

# Gulf Breeze Drainage Study

For

City of Gulf Breeze, Florida  
1070 Shoreline Drive  
Gulf Breeze, FL 32561



## Feasibility Report

HMM Project No. 297654  
October 2014



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# City of Gulf Breeze Drainage Improvements – Surrey Drive, York Street and Navarre Street Extension Feasibility Study

## Feasibility Report HMM Project Number 297654

### PROJECT PURPOSE

The City of Gulf Breeze (City) has engaged Hatch Mott MacDonald (HMM) to review the feasibility of extending the previously designed Washington Avenue exfiltration/transmission system to service two localized depressions located on Surrey Drive and York Street in addition to a third extension along Navarre Street to its intersection with San Carlos Street. The proposed extension would collect runoff from these low lying areas within a closed basin which are subject to intermittent flooding.

### PROJECT LOCATION

The proposed project would be located from the northerly terminus of the previously designed Washington Avenue exfiltration/transmission system northward to Norwich Drive, west along Norwich Drive to York Street, along Navarre Street from Surrey Drive to San Carlos Street, westerly along Surrey Drive to the localized depression and westerly along York Street to the localized depression as illustrated in *Figure 1 - Proposed Gulf Breeze Drainage Improvements Project Extension*. The entirety of the project is located within a portion of Section 6, Township 3S, Range 29W and Flood Zone X, areas outside the 0.20% annual chance (500 Year) flood as indicated by FEMA Flood Insurance Rate Maps, 12113C0602G and 12113C0606G, effective December 19, 2006. See *Figure 2* and *Figure 3 - FEMA Flood Maps*. Although, the current flood insurance rate maps do not place the project area within a special flood hazard area, this areas are localized depression within closed basins and have historically been subject to intermittent flooding.

### PROJECT HISTORY

The Gulf Breeze Drainage Improvements project is a single phase project involving the construction of approximately 6,700 LF of stormwater collection/transmission facilities (of which approximately 3,000 LF will function as an exfiltration trench), 2 stormwater lift stations and approximately 3,550 LF of 12 stormwater force main and one hydrodynamic separator. The purpose of the project is to reduce the frequency, severity and duration of localized flooding along Washington Avenue, in the Camelia Street, Florida Avenue and Dolphin Street area as well as the Nightingale Drive, Russ Drive, Dracena Way and Center Street area. These areas are low laying areas within closed basins which are subject to intermittent localized flooding although not reflected on current FEMA Flood Insurance Rate Maps

## DATA GATHERING

Hatch Mott MacDonald personnel acquired available LIDAR topographic data circa 2007. Although somewhat dated, the use of this LIDAR data is considered appropriate due to the built-out nature of the area with low potential for recent modification of area contours. HMM personnel utilized the lidar topographic data to delineate the extents of the water sheds which currently contribute stormwater runoff to the three proposed extension termini. The LIDAR data was then further reviewed to determine connectivity between these locations and the Washington Avenue exfiltration/transmission system.

## EXISTING CONDITIONS ANALYSIS

Previous survey establishes the elevation of the low point along Washington Avenue at approximately 10.00' in the vicinity of the proposed Washington Avenue Lift Station (WALS). As a check, the LIDAR data in this area was reviewed and also found to indicate an elevation of approximately 10.00' at this same location. It is therefore believed that use of the LIDAR data for determining the feasibility of the proposed system extension is appropriate.

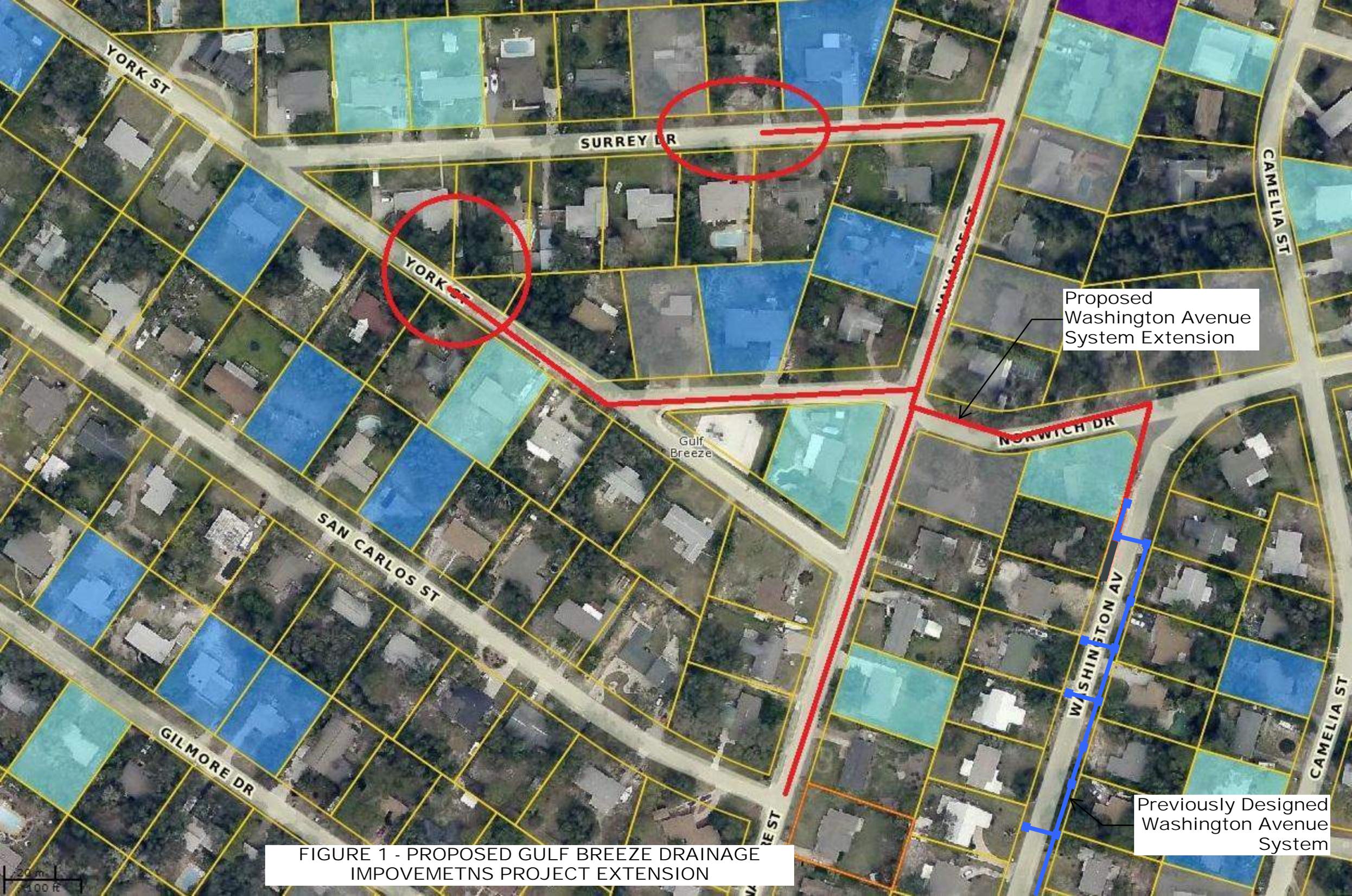
A more detailed review of the elevations throughout the proposed system extension reveals the following:

1. The elevation of the localized depression along Surrey Drive is approximately 12.00'
2. The elevation of the localized depression along York Street is approximately 11.00'
3. The elevation near the intersection of Navarre Street and San Carlos Street is approximately 10.00'
4. It appears that there may be a slight ridge that exists between Navarre Street and Washington Avenue at an elevation somewhat greater than 10.00' but less than 11.00'.
5. The previously designed Washington Avenue System is comprised of piping which is laid at 0% slope at an elevation of 5.50'. The system is intended to provide storage and exfiltration of stormwater runoff up to an elevation of 7.50' after which the system will begin to convey flows, as it is capable, under a pressurized condition. Once water surface elevation reaches the ground surface at any point along the system runoff will continue along the surface to the lowest adjacent elevation as it has historically done.
6. In general, once the localized depressions on Surrey Drive and York Street have been filled stormwater runoff would continue in a south westerly direction flowing across York Street and San Carlos Street. At this point the flows would turn to the east, after filling any additional depressional storage, and flow between San Carlos Street and Gilmore Drive ultimately arriving near the intersection of Navarre Street and San Carlos Street. See *Figure 4 – Existing Stormwater Runoff Flow Path*.

## **FEASIBILITY FINDINGS:**

Based upon the above noted existing conditions HMM offers the following with respect to the feasibility of extending the previously designed Washington Avenue System to service the three additional areas:

1. LIDAR data appears to indicate that the installation of the proposed extension can be accomplished. In other words there are no depressions along the proposed route which have an elevation that would prevent the installation of the proposed extension piping if constructed at 0% slope at an invert of 5.50'.
2. The elevations at the desired collection points are greater than or at least equal to the lowest elevations along the previously designed Washington Avenue system. This should preclude the possibility of unintended conveyance and pop-off of flows from other areas (i.e. Washington Avenue) into the Surrey Drive, York Street or Navarre Street depressions and worsening of flood conditions at these locations.
3. The ridgeline between Navarre Street and Washington Avenue would require flood stages along Navarre Street to rise to an elevation sufficient to crest the ridge prior to continuing to Washington Street.
4. Installation of the proposed system extension would help to reduce the frequency, extents and duration of flooding at the three localized depressions, however, this would also reduce time of concentration for these flows to reach the Washington Street area, and would eliminate much of the depressional storage within the broader area that must be filled currently. These two factors would tend to adversely affect flood frequency, duration and extents at Washington Avenue.
5. Although, construction of the WALs in conjunction with the Gulf Breeze Drainage Improvements project is currently underway, the extension of the system to the three depressed areas may result in sufficient additional flow reaching the WALs such that flooding conditions at this location may be exacerbated. In other words, the rate of flow from the extension may exceed the ability of the proposed WALs to pump flow from Washington Avenue.
6. If it is desired to construct the proposed extension some provision to limit flow rates to no more than the pumping capacity of the WALs must be included in the design. This will insure that flooding conditions along Washington Avenue are not adversely affected by the proposed construction. However, with the institution of rate controls on the proposed extension, the benefit to the localized depressions will be decreased and any benefit to Washington Avenue from the construction of the WALs may still be reduced or even eliminated.
7. It is our understanding that the City is currently seeking funding through Santa Rosa County for the construction of drainage improvements along Gilmore Drive. The connection of the three locations in question to this project may be a more appropriate/beneficial solution and would prevent any unintended adverse impacts to the Washington Avenue area and/or WALs.

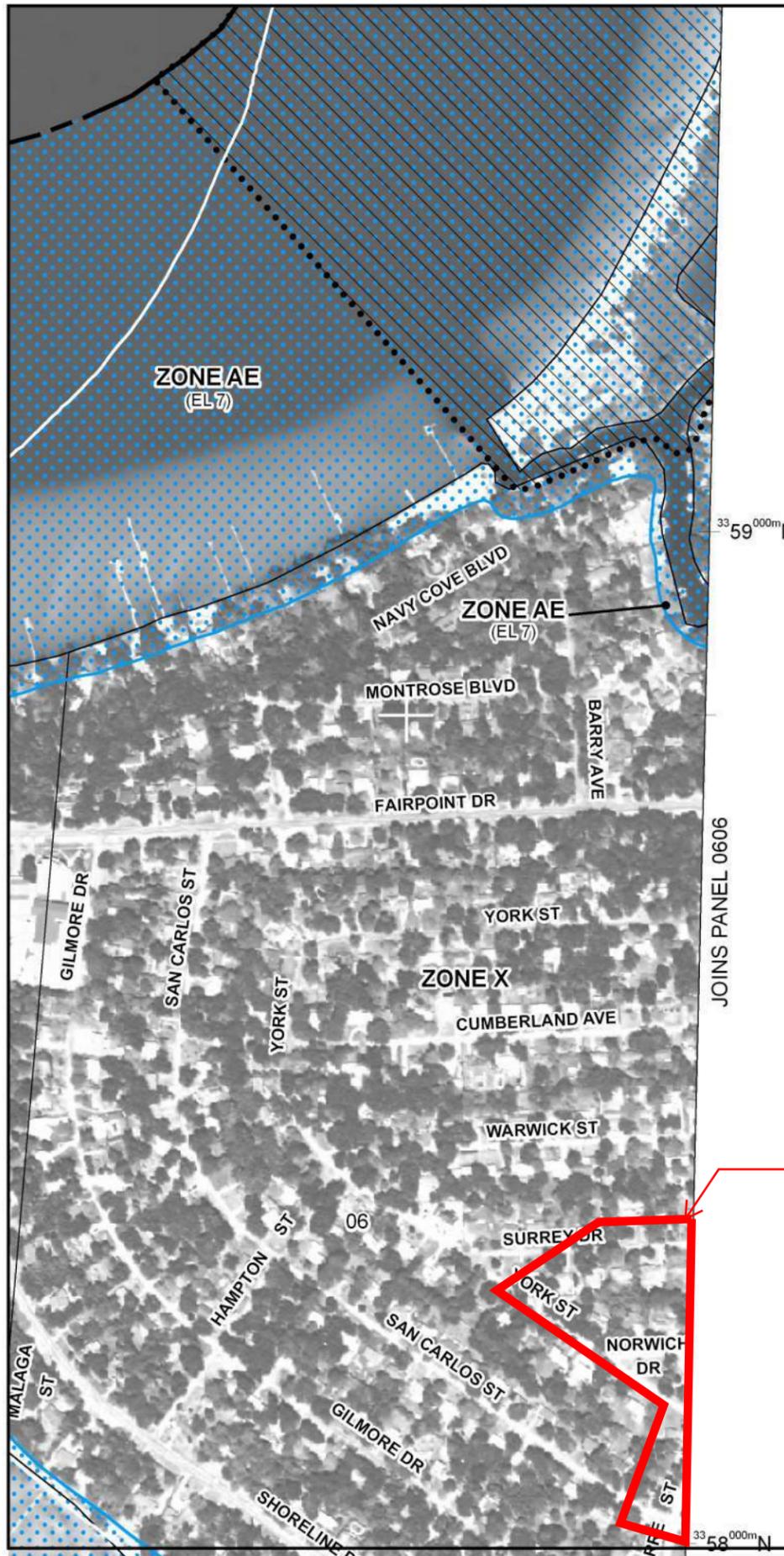


Proposed  
Washington Avenue  
System Extension

Previously Designed  
Washington Avenue  
System

FIGURE 1 - PROPOSED GULF BREEZE DRAINAGE  
IMPOVEMETNS PROJECT EXTENSION

20 m  
100 ft



- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
  - ZONE D** Areas in which flood hazards are undetermined, but possible.
  - COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
  - OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
  - 0.2% annual chance floodplain boundary
  - Floodway boundary
  - Zone D boundary
  - CBRS and OPA boundary
  - Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
  - Base Flood Elevation line and value; elevation in feet\*
  - Base Flood Elevation value where uniform within zone; elevation in feet\*
- \* Referenced to the North American Vertical Datum of 1988
- Cross section line
  - Transect line
  - 87°07'45", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
  - 2476000mN 1000-meter Universal Transverse Mercator grid values, zone 16
  - 600000 FT 5000-foot grid ticks: Florida State Plane coordinate system, North zone (FIPZONE 0903), Lambert Conformal Conic projection
  - DX5510 x Bench mark (see explanation in Notes to Users section of this FIRM panel)
  - M1.5 River Mile

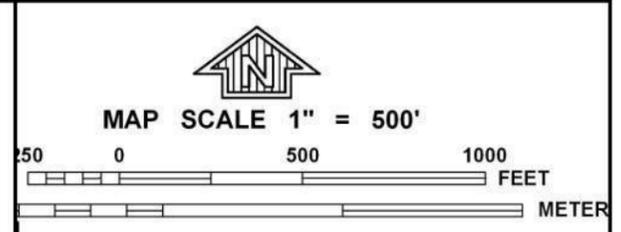
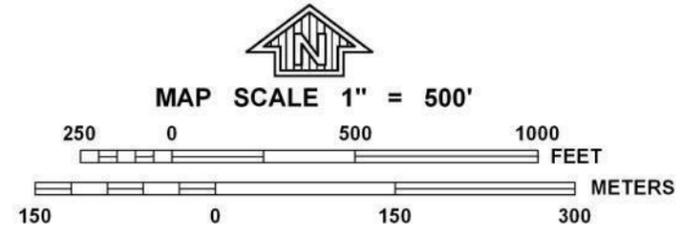
**MAP REPOSITORY**  
Refer to listing of Map Repositories on Map Index

**EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**  
DECEMBER 19, 2006

**EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL**

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



PANEL 0602G

**FIRM**  
FLOOD INSURANCE RATE MAP

**SANTA ROSA COUNTY, FLORIDA AND INCORPORATED AREAS**

**PANEL 602 OF 657**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GULF BREEZE, CITY OF	120275	0602	G
SANTA ROSA COUNTY	120274	0602	G

- NOTE -

THIS MAP INCLUDES COASTAL BARRIER RESOURCES SYSTEM BOUNDARIES ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND / OR SUBSEQUENT LEGISLATION.

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



**MAP NUMBER**  
12113C0602G

**EFFECTIVE DATE**  
DECEMBER 19, 2006

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

FIGURE 2 - FEMA FLOOD MAPS



  
**MAP SCALE 1" = 500'**  
 0 500 1000 FEET  
 0 500 1000 METER

**NFIP**  
 PANEL 0606G

**FIRM**  
 FLOOD INSURANCE RATE MAP  
 SANTA ROSA COUNTY,  
 FLORIDA  
 AND INCORPORATED AREAS  
 PANEL 606 OF 657  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)  
 CONTAINS:  

COMMUNITY	NUMBER	PANEL	SUFFIX
GULF BREEZE, CITY OF	120275	0606	G
SANTA ROSA COUNTY	120274	0606	G

 - NOTE -  
 THIS MAP INCLUDES COASTAL BARRIER RESOURCES SYSTEM BOUNDARIES ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND / OR SUBSEQUENT LEGISLATION.  
 Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
 12113C0606G  
**EFFECTIVE DATE**  
 DECEMBER 19, 2006  
 Federal Emergency Management Agency

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FIGURE 3 - FEMA FLOOD MAPS



FIGURE 4 - EXISTING STORMWATER RUNOFF FLOW PATH