ATTACHMENT NO. 37

DRAFT SEAGRASS MONITORING PLAN

LIDO KEY HURRICANE AND STORM DAMAGE REDUCTION PROJECT
DRAFT SEAGRASS BIOLOGICAL MONITORING PLAN
SARASOTA COUNTY, FLORIDA

FDEP PERMIT NO. 0333315-001-JC

AUGUST 2015

CB&I COASTAL PLANNING & ENGINEERING, INC.

LIDO KEY HURRICANE AND STORM DAMAGE REDUCTION PROJECT
DRAFT SEAGRASS BIOLOGICAL MONITORING PLAN
SARASOTA COUNTY, FLORIDA

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1.0 INTRODUCTION

The federally-authorized Lido Key Hurricane and Storm Damage Reduction (HSDR) Project includes beach nourishment on Lido Key using sediment from the two adjacent passes and the construction of two groins to stabilize the southern shoreline. Big Sarasota Pass is designated as the primary and initial sand source under FDEP Permit No. 0333315-001-JC. New Pass may be used (under FDEP Permit No. 0039755-003-JC) as a supplemental sand source, subject to the sand sharing agreement between Lido Key and Longboat Key.

The Lido Key HSDR Project consists of the placement of sand along a 1.6 mile segment of the Lido Key coastline between FDEP monuments R-34.5 and R-44. The Big Sarasota Pass borrow area design includes three cuts labeled B, C and D (Figure 1). Borrow Areas B and C are proposed as the initial sediment sources. A September 2014 benthic resource investigation documented a total of 5.71 acres of seagrass within the project area and surrounding areas. The total inside the borrow area boundaries was 1.68 acres, and an additional 4.03 acres were identified within 150 m of the borrow areas (CB&I, 2014). No seagrass was observed within the fill placement area or the associated fill placement area mixing zone. Based on additional data provided by Southwest Florida Water Management District (SWFWMD, 2012), an additional 20.6 acres of seagrass are located beyond the 150 m mixing zone out to 300 m from the dredge area within Sarasota Bay (Figure 1). Seagrass resources will be buffered and avoided during construction, and no dredging, placing of pipeline/equipment, anchoring, or spudding will be allowed inside the 100 ft buffer. Turbidity will be monitored to ensure that levels are no higher than 29 NTU above background levels outside of the preserve or at the edge of the seagrasses, and no higher than background levels inside of the Outstanding Florida Water.

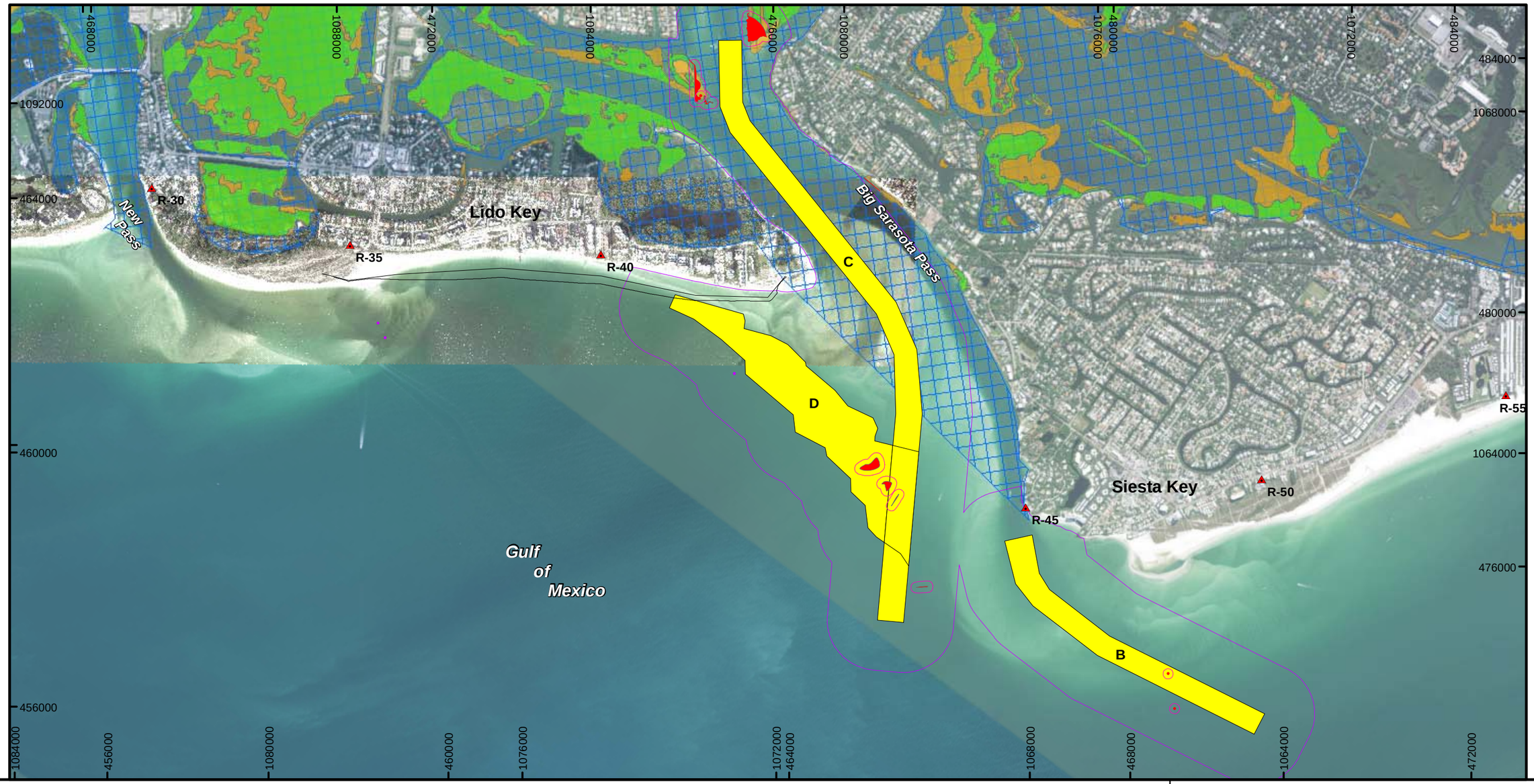
Although turbidity requirements will be strictly enforced, this seagrass biological monitoring plan aims to ensure that no secondary impacts to SAV result from the dredging of Borrow Areas B, C and D . Monitoring will include both the buffered seagrasses within the borrow areas and seagrasses located within 300 m of the borrow areas (Figure 1). The protocol described below has been developed in coordination with FDEP.

2.0 MONITORING PROTOCOL

2.1 SURVEY SCHEDULE

All submerged aquatic vegetation (SAV) resources within the potential influence of the project will be monitored before and after each dredging event of cuts B, C and/or D within the vicinity of Big Sarasota Pass associated with the Lido Key HSDR Project. Monitoring will also ensure the 100 m buffer zone (Figure 1) is providing adequate protection of the seagrass and that no unanticipated impacts from dredging are occurring.

All monitoring surveys shall be conducted within the summer SAV growing season during the period of peak seagrass biomass and distribution (June 1 – September 30) (Karazsia, 2010). If dredging occurs during the growing season, then SAV surveys shall be conducted immediately prior to dredging and immediately after dredging has been completed, within the same growing season. However, if dredging occurs outside of the growing season (e.g., winter months), then monitoring shall be done during the summer growing season immediately prior to construction and the summer growing season immediately



Notes:

1. Coordinates are in feet based on the Florida State Plane Coordinate System, West Zone, North American Datum of 1983 (NAD 83).
2. Lido Key aerial photography provided by Aerial Cartographics of America, date flown August 10, 2014.
3. Additional background imagery is ESRI's Imagery Basemap.

Legend:

- Outstanding Florida Waters
- Borrow Areas (B,C,D)
- Beach Design
- Monitoring Area (300m)
- FDEP Monuments

Seagrass Data:

- CB&I, 2014

SWFWMD, 2012

- Continuous
- Discontinuous
- Dial Cordy, 2001
- 100 ft. Seagrass Buffer

0 1,000 2,000 Feet

1 inch = 2,000 feet

TITLE:

Lido Key, Sarasota County
Florida Hurricane and Storm Damage Reduction Project
Seagrass Resources

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Date: 06/10/15	By: HMV	Comm No. : 150252	Figure No. 1

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following construction; in this scenario, the post-construction survey shall be done as close as possible to the same time of year as the pre-construction survey to avoid seasonal differences.

2.2 SURVEY METHODOLOGY

During each pre- and post-construction survey, the following monitoring tasks shall be completed in areas of SAV cover located within the borrow areas to 300 m beyond the dredge template.

2.2.1 *In-situ* Seagrass Delineation

During each survey, biologists will investigate areas where seagrass has been previously documented. The first pre-construction survey will be based on seagrass observations from the 2014 benthic resource investigation (CB&I, 2014) and on the most recent available seagrass delineation provided by SWFWMD (2012) (Figure 1). If additional areas of seagrass are observed, subsequent surveys will be expanded to include these locations. Divers (or snorkelers if depth is shallow) will visually locate the edge of the seagrass beds and follow the edge of the community while towing a buoy equipped with a Differential Global Positioning System (DGPS) antenna linked to a topside laptop computer running HYPACK navigational software. The positioning data will be recorded, and the total acreage of seagrass within each patch during each survey shall be reported. These seagrass areas will also be characterized based on qualitative and quantitative data (described in Sections 2.2.2 and 2.2.3, respectively) collected within each patch. The post-construction SAV acreage will be compared to the pre-construction SAV acreage.

2.2.2 Qualitative Assessment

Biologists will visually assess species composition, above-ground biomass, epiphyte coverage, and overall condition of each seagrass patch within the mixing zone survey area. A detailed description of the current condition of seagrass resources will be provided, including a description of any visually conspicuous changes in the condition of resources compared to previous surveys.

2.2.3 Quantitative Survey

The seagrass located within the vicinity of the Lido Key HSDR Project consists of some patchy areas of seagrass ranging in size from less than 0.5 m^2 (0.0001 acre) up to 1.18 acres within the Borrow Areas and mixing zones as well as areas of large continuous seagrass beds within Sarasota Bay (located within 300 m of Borrow Area C) (Figure 1).

Data Collection within Patches. Biologists will document the Braun-Blanquet (BB) cover-abundance scores (Table 1) for SAV within haphazardly placed 0.25 m^2 (0.5 m x 0.5 m) quadrats established during the initial pre-construction survey within each seagrass patch. Quadrat placement will not be biased (e.g., towards the center of the patches or densest areas), but will be distributed throughout the patch to characterize the cover. The number of quadrats per SAV patch will be determined during the pre-construction baseline survey and will depend upon the size of each bed. Generally, FDEP recommends that at least 10% of the area be sampled, with a minimum of three (3) quadrats sampled per patch. For larger patches, FDEP will be consulted regarding the possible use of larger quadrats (0.5 m^2 or 1.0 m^2). The corresponding pre- and post-construction surveys will sample the same number and sizes of quadrats for each patch, even if patch size has declined. A BB score will be reported for each of the SAV taxa present within quadrats. Additionally, the BB score for total cover of all SAV taxa present within

quadrats shall be reported. Note, the total BB score is not the sum of individual taxa BB cover scores; it is a separate measurement.

Data Collection along Permanent Transects. Biologists will establish and monitor permanent, 50 m long transects within large continuous seagrass beds located within 300 m of Borrow Area C (Figure 1). The number of transects established will be determined based on the size of the seagrass beds delineated during the pre-construction survey based on FDEP guidance. Eleven (11) 0.25 m^2 (0.5 m x 0.5 m) quadrats will be sampled at regular intervals every 5 m along each transect (at the 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 m locations). The permanent transects and quadrats will be sampled in the same locations during the post-construction survey. A BB score shall be reported for each of the SAV taxa present within quadrats. Additionally, the BB score for total cover of all SAV taxa present within quadrats shall be reported. Note, the total BB score is not the sum of individual taxa BB cover scores; it is a separate measurement.

Table 1. Braun-Blanquet Abundance Scores.

Score	Cover
0	Taxa absent from quadrat
0.1	Taxa represented by a solitary shoot, <5% cover
0.5	Taxa represented by a few (<5) shoots, <5% cover
1	Taxa represented by many (>5) shoots, <5% cover
2	Taxa represented by many (>5) shoots, 5 - 25% cover
3	Taxa represented by many (>5) shoots, 25 - 50% cover
4	Taxa represented by many (>5) shoots, 50 - 75% cover
5	Taxa represented by many (>5) shoots, 75 - 100% cover

The FDEP JCP compliance officer will be notified when each survey will begin and when each survey is complete.

3.0 REPORTING

Raw data, including copies of data sheets and shapefiles of the seagrass patches, will be submitted to FDEP within 45 days of the completion of each survey. A post-construction seagrass monitoring report will be prepared and submitted to the FDEP for review within 90 days of the completion of each monitoring event. The report shall include statistical analyses to evaluate whether the cover of SAV changed significantly over time (i.e., statistical comparison of pre- and post-construction BB score data). Summary statistics (means and standard deviation values) shall be presented, and the report shall provide a comparison of pre- and post-construction BB cover values for each patch and for the entire survey area. The results section of the monitoring report shall include: the frequency of occurrence (proportion of all quadrats that contained seagrass), the density (mean BB score for all quadrats sampled), and the abundance (mean BB score for only those quadrats containing seagrass). Additionally, if available at the time of the post-construction seagrass survey, the as-built survey data will be evaluated to determine if any dredging occurred beyond the authorized footprint or if sloughing of materials occurred. If analysis indicates that unpermitted impacts to seagrass habitat have resulted from the project, FDEP shall be notified.

4.0 REFERENCES

CB&I (Coastal Planning & Engineering, Inc., a CB&I Company). 2014. Lido Key Hurricane and Storm Damage Reduction Project Benthic Resource Investigation Observation Report. Submitted to U.S. Army Corps of Engineers. Jacksonville District, Jacksonville, Florida.

Karazsia, J. 2010. A Science-based Seagrass Survey Window for Coastal Construction Planning in Florida. Prepared by Jocelyn Karazsia, NOAA NMFS Southeast Region, Habitat Conservation Division. May 1, 2010.