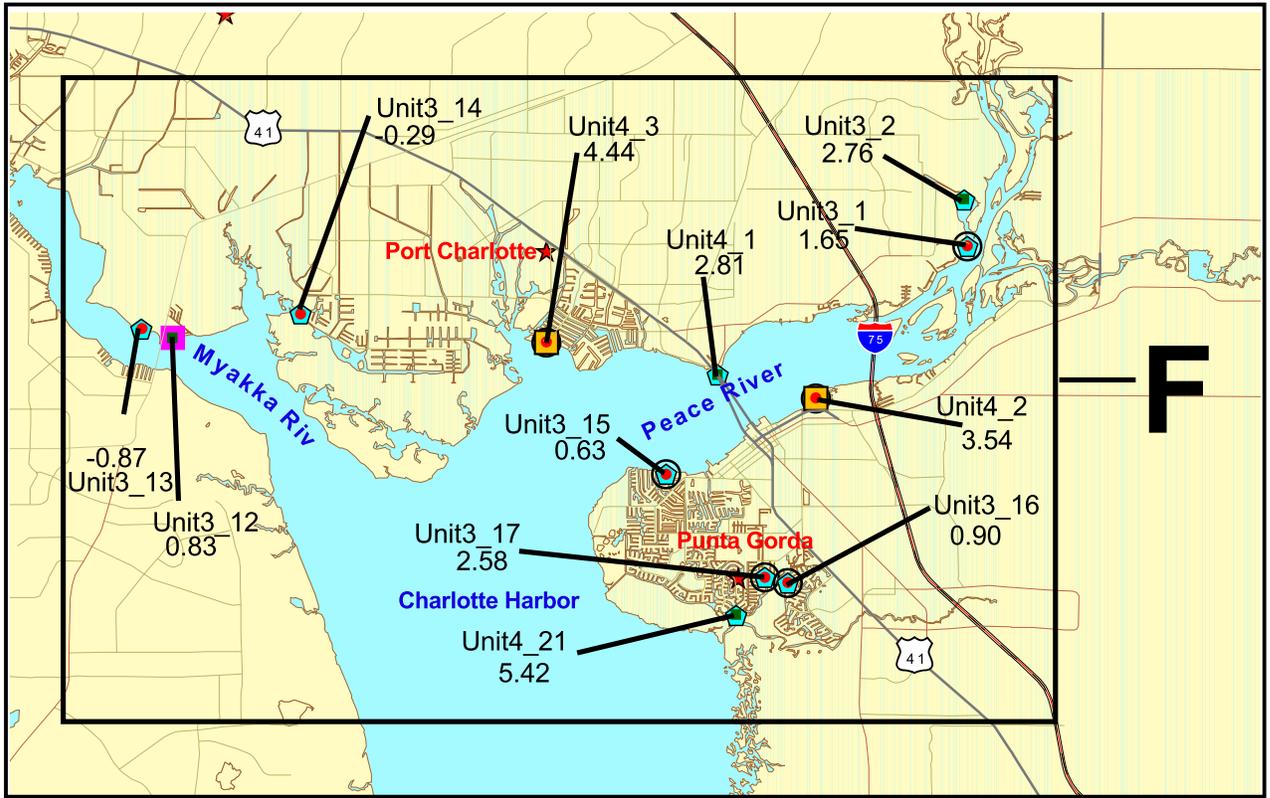
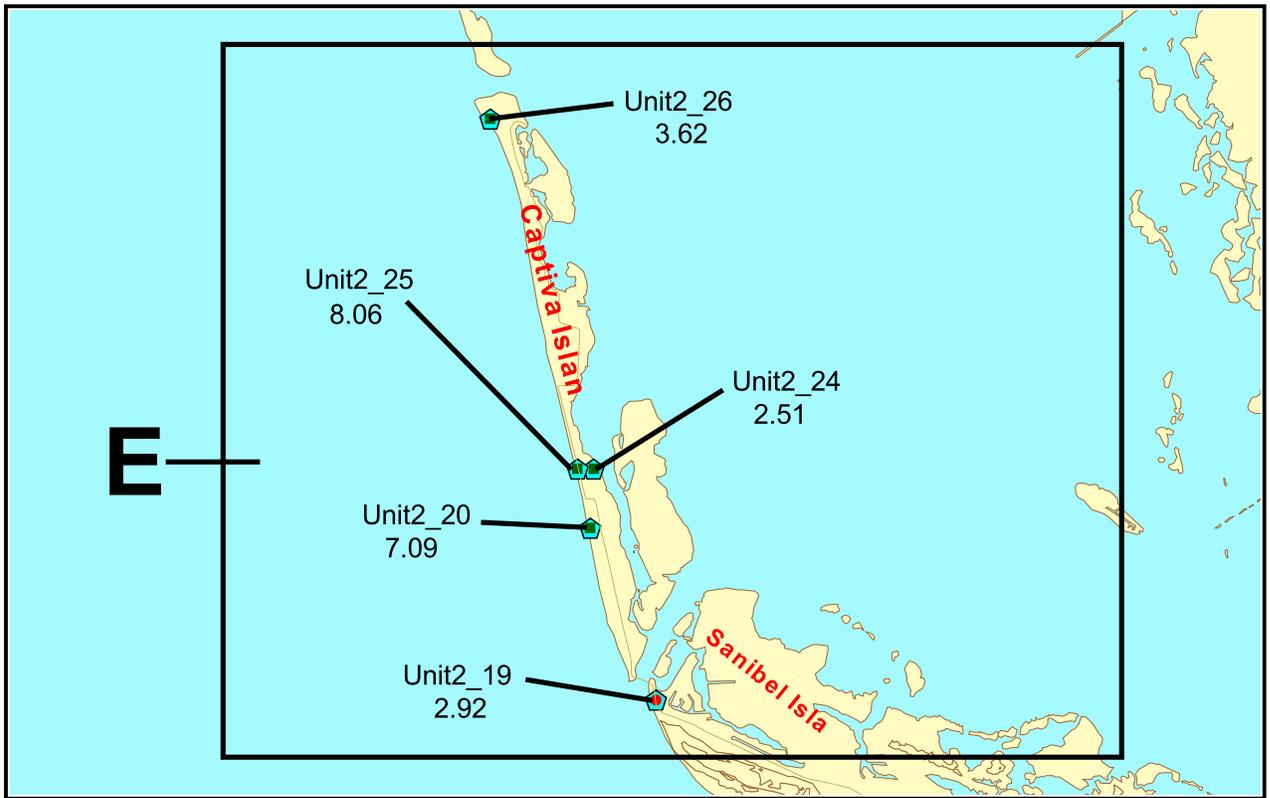
LEGEND:

Florida Counties	not over seawall	fair
Cities / Municipalities	runup	good
County Road	surge	poor
Interstate	wave height	Unit3_2 = High Water
State Road	wave runup	3.31 = surveyed elevation
U.S. Road	did not exceed seawall elevation	(NAD 83, NAVD 88)

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Figure 7
Hurricane Charley:
CHWM Unit ID's and
Surveyed Elevations
Insets C & D



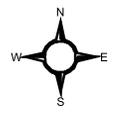


LEGEND:

Florida Counties	not over seawall	fair
Cities / Municipalities	runup	good
County Road	surge	poor
Interstate	wave height	Unit3_2 = High Water Mark ID
State Road	wave runup	3.31 = surveyed elevation (NAD 83, NAVD 88)
U.S. Road	did not exceed seawall elevation	

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Figure 8
Hurricane Charley:
CHWM Unit ID's and
Surveyed Elevations
Insets E & F



Appendices

Appendix B: Survey Sheets from Charlotte County



FEMA

PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-1

HWM ID: Unit3_15 **Type of Mark:** no mark

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Peace River **Quality of Mark:** good

Survey Elevation (NAVD 88): 0.63 ft **NGVD 29:** 1.76 ft **HWM Object:** seawall

Flooding Type: surge

HWM Address: 1950 Jamaica Way

Location of HWM Object: survey at 42 inches below top of seawall. seawall in back yard of house

HWM Type: eyewitness report

Closest Municipality: Punta Gorda **County:** Charlotte **State:** FL

Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS

Date of Flagging/Interview: 8/23/2004

Survey Crew: RAP,DT **Survey Company:** PBS&J

Survey Date: 8/31/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.9257588 **Easting:** 631332.4458

Survey Longitude: 82.0762175 **Northing:** 942191.935

Approx. First Floor Elevation: 4.13 top seawall

Comments:
witness states level was seen by counting # of exposed rungs on ladder of dock.



unit3_15b.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

James E. Godfrey PLS 4541

James E. Godfrey- Professional Land Surveyor, State of Florida
PBS&J Licensed Business 24
5300 W. Cypress St. Suite 200, Tampa Florida. 33607 PH. 813 282-7275

PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-2

HWM ID	Unit3_16	Type of Mark:	no mark
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Alligator Creek	Quality of Mark:	good
Survey Elevation (NAVD 88):	0.90 ft NGVD 29: 2.04 ft	HWM Object:	seawall
Flooding Type:	surge		
HWM Address:	3712 Candia Drive		
Location of HWM Object	survey at 36 inches below top of seawall. seawall in back yard of house		
HWM Type:	eyewitness report		
Closest Municipality:	Punta Gorda	County: Charlotte	State: FL
Name of Flagger/Interviewer:	Hatchett	Flagger Company:	URS
Date of Flagging/Interview:	8/23/2004		
Survey Crew:	RAP,DT	Survey Company:	PBS&J
Survey Date:	8/31/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.8965681	Easting:	642008.3454
Survey Longitude:	82.0434414	Northing:	931576.013
Approx. First Floor Elevation:	3.90 top seawall		

Comments:
Witness states water level never got higher than normal high tide



unit3_16.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



FEMA

PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C PREL. 10/18/2004 FINAL 11/4/2004 SHEET Char-3

HWM ID Unit3_17 Type of Mark: stake with flag in yard
 Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004
 Stream Name/Flood Source: N. Alligator Creek Quality of Mark: good
 Survey Elevation (NAVD 88): 2.58 ft NGVD 29: 3.72 ft HWM Object: seawall
 Flooding Type: surge
 HWM Address: 532 Canada Court
 Location of HWM Object: survey at 12 inches below top of seawall, seawall in back yard of house

HWM Type: eyewitness report
 Closest Municipality: Punta Gorda County: Charlotte State: FL

Name of Flagger/Interviewer: Hatchett Flagger Company: URS
 Date of Flagging/Interview: 8/23/2004

Survey Crew: RAP,DT Survey Company: PBS&J
 Survey Date: 8/31/2004
 Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)
 Survey Latitude: 26.8980182 Easting: 639980.9724
 Survey Longitude: 82.0496626 Northing: 932103.8687
 Approx. First Floor Elevation: 3.58 top seawall

Comments:

go 9 feet on 240 degree heading to survey spot. Survey 12 inches down from top of seawall. Witness states water level reached 6 inches above normal high tide.



unit3_17a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-4

HWM ID: Unit4_1 **Type of Mark:** stave

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Peace River **Quality of Mark:** good

Survey Elevation (NAVD 88): 2.81 ft **NGVD 29:** 3.93 ft **HWM Object:** shoreline

Flooding Type: wave runup

HWM Address: Rt. 41 bridge

Location of HWM Object: 25 feet from headwall, which is 30 inches below. Headwall was marked already.

HWM Type: debris line

Closest Municipality: Port Charlotte **County:** Charlotte **State:** FL

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry

Date of Flagger/Interview: 8/18/2004

Survey Crew: RAP,DT **Survey Company:** PBS&J

Survey Date: 8/31/2004

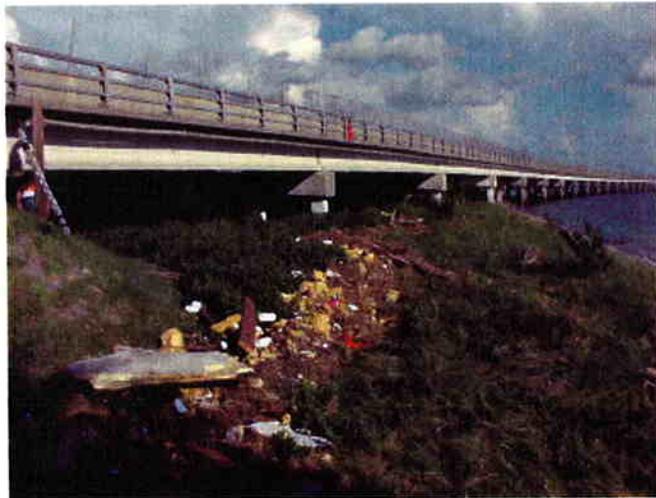
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.952483 **Easting:** 635848.6098

Survey Longitude: 82.0623719 **Northing:** 951903.7949

Approx. First Floor Elevation:

Comments:



unit4_1.pic1.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-5

HWM ID	Unit4_2	Type of Mark:	n/a
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Peace River	Quality of Mark:	fair
Survey Elevation (NAVD 88):	3.54 ft NGVD 29: 4.67 ft	HWM Object:	n/a
Flooding Type:	surge		
HWM Address:	311 Bay Ridge Place		
Location of HWM Object	n/a		
HWM Type:	eyewitness report		
Closest Municipality:	Punta Gorda	County: Charlotte	State: FL
Name of Flagger/Interviewer:	Simmons	Flagger Company:	Dewberry
Date of Flagging/Interview:	8/18/2004		
Survey Crew:	RAP,DT	Survey Company:	PBS&J
Survey Date:	8/31/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.9461793	Easting:	644475.2489
Survey Longitude:	82.035888	Northing:	949609.0367
Approx. First Floor Elevation:	3.54 top seawall		

Comments:

Bright yellow house. Waves just splashing on seawall



unit4_2.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-6

HWM ID	Unit4_3	Type of Mark:	n/a
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Peace River	Quality of Mark:	fair
Survey Elevation (NAVD 88):	4.44 ft NGVD 29: 5.56 ft	HWM Object:	n/a
Flooding Type:	surge		
HWM Address:	4476 Harbor Blvd		
Location of HWM Object	n/a		
HWM Type:	eyewitness report		
Closest Municipality:	outside Punta Gorda	County: Charlotte	State: FL
Name of Flagger/Interviewer:	Simmons	Flagger Company:	Dewberry
Date of Flagging/Interview:	8/18/2004		
Survey Crew:	RAP,DP,TT	Survey Company:	PBS&J
Survey Date:	9/10/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.9612967	Easting:	620863.5261
Survey Longitude:	82.1083812	Northing:	955117.7504
Approx. First Floor Elevation:			

Comments:

water did not get over seawall, within range of normal tide



unit4_3.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-7

HWM ID Unit4_21 **Type of Mark:** stake
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico / Charlotte Harbor **Quality of Mark:** good
Survey Elevation (NAVD 88): 5.42 ft **NGVD 29: 6.56 ft** **HWM Object:** grass lawn
Flooding Type: wave runup
HWM Address: 5504 River Bay Dr 0
Location of HWM Object debris line along grass 5-6 feet above water line

HWM Type: debris line
Closest Municipality: Punta Gorda **County:** Charlotte **State:** FI

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry

Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,DT **Survey Company:** PBS&J

Survey Date: 8/31/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.8878297 **Easting:** 637480.0786

Survey Longitude: 82.057331 **Northing:** 928401.3848

Approx. First Floor Elevation:

Comments:



unit4_21.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-8

HWM ID Unit4_23 **Type of Mark:** stake
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Charlotte Harbor **Quality of Mark:** good
Survey Elevation (NAVD 88): 2.84 ft **NGVD 29: 3.99 ft** **HWM Object:** lawn
Flooding Type: wave runup
HWM Address: 24149 Jolly Roger Blvd.
Location of HWM Object debris line behind house

HWM Type: debris line
Closest Municipality: Pirate Harbor/Punta Gorda **County:** Charlotte **State:** FL

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,CG **Survey Company:** PBS&J
Survey Date: 9/8/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.8060101 **Easting:** 639902.8913
Survey Longitude: 82.0498618 **Northing:** 898659.0563

Approx. First Floor Elevation:

Comments:

Mr. Stewart stayed during storm



unit4_23.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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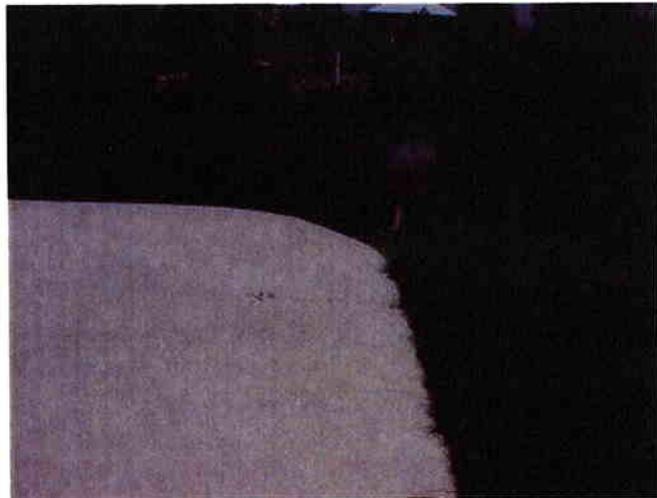
CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-9

HWM ID	Unit4_24	Type of Mark:	stave
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Charlotte Harbor	Quality of Mark:	fair
Survey Elevation (NAVD 88):	3.17 ft NGVD 29: 4.32 ft	HWM Object:	lawn
Flooding Type:	wave runup		
HWM Address:	24308 Lafitte Blvd.		
Location of HWM Object	debris line on side of concrete pad/driveway near bulkhead.		
HWM Type:	debris line		
Closest Municipality:	Pirate Harbor/Punta Gorda	County: Charlotte	State: FL
Name of Flagger/Interviewer:	Simmons	Flagger Company:	Dewberry
Date of Flagging/Interview:	8/21/2004		
Survey Crew:	RAP,CG	Survey Company:	PBS&J
Survey Date:	9/8/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.7998549	Easting:	641618.0027
Survey Longitude:	82.0446012	Northing:	896421.0219
Approx. First Floor Elevation:			

Comments:



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit4_24.jpg

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C PREL. 10/18/2004 FINAL 11/4/2004 SHEET Char-10

HWM ID Unit4_25 Type of Mark:

Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004

Stream Name/Flood Source: Charlotte Harbor Quality of Mark: fair

Survey Elevation (NAVD 88): 3.80 ft NGVD 29: 4.95 ft HWM Object:

Flooding Type: surge

HWM Address: end of road near Hog Creek

Location of HWM Object

HWM Type: eyewitness report

Closest Municipality: Cape Coral County: Charlotte State: FL

Name of Flagger/Interviewer: Simmons Flagger Company: Dewberry

Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,CG Survey Company: PBS&J

Survey Date: 9/8/2004

Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)

Survey Latitude: 26.7757691 Easting: 638012.8421

Survey Longitude: 82.0556416 Northing: 887667.3539

Approx. First Floor Elevation:

Comments:

no evidence of flooding



unit4_25.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Char-11

HWM ID	Unit4_26	Type of Mark:	USGS metal stake
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Charlotte Harbor	Quality of Mark:	fair
Survey Elevation (NAVD 88):	5.04 ft NGVD 29: 6.2 ft	HWM Object:	grass lawn
Flooding Type:	wave runup		
HWM Address:	3192 Matecumbe Key Road		
Location of HWM Object	Burnt Store Marina near boat ramp		
HWM Type:	debris line		
Closest Municipality:	Punta Gorda	County: Charlotte	State: FL
Name of Flagger/Interviewer:	Simmons	Flagger Company:	Dewberry
Date of Flagging/Interview:	8/21/2004		
Survey Crew:	RAP,CG	Survey Company:	PBS&J
Survey Date:	9/8/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.7607653	Easting:	638228.7723
Survey Longitude:	82.0549726	Northing:	882213.4587
Approx. First Floor Elevation:			

Comments:

Dock master has pictures showing damage and debris lines on grass. No flood damage. Two gentlemen from USGS visited earlier in week.

NO IMAGE TO DISPLAY

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

n/a

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

Appendices

Appendix C: Survey Sheets from Collier County



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125130 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Coll-1

HWM ID	Unit3_4	Type of Mark:	red spray paint
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Gulf of Mexico	Quality of Mark:	good
Survey Elevation (NAVD 88):	3.79 ft NGVD 29: 5.07 ft	HWM Object:	ground
Flooding Type:	wave runup		
HWM Address:	west end of 33 Ave. S		
Location of HWM Object	47 feet due west from guard rail. Starting position marked with red spray paint.		
HWM Type:	rack line		
Closest Municipality:	Naples	County: Collier	State: FL
Name of Flagger/Interviewer:	Hatchett	Flagger Company:	URS
Date of Flagging/Interview:	8/19/2004		
Survey Crew:	MR,RL,BH	Survey Company:	PBS&J
Survey Date:	9/9/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.1087846	Easting:	392615.2899
Survey Longitude:	81.8031338	Northing:	646042.1533
Approx. First Floor Elevation:			

Comments:



unit3_4.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 1.0 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125130 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Coll-2

HWM ID: Unit3_5 **Type of Mark:**

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Naples Bay **Quality of Mark:** good

Survey Elevation (NAVD 88): 2.22 ft **NGVD 29:** 3.49 ft **HWM Object:** ground

Flooding Type: wave runup

HWM Address:

Location of HWM Object: Head SE from SE corner of Naples Community Sailing Center trailer, 29 feet on 115 degree heading. 40 inches down from SE corner of deck. (top of deck)

HWM Type: rack line

Closest Municipality: Naples **County:** Collier **State:** FL

Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS

Date of Flagging/Interview: 8/19/2004

Survey Crew: MR,RL,BH **Survey Company:** PBS&J

Survey Date: 9/9/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.1355022 **Easting:** 396177.1354

Survey Longitude: 81.7924602 **Northing:** 655732.0882

Approx. First Floor Elevation:

Comments:
rack line sheltered by mangroves.



unit3_5.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 120067 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Coll-3

HWM ID: Unit3_6 **Type of Mark:** flagged stake
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 4.69 ft **NGVD 29: 6 ft** **HWM Object:** ground
Flooding Type: wave runup
HWM Address: Marco Island Residence Beach, 130 S. Collier Blvd.
Location of HWM Object: Go 90 feet on 300 degree heading from end of north arm of walkway. Position marked with flagged stake.

HWM Type: rack line
Closest Municipality: Marco Island **County:** Collier **State:** FL

Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS

Date of Flagging/Interview: 8/19/2004

Survey Crew: MR,RL,BH **Survey Company:** PBS&J

Survey Date: 9/9/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 25.9355949 **Easting:** 415127.3628

Survey Longitude: 81.7334566 **Northing:** 582957.0577

Approx. First Floor Elevation:

Comments:
gate attendant "Bob" very helpful



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit3_6b.jpg

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120067 PREL. 10/18/2004 FINAL 11/4/2004 SHEET Coll-4

HWM ID Unit3_7 Type of Mark: red spray paint
Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004
Stream Name/Flood Source: Goodland Bay Quality of Mark: good
Survey Elevation (NAVD 88): 1.30 ft NGVD 29: 2.61 ft HWM Object: ground
Flooding Type: wave runup
HWM Address: Marco Island Residence Beach, 130 S. Collier Blvd.
Location of HWM Object: east side of north end of bridge. Marked on seawall. This point is closest to seawall

HWM Type: rack line
Closest Municipality: Marco Island County: Collier State: FL

Name of Flagger/Interviewer: Hatchett Flagger Company: URS
Date of Flagging/Interview: 8/19/2004

Survey Crew: MR,RL,BH Survey Company: PBS&J
Survey Date: 9/9/2004
Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)
Survey Latitude: 25.9660187 Easting: 423499.0521
Survey Longitude: 81.7081653 Northing: 593969.4776
Approx. First Floor Elevation:

Comments:



unit3_7b.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120067 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Coll-5

HWM ID: Unit3_8 **Type of Mark:** red spray paint

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Goodland Bay **Quality of Mark:** good

Survey Elevation (NAVD 88): 0.81 ft **NGVD 29:** 2.12 ft **HWM Object:** ground

Flooding Type: wave runup

HWM Address: Marco Island Residence Beach, 130 S. Collier Blvd.

Location of HWM Object: east side of north end of bridge. Marked on seawall. This point is farthest from seawall

HWM Type: rack line

Closest Municipality: Marco Island **County:** Collier **State:** FL

Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS

Date of Flagging/Interview: 8/19/2004

Survey Crew: MR,RL,BH **Survey Company:** PBS&J

Survey Date: 9/9/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 25.965967 **Easting:** 423506.3962

Survey Longitude: 81.7081426 **Northing:** 593950.623

Approx. First Floor Elevation:

Comments:



unit3_8b.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120067 PREL. 10/18/2004 FINAL 11/4/2004 SHEET Coll-6

HWM ID Unit2_27 Type of Mark: stake with red paint
Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004
Stream Name/Flood Source: Gulf of Mexico Quality of Mark: good
Survey Elevation (NAVD 88): 4.90 ft NGVD 29: 6.16 ft HWM Object: beach
Flooding Type: wave runup
HWM Address: Clam Pass Park
Location of HWM Object: on beach ramp behind concessionaire

HWM Type: debris line
Closest Municipality: North Naples County: Collier State: FL

Name of Flagger/Interviewer: Beauvois Flagger Company: URS
Date of Flagging/Interview: 8/23/2004

Survey Crew: MR,RL,BH Survey Company: PBS&J
Survey Date: 9/9/2004
Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)
Survey Latitude: 26.2169403 Easting: 388251.4367
Survey Longitude: 81.8171848 Northing: 685383.9683

Approx. First Floor Elevation:

Comments:

ride the Tram in, it stops at the concession stand



unit2_27b.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125130 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Coll-7

HWM ID: Unit2_28 **Type of Mark:** stake with red paint
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 5.69 ft **NGVD 29: 6.96 ft** **HWM Object:** ground
Flooding Type: wave runup
HWM Address: across from 2100 Gulf Shore Blvd N.
Location of HWM Object: due west of entrance to park

HWM Type: debris line
Closest Municipality: Naples **County:** Collier **State:** Fl
Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/23/2004
Survey Crew: MR,RL,BH **Survey Company:** PBS&J
Survey Date: 9/9/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.1709993 **Easting:** 389623.4153
Survey Longitude: 81.8126814 **Northing:** 668675.7196
Approx. First Floor Elevation:

Comments:
~ 5 feet of surge



unit2_28a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125130 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Coll-8

HWM ID Unit2_29 **Type of Mark:** red painted stake

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good to fair

Survey Elevation (NAVD 88): 5.93 ft **NGVD 29: 7.2 ft** **HWM Object:** ground/dune

Flooding Type: wave runup

HWM Address: approximately 14 Ave. S

Location of HWM Object access through 14 Ave S beach access; go over boardwalk, turn right. Behind first house on right

HWM Type: debris line

Closest Municipality: Naples **County:** Collier **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS

Date of Flagging/Interview: 8/23/2004

Survey Crew: MR,RL,BH **Survey Company:** PBS&J

Survey Date: 9/9/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.129846 **Easting:** 391796.6624

Survey Longitude: 81.8057728 **Northing:** 653702.9856

Approx. First Floor Elevation:

Comments:
~ 4 feet of surge



unit2_29a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120067

PREL. 10/18/2004 FINAL 11/4/2004 SHEET Coll-9

HWM ID	Unit2_30	Type of Mark:	red painted stake
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Gulf of Mexico	Quality of Mark:	good
Survey Elevation (NAVD 88):	7.85 ft NGVD 29: 9.08 ft	HWM Object:	dune
Flooding Type:	wave runup		
HWM Address:	Delinor-Wiggins Park		
Location of HWM Object	North of boardwalk next to office in park		
HWM Type:	debris line		
Closest Municipality:	Naples	County: Collier	State: FL
Name of Flagger/Interviewer:	Beauvois	Flagger Company:	URS
Date of Flagger/Interview:	8/23/2004		
Survey Crew:	RAP,DP,TT	Survey Company:	PBS&J
Survey Date:	9/10/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.2730888	Easting:	384926.9184
Survey Longitude:	81.8277224	Northing:	705815.3794
Approx. First Floor Elevation:			

Comments:

Gate combo is 6789, first boardwalk on left adjacent to office



unit2_30b.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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Appendices

Appendix D: Survey Sheets from Lee County



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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124

PREL. 10/18/2004 FINAL 11/4/2004 SHEET Lee-1

HWM ID Unit1_1 Type of Mark: red paint on road
Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004
Stream Name/Flood Source: Caloosahatchee River Quality of Mark: good
Survey Elevation (NAVD 88): 1.01 ft NGVD 29: 2.16 ft HWM Object: boat ramp
Flooding Type: wave runup
HWM Address: across street from 240 E. Riverside Drive
Location of HWM Object: red spray paint on road

HWM Type: rack line
Closest Municipality: Ft. Meyers County: Lee State:

Name of Flagger/Interviewer: Niedoroda, Beauvois, Goodwin, Hatchett Flagger Company: URS, PBSJ
Date of Flagging/Interview: 8/17/2004

Survey Crew: RAP,DP,TT Survey Company: PBS&J
Survey Date: 9/9/2004

Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)
Survey Latitude: 26.6829469 Easting: 716696.7779
Survey Longitude: 81.8146251 Northing: 853967.1736

Approx. First Floor Elevation:

Comments:



unit1_1c.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-2

HWM ID: Unit1_2 **Type of Mark:** red paint on post
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** fair
Survey Elevation (NAVD 88): 6.13 ft **NGVD 29: 7.3 ft** **HWM Object:** sign post
Flooding Type: wave height
HWM Address:
Location of HWM Object: sign post on left side of road heading toward island

HWM Type: mud line on post
Closest Municipality: Ft. Meyers **County:** Lee **State:** FI

Name of Flagger/Interviewer: Niedoroda, Beauvois, Goodwin, Hatchett **Flagger Company:** URS, PBSJ
Date of Flagging/Interview: 8/17/2004

Survey Crew: RAP,WR **Survey Company:** PBS&J
Survey Date: 8/24/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4849964 **Easting:** 653831.2112
Survey Longitude: 82.0071401 **Northing:** 781971.1936
Approx. First Floor Elevation:

Comments:



unit1_2.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 PREL. 10/18/2004 FINAL 11/4/2004 SHEET Lee-3

HWM ID	Unit1_3	Type of Mark:	red paint on post
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Gulf of Mexico	Quality of Mark:	fair
Survey Elevation (NAVD 88):	5.33 ft NGVD 29: 6.5 ft	HWM Object:	ground
Flooding Type:	wave runup		
HWM Address:			
Location of HWM Object	ground on left side of road leading to island		
HWM Type:	rack line		
Closest Municipality:	Ft. Meyers	County: Lee	State: FL
Name of Flagger/Interviewer:	Niedoroda, Beauvois, Goodwin, Hatchett	Flagger Company:	URS, PBSJ
Date of Flagging/Interview:	8/17/2004		
Survey Crew:	RAP,TT	Survey Company:	PBS&J
Survey Date:	8/27/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.4847768	Easting:	653557.9136
Survey Longitude:	82.0079756	Northing:	781891.3905
Approx. First Floor Elevation:			

Comments:

NO IMAGE TO DISPLAY

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

n/a

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-4

HWM ID: Unit1_4a **Type of Mark:** red paint on post

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** fair

Survey Elevation (NAVD 88): 5.93 ft **NGVD 29: 7.1 ft** **HWM Object:** ground

Flooding Type: wave runup

HWM Address:

Location of HWM Object: rack line on ground on left side of road leading to bridge, 10 ft off road

HWM Type: rack line

Closest Municipality: Ft. Meyers **County:** Lee **State:** FL

Name of Flagger/Interviewer: Niedoroda, Beauvois, Goodwin, Hatchett **Flagger Company:** URS, PBSJ

Date of Flagging/Interview: 8/17/2004

Survey Crew: RAP,WR **Survey Company:** PBS&J

Survey Date: 9/2/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.485644 **Easting:** 657327.5851

Survey Longitude: 81.9964507 **Northing:** 782206.5557

Approx. First Floor Elevation:

Comments:

take reading on both locations



unit_4a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-5

HWM ID Unit1_4b **Type of Mark:** red paint on post

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** fair

Survey Elevation (NAVD 88): 4.90 ft **NGVD 29: 6.07 ft** **HWM Object:** ground

Flooding Type: wave runup

HWM Address:

Location of HWM Object rack line on ground on left side of road leading to bridge. 15 ft off road

HWM Type: rack line

Closest Municipality: Ft. Meyers **County:** Lee **State:** FL

Name of Flagger/Interviewer: Niedoroda, Beauvois, Goodwin, Hatchett **Flagger Company:** URS, PBSJ

Date of Flagger/Interview: 8/17/2004

Survey Crew: RAP,DT,CG **Survey Company:** PBS&J

Survey Date: 9/2/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.4856308 **Easting:** 657326.291

Survey Longitude: 81.9964546 **Northing:** 782201.7261

Approx. First Floor Elevation:

Comments:
take reading on both locations



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Unit1_4b.jpg

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-6

HWM ID: Unit1_5 **Type of Mark:**

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Caloosahatchee River **Quality of Mark:** good

Survey Elevation (NAVD 88): 3.57 ft **NGVD 29:** 4.74 ft **HWM Object:** dock box

Flooding Type: surge

HWM Address: 15111 Shell Point Blvd.

Location of HWM Object: Top of Dock box at #1510 "Sweet Caroline" boat slip

HWM Type: eyewitness report

Closest Municipality: Ft. Meyers **County:** Lee **State:** FL

Name of Flagger/Interviewer: Niedoroda, Beauvois, Goodwin, Hatchett **Flagger Company:** URS, PBSJ

Date of Flagging/Interview: 8/17/2004

Survey Crew: RAP,DT,CG **Survey Company:** PBS&J

Survey Date: 9/2/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.517174 **Easting:** 656435.4612

Survey Longitude: 81.9991779 **Northing:** 793667.065

Approx. First Floor Elevation: 1.67 wood deck

Comments:

take elevation of top of dock box



unit1_5.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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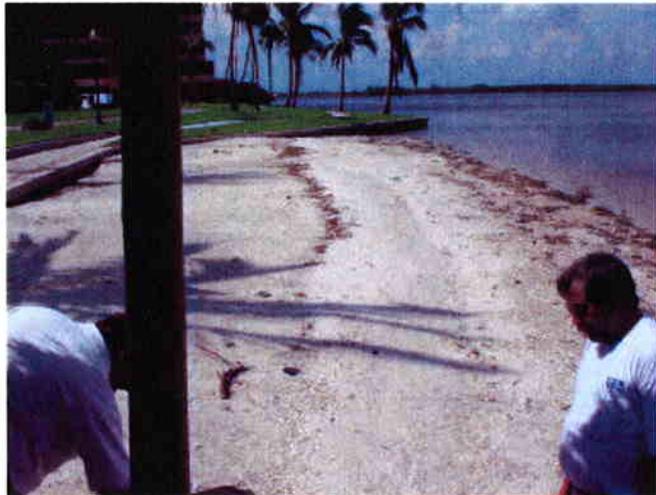


PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-7

HWM ID Unit1_6 **Type of Mark:**
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Caloosahatchee River **Quality of Mark:** fair
Survey Elevation (NAVD 88): 1.90 ft **NGVD 29:** 3.07 ft **HWM Object:** deck
Flooding Type: wave runup
HWM Address: 15112 Shell Point Blvd.
Location of HWM Object at base of deck
HWM Type: rack line
Closest Municipality: Ft. Meyers **County:** Lee **State:** FL
Name of Flagger/Interviewer: Nedoroda, Beauvois, Goodwin, Hatchett **Flagger Company:** URS, PBSJ
Date of Flagging/Interview: 8/17/2004
Survey Crew: RAP,DT,CG **Survey Company:** PBS&J
Survey Date: 9/2/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.5205537 **Easting:** 657341.8115
Survey Longitude: 81.9964061 **Northing:** 794895.5514
Approx. First Floor Elevation: 3.32 wood deck

Comments:

17 inch down from deck at northeast corner post



unit1_6.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 PREL. 10/18/2004 FINAL 11/4/2004 SHEET Lee-8

HWM ID	Unit1_7	Type of Mark:	
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Gulf of Mexico	Quality of Mark:	good
Survey Elevation (NAVD 88):	4.06 ft NGVD 29: 5.24 ft	HWM Object:	inside wall
Flooding Type:	surge		
HWM Address:			
Location of HWM Object	corner of meeting room, interior wall		
HWM Type:	water line		
Closest Municipality:	Estero	County: Lee	State: FL
Name of Flagger/Interviewer:	Niedoroda, Beauvois, Goodwin, Hatchett	Flagger Company:	URS, PBSJ
Date of Flagger/Interview:	8/17/2004		
Survey Crew:	RAP,CG	Survey Company:	PBS&J
Survey Date:	9/1/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.4574372	Easting:	674890.4692
Survey Longitude:	81.94277	Northing:	771958.1128
Approx. First Floor Elevation:	2.21		

Comments: measuring point 23 inch above floor



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit1_7b.jpg

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CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-9

HWM ID: Unit3_1 **Type of Mark:** red paint on seawall

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Peace River **Quality of Mark:** good

Survey Elevation (NAVD 88): 1.65 ft **NGVD 29:** 2.79 ft **HWM Object:** sea wall

Flooding Type: surge

HWM Address: 27436 San Marino Drive

Location of HWM Object: Point located 6 inches down from top of seawall, at NE corner of indentation in seawall. Marked with red spray paint. 6 inches down from top of seawall.

HWM Type: eyewitness report

Closest Municipality: Port Charlotte **County:** Lee **State:** FL

Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS

Date of Flagging/Interview: 8/18/2004

Survey Crew: RAP,DT **Survey Company:** PBS&J

Survey Date: 8/31/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.9871296 **Easting:** 657730.7168

Survey Longitude: 81.9951972 **Northing:** 964493.0507

Approx. First Floor Elevation: 2.15 top seawall

Comments:

point located 6 inches down from top of seawall. Line located ~ 1 foot above current water level. Tide was almost at low stage



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit3_1.jpg

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C PREL. 10/18/2004 FINAL 11/4/2004 SHEET Lee-10

HWM ID Unit3_2 Type of Mark: flagged stake
Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004
Stream Name/Flood Source: Peace River Quality of Mark: good
Survey Elevation (NAVD 88): 2.76 ft NGVD 29: 3.9 ft HWM Object: rip rap
Flooding Type: wave runup
HWM Address: 2128 Harbour Drive
Location of HWM Object 4 feet SSE from stake in ground

HWM Type: rack line
Closest Municipality: Port Charlotte County: Lee State: FL

Name of Flagger/Interviewer: Hatchett Flagger Company: URS
Date of Flagging/Interview: 8/18/2004

Survey Crew: RAP,DT Survey Company: PBS&J
Survey Date: 8/31/2004

Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)
Survey Latitude: 26.9996824 Easting: 657445.064
Survey Longitude: 81.9960739 Northing: 969056.046

Approx. First Floor Elevation:

Comments:

rack line ~1 foot above current water level. Tide was almost at low stage



unit3_2a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-11

HWM ID: Unit3_10 **Type of Mark:** blue magic marker

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Caloosahatchee River **Quality of Mark:** good

Survey Elevation (NAVD 88): 3.66 ft **NGVD 29:** 4.83 ft **HWM Object:** inside wall

Flooding Type: surge

HWM Address: 15051 Punta Rassa Road

Location of HWM Object: left door jamb of entrance to parts room

HWM Type: mud line on wall

Closest Municipality: Ft. Meyers **County:** Lee **State:** FL

Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS

Date of Flagging/Interview: 8/20/2004

Survey Crew: RAP,DT,CG **Survey Company:** PBS&J

Survey Date: 9/2/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.4876355 **Easting:** 652283.7687

Survey Longitude: 82.0118713 **Northing:** 782930.577

Approx. First Floor Elevation: 2.82

Comments:

blue magic marker line extended out of building on door jamb. 10 inches off slab.



unit3_10a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-12

HWM ID: Unit3_11 **Type of Mark:** flagged stake
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Caloosahatchee River **Quality of Mark:** good
Survey Elevation (NAVD 88): 2.24 ft **NGVD 29:** 3.42 ft **HWM Object:** ground
Flooding Type: wave runup
HWM Address: 4863 Griffin Blvd.
Location of HWM Object: 48 feet west of red spray paint mark on road.
HWM Type: rack line
Closest Municipality: Ft. Meyers **County:** Lee **State:** Fl
Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS
Date of Flagging/Interview: 8/20/2004
Survey Crew: RAP,WR,TT **Survey Company:** PBS&J
Survey Date: 8/24/2004,9/7/04
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.5414521 **Easting:** 678361.4318
Survey Longitude: 81.9321115 **Northing:** 802497.6085
Approx. First Floor Elevation:

Comments:



unit3_11.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-13

HWM ID: Unit3_12 **Type of Mark:** red paint on road, stake marking s

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Myakka River **Quality of Mark:** poor

Survey Elevation (NAVD 88): 0.83 ft **NGVD 29:** 1.95 ft **HWM Object:** ground

Flooding Type: wave runup

HWM Address: across street from 14502 Sturkie Ave

Location of HWM Object: on ground across stree from 14502 Sturkie Ave

HWM Type: rack line

Closest Municipality: Port Charlotte **County:** Lee **State:** FL

Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS

Date of Flagging/Interview: 8/23/2004

Survey Crew: RAP,CG **Survey Company:** PBS&J

Survey Date: 9/1/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.9623015 **Easting:** 588080.9827

Survey Longitude: 82.2090258 **Northing:** 955524.172

Approx. First Floor Elevation:

Comments:
neighbor's state's water never got over road surface. Note: this debris line possibly deposited on later high tide event.



unit3_12b.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA -1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-14

HWM ID: Unit3_13 **Type of Mark:** red spray paint
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Myakka River **Quality of Mark:** good
Survey Elevation (NAVD 88): -0.87 ft **NGVD 29:** 0.25 ft **HWM Object:** pier piling
Flooding Type: surge
HWM Address: 14214 Riverbeach Drive (across street)
Location of HWM Object: bottom of 3rd pier piling from shore, east side of pier across street from 14214 River Beach Drive

HWM Type: eyewitness report
Closest Municipality: Port Charlotte **County:** Lee **State:** FL

Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS
Date of Flagging/Interview: 8/23/2004

Survey Crew: RAP,CG **Survey Company:** PBS&J
Survey Date: 9/1/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.9649187 **Easting:** 585391.2949
Survey Longitude: 82.2172882 **Northing:** 956480.0835

Approx. First Floor Elevation:

Comments:

eyewitness states water level did not exceed normal high tide. Rack lines deposited on following high tide ~11:00 pm



unit3_13a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-15

HWM ID: Unit3_14 **Type of Mark:** duct tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Manchester Water Way off Myakka River **Quality of Mark:** good
Survey Elevation (NAVD 88): -0.29 ft **NGVD 29:** 0.83 ft **HWM Object:** dock
Flooding Type: surge
HWM Address: 16911 Ohara
Location of HWM Object: Survey bottom of tape on bottom of dock.
HWM Type: eyewitness report
Closest Municipality: Port Charlotte **County:** Lee **State:** FL
Name of Flagger/Interviewer: Hatchett **Flagger Company:** URS
Date of Flagging/Interview: 8/23/2004
Survey Crew: RAP,CG **Survey Company:** PBS&J
Survey Date: 9/1/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.9688766 **Easting:** 599327.3882
Survey Longitude: 82.1745091 **Northing:** 957897.1913
Approx. First Floor Elevation:

Comments:

Witness states water level never got higher than the bottom of dock.



unit3_14.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124

PREL. 10/18/2004 FINAL 11/4/2004 SHEET Lee-16

HWM ID	Unit2_1	Type of Mark:	red paint line
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Gaspirilla Sound	Quality of Mark:	good
Survey Elevation (NAVD 88):	3.31 ft NGVD 29: 4.45 ft	HWM Object:	pier piling
Flooding Type:	surge		
HWM Address:	Harbor Drive		
Location of HWM Object	last piling on left at end of pier.		
HWM Type:	water line		
Closest Municipality:	Boca Grande	County: Lee	State: FL
Name of Flagger/Interviewer:	Beauvois	Flagger Company:	URS
Date of Flagging/Interview:	8/20/2004		
Survey Crew:	RAP,DP,TT	Survey Company:	PBS&J
Survey Date:	9/10/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.7462408	Easting:	572335.5633
Survey Longitude:	82.2568764	Northing:	877014.5878
Approx. First Floor Elevation:	2.31 top wood deck		

Comments:

boat crashed into pier. Water 3 1/2 to 4 feet above high tide



unit2_1.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-17

HWM ID: Unit2_2 **Type of Mark:** red paint line
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gaspirilla Sound **Quality of Mark:** good
Survey Elevation (NAVD 88): 2.65 ft **NGVD 29:** 3.79 ft **HWM Object:** ground
Flooding Type: wave runup
HWM Address: Harbor Drive
Location of HWM Object: 2 feet from piling to line angled toward road

HWM Type: rack line
Closest Municipality: Boca Grande **County:** Lee **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagger/Interview: 8/20/2004

Survey Crew: RAP,DP,TT **Survey Company:** PBS&J
Survey Date: 9/10/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.7463454 **Easting:** 572264.6972
Survey Longitude: 82.2570938 **Northing:** 877052.7654
Approx. First Floor Elevation:

Comments:

**NO IMAGE TO
DISPLAY**

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit2_2.jpg

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120402 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-18

HWM ID	Unit2_12	Type of Mark:	red paint line
Name of Storm Event:	Hurricane Charley	Date of Flood Event:	8/13/2004
Stream Name/Flood Source:	Bay Side of Sanibel	Quality of Mark:	good
Survey Elevation (NAVD 88):	0.43 ft NGVD 29: 1.6 ft	HWM Object:	beach
Flooding Type:	wave runup		
HWM Address:	Island Incident Command Turn Left from bridge, 1st Ramp on left		
Location of HWM Object	6 feet inland from end of concrete		
HWM Type:	debris line		
Closest Municipality:	Sanibel Island	County: Lee	State: FL
Name of Flagger/Interviewer:	Beauvois	Flagger Company:	URS
Date of Flagging/Interview:	8/21/2004		
Survey Crew:	RAP,DT,CG	Survey Company:	PBS&J
Survey Date:	9/2/2004		
Survey Project:		Vertical Datum: NAVD 88	Horizontal Datum: NAD83(90)
Survey Latitude:	26.4535875	Easting:	644465.6035
Survey Longitude:	82.0357635	Northing:	770556.2853
Approx. First Floor Elevation:	2.35 top conc. Wall		

Comments:
6 feet inland from end of pier



unit2_12c.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120402 PREL. 10/18/2004 FINAL 11/4/2004 SHEET Lee-19

HWM ID Unit2_13 Type of Mark: duct tape
 Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004
 Stream Name/Flood Source: Gulf of Mexico Quality of Mark: good
 Survey Elevation (NAVD 88): 3.51 ft NGVD 29: 4.68 ft HWM Object: center garage support beam
 Flooding Type: surge
 HWM Address: 440 East Gulf
 Location of HWM Object 1 foot off slab

HWM Type: water line
 Closest Municipality: Sanibel Island County: Lee State: FL

Name of Flagger/Interviewer: Beauvois Flagger Company: URS
 Date of Flagger/Interview: 8/21/2004

Survey Crew: RAP,DT,CG Survey Company: PBS&J
 Survey Date: 9/2/2004
 Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)
 Survey Latitude: 26.4478264 Easting: 647846.5778
 Survey Longitude: 82.0254285 Northing: 768461.4238
 Approx. First Floor Elevation: 3.51

Comments:
 north center beam in garage



unit2_13a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 120402 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-20

HWM ID: Unit2_14 **Type of Mark:** tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 4.92 ft **NGVD 29: 6.09 ft** **HWM Object:** outside office bldg wall
Flooding Type: wave runup
HWM Address: 205 Periwinkle Way
Location of HWM Object: 9 1/2 inches above concrete patio

HWM Type: debris line
Closest Municipality: Sanibel Island **County:** Lee **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,DT,CG **Survey Company:** PBS&J
Survey Date: 9/2/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4511202 **Easting:** 650128.5318
Survey Longitude: 82.0184547 **Northing:** 769658.2683
Approx. First Floor Elevation: 4.12-patio/4.3-Fin Flr

Comments:



unit2_14a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 120402 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-21

HWM ID: Unit2_15 **Type of Mark:** duct tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 6.36 ft **NGVD 29:** 7.53 ft **HWM Object:** ground
Flooding Type: wave runup
HWM Address: 979 East Gulf Drive
Location of HWM Object: Bldg #1 unit 161, 7 feet 4 inches from building support SSW

HWM Type: debris line
Closest Municipality: Sanibel Island **County:** Lee **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,DT,CG **Survey Company:** PBS&J
Survey Date: 9/2/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.437769 **Easting:** 642851.1311
Survey Longitude: 82.0406925 **Northing:** 764807.076
Approx. First Floor Elevation:

Comments:
 5th unit from oceanfront



unit2_15b.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 120402 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-22

HWM ID: Unit2_16 **Type of Mark:** tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 5.45 ft **NGVD 29:** 6.62 ft **HWM Object:** outside wall
Flooding Type: wave runup
HWM Address: 1605 Mid Gulf Drive
Location of HWM Object: wall outside of unit #226, Storage door, 5 inches above concrete slab

HWM Type: debris line
Closest Municipality: Sanibel Island **County:** Lee **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,DT,CG **Survey Company:** PBS&J
Survey Date: 9/2/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4289993 **Easting:** 637315.4614
Survey Longitude: 82.0576052 **Northing:** 761621.6074
Approx. First Floor Elevation: 5.03 top conc. Slab

Comments:
 enter and go right around to rear, across from tennis courts



unit2_16.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120402 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-23

HWM ID: Unit2_17 **Type of Mark:** red spray paint
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: San Carlos Bay **Quality of Mark:** fair
Survey Elevation (NAVD 88): 2.84 ft **NGVD 29:** 4.01 ft **HWM Object:** ground
Flooding Type: wave runup
HWM Address: end of Dixie Blvd / NE Bayside
Location of HWM Object:

HWM Type: debris line
Closest Municipality: Sanibel Island **County:** Lee **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,DT,CG **Survey Company:** PBS&J
Survey Date: 9/2/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4673147 **Easting:** 637777.9452
Survey Longitude: 82.0562105 **Northing:** 775548.2206

Approx. First Floor Elevation:

Comments:



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit2_17.jpg

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120402 PREL. 10/18/2004 FINAL 11/4/2004 SHEET Lee-24

HWM ID Unit2_18 Type of Mark: duct tape
 Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004
 Stream Name/Flood Source: Gulf of Mexico Quality of Mark: fair
 Survey Elevation (NAVD 88): 7.12 ft NGVD 29: 8.3 ft HWM Object: outside wall cottage #8
 Flooding Type: surge
 HWM Address: 2823 W. Gulf Drive
 Location of HWM Object 1 foot 16 inches from ground (Cottage #8)

HWM Type: grassy debris
 Closest Municipality: Sanibel Island County: Lee State: FL

Name of Flagger/Interviewer: Beauvois Flagger Company: URS

Date of Flagger/Interview: 8/21/2004

Survey Crew: RAP,DT,CG Survey Company: PBS&J

Survey Date: 9/2/2004

Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)

Survey Latitude: 26.4232603 Easting: 627272.1516

Survey Longitude: 82.088291 Northing: 759541.2822

Approx. First Floor Elevation: 5.62 ground

Comments: across from Long Acre Lake



unit2_18a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 120402 PREL. 10/18/2004 FINAL 11/4/2004 SHEET Lee-25

HWM ID Unit2_19 Type of Mark: red spray paint
Name of Storm Event: Hurricane Charley Date of Flood Event: 8/13/2004
Stream Name/Flood Source: Gulf of Mexico Quality of Mark: good
Survey Elevation (NAVD 88): 2.92 ft NGVD 29: 4.09 ft HWM Object: concrete culvert
Flooding Type: surge
HWM Address: 6406 Sanibel Captiva Road
Location of HWM Object: culvert in front of Santiva General Store. 3 feet from top of culvert

HWM Type: mud line
Closest Municipality: Sanibel Island County: Lee State: FL

Name of Flagger/Interviewer: Beauvois Flagger Company: URS
Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,DP,TT Survey Company: PBS&J
Survey Date: 9/9/2004
Survey Project: Vertical Datum: NAVD 88 Horizontal Datum: NAD83(90)
Survey Latitude: 26.4802132 Easting: 597085.4863
Survey Longitude: 82.1806191 Northing: 780274.0591

Approx. First Floor Elevation:

Comments:

line is 3 feet from top of culvert. Eyewitness reports surge was from bayside



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit2_19a.jpg

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-26

HWM ID: Unit2_20 **Type of Mark:** painted tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 7.09 ft **NGVD 29:** 8.26 ft **HWM Object:** ground
Flooding Type: wave runup
HWM Address: 16394 Sanibel Captiva Road
Location of HWM Object: behind house, 20 feet toward house.

HWM Type: debris line
Closest Municipality: Sanibel Island **County:** Lee **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/22/2004

Survey Crew: RAP,DP,TT **Survey Company:** PBS&J
Survey Date: 9/9/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.5007802 **Easting:** 594523.1947
Survey Longitude: 82.1884859 **Northing:** 787753.4979

Approx. First Floor Elevation:

Comments:

~ 6 feet surge, yellow house, 1.3 miles from Blind Pass



unit2_20a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-27

HWM ID: Unit2_24 **Type of Mark:** stake with red paint & tape

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Pine Island Sound **Quality of Mark:** good

Survey Elevation (NAVD 88): 2.51 ft **NGVD 29:** 3.68 ft **HWM Object:** ground (vacant lot)

Flooding Type: wave runup

HWM Address: 16083 Sanibel Captiva Rd.

Location of HWM Object: end of vacant lot by the bay

HWM Type: debris line

Closest Municipality: Sanibel Island **County:** Lee **State:** FI

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS

Date of Flagging/Interview: 8/22/2004

Survey Crew: RAP,DP,TT **Survey Company:** PBS&J

Survey Date: 9/9/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.5078519 **Easting:** 594673.4663

Survey Longitude: 82.1880379 **Northing:** 790323.7227

Approx. First Floor Elevation:

Comments:
surge from bay



unit2_24a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-28

HWM ID: Unit2_25 **Type of Mark:** stake with red paint and tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 8.06 ft **NGVD 29:** 9.23 ft **HWM Object:** beach
Flooding Type: wave runup
HWM Address: across street (oceanside) from 16083 Sanibel Captiva Rd
Location of HWM Object:

HWM Type: debris line
Closest Municipality: Sanibel Island **County:** Lee **State:** FI

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/22/2004

Survey Crew: RAP,DP,TT **Survey Company:** PBS&J
Survey Date: 9/9/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.507823 **Easting:** 594047.656

Survey Longitude: 82.1899515 **Northing:** 790314.1255

Approx. First Floor Elevation:

Comments:
Oceanside



unit2_25a.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-29

HWM ID: Unit2_26 **Type of Mark:** red painted stake
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 3.62 ft **NGVD 29:** 4.79 ft **HWM Object:** beach
Flooding Type: wave runup
HWM Address: Beachside of Land's End Condos
Location of HWM Object: 24 feet SW of palm tree

HWM Type: debris line
Closest Municipality: Captiva **County:** Lee **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/23/2004

Survey Crew: RAP,DP,TT **Survey Company:** PBS&J
Survey Date: 9/9/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.5497164 **Easting:** 590649.226
Survey Longitude: 82.2004161 **Northing:** 805546.8957
Approx. First Floor Elevation:

Comments:

South Seas Community is at the end of Captiva



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit2_26c.jpg

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-30

HWM ID: Unit2_32 **Type of Mark:** duct tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Caloosahatchee River **Quality of Mark:** good
Survey Elevation (NAVD 88): 4.14 ft **NGVD 29:** 5.35 ft **HWM Object:** outside building wall
Flooding Type: surge
HWM Address: Jack's Marine on Marina Park Drive
Location of HWM Object: side of grey shed facing dog kennels behind main office

HWM Type: mud line
Closest Municipality: N Ft Myers Shores **County:** Lee **State:** FL

Name of Flagger/Interviewer: Beauvois **Flagger Company:** URS
Date of Flagging/Interview: 8/23/2004

Survey Crew: RAP,DP,TT **Survey Company:** PBS&J
Survey Date: 9/10/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.7214292 **Easting:** 745791.1633
Survey Longitude: 81.725431 **Northing:** 868007.7463
Approx. First Floor Elevation: 3.00 Top conc. Slab

Comments:
 residents have photos of flood



unit2_32b.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-31

HWM ID: Unit4_4 **Type of Mark:** none
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 5.04 ft **NGVD 29:** 6.22 ft **HWM Object:** outside wall
Flooding Type: surge
HWM Address: 441 Estero Blvd
Location of HWM Object: outside shed wall under house

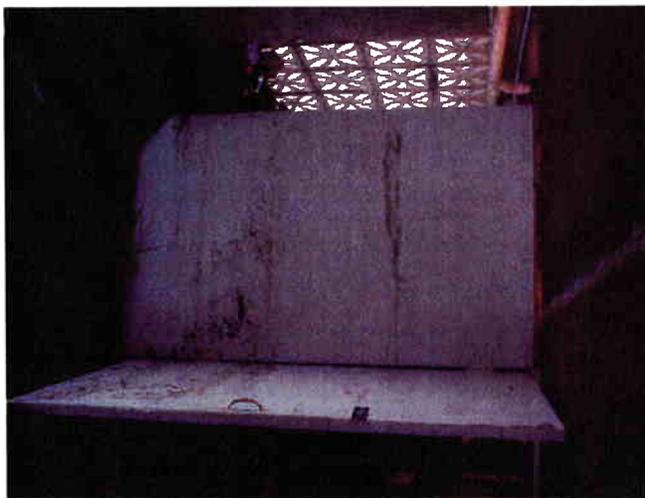
HWM Type: mud line
Closest Municipality: Ft Myers Beach **County:** Lee **State:** FL

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/19/2004

Survey Crew: RAP,CG **Survey Company:** PBS&J
Survey Date: 9/1/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4591651 **Easting:** 668479.0263
Survey Longitude: 81.9623662 **Northing:** 772583.7894
Approx. First Floor Elevation: 2.58 ground

Comments:



unit4_4.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-32

HWM ID: Unit4_5 **Type of Mark:** ribbon
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 6.89 ft **NGVD 29:** 8.07 ft **HWM Object:** side of house
Flooding Type: surge
HWM Address: 511 Carlos Circle
Location of HWM Object: debris line on west side of house behind unlocked gate, 29 inches above concrete walk

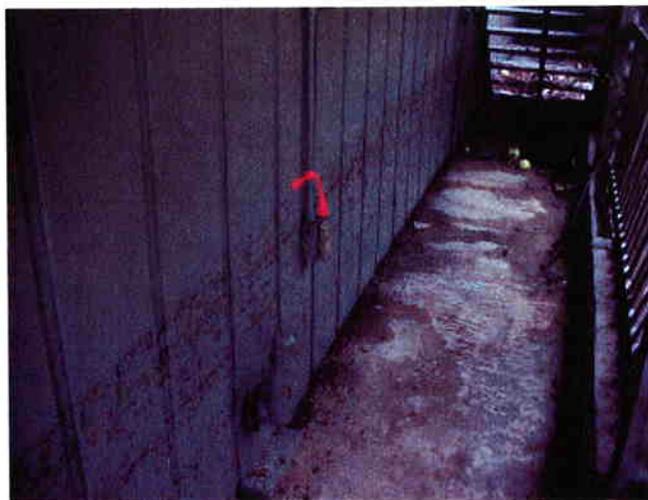
HWM Type: mud line
Closest Municipality: Ft Myers Beach **County:** Lee **State:** FI

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/19/2004

Survey Crew: RAP,CG **Survey Company:** PBS&J
Survey Date: 9/1/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4589346 **Easting:** 668750.755
Survey Longitude: 81.9615357 **Northing:** 772500.1065
Approx. First Floor Elevation: 4.39 ground

Comments:



unit4_5.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-33

HWM ID Unit4_6 **Type of Mark:** none
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good
Survey Elevation (NAVD 88): 8.23 ft **NGVD 29: 9.41 ft** **HWM Object:** inside wall of house
Flooding Type: surge
HWM Address: 1669 I Street
Location of HWM Object inside wall of ground floor of house, 2nd row of houses from beach. mark is 29 3/4 inches above floor

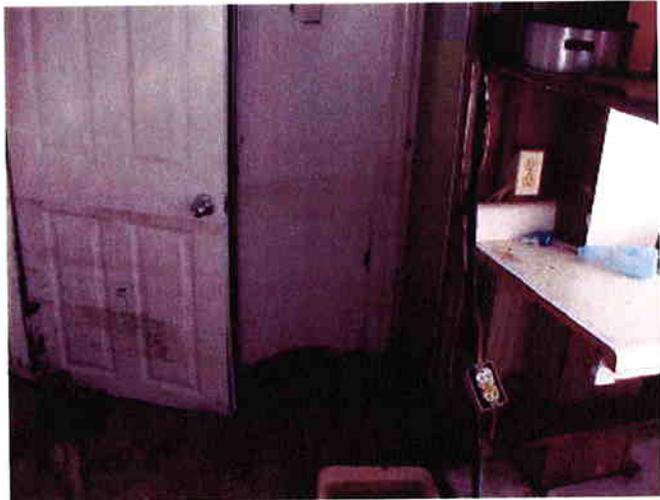
HWM Type: mud line
Closest Municipality: Ft Myers Beach **County:** Lee **State:** Fl

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/19/2004

Survey Crew: RAP,CG **Survey Company:** PBS&J
Survey Date: 9/1/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4506192 **Easting:** 672664.1566
Survey Longitude: 81.9495778 **Northing:** 769478.9813
Approx. First Floor Elevation: 5.73

Comments:
 mark is 29 3/4 inches above floor



unit4_6.jpg

Survey Certification: Coastal High Water Mark-Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-34

HWM ID: Unit4_7 **Type of Mark:** tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** fair
Survey Elevation (NAVD 88): 6.64 ft **NGVD 29:** 7.82 ft **HWM Object:** side of house
Flooding Type: surge
HWM Address:
Location of HWM Object: outside wall adjacent to carport of yellow house
HWM Type: mud line
Closest Municipality: Ft Myers Beach **County:** Lee **State:** FL
Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/19/2004
Survey Crew: RAP,TT **Survey Company:** PBS&J
Survey Date: 9/7/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4428277 **Easting:** 678552.2482
Survey Longitude: 81.9315863 **Northing:** 766649.6488
Approx. First Floor Elevation: 4.14 ground

Comments:
 bottom of tape marked 4_7, , 34 3/4 inchesw above ground



unit4_7.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

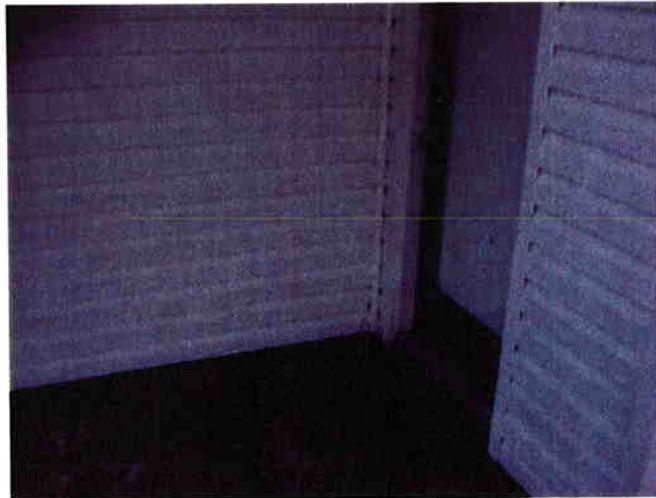


PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-35

HWM ID Unit4_9 **Type of Mark:** tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** fair
Survey Elevation (NAVD 88): 5.38 ft **NGVD 29:** 6.56 ft **HWM Object:** siding
Flooding Type: surge
HWM Address: 5474 Oak Ridge
Location of HWM Object mud line near front door
HWM Type: mud line
Closest Municipality: Ft Myers Beach **County:** Lee **State:** Fl
Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/19/2004
Survey Crew: RAP,TT **Survey Company:** PBS&J
Survey Date: 9/7/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4324703 **Easting:** 684569.7798
Survey Longitude: 81.9132035 **Northing:** 762888.6053
Approx. First Floor Elevation: 4.46-porch/4.7-Fin Flr

Comments:

mark is 11 inches above concrete pad under stairs, front of building.
 Beige vinyl sided house



Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

unit4_9.jpg

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-36

HWM ID: Unit4_10 **Type of Mark:** tape

Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004

Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** good

Survey Elevation (NAVD 88): 6.14 ft **NGVD 29:** 7.32 ft **HWM Object:** screen

Flooding Type: surge

HWM Address: 219 Dakota Ave

Location of HWM Object: front of house facing Dakota Ave

HWM Type: mud line

Closest Municipality: Ft Myers Beach **County:** Lee **State:** FL

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry

Date of Flagging/Interview: 8/19/2004

Survey Crew: RAP,TT **Survey Company:** PBS&J

Survey Date: 9/7/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)

Survey Latitude: 26.4324159 **Easting:** 684396.8749

Survey Longitude: 81.913732 **Northing:** 762868.7062

Approx. First Floor Elevation: 3.51 conc. Slab @ col.

Comments:

tape is on pier of porch



unit4_10.pic1.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project



PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

CONTENTS: Individual Historical High Water Mark Survey Report

TYPE: High Water Mark Survey

COMM. NO. 125124

PREL. 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-37

HWM ID Unit4_12 **Type of Mark:** stake/flag
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Gulf of Mexico **Quality of Mark:** fair
Survey Elevation (NAVD 88): 3.65 ft **NGVD 29: 4.84 ft** **HWM Object:** ground
Flooding Type: wave runup
HWM Address: 8700 Estero Blvd.
Location of HWM Object unnamed park road off Estero Blvd. On Black Island in Lovers Key State Park.

HWM Type: debris line
Closest Municipality: Ft Myers Beach **County:** Lee **State:** Fl

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/19/2004

Survey Crew: RAP,TT **Survey Company:** PBS&J
Survey Date: 9/7/2004

Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.4028163 **Easting:** 696855.8925
Survey Longitude: 81.8756905 **Northing:** 752120.0949

Approx. First Floor Elevation:

Comments:

10 feet off unnamed road, ~150 feet Estero



unit4_12.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project

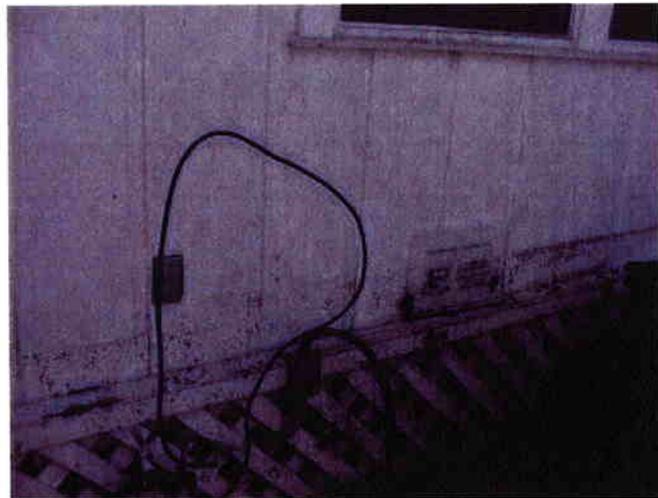


FEMA

PROJECT: FEMA - 1539 - DR - FL Coastal High Water Mark Survey Project
CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 12015C **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-38

HWM ID: Unit4_15 **Type of Mark:** tape
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Pine Island Sound **Quality of Mark:** good
Survey Elevation (NAVD 88): 4.60 ft **NGVD 29:** 5.78 ft **HWM Object:** side of wall
Flooding Type: surge
HWM Address: 13771 Waterfront Drive; PO Box 410
Location of HWM Object:
HWM Type: mud line
Closest Municipality: Bokeelia **County:** Lee **State:** FL
Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/20/2004
Survey Crew: RAP,CG **Survey Company:** PBS&J
Survey Date: 9/8/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.6611971 **Easting:** 605935.9442
Survey Longitude: 82.1538036 **Northing:** 846047.6098
Approx. First Floor Elevation: 2.14 top conc slab

Comments:
HWM line 29.5 inches above 1/2 inch below light fixture



unit4_15.pic2.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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CONTENTS: Individual Historical High Water Mark Survey Report
TYPE: High Water Mark Survey
COMM. NO. 125124 **PREL.** 10/18/2004 **FINAL** 11/4/2004 **SHEET** Lee-39

HWM ID Unit4_30 **Type of Mark:** stave
Name of Storm Event: Hurricane Charley **Date of Flood Event:** 8/13/2004
Stream Name/Flood Source: Matalacha Pass **Quality of Mark:** fair
Survey Elevation (NAVD 88): 3.27 ft **NGVD 29: 4.45 ft** **HWM Object:** lawn
Flooding Type: wave runup
HWM Address: southern end of SW 1st Ct.
Location of HWM Object: souther end of SW 1st Ct

HWM Type: debris line
Closest Municipality: Cape Coral **County:** Lee **State:** Fl

Name of Flagger/Interviewer: Simmons **Flagger Company:** Dewberry
Date of Flagging/Interview: 8/21/2004

Survey Crew: RAP,TT **Survey Company:** PBS&J
Survey Date: 9/7/2004
Survey Project: **Vertical Datum:** NAVD 88 **Horizontal Datum:** NAD83(90)
Survey Latitude: 26.5373749 **Easting:** 663530.1028
Survey Longitude: 81.9774778 **Northing:** 801010.397
Approx. First Floor Elevation:

Comments:



unit4_30.jpg

Survey Certification: Coastal High Water Mark Location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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