



**LEE COUNTY**  
SOUTHWEST FLORIDA

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# **Blind Pass Restoration**

## **Physical Monitoring Plan**



***DEP Permit 0265943-JC***

October 2008  
Revised January 2010  
Revised September 2010

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**Blind Pass Restoration  
Physical Monitoring Plan  
0265943-JC**

**Introduction**

The restoration of Blind Pass entails the maintenance dredging of approximately 127,000 cubic yards from the historic location of the pass between Sanibel and Captiva islands. The material to be removed from the pass contains 3 separate categories of material. The categories are classified as beach compatible, nearshore compatible, and non-compatible. The beach compatible material is comprised of material with less than 10% by weight finer than the 230 sieve (.06 mm) and less than 5% coarser than the 4 sieve (4.76 mm). The nearshore compatible material contains between 10% and 20% by weight of material passing the 230 sieve and less than 5% by weight coarser than the 4 sieve. The remaining non-compatible material contains greater than 20% by weight of silt (material passing the 230 sieve), or greater than 5% by weight of fine gravel (material retained on the 4 sieve), or other foreign materials such as clay, wood and rock. The maintenance dredge cycle is predicted to be every 5 years, defined as the project's predicted design life.

The following details specific activities to be implemented to monitor the performance of the pass system and materials placed on the beach and in the nearshore. Specific activities shall be orchestrated to quantify the ebb shoal development and the stability of the pass. The shoreline response shall be recorded, in addition to sediment analysis of the beach and nearshore placement areas. Aerial photography shall also be used to provide a visual reference to project performance. (Alternate monitoring activities to assess the construction process shall be implemented as defined in the projects sediment QA/QC plan).

All monitoring activities as described herein shall be conducted and provided in accordance with the "Monitoring Standards for Beach Erosion Control Projects", March 2004 (or a more recent version) as established by the DEP Bureau of Beaches and Coastal Systems. The timing of the activities shall be in accordance with table 1.

**Table 1 Timing of Monitoring Activities**

<b>Monitoring Activity</b>	<b>Pre-Con.</b>	<b>Post Con.</b>	<b>6 Month</b>	<b>1<sup>st</sup> Year Monitoring</b>	<b>2<sup>nd</sup> Year Monitoring</b>	<b>3<sup>rd</sup> Year Monitoring</b>	<b>5<sup>th</sup> Year Monitoring</b>
<b>Ebb Shoal Survey</b>	X	X	X	X	X	X	X
<b>Blind Pass Survey</b>	X	X	X	X	X	X	X
<b>Beach Profiles</b>	X	X		X	X	X	X
<b>Aerial Photography</b>	X	X		X	X	X	X
<b>Sediment Analysis</b>		X					
<b>Hydraulic Data</b>		X		X			
<b>Report</b>		X	X	X	X	X	X

## **Bathymetric Surveys of Pass and Ebb Shoal**

Hydrographic surveys of the ebb shoal complex and interior waters of Blind Pass shall be conducted to document the inlet shoreline position, infilling and migration rates, and the development of the ebb shoal. The survey lines shall be spaced no greater than 200 feet apart, and will be aligned parallel to the shoreline. The alignment spacing shall be sufficient to document the channel position and shoal formation. The work shall extend 1000 ft either side of the pass or to the MHW line, whichever is less. The seaward extent of the surveys shall be a minimum of 3,000 feet offshore and 600 feet inland past the work area. Data points shall be collected at a maximum spacing of 25 feet. Figure 1 shows the survey limits and alignments.

In accordance with table 1, surveys shall be conducted as a pre-construction, post construction, and during the 6 month, 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 5<sup>th</sup> year monitoring events. Additional surveys will be collected if a major storm event or other natural phenomenon warrants the work. Pre-construction surveys shall be conducted within 90 days prior of construction and the post construction shall be within 60 days of the completion of dredging. The monitoring events will be conducted annually during the same time of year as the post construction surveys.

## **Beach Profile Surveys**

Profile surveys of the active beach zone will be collected along the shoreline at each reference monument (R monument) from R106, north of Blind Pass, to R118, south of the fill area and will include half monuments from R110.5 to R113.5. Table 2 shows the reference monuments and the positioning data to be used. (The surveyor conducting the work shall field verify all control information). The surveys will be utilized to identify the shoreline position, the average beach width and the sediment transport rates in the vicinity of Blind Pass. The surveys will commence a minimum of 150 feet landward of the monument or from the edge of a building or road, whichever is encountered first, to a minimum offshore distance of 1,500 feet from the MHW line or an elevation of -15 feet NAVD, whichever is more landward. Figure 2 shows the beach profile locations and azimuths.

The beach portion of the profile survey will extend from a minimum of 150 feet landward of the monument or from the edge of a building or road, whichever is the most seaward, to a wading depth deep enough to ensure (at minimum) a 50-foot overlap with the offshore portion of the profile survey. Profile data points along the beach portion of the profile survey will be collected at a maximum interval of 25 feet and at all breaks in grade. The offshore portion of the profile survey will extend from as close to shore as safely possible to ensure at least a 50-foot overlap with the beach portion of the profile survey to length of at least 1,500 feet from the MHW line or an elevation of -15 feet NAVD, whichever is more landward. Profile data points along the offshore portion of the profile survey will be collected at a maximum interval of 25 feet. The beach and offshore portions of the profile survey will be collected within 7 days of each other for each profile line.



FIGURE 1  
 BLIND PASS RESTORATION  
 PHYSICAL MONITORING PLAN  
 BATHYMETRIC SURVEY PLAN VIEW

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 S O U T H W E S T F L O R I D A

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 1" = 800'  
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- NOTES:
- 1) SURVEYOR SHALL FIELD VERIFY ALL MONUMENT LOCATIONS.
  - 2) FILL AREA EXTENDS FROM R112 TO R114.
  - 3) ALL WORK TO BE COMPLETED IN ACCORDANCE WITH THE "MONITORING STANDARDS FOR BEACH EROSION CONTROL PROJECTS" (DEP, 2004).

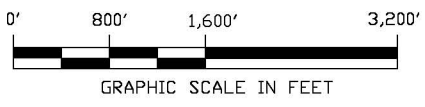


FIGURE 2  
 BLIND PASS RESTORATION  
 PHYSICAL MONITORING PLAN  
 BEACH & OFFSHORE PROFILE PLAN

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**Table 2 Reference Monument Control Data**

<b>Reference Monument</b>	<b>Northing (ft)</b>	<b>Easting (ft)</b>	<b>Azimuth</b>	<b>Elevation (ft)</b>
<b>R106</b>	784,350.78	595,542.25	264°	4.40
<b>R107</b>	783,251.82	595,470.49	266°	8.89
<b>R108</b>	782,037.27	595,961.74	265°	4.42
<b>R109</b>	781,249.23	596,320.30	215°	8.67
<b>R109</b>	781,249.23	596,320.30	270°	8.67
<b>R110</b>	780,942.06	596,646.95	250°	2.99
<b>R110.5</b>	780,471.80	596,888.80	250°	2.63
<b>R111</b>	780,026.82	597,069.39	255°	6.09
<b>R111.5</b>	779,736.90	597,360.20	240°	4.38
<b>R112</b>	779,385.95	597,555.16	240°	4.53
<b>R112.5</b>	779,074.50	598,216.60	240°	1.14
<b>R113</b>	778,420.05	598,285.85	240°	0.42
<b>R113.5</b>	778,033.00	598,512.90	240°	3.16
<b>R114</b>	777,758.64	598,739.71	240°	1.80
<b>R115</b>	776,778.55	599,364.66	225°	1.32
<b>R116</b>	775,929.83	600,134.25	220°	0.57
<b>R117</b>	775,201.74	600,911.20	220°	3.14
<b>R118</b>	774,720.73	601,888.70	210°	3.17

- Notes: (1) Horizontal coordinates reference State Plane West (NAD83).  
(2) Vertical elevations reference NAVD88.  
(3) Surveyor shall field verify all coordinates and control information.

### **Aerial Photography**

Vertical aerial photography will be conducted concurrently with the pre-construction, post construction and monitoring survey events as detailed in Table 1. The photographs will be acquired along the shoreline from R-106 to R-118 and will include the ebb shoal complex and the proposed dredge area in the interior of Blind Pass. The photography will be in color with a 30% forward overlap at an elevation of 3,000 feet (1:6,000 negative scale), and will be acquired at a time of low tide as close to the date of the survey events as possible.

The imagery of the photos will be clear and sharp in detail, of uniform density, average contrast, and free of clouds and cloud shadows, free of light streaks, smoke, static marks, fog, or other blemishes which would render the aerial photographic images unsuitable for their intended purpose. Light reflections from water areas will be kept to the minimum possible, by means of timing and the use of filters (photographs shall be taken before 2:00 p.m. to avoid shadows; shall not be taken at noon to avoid glare caused by the sun; and shall be taken as close to 10:00 a.m. as possible). The photo flight will be conducted at low tide and when wave heights in the mapping area are less than one foot.

## **Inlet Hydraulics**

Inlet hydraulics data shall be obtained commencing within six weeks of opening the inlet to tidal flow. Subsequent annual monitoring shall generally coincide with the bathymetric and beach profile surveys for the post and 1<sup>st</sup> year post construction monitoring. Concurrent measurements of tidal amplitude shall be obtained within the project area in Pine Island Sound and the Gulf of Mexico. Current velocities shall be measured within the Blind Pass channel throat and 2 additional locations in the interior system. One location will be the entrance to Roosevelt Channel and the other will be the entrance to Dinkins Bayou. The inlet hydraulics data set shall be obtained for a minimum 30-day period for each monitoring event.

## **Sediment Analysis**

A grain size analysis shall be conducted on sediment samples collected during construction and immediately post construction. Samples collected during construction shall be conducted in accordance with the projects Sediment Quality Assurance / Quality Control plan. Post construction samples will be collected at each full and half R monument in the fill area as show on Figure 3. The samples will be excavated from depths of 6 to 12 inches below the surface in the newly constructed berm. The sediment analysis shall consist of the following phi sized sieves: -4.25, -4.00, -3.50, -3.00, -2.50, -2.25, -2.00, -1.50, -1.00, -0.50, -0.00, 0.50, 1.00, 1.50, 2.00, 2.50, 3.00, 3.50, 3.75 and 4.00. All sieve reports will be included in the respective monitoring report with the presence or absence of gravel and fines noted.

## **Report Documentation**

Monitoring reports will be submitted to the DEP within 90 days following completion of the survey event. In general, the monitoring reports will include:

- **Beach and Offshore Profile Surveys:** The beach and offshore profile surveys are intended to document the changes in the active profile. The data for each monitoring survey will be compared to the pre-construction and post construction data, and additionally compared to the data acquired during the previous monitoring event. The data will be analyzed to assess erosion and accretion patterns and the amount of placed sand that is remaining within the project limits.
- **Bathymetric Surveys of the Pass and Ebb Shoal Complex:** The bathymetric surveys are intended to document the changes in the channel alignment and ebb shoal complex. The data for each monitoring event will be compared to the pre-construction and post construction data, and additionally compared to the data acquired during the previous monitoring event. The data will be analyzed to assess migration and infilling patterns in addition to sediment transport rates. The inlet shoreline position (MHWL) will be mapped to show the project performance over the monitoring periods.
- **Aerial Photography:** The aerial photography will be submitted as part of the monitoring reports to provide a qualitative assessment of the project's performance. The aerial



FIGURE 3  
 BLIND PASS RESTORATION  
 PHYSICAL MONITORING PLAN  
 SEDIMENT SAMPLING PLAN

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photographs will be used as a tool to evaluate the performance of the project and any changes to the adjacent shorelines.

- **Hydraulics Data:** Measurement of tidal amplitudes and currents will be used to evaluate the hydraulic stability of the inlet. Comparison will be made to the predicted values and changes evaluated annually to establish trends over time. This is expected to be a tool to be used in conjunction with other surveys to evaluate future maintenance needs.
- **Sand Samples:** The results of the sand sample analyses will be provided.

**Appendices:** The report appendices will include plots of the beach and offshore profile survey data for each profile, aerial photography, and the sand size distribution data and curves. Appendices shall also include graphical representations of volumetric and shoreline position changes for the monitoring area. Results shall be analyzed for patterns, trends, or changes between annual surveys and cumulatively since project construction. Additional appendices may be included as needed.

The report will summarize and discuss the data obtained, performance of the project including the inlet (channel shoaling, ebb shoal growth, and inlet geometric and hydraulic stability) and beach fill, and erosion and accretion patterns within the monitored area. The report will also include a comparative review of the project performance to performance expectations, the previous monitoring period, and cumulative performance; and identification of potential adverse impacts attributable to the project. The 5<sup>th</sup> Year Monitoring Report will also consider the data collected over the full period of monitoring in addition to data from the Captiva-Sanibel Island Beach Restoration Project, and calculate an updated sediment budget for the inlet.

## **Conclusion**

The activities described above shall be implemented to document the project performance over the permit lifespan. Any deviation from the plan shall not be allowed without prior written approval from the DEP.