32. Description of the overall project and of each activity in or affecting US waters or state critical areas

The proposed activity is a beach nourishment project along Isle of Palms, SC (Sheet 01). Work will include placement via hydraulic (cutterhead) dredge of up to 2,000,000 cubic yards (cy) of beach-quality sediment along up to 19,000 feet (ft) of shoreline. The project encompasses two reaches with the first extending from 53rd Avenue East to the Wild Dunes Links Course's 18th hole and the second extending from Breach Inlet to 14th Avenue. Sand will be obtained from offshore borrow areas ~2–3 miles from the beach, situated on bathymetric high areas to reduce the potential for infilling with mud. Due to the dynamic nature of shoals attaching to the Isle of Palms beach, the exact fill limits will be determined at the time of construction; however, no fill will be placed beyond the boundaries shown in Sheet 02. Fill will be placed along areas showing significant volume losses since 2008.

The previous large-scale nourishment project at Isle of Palms was completed in spring/summer of 2008. That project added ~875,000 cy of sand to the beach in three reaches between 54th Avenue and the area near the 17th hole (Stations 224+00–340+00). Additional work was completed in 2012 by transferring ~80,000 cy of sand from accretional areas to a localized hotspot erosional area (Stations 306+00–320+00). By 2014, erosion along this hotspot continued, and the area between Station 260+00 and Station276+00 was also eroding. Another transfer project was completed, moving a total of ~248,000 cy of sand to the two erosional areas.

Nourishment Plan

Borrow Area(s)

Two potential borrow areas have been identified based on preliminary geotechnical borings and coordination with cultural resource agencies. Area E is shown on Sheet 08 and encompasses ~310 acres in the vicinity of Borrow Area B, which was used during the 2008 project. Area F is ~65 acres and is to the north and east of Area E. CSE has obtained borings in each area to determine sediment compatibility. Both areas contain mostly clean sand with small shell hash intermixed. Table 1 shows the sediment statistics for each core and averaged for each area. Area E has a mean grain size of 0.443 millimeters (mm) and shell percentage of 26.9 percent. Most of the shell content is sand-sized material less than 2 mm. Area F is similar with a mean grain size of 0.383 mm and shell content of 27.5 percent. At the maximum volume, the project will require ~150 acres of borrow area to be utilized, leaving significant areas untouched. The Applicant will obtain additional borings to refine the borrow areas prior to construction to maximize sediment compatibility.

In conducting geotechnical investigations, the Applicant discovered additional areas offshore of Isle of Palms which contain quality beach-compatible sand (Fig 1). The sand in these areas is clean, tan sand with generally less shell material than Areas E and F, and of that, the shell material is smaller in size. While the overall mean grain size is similar to Areas E and F (Table 1), the distribution of the sand grain size is different in the two areas. Areas E and F have a higher concentration of fine-grained sand and occasional silty material with slightly larger shell fragments. The two additional areas have a slightly larger sand size and smaller shell fragments. Figure 2 shows photos of the typical sediment in the offshore areas compared to Areas E and F.

The Applicant initially proposed that these areas be the primary borrow areas; however, after consultation with the State Historic Preservation Office (SHPO), it was discovered that a large area offshore of Isle of Palms is being proposed to be designated as a historic district. These potential borrow areas were located within the proposed boundary. The Applicant believes that the sand in these areas is of better, beach-fill material due to the lower fine sand and silt content, smaller shell size, and color; however, SHPO indicated that they would not agree to allow dredging of any of the area within the proposed historic district. Due to the urgent need for a comprehensive beach restoration project, the Applicant is moving forward with the proposed project using Borrow Areas E and F to avoid impacting the proposed historic district, despite the presence of more suitable fill within the district.

Table 1. Grain size statistics for initial sediment samples in the borrow search focus area (see Sheet 08).

Area	Station	Interval	Mean (mm)	STD (mm)	Percent Shell	Percent >2mm
Area E	IOP 1	0-7	**0.344**	0.406	19.0	5.0
	IOP 11	0-7	**0.417**	0.280	16.4	12.0
	IOP 37	0-7	**0.127**	0.647	8.8	0.5
	IOP 48	0-7	**0.523**	0.293	33.1	19.7
	IOP 49	0-7	**0.436**	0.381	31.7	9.2
	IOP 50	0-7	**0.378**	0.357	21.6	9.1
	IOP 51	0-7	**0.419**	0.330	30.3	13.1
	IOP 72	0-7	**0.896**	0.360	54.5	22.0
		Average	**0.443**	**0.382**	**26.9**	**11.3**
Area F	IOP 24	0-7	**0.333**	0.421	22.8	6.4
	IOP 25	0-7	**0.384**	0.320	31.4	13.2
	IOP 46	0-7	**0.404**	0.282	31.2	16.9
	IOP 47	0-7	**0.410**	0.329	24.5	11.0
		Average	**0.383**	**0.338**	**27.5**	**11.9**

Area	Station	Interval	Mean (mm)	STD (mm)	Percent Shell	Percent >2mm
Area G	IOP 5	0-7	**0.422**	0.427	36.0	7.6
	IOP 6	0-7	**0.302**	0.467	21.8	5.0
	IOP 16	0-7	**0.471**	0.347	33.5	13.0
	IOP 30	0-7	**0.442**	0.381	32.0	11.3
	IOP 31	0-7	**0.459**	0.336	32.8	12.1
	IOP 32	0-7	**0.491**	0.371	36.6	12.2
	Average		**0.431**	**0.388**	**32.1**	**10.2**
Area H	IOP 7	0-7	**0.373**	0.386	24.9	8.8
	IOP 18	0-7	**0.327**	0.455	24.8	4.6
	IOP 22	0-7	**0.347**	0.345	26.2	6.9
	IOP 33	0-7	**0.265**	0.490	19.5	3.1
	IOP 34	0-7	**0.298**	0.509	20.1	4.0
	IOP 35	0-7	**0.337**	0.447	23.5	4.3
	IOP 36	0-7	**0.209**	0.455	15.5	3.4
	Average		**0.308**	**0.441**	**22.1**	**5.0**

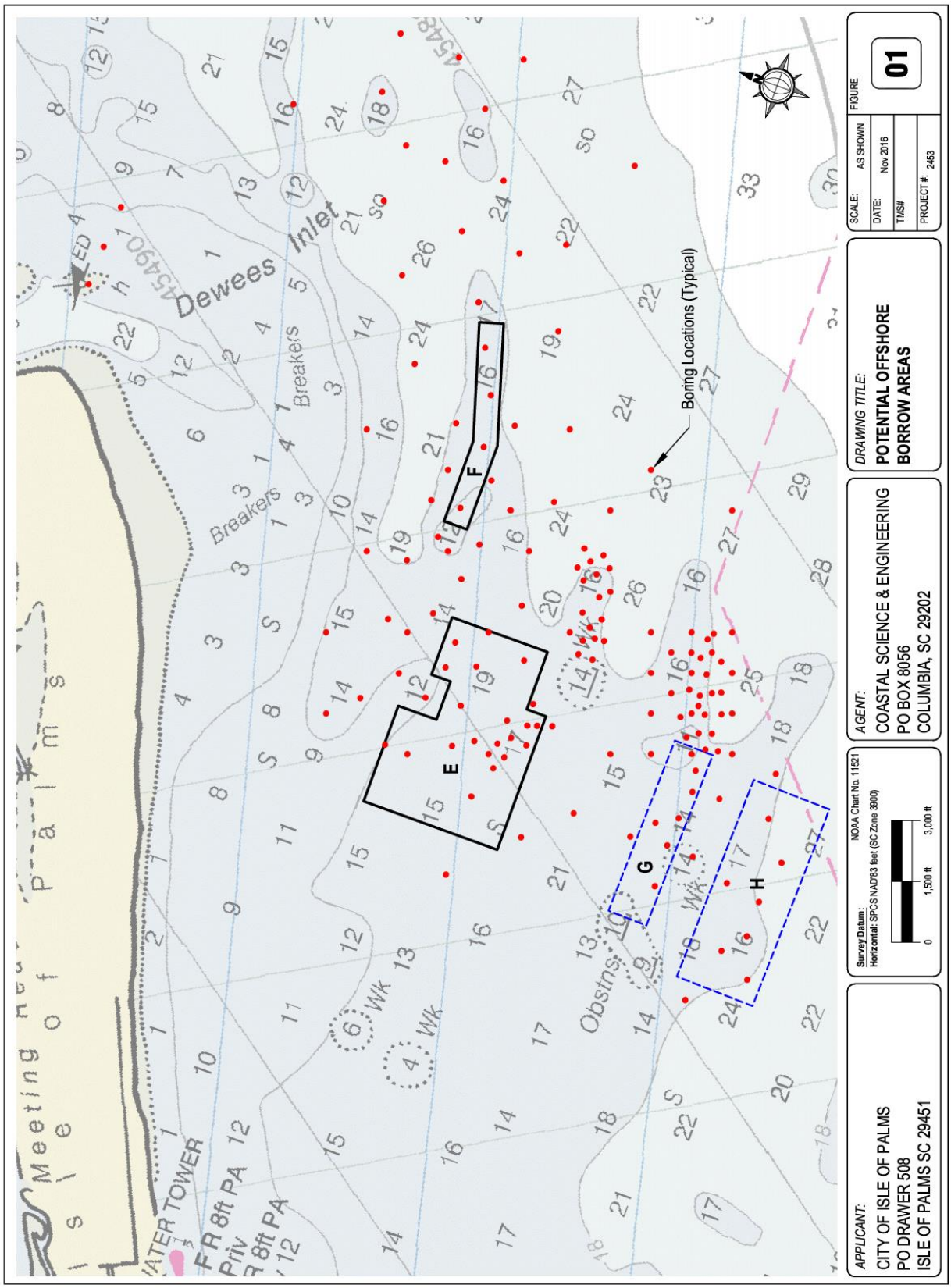


Figure 1. Map showing the location of the offshore borrow areas (black lines) and areas SHPO identified as being within the boundary of a proposed historic district (blue lines).

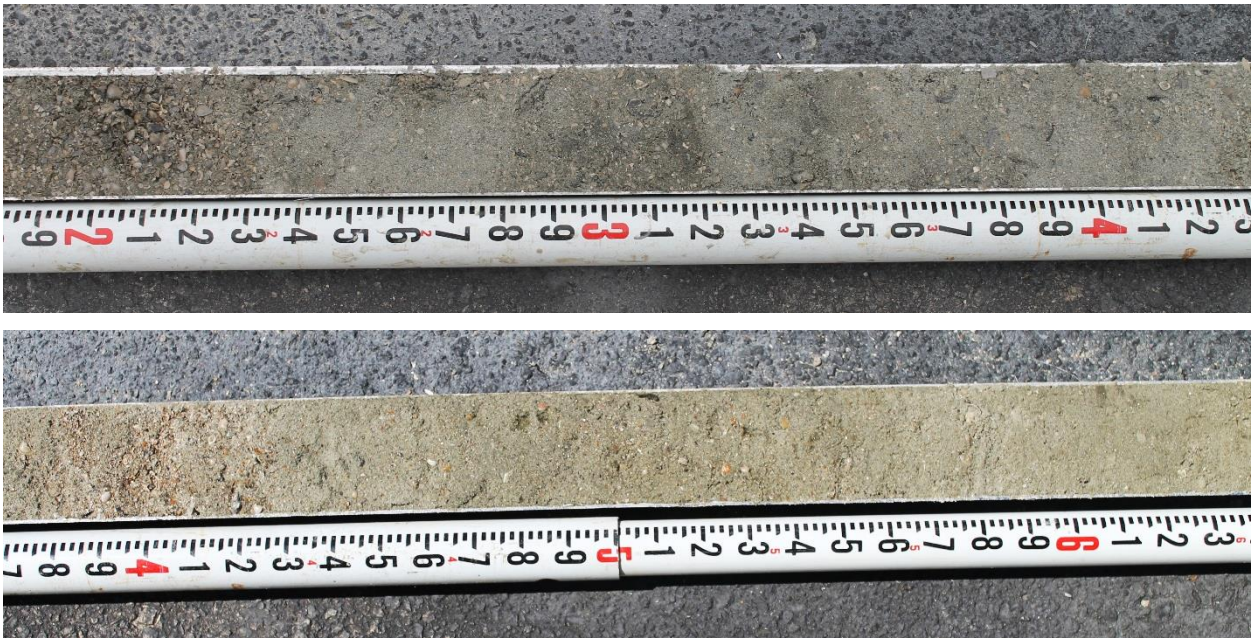


Figure 2. Photos of typical borings from Areas E and F (upper) and the offshore areas in the proposed historic district (lower). Note the sand in the lower boring is more tan and contains less silty material (as visible in the darker areas in the top photo).

Nourishment

Reaches 1 and 2

Nourishment will be placed in two contiguous reaches extending ~10,800 linear feet (lf) from Station 222+00 (53rd Avenue) to 330+00 (Dewees Inlet) as shown in Sheet 02. Fill Reach 1 extends 5,800 lf from Station 222+00 to Station 280+00 and will receive up to 750,000 cy of sand. Fill Reach 2 extends 5,000 lf from Station 280+00 to Station 330+00 and will receive up to 650,000 cy of sand. In total, up to 1,400,000 cy of sand may be placed during the nourishment. The project area is subject to rapid changes associated with shoal-bypassing events; therefore, the quantities and fill limits may be adjusted at the time of construction. Any changes will not increase the overall quantity or nourishment limits. Some portions of the shoreline within the project area may not be nourished if the beach condition at the time of construction is sufficient (likely in the area of shoal attachment).

Reach 3

Nourishment will be placed in the area extending from the south end of the island at Breach Inlet (Station 6+00) ~8,000 ft north to 14th Avenue (Sea Cabins Pier at Station 86+00). Reach 3 will receive between 300,000 and 600,000 cy of sand (average fill density of 37.5 cy/ft up to 75 cy/ft). Fill will taper at each end to the existing contours.

Nourishment will be accomplished using a hydraulic cutterhead dredge and additional equipment typical of beach nourishment projects, including submerged pipelines, bulldozers, loaders, and accessory equipment. Temporary training dikes will be used to contain the slurry discharge parallel to the shore. Nourishment fill sections will be dependent on the condition of the beach at the specific location, varying from ~30 cy/ft to 400 cy/ft with tapers at the ends of each fill reach. The construction berm elevation will be placed at +5.5 ft NAVD, and a small dune and storm berm will be constructed along the portions of the beach lacking any significant dune structure at the time of the project (Sheets 05 and 06). The dune will consist of a crest elevation no greater than +10 ft NAVD and crest width no wider than 15 ft, with a seaward slope of 1 on 4. The storm berm will be constructed at +7 ft to +8 ft NAVD and will extend up to 50 ft seaward of the dune toe. The seaward slope of the construction berm will be 1 on 20 between +5.5 ft and the mean high water (MHW) contour. Sand fencing and vegetation will be installed in strategic locations along the landward end of the berm to facilitate natural dune growth.

33. Overall project purpose and the basic purpose of each activity in or affecting US waters

The purpose of the project is for beach restoration, including:

- Restore the recreational beach along the northeast erosion zone of Isle of Palms from 53rd Avenue to Dewees Inlet.
- Restore the recreational beach along the southern end of the island which has experienced atypical erosion over the past few years.
- Restore a protective beach seaward of buildings such that dune enhancement may be initiated by the Applicant and individual property owners.
- Place nourishment volumes of variable section densities so as to reduce the variability of beach width caused by inlet sand-bypassing processes.
- Provide a protective buffer between existing infrastructure and the ocean.
- Eliminate the need for emergency erosion control measures.
- Improve the overall aesthetics of the beach and enhance its recreational value.

History

Reaches 1-2

The eastern end of Isle of Palms has been impacted by several discrete shoal-bypass events since the early 1980s, each of which produced dramatic fluctuations in the shoreline and resulted in some level of remedial action. To date, measures to restore the beach or protect infrastructure include sand scraping from accretional areas, installation of sand bags or other temporary structural measures, small-scale nourishment from upland sources, and nourishment by hydraulic dredge (using sediments from the 41st Street marina basin and from an offshore source). The episodic shoal-bypass events create erosion and accretion patterns that follow a well-documented general pattern including accretion along the beach behind the shoal and erosion of the adjacent beach on either side of the shoal. Once attached, the shoal sand spreads laterally and restores the adjacent beaches. While the general pattern is understood, each event is unique in the attachment location, shoal size, and duration of the attachment process. Also, each shoal moves under unique wave conditions which impacts all of these factors and determine the direction and magnitude of net sediment transport on either side of the shoal.

Beach recession rates of the order 200–500 ft have been associated with previous events along the northeast end of Isle of Palms. While localized shoreline change and volumetric erosion or accretion are large in magnitude with each event, the net annual sand loss rate (deficit) is low—in the range 15,000–30,000 cy/yr. Any long-term solution to erosion must therefore restore the small annual deficit as well as add a large volume that widens the beach sufficiently to buffer development from cyclical erosion events. Historical data indicate that shoal-bypassing events and the influx of sediment they have introduced to the beach at the northeast end of Isle of Palms are responsible for the relatively healthy beach along downdrift sections of the island.

Studies of previous shoal-bypassing events suggest that downcoast areas of Isle of Palms receive almost no sand from the northeast end of the island during Stage 2 of the shoal-bypass cycle. It is during Stage 3 when the majority of downcoast transport occurs. Therefore, a goal of the proposed project is to reshape the shoreline closer to Stage 3 conditions so that sand will move alongshore and downcoast under normal wave processes.

Reach 3

Reach 3 has typically been accretional in recent history, leading to a stable dune field fronting all properties. In the area near the spit, the beach accreted to the point that another row of buildable lots developed and houses were constructed seaward of the original beachfront homes in the late 1980s. Many of the older homes (built

lower than modern design restrictions) were destroyed during Hurricane *Hugo*; however, following the storm, the spit area and beach fronting the commercial area have accreted. No significant erosion issues have occurred along the reach since it was developed. Periodic small-scale erosion typical of stable to accretional beaches (ie – Kiawah Island) has been noted, but the long-term trend has been minor accretion.

Beach Condition Changes 2008–2015

The Applicant completed a large-scale beach nourishment project in 2008, which added ~875,000 cy of sand to the beach between Stations 222+00 and 340+00. Following the project, the Applicant has monitored the project area beach using a series of beach profiles spaced at 200 ft and extending offshore up to 15,000 ft to encompass the Dewees Inlet delta. Profiles have also been obtained at 1,000-ft intervals along the beach west of the project area. Surveys have been obtained at least annually, and several additional surveys were obtained during scraping events or after storms. A map showing monitoring stations is shown in Figure 1.

From 2008 to 2012, the beach condition in the project area remained healthy with erosion varying across the project area and hotspots located along the area of the 2007 shoal attachment (Dunecrest Lane) and near the Ocean Club condo unit. Overall, the project area lost ~540,000 cy of sand between 2008 and 2012 (Fig 2), leaving the beach with ~456,400 cy more sand than the pre-nourishment condition (including the effects of natural accretion). The majority of the loss was due to spreading of shoal sand, which had created an artificial bulge in the shoreline. Despite the rapid erosion in the area near Dunecrest Lane and Beachwood East, the initial beach width was great enough to maintain a dune and dry beach through 2014. In front of Ocean Club (Station 314+00), the erosion reached a point by 2012 that restorative action was required and the first "shoal management" project was constructed. While there was still a dune present and substantially more sand than the pre-2008 condition, the likelihood of future erosion warranted action. The project moved ~80,000 cy of sand from an accretional area in the lee of another attaching shoal to the area fronting Seascape, Ocean Club, and the 18th hole of the Links Course.

The placed sand eroded over the next few months, and by 2014, the hotspot erosion continued near Ocean Club. Homeowners installed emergency erosion measures under individual permits, including sandbags and experimental wave-dissipation systems. At this time, the attaching shoal remained a few hundred feet offshore, and the accompanying adjacent erosion was at its most extreme. The area near Ocean Club was critically eroded, and structures were imminently threatened. At the same time, erosion near Beachwood East accelerated and was beginning to threaten properties. Another shoal management project was conducted in winter 2014–2015, transferring a total of ~248,000 cy to two fill areas. The area near Ocean Club received ~180,000 cy and the area near Beachwood East received ~70,000 cy. Following the project, the fill near Ocean Club proved to be longer lasting than the 2012 project, and some sand remained in place until the October 2015 storm event associated with Hurricane *Joaquin*. The fill fronting Beachwood eroded rapidly due to continued focused erosion associated with the attaching shoal, and homeowners reinstalled emergency measures.

The eastern end of the island lost sand every year between 2008 and 2014, but gained sand between 2014 and 2015, indicating that the shoal is now becoming part of the active beach. Evidence of natural restoration of the eastern erosional arc is visible; however, the western erosion area fronting Beachwood East has not yet begun to recover. The beach between Stations 222+00 and 330+00 holds ~280,000 cy more sand than it did prior to the 2008 nourishment. Additional sand is still migrating in with the attaching shoal, but it is likely an insufficient volume to fully restore the erosional areas to a healthy condition that can withstand later shoal events. Since March 2009 (the first comprehensive island-wide survey), the eastern end of the island has lost 647,100 cy while the central and western portions of the island have gained 656,700 cy.

Along the western end of the island, the historical trend has been accretion; however, since 2010, the beach west of 7th Avenue has lost ~241,000 cy of sand. The erosion has been most severe along the western end of the beach, closest to 2nd and 3rd Avenues. The erosion has migrated along the beach in arcs, generally moving north from Breach Inlet. Hurricane *Sandy* caused severe erosion and damage to many walkovers. The beach had shown signs of recovery prior to Hurricane *Matthew*, which caused 30–50 ft of dune erosion.

Basis for Nourishment Volumes and Anticipated Longevity

Reaches 1-2

The proposed plan is based on an ideal beach profile which contains 350 cy of sand to −10 ft NAVD. The ideal volume represents a healthy beach section with sufficient sand to maintain a dune and withstand storm-induced erosion. In addition, the nourishment profile is designed to withstand average erosion over an ~10-year period. The historical annual loss rate is estimated to average ~2.0 cy/ft/yr (CSE 2007, Kana & Gaudiano 2009); however, losses since 2008 have averaged ~19.3 cy/ft/yr. The higher rate is a function of the time interval, which captures the maximum beach losses associated with spreading of the 2007 shoal (and nourishment) sand, but does not yet capture significant gains of the approaching shoal. The proposed borrow source is well removed from the active littoral zone and Dewees Inlet. Therefore, the proposed nourishment will add a new supply of sand to the Isle of Palms system. The proposed nourishment volume is expected to have an estimated ten-year life under normal erosion patterns; however, hotspots created by inlet effects may reduce the life of nourishment in some locations. The proposed project would create a wider beach then the 2008 project with the intent of providing longer-term shore protection.

The Applicant expects changes in the shoals of Dewees Inlet to follow similar patterns as the 2008–2014 period. Presently, the inlet configuration is similar to the 2008 condition with a large shoal recently attached and the inlet channel deflected to the south. Since 2008, monitoring has confirmed a large-scale channel avulsion event, which resulted in reorientation of the Dewees Inlet channel and a release of a large sand mass as a discrete shoal event. The shoal migrated from the outer delta between 2008 and 2015 and is presently the shoal that is attaching to the beach. Two smaller shoal events built from the 2007 shoal attachment event, attaching in 2009 and 2010. The Applicant expects at least one additional shoal-bypass event is likely to occur over the next 8–10 years (Gaudiano & Kana 2001). Sand presently on the shoal platform off the central project area is expected to migrate landward and add to the supply of visible sand on the beach.

Reach 3

The nourishment design along Reach 3 intends to add sufficient volume of sand to restore the primary dune and recreational beach lost since 2010 as well as create additional beach to enhance resiliency to future damage. The full volume (60 cy/ft) would add ~75 ft of new beach width after profile adjustment, which restores the beach to at or above the 2010 condition in most areas. Along the commercial area, sand would be placed to increase dune height and recreational area. This would also provide a feeder beach for spreading sand to feed the areas further south.

The Applicant anticipates these influxes of sand will provide a reasonable dry-beach buffer along the project areas. However, localized erosion hotspots may develop at some point in time within ten years after nourishment. The Applicant plans to conduct detailed annual surveys of the beach, inlet, and shoals so as to develop sediment budgets and identify developing problems before they threaten property and community infrastructure. Results of annual monitoring will be submitted for review to regulatory agencies.

The proposed nourishment project is consistent with the Applicant's long-term beach management plan (Jones 2008).

CSE. 2007. Shoreline assessment and long-range plan for beach restoration along the northeast erosion zone, Isle of Palms, South Carolina. Feasibility Report for Wild Dunes Community Association, Isle of Palms, SC. Coastal Science & Engineering (CSE), Columbia, SC, 76 pp.

Gaudiano, DJ, and TW Kana. 2001. Shoal bypassing in South Carolina tidal inlets: geomorphic variables and empirical predictions for nine mesotidal inlets. Jour Coastal Research, Vol 17, pp 280-291.

Jones, CP. 2008. Isle of Palms long-term beach management. Report prepared for the City of Isle of Palms, SC; Durham, NC, 43 pp + appendices (February).

Kana, TW, and DJ Gaudiano. 2009. Regional beach volume changes at decadal to century time scales – central South Carolina USA. In JM Smith (ed), Proc 31st Intl Conf on Coastal Engineering (Hamburg, Germany: 31 Aug–5 Sep 2008), World Scientific, pp 2340–2351.

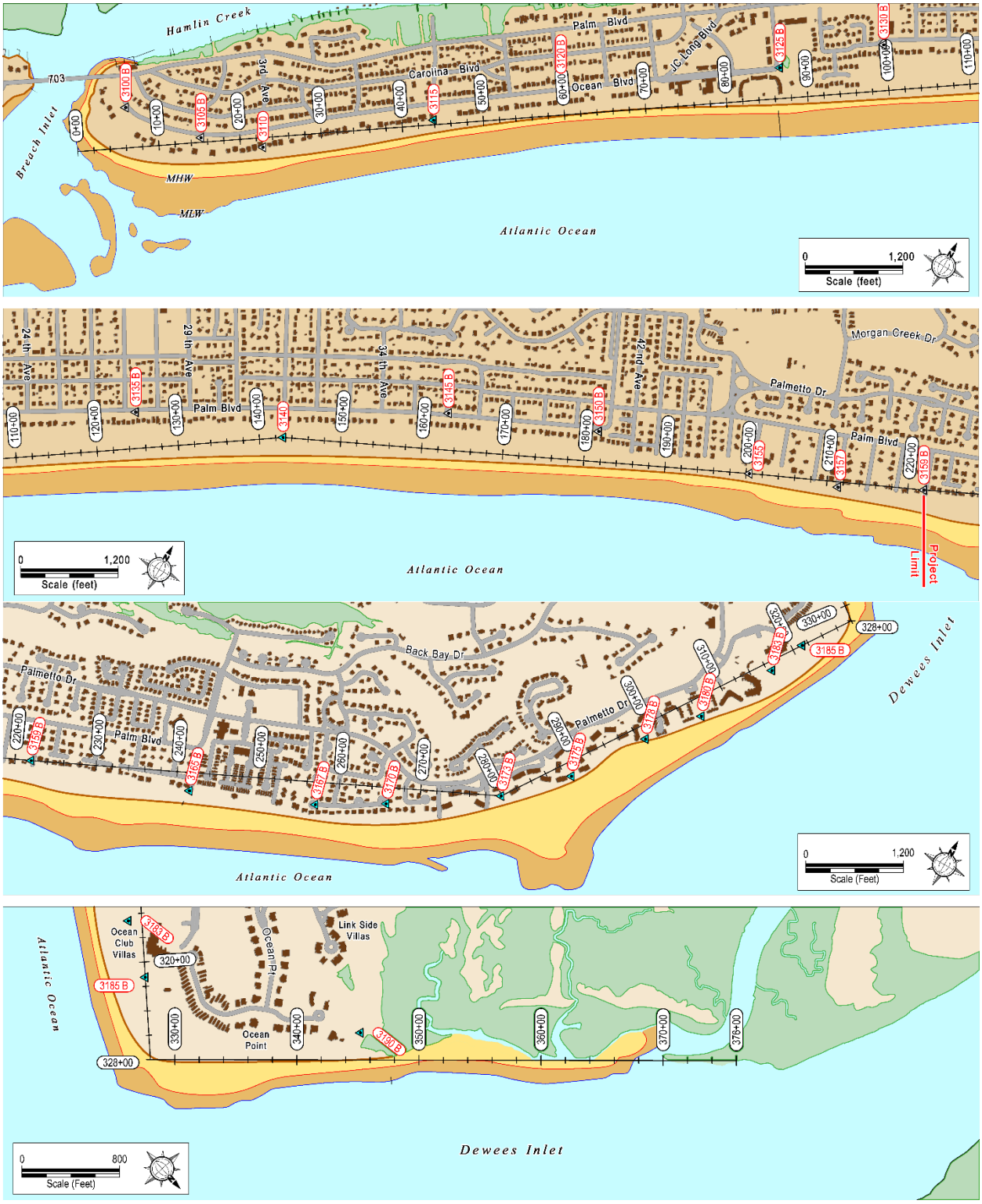


Figure 1. The Applicant established a monitoring baseline to encompass the length of Isle of Palms. The baseline between Stations 222+00 and 376+00 corresponds to the baseline used in the 2008 project. Red labels indicate locations of OCRM survey monuments. City profile sections are oriented perpendicular to the baseline while OCRM profiles are perpendicular to the local beach azimuth. [CSE and OCRM azimuths are only significantly different at Breach Inlet.]

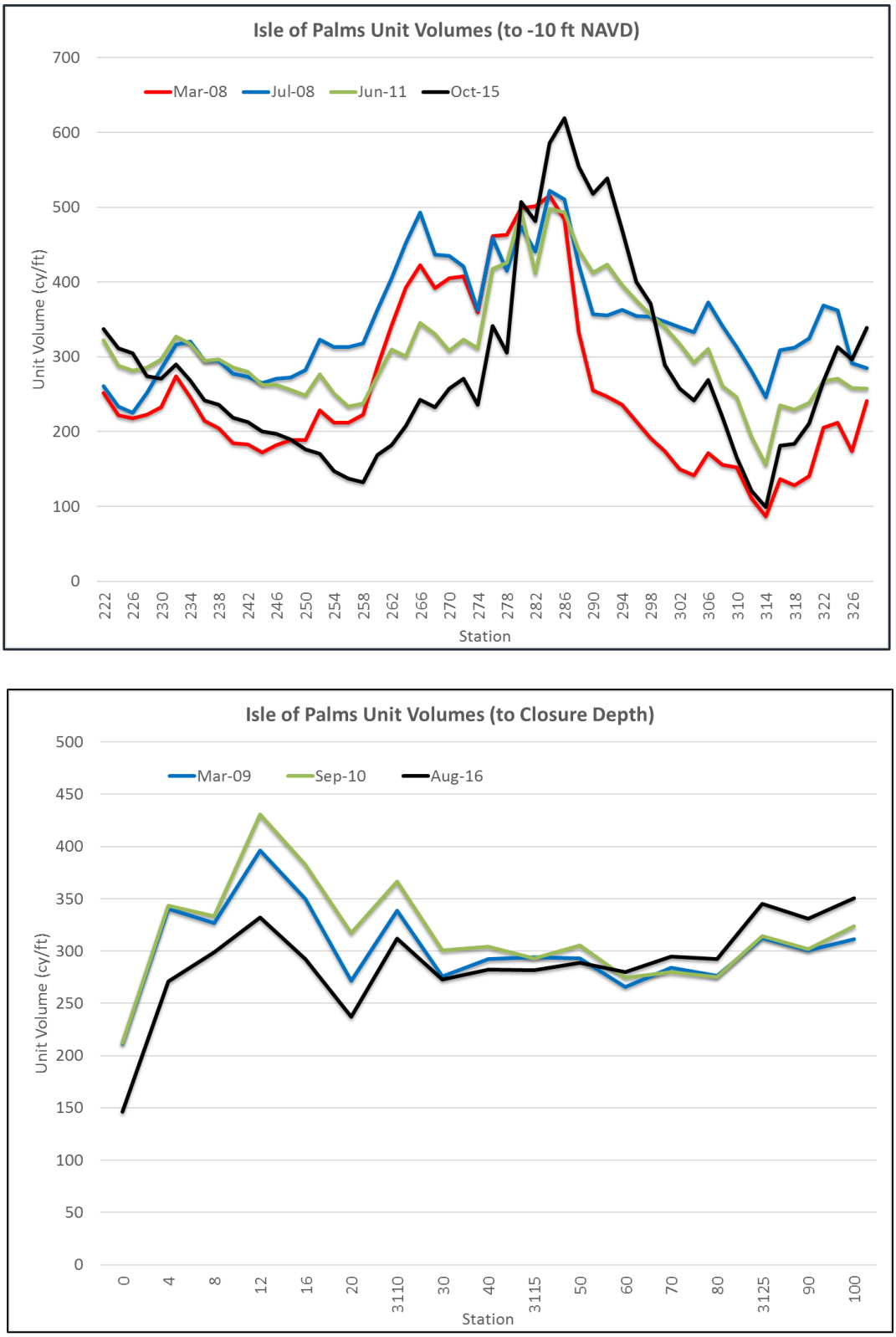


Figure 2. Beach unit volumes along the project areas measured from the structure line to the local closure depth. [Upper] Reaches 2–3: Where the black line is higher than the red line, more sand is present on the beach than existed prior to the 2008 nourishment project. Erosion hotspots are present at Stations 246+00–274+00 and 310+00–318+00. [Lower] Reach 1 showing the 2009, 2010, and 2016 beach volumes. The limits of Reach 1 extend from Station 6+00 to Station 86+00.

39. Describe measures taken to avoid and minimize impacts to waters of the United States

The proposed project is anticipated to be constructed between 1 November and 31 July to minimize potential impacts to sea turtles; however, the final project schedule will be determined in coordination with environmental agencies with appropriate conditions in place for varying windows (ie – turtle monitoring). No construction activities will take place during sea turtle hatching season (1 August to 31 October). Construction will take place over an ~60-day to 120-day period, working 24 hours per day. Turbidity associated with the project will be localized and short-term given the dominance of sand-sized material with ~2 percent mud in the deposits. Turbid plumes are expected to dissipate in minutes to hours within ~500 ft of the discharge point based on prior experience.

The proposed project will result in excavation and mortality of ~150 acres of surficial benthic organisms in the borrow area. Filling operations will bury ~125 acres of shallow beach and inshore habitat (ocean shoreline), resulting in mortality and displacement of existing benthic populations. Nourishment will provide an additional ~60 acres of dry-sand beach (habitat for turtle nesting, shorebird roosting, and recreational area). A wider dry beach will allow natural expansion of the foredune and its associated vegetation. The recreated wet-sand beach will be similar to or greater in area than the previous wet-sand beach buried by the fill. It is expected that these areas will recolonize naturally and rapidly with a similar suite of species (cf – Jutte et al 2002, CZR 2014).

The proposed borrow areas are situated around a submarine ridge where natural bottom depths vary from 15 ft to 30 ft. The excavations will be of the order 7 ft ±1 ft, which is comparable to the natural depth variation in the area. Sediments in the available borings suggest the proposed borrow areas contain actively mobile sediments. Anaerobic conditions were generally not detected within the upper 8 ft of the substrate for the cores in the proposed borrow search areas. Small quantities of interstitial mud were detected in some samples. The Applicant plans to obtain additional borings to further refine the boundaries of the proposed borrow area(s) and optimize sediment quality for the project (within the proposed area footprints shown in Sheets 08 and 10).

The Applicant provided an *"Operations, Monitoring, and Contingency Plan"* for the 2008 nourishment project, which included details on how the application would ensure sediment quality of the beach fill, document removal of sandbags, conduct environmental monitoring during and after the project, and report findings of these efforts to the USACE and others. The Applicant proposes to enact similar steps to ensure the project is completed with minimal environmental impacts and that any deviations from expectations are documented appropriately.

The Applicant (through its Agent) will provide all contractors associated with construction a copy of the permit and associated drawings. A copy of the permit will be kept at the construction site at all times.

CZR. 2014. Nags Head beach 2011 nourishment project. Post-Year 2 and Final Report for Town of Nags Head, North Carolina. CZR Incorporated (Wilmington NC) and CSE (Columbia SC), 65 pp plus appendices.

IOP. 2008. Local comprehensive beach management plan – City of Isle of Palms, South Carolina – 80 pgs.

Jutte, PC, RF Van Dolah, and PT Gayes. 2002. Recovery of benthic communities following offshore dredging, Myrtle Beach, South Carolina. Jour Shore & Beach, Vol 70(3), pp 25-30.

Sea Turtles

The Applicant proposes to construct the project outside of sea turtle hatching season (August-October), and if practicable, outside of sea turtle nesting season (May-August). Should portions of the project overlap with turtle nesting season, standard protection and monitoring actions will be completed to minimize impacts to turtles. Action items include:

- Daily early morning surveys for sea turtles.
- Nest relocation by qualified personnel for nests laid in areas where they may be impacted by construction activities.

- Equipment storage will be off the beach to the maximum extent practicable and as far landward as possible. Temporary fencing or other measures will be utilized to prevent turtles from being trapped by equipment.
- Direct night-time lighting of the beach will be limited to the immediate construction area and shielded according to USFWS recommendations. If any turtles are observed in the construction area, activities will cease until the turtle(s) returns to the water and any nest is marked.
- Tilling of the nourished beach and compaction monitoring for three years after nourishment.
- Escarpment monitoring and leveling for three years after nourishment.

Emergency Erosion Control Device Removal

Much of the need for the 2008 contingency plan arose from the extensive use of sandbags in 2007–2008 and the requirement that those bags be removed and documented as part of the project. The Applicant (City of Isle of Palms) was not the owner or responsible party of the sandbags, but took responsibility for removal of the bags during the project. For the proposed project, individual persons holding permits for erosion control measures will be responsible for removing temporary structures. In areas with sufficient storm protection, emergency measures will be removed prior to sand being placed at that location, and the nourishment fill will reach to the escarpment line or as landward as possible. In areas where removal of the emergency measures would leave properties threatened to damage, sand will be placed seaward of the structures, and the structures will be removed at the time of sand placement or immediately thereafter.

The Applicant will obtain agreements with the emergency-order permit holders prior to construction which will require removal of all emergency measures prior to or during nourishment. The agreement will note that failure to remove emergency measures will subject the permit holder to fines or other penalty from OCRM and/or the USACE. Nourishment sand will not be placed on top of or landward of emergency structures at any time during the nourishment effort.

Removal of emergency measures will be documented photographically as each structure is removed. Records will be checked with existing OCRM tallies for numbers of sandbags and lengths of wave-dissipation systems. The Applicant will forward weekly updates to OCRM staff which will include the location and description of removal efforts and progress of nourishment. Approval of complete removal will be coordinated between OCRM and the emergency permit holders. No dune construction, sand fencing, or vegetation will be completed until OCRM has indicated a property is eligible.

Sediment Quality

The Applicant will define permitted borrow areas so as to reduce the amount of gravel and shell material placed on the beach. Specific monitoring will include:

1) Collection of additional borings in Areas E and F; analysis of sediment quality; and preparation of maps of sediment grain size, percent mud, percent gravel, and percent shell material.
2) Review of borrow area geotechnical data with permitting agency officials and identification of priority subareas for excavation. The Applicant (through its Agent) will determine a dredging strategy to utilize the borrow areas in an efficient manner while maintaining sediment quality throughout the project.
3) Pre-construction, native-beach sand samples will be obtained at 1,000-ft intervals along the project area (between Stations 6+00 and 86+00 and Stations 230+00 and 320+00). At each location, samples will be taken at the toe of the dune, middle of the dry-sand berm, approximate mean sea level, and shallow subtidal zone (wading depth). Samples will be sieved at 0.25-phi intervals and acid-washed to determine shell content.

4) The Applicant (through its Agent) will have qualified personnel under the direction of a registered professional geologist monitoring sediment quality on the beach during construction and correlating it with the borrow area conditions.

5) During construction, samples of the beach fill will be obtained at 200-ft intervals and compared to the native and borrow area samples. Samples along one shore-perpendicular transect will be combined into one physical composite and sent to the laboratory for grain-size analysis. Samples will be analyzed as soon as possible but will not exceed five (5) days after collection. Sediment test results will be submitted weekly to USACE and SCDHEC-OCRM for review.

6) Additional sampling and frequent observation will be completed during the initial 4–6 hours of pumping when the dredge moves to a new borrow site until the on-site technical representative (OTR) and contractor are satisfied with the quality of sand. The contractor will also have observers monitoring sediment quality 24 hours per day and will immediately report any significant changes in the discharge to the OTR so that decisions to move the dredge can be accomplished in a timely manner.

7) Upon completion of construction, the Applicant (through its Agent) will resample the project area and obtain representative samples of the beach fill using the same stations as the pre-project samples. Results will be compared with pre-project beach samples and borrow area sediment test results. Data will be submitted to the USACE and OCRM in a comprehensive final report.

8) Relocation of the dredge if unacceptable sediments are encountered. The contractor in consultation with the owner's on-site technical representative will notify the Applicant, USACE, and OCRM if significant non-compatible material is encountered in the borrow area. The dredge will be relocated to other subareas within the permitted borrow area if the following conditions are encountered:

    a. Evidence of high concentrations of mud persisting for more than 30 minutes in the slurry based on visual observation at the discharge pipe and monitoring of specific gravity of the slurry at the dredge.

    b. Evidence of high concentrations of nonshell gravel such as chunks of limestone, marl, or similar cemented sediments which persist for more than 30 minutes in the slurry based on visual observation at the discharge pipe and monitoring of specific gravity of the slurry at the dredge.

    c. Evidence of high concentrations of coarse shell material exceeding pebble-sized clasts (eg – oyster shells, quahogs, etc) which persist for more than 30 minutes in the slurry based on visual observations at the discharge pipe and monitoring of specific gravity of the slurry at the dredge.

9) Accumulations of mud rollers and coarse gravel material (ie – rock fragments, large shells). Because of the lag time between excavations in the borrow area and pump-out onto the beach, accumulations of mud rollers and coarse gravel material may occur before the dredge can be relocated. If such accumulations exceed the equivalent of one 15-cy dump truck per 100 linear feet of beach, the Applicant will arrange to pick up the coarse material using hand labor or a beach-sweeping device as soon as practicable upon completion of the section or upon completion of the project. To the extent practicable, such accumulations will be raked into stockpiles above the high-tide mark and will be removed prior to completion of the project.

10) Beach compaction tilling –The Applicant will perform tilling of the fill berm upon project completion as specified in the contract documents. Tilling will be accomplished to a depth of ~36 inches and will span the dry berm. The Applicant (through its Agent) will perform post-tilling compaction tests at ~500-ft intervals along the project area and will report the results to USACE and SCDHEC-OCRM following standard testing protocols.

Monitoring Plan

The Applicant will establish and complete the following monitoring plan as part of the proposed project. Some of these action items were mentioned previously, but are included here for completeness.

Beach Surveys – The Applicant will conduct topographic and bathymetric beach surveys before and after the project, and for 3 years post project. Surveys will be conducted at profiles not to exceed 200 ft in spacing in Reaches 2-3 and 500 ft in Reach 1 in the alongshore direction and will encompass the beach between a point landward of the stable dune and extend to depths of -12 ft NAVD, or a distance of 3,000 ft from the shoreline, whichever is closer. Post construction surveys will compare beach volumes and contour positions to before-and-after project conditions to document beach volume changes and identify any erosion hotspots. Annual reports will be submitted to USACE and SCDHEC-OCRM.

Borrow Area Surveys – The Applicant will conduct pre-project, post-project, and out-year bathymetric surveys of the utilized dredge area. Surveys will encompass the boundaries of the dredge area and will include a minimum 400 ft buffer along the outside of each area. Surveys will be completed using track lines at a spacing not to exceed 100 ft. Out-year surveys will be completed in years 1, 3, and 5 following construction. Data will be used to determine infilling rates and topographical changes to the seafloor. Results will be included in annual monitoring reports in conjunction with the beach surveys.

Sediment Monitoring

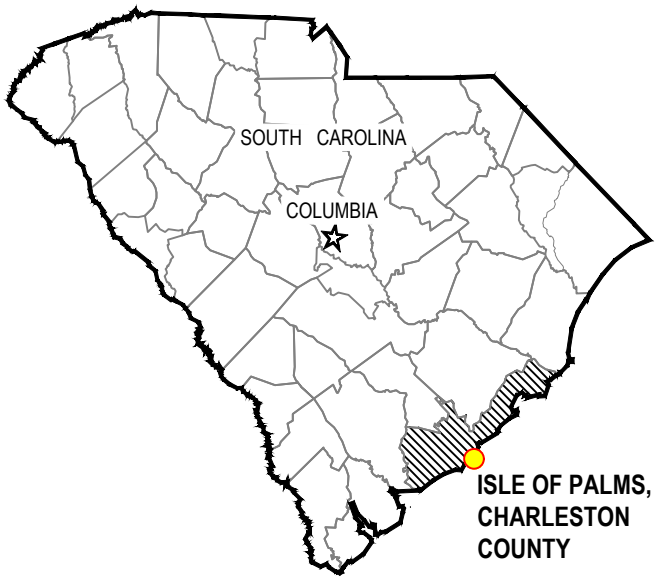
Beach – Pre and post nourishment beach sediment samples will be taken at stations spaced 1,000 ft in the alongshore direction. At each station, samples will be obtained using a push core at the toe of the dune, crest of the berm, mid beach face, and shallow underwater zone. Samples will be dried and tested for grain size distribution and shell content. Results will be included in a comprehensive project report.

Borrow Area – Pre-project, post-project, and out-year surficial sediment samples will be obtained in the dredge areas to evaluate possible changes to the sediment characteristics over time as new sediment infills the borrow area. Ten sediment samples will be collected at random locations within each borrow area using push cores ~10cm in diameter and 10cm deep. Samples will be analyzed for grain size, shell content, and mud content. Results can be used to infer recovery of the borrow area and what type of benthic community is likely present. Summaries of the findings will be submitted in annual reports to USACE and SCDHEC-OCRM.

Lighting – The Applicant will conduct one lighting survey of the beach in the first May following nourishment following guidelines prepared by USFWS. A summary report of the survey, including the methodology, map of lighting sources, and description of each source) will be submitted to USFWS within three months of the survey. Following submission of the survey results, the Applicant will meet with USFWS to discuss the report.

40. Provide a brief description of the proposed mitigation plan to compensate for impacts to aquatic resources or provide justification as to why mitigation should not be required

The restorative nature of the project and the lack of impacts to freshwater or estuarine wetlands suggest that no mitigation for the action be required. The project will restore and preserve dry sand and dune habitat used by shorebirds and endangered species. Impacts of beach nourishment projects are well understood and, when designed properly and the site allows, limited to temporary impacts to the immediate beach and borrow area. Borrow areas have been selected to minimize placement of silt-sized particles on the beach and to closely match the native grain size along the beach. The project is proposed to be constructed during periods of low biological activity to minimize impacts to benthic organisms and sea turtles. The Applicant proposes that no mitigation should be required for the proposed project, as is the typical custom for beach nourishment activities.



DIRECTIONS:

From Charleston, take US-17 North. Turn right onto SC 517 (Isle Of Palms connector). Turn left onto palm blvd. The project limits extend along the beach at Ocean Point Dr (*Dewees Inlet*) to approximately 53rd Ave and from the Pier at 14th Ave to Breach Inlet.

Project Location

Latitude: 32° 48.5' N

Longitude: 79° 43.4' W

APPLICANT:

CITY OF ISLE OF PALMS
PO BOX 508
ISLE OF PALMS SC 29451

DRAWING TITLE:

VICINITY MAP

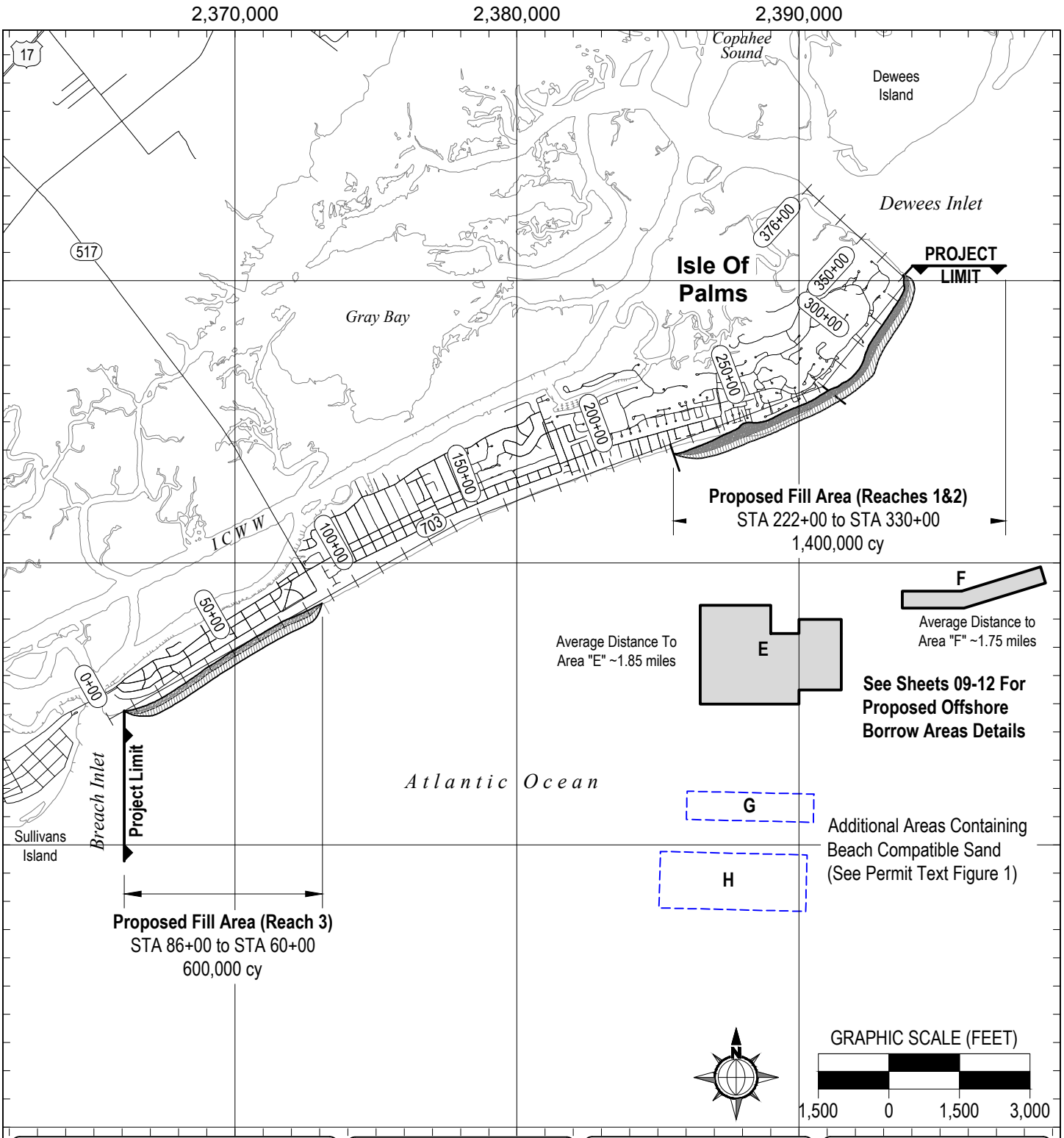
SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
COASTAL SCIENCE & ENGINEERING
No. C01950

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

AGENT: ***P/N 2010...***

COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

SCALE: AS SHOWN	SHEET #: 01
DATE: Nov2016	
TMS#	
PROJECT #: 2435	



APPLICANT:
CITY OF ISLE OF PALMS
PO BOX 508
ISLE OF PALMS SC 29451

DRAWING TITLE:
PROJECT PLAN MAP

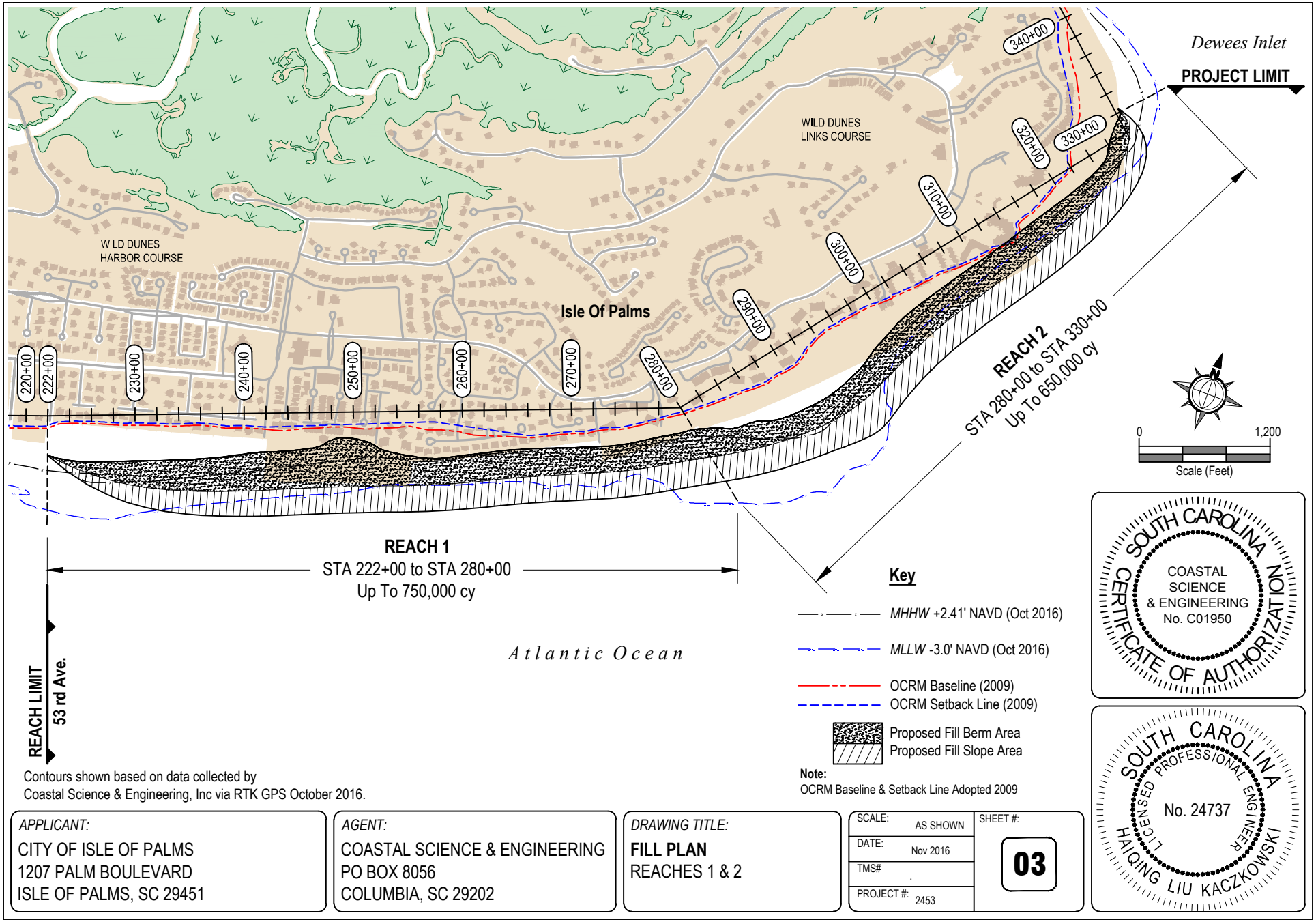
AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

SCALE: AS SHOWN
DATE: Nov 2016
TMS#
PROJECT #: 2453

SHEET #: **02**

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
COASTAL SCIENCE & ENGINEERING
No. C01950

SOUTH CAROLINA PROFESSIONAL ENGINEER
LICENSED
No. 24737
HAIQING LIU KACZKOWSKI
11/2/16



Contours shown based on data collected by
Coastal Science & Engineering, Inc via RTK GPS October 2016.

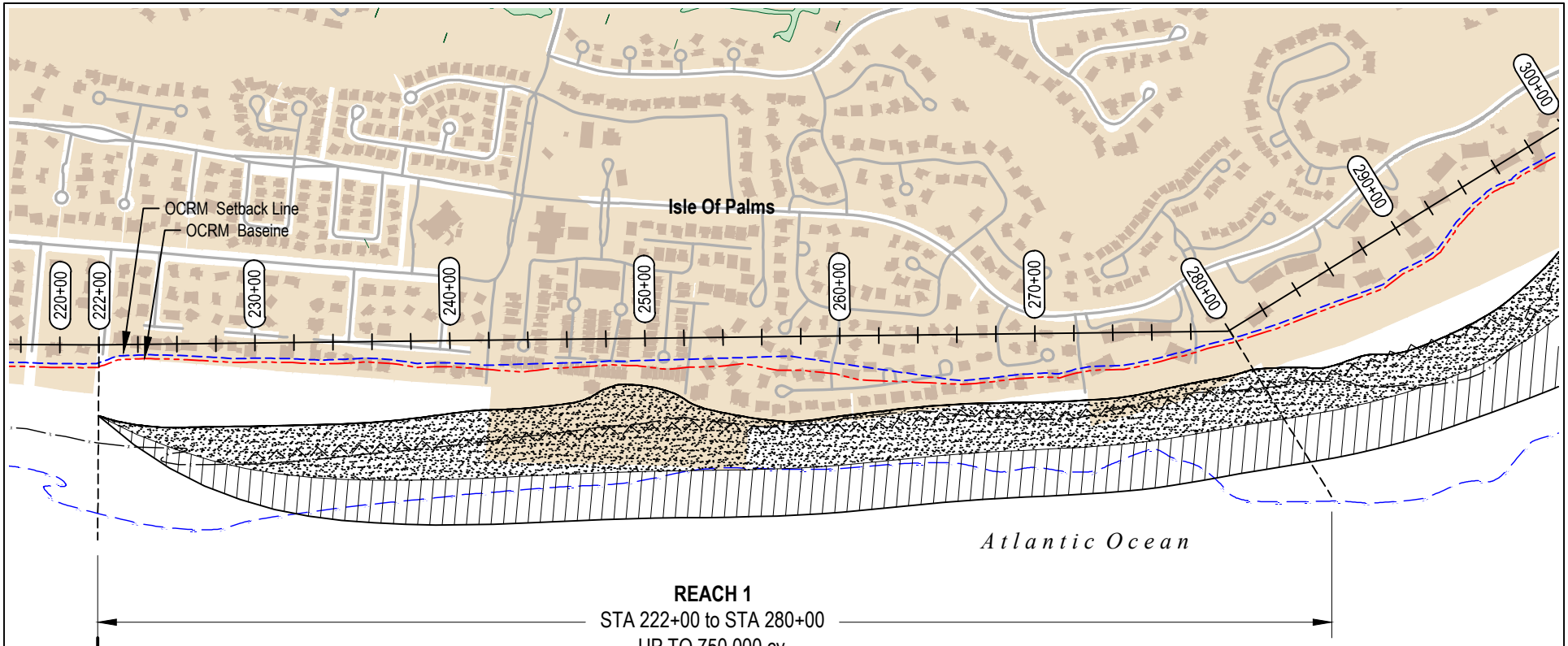
APPLICANT:
CITY OF ISLE OF PALMS
1207 PALM BOULEVARD
ISLE OF PALMS, SC 29451

AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

DRAWING TITLE:
FILL PLAN
REACHES 1 & 2

SCALE:	AS SHOWN
DATE:	Nov 2016
TMS#	.
PROJECT #:	2453

SHEET #: **03**



REACH 1
STA 222+00 to STA 280+00
UP TO 750,000 cy

WORK AREA LIMIT
53 rd Ave.

Notes:

- Exact fill limits and volumes to be determined at the time of construction.
- Emergency measures will be removed before or during nourishment.
- No fill will be placed on or landward of emergency erosion control measures.
- A small dune may be constructed in areas lacking any dune features at time of construction (see sections).
- Sand fencing and native vegetation will be installed along the landward end of the fill in accordance with OCRM guidelines.

Key

- Sand Fence / Vegetation
- *MHHW* +2.41' NAVD (Oct 2016)
- *MLLW* -3.0' NAVD (Oct 2016)
- OCRM Baseline (2009)
- OCRM Setback Line (2009)
- Proposed Fill Berm Area
- Proposed Fill Slope Area

0 800
Scale (Feet)

Note:
OCRM Baseline & Setback Line Adopted 2009

Contours shown based on data collected by
Coastal Science & Engineering, Inc via RTK GPS October 2016.

SOUTH CAROLINA
COASTAL SCIENCE & ENGINEERING
No. C01950
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

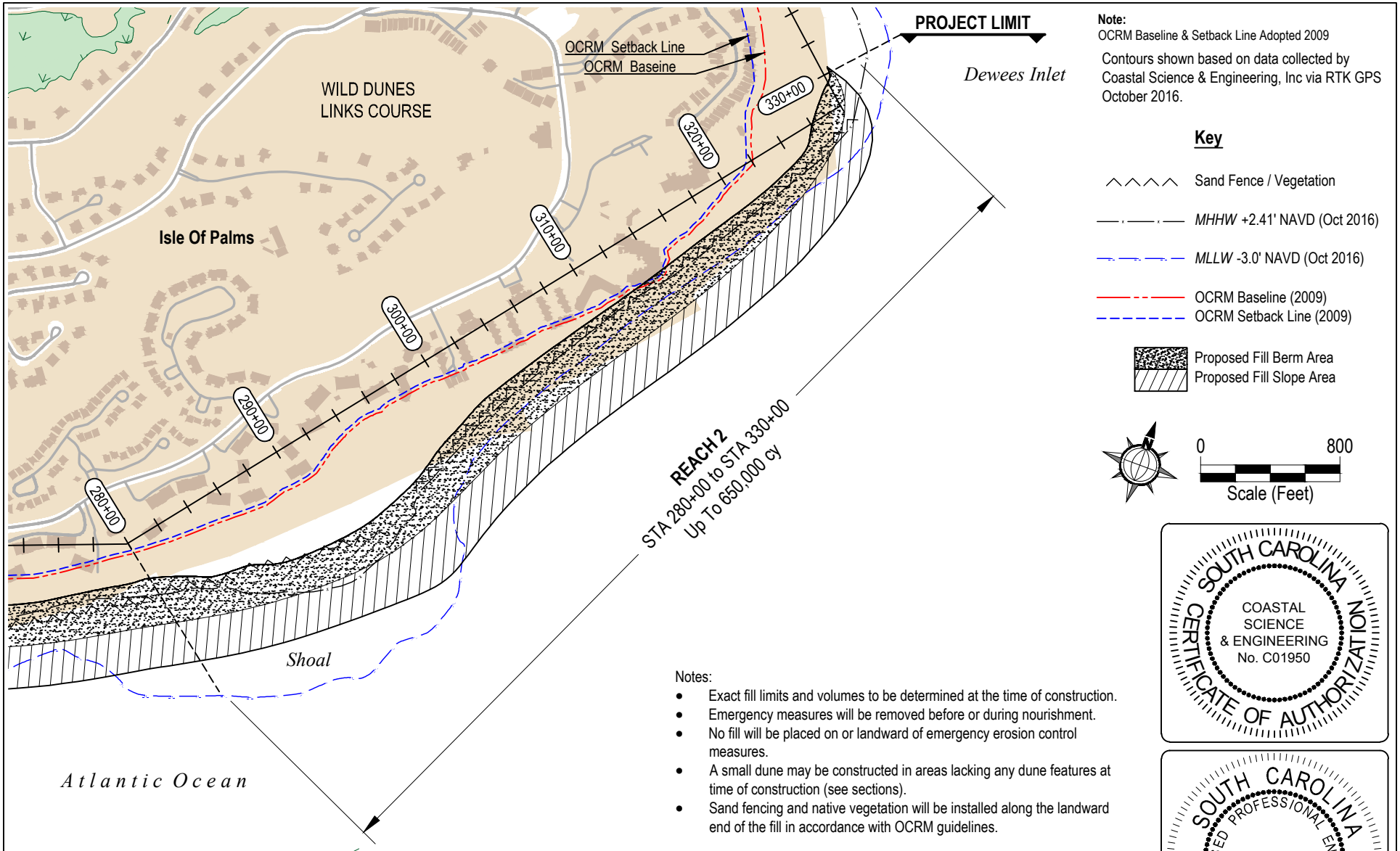
APPLICANT:
CITY OF ISLE OF PALMS
1207 PALM BOULEVARD
ISLE OF PALMS, SC 29451

AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

DRAWING TITLE:
REACH 1 PLAN
STA 222+00 to 280+00

SCALE:	AS SHOWN
DATE:	NOV 2016
TMS#	.
PROJECT #:	2453

SHEET #: **04**



Note:
OCRM Baseline & Setback Line Adopted 2009

Contours shown based on data collected by Coastal Science & Engineering, Inc via RTK GPS October 2016.

Key

- Sand Fence / Vegetation
- *MHHW* +2.41' NAVD (Oct 2016)
- *MLLW* -3.0' NAVD (Oct 2016)
- OCRM Baseline (2009)
- OCRM Setback Line (2009)
- Proposed Fill Berm Area
- Proposed Fill Slope Area

0 800
Scale (Feet)

Notes:

- Exact fill limits and volumes to be determined at the time of construction.
- Emergency measures will be removed before or during nourishment.
- No fill will be placed on or landward of emergency erosion control measures.
- A small dune may be constructed in areas lacking any dune features at time of construction (see sections).
- Sand fencing and native vegetation will be installed along the landward end of the fill in accordance with OCRM guidelines.

SOUTH CAROLINA
COASTAL SCIENCE & ENGINEERING
No. C01950
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

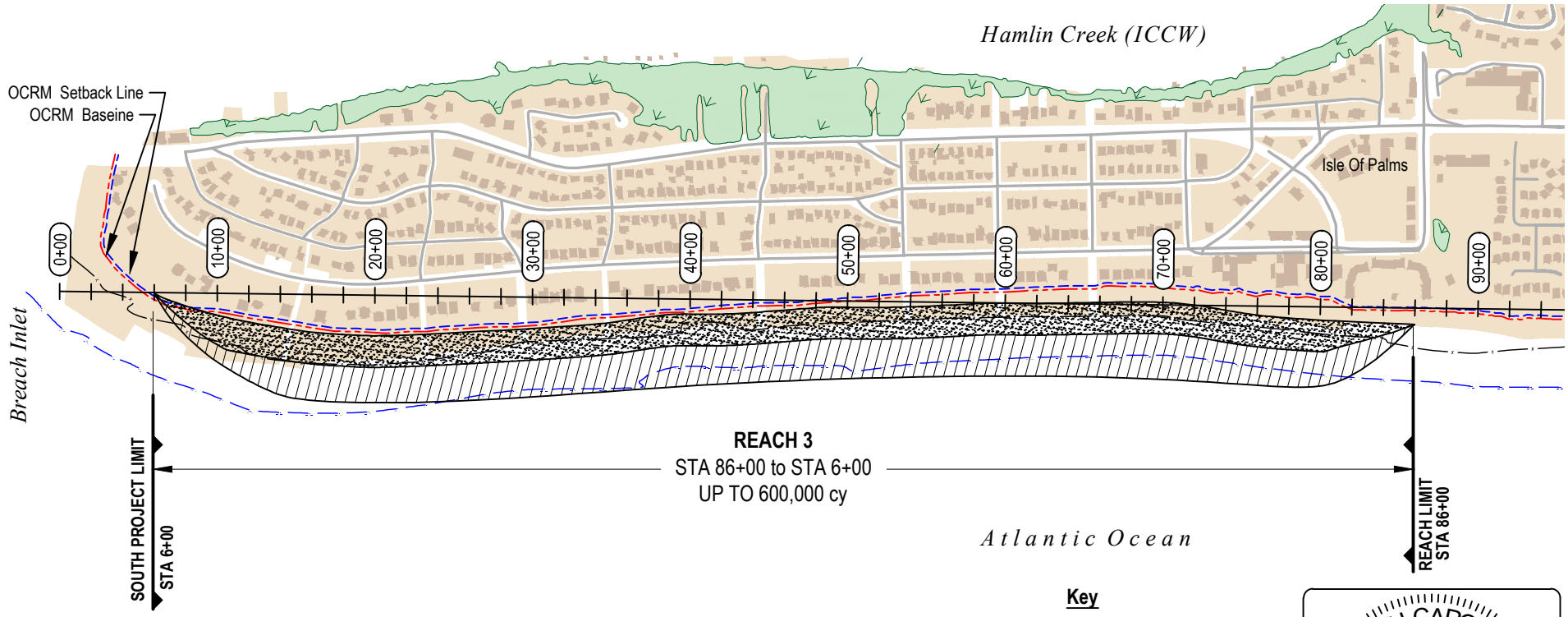
APPLICANT:
CITY OF ISLE OF PALMS
1207 PALM BOULEVARD
ISLE OF PALMS, SC 29451

AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

DRAWING TITLE:
REACH 2 PLAN
STA 280+00 to 330+00

SCALE:	AS SHOWN
DATE:	NOV 2016
TMS#	.
PROJECT #:	2453

SHEET #: **05**



Notes:

- Exact fill limits and volumes to be determined at the time of construction.
- A small dune may be constructed in areas lacking any dune features at time of construction (see sections).

Key

- Sand Fence / Vegetation
- *MHHW* +2.41' NAVD (Oct 2016)
- *MLLW* -3.0' NAVD (Oct 2016)
- OCRM Baseline (2009)
- OCRM Setback Line (2009)
- Proposed Fill Berm Area
- Proposed Fill Slope Area

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
COASTAL SCIENCE & ENGINEERING
No. C01950

Note:
OCRM Baseline & Setback Line Adopted 2009

0 1,000
Scale (Feet)

Contours shown based on data collected by
Coastal Science & Engineering, Inc via RTK GPS October 2016.

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

APPLICANT:
CITY OF ISLE OF PALMS
1207 PALM BOULEVARD
ISLE OF PALMS, SC 29451

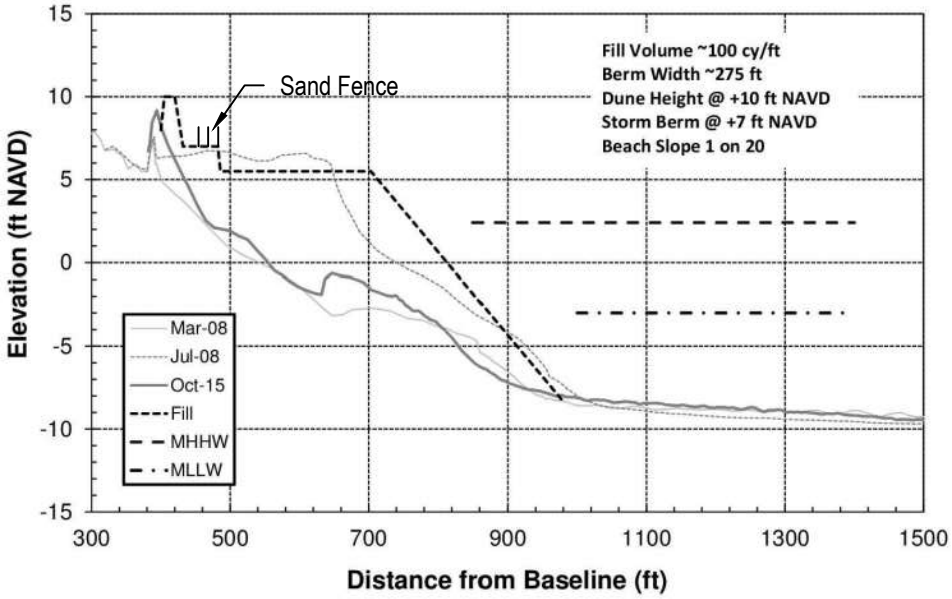
AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

DRAWING TITLE:
REACH 1 PLAN
STA 222+00 to 280+00

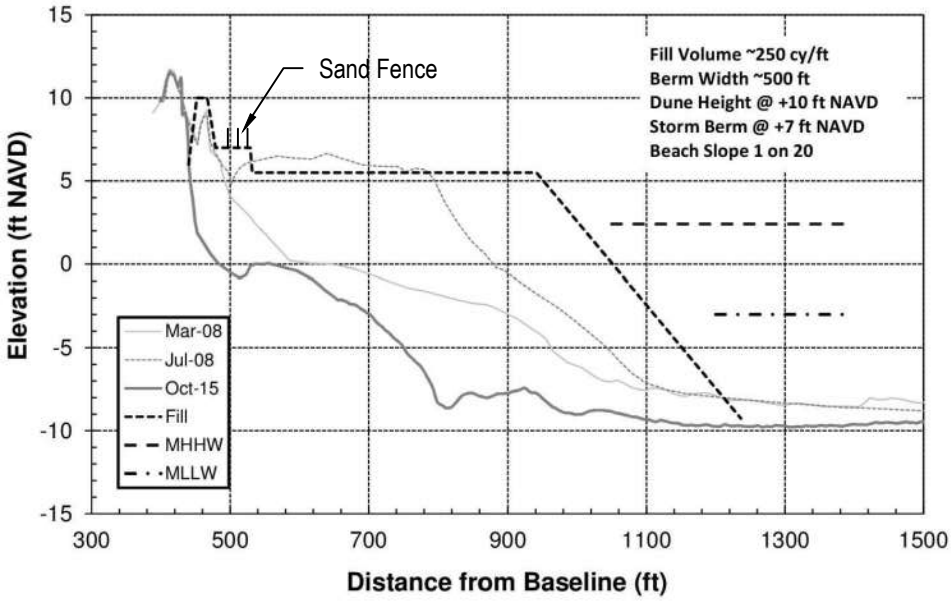
SCALE:	AS SHOWN
DATE:	NOV 2016
TMS#	.
PROJECT #:	2453

SHEET #: **06**

Station: 246+00



Station: 258+00



APPLICANT:
CITY OF ISLE OF PALMS
PO DRAWER 508
ISLE OF PALMS SC 29451

DRAWING TITLE:
FILL SECTIONS
REACH 1

AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

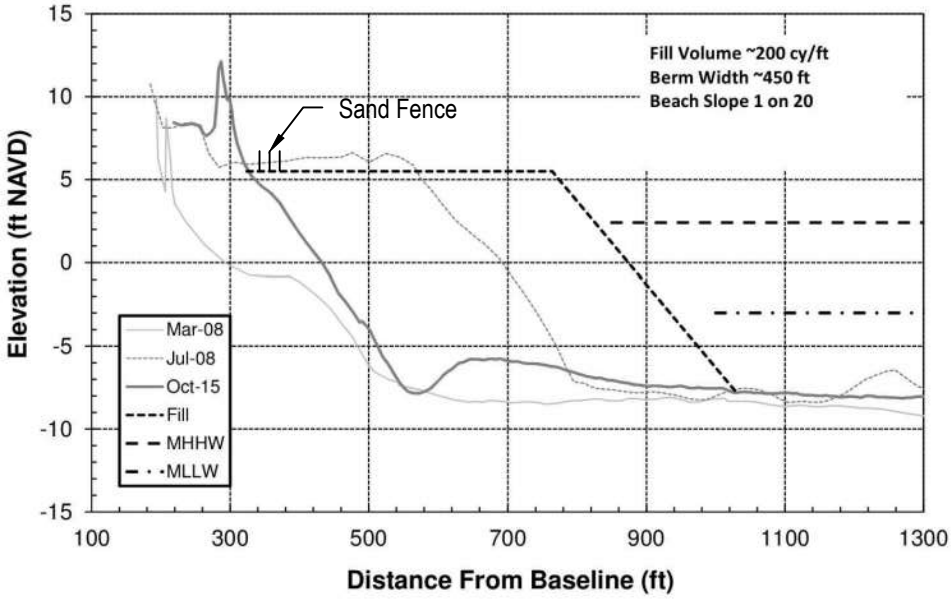
SCALE: AS SHOWN
DATE: NOV 2016
TMS#
PROJECT #: 2453

SHEET #: **07**

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
COASTAL SCIENCE & ENGINEERING
No. C01950

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

Station: 306+00



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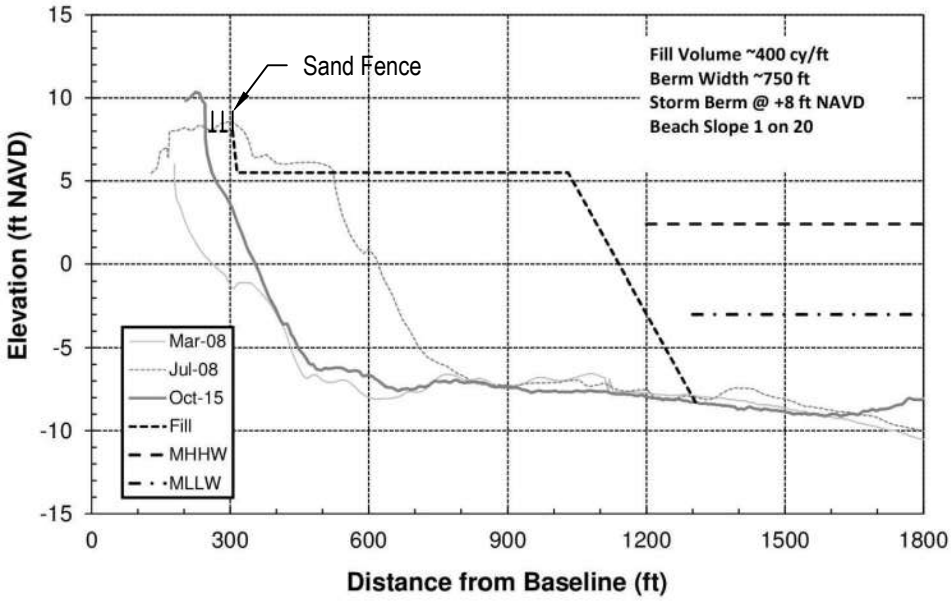


APPLICANT:
CITY OF ISLE OF PALMS
PO DRAWER 508
ISLE OF PALMS SC 29451

AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

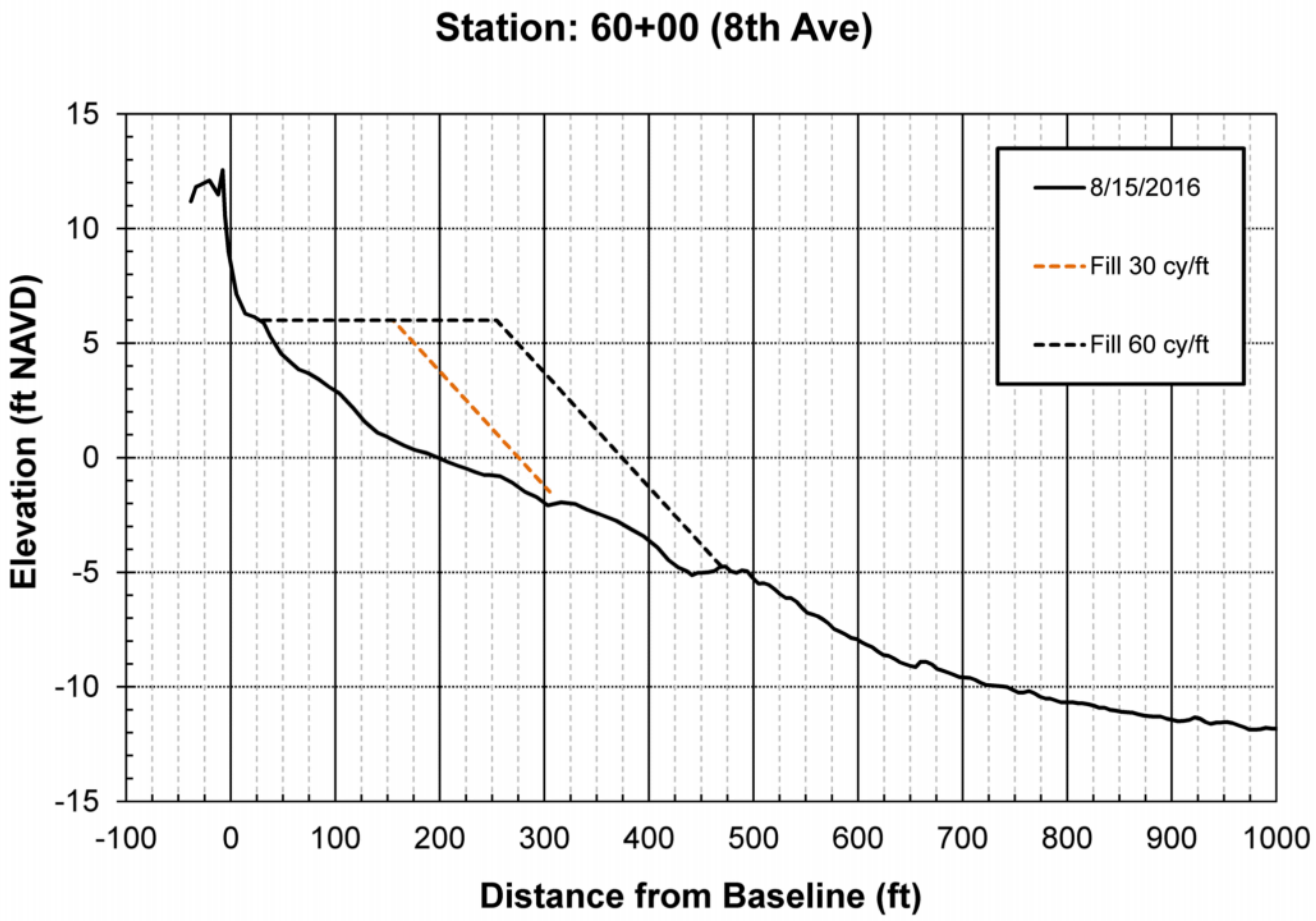
DRAWING TITLE:
FILL SECTIONS
REACH 2

SCALE: AS SHOWN
DATE: NOV 2016
TMS#
PROJECT #: 2453

SHEET #: **08**

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
COASTAL SCIENCE & ENGINEERING
No. C01950

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI



APPLICANT:
CITY OF ISLE OF PALMS
PO DRAWER 508
ISLE OF PALMS SC 29451

AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

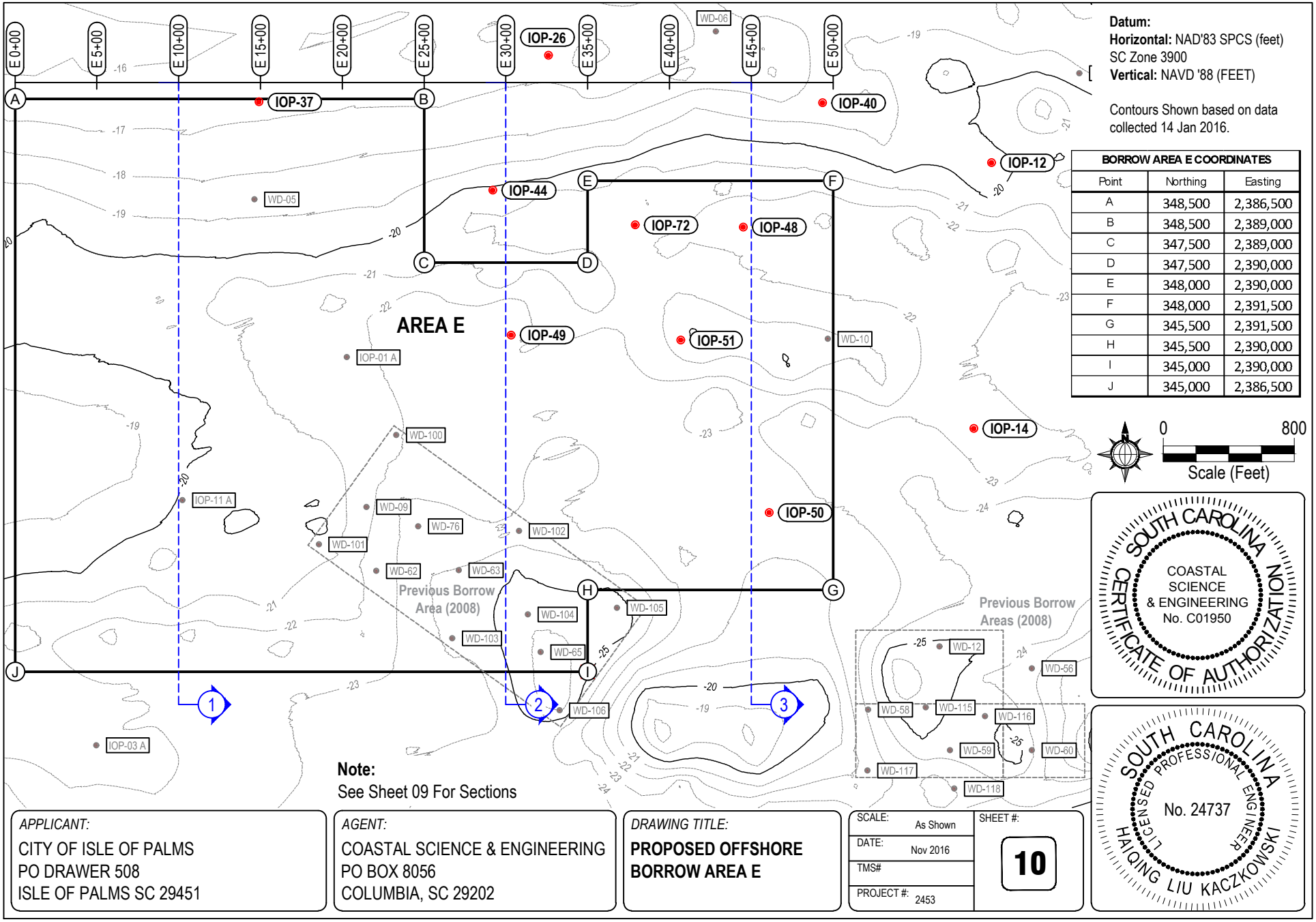
DRAWING TITLE:
FILL SECTION
REACH 3

SCALE: AS SHOWN
DATE: NOV 2016
TMS#
PROJECT #: 2453

SHEET #: **09**

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
COASTAL SCIENCE & ENGINEERING
No. C01950

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI



Datum:
Horizontal: NAD'83 SPCS (feet)
SC Zone 3900
Vertical: NAVD '88 (FEET)

Contours Shown based on data collected 14 Jan 2016.

BORROW AREA E COORDINATES

Point	Northing	Easting
A	348,500	2,386,500
B	348,500	2,389,000
C	347,500	2,389,000
D	347,500	2,390,000
E	348,000	2,390,000
F	348,000	2,391,500
G	345,500	2,391,500
H	345,500	2,390,000
I	345,000	2,390,000
J	345,000	2,386,500

0 800
Scale (Feet)

Note:
See Sheet 09 For Sections

SOUTH CAROLINA
COASTAL SCIENCE & ENGINEERING
No. C01950
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

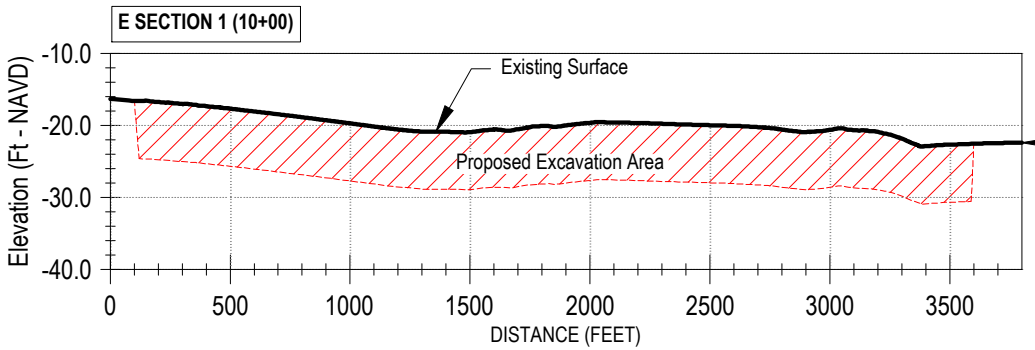
APPLICANT:
CITY OF ISLE OF PALMS
PO DRAWER 508
ISLE OF PALMS SC 29451

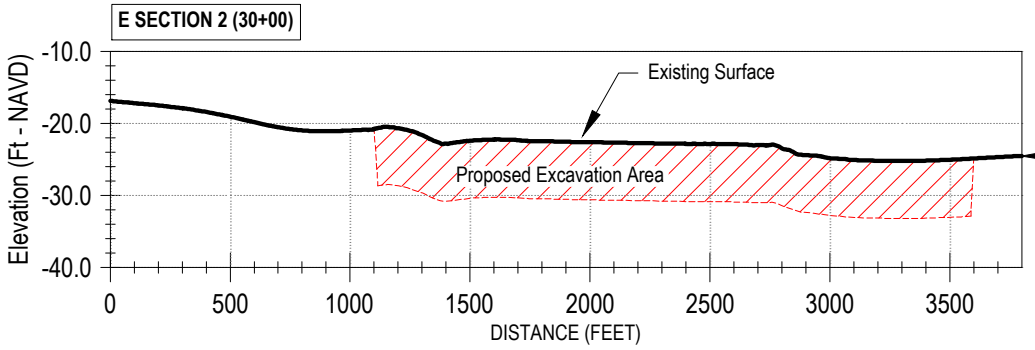
AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

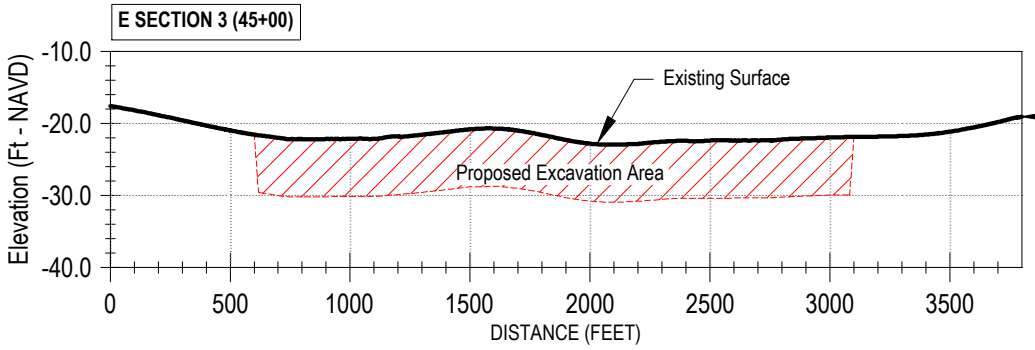
DRAWING TITLE:
PROPOSED OFFSHORE BORROW AREA E

SCALE: As Shown
DATE: Nov 2016
TMS#
PROJECT #: 2453

SHEET #: **10**







SURVEY DATUM:
HORIZONTAL:
SPCS NAD 83 FEET
SC ZONE 3900

VERTICAL:
NAVD 1988 FEET
EXAGGERATION: 30

Elevations Shown based on data collected 14 Jan 2016.

Existing Condition (Jan 2016)
Proposed Excavation Area
Excavation Limit

Note:
Proposed dredge depth shall be 8 ft below existing surface.
(7ft + 1 ft overdredge)

SOUTH CAROLINA
COASTAL SCIENCE & ENGINEERING
No. C01950
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

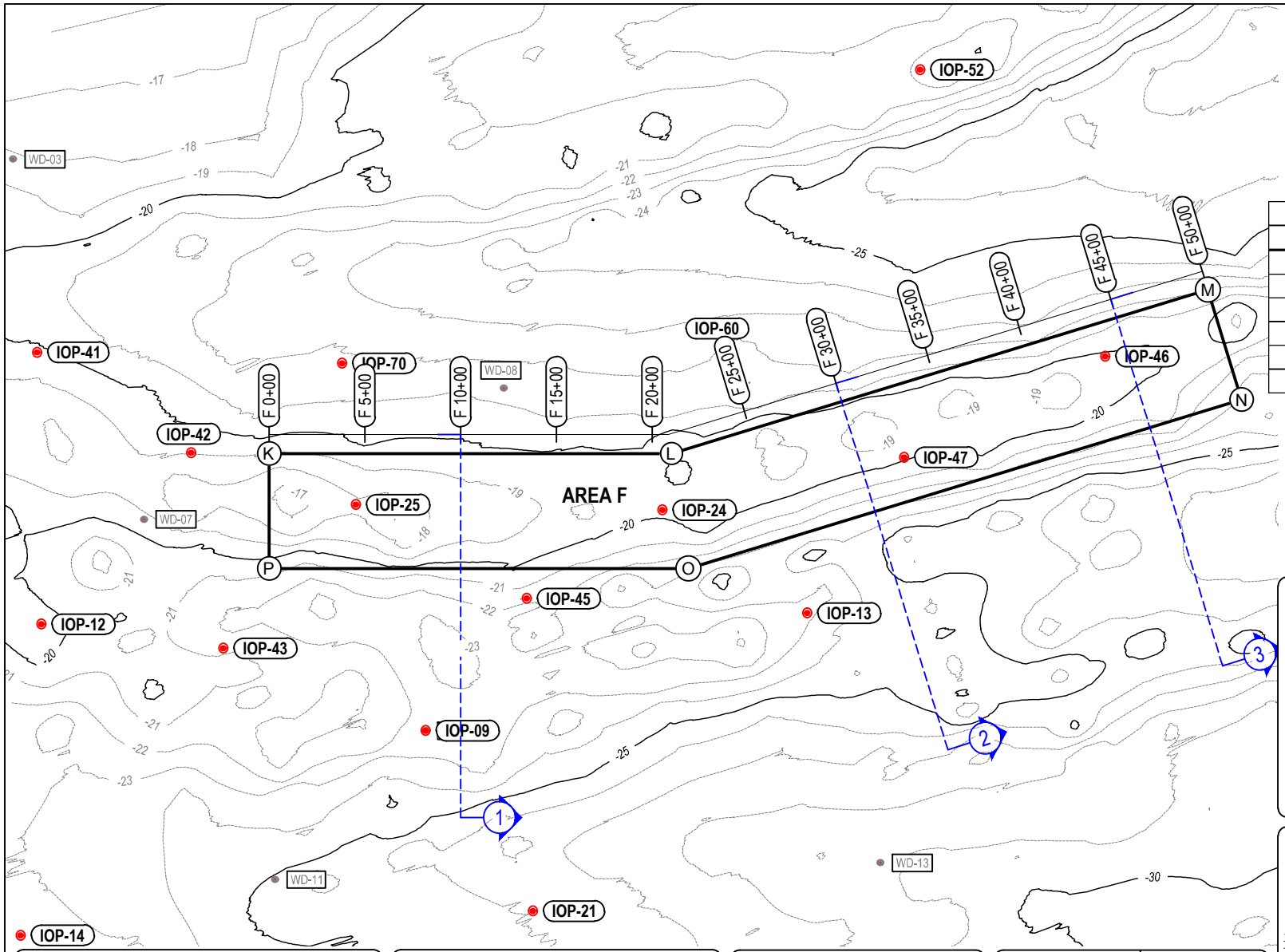
APPLICANT:
CITY OF ISLE OF PALMS
PO DRAWER 508
ISLE OF PALMS SC 29451

AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

DRAWING TITLE:
OFFSHORE BORROW AREA E SECTIONS 1-3

SCALE: AS SHOWN
DATE: Nov 2016
TMS#
PROJECT #: 2453

SHEET #: 11



Datum:
Horizontal: NAD'83 SPCS (feet)
SC Zone 3900
Vertical: NAVD '88 (FEET)

Contours Shown based on data collected 14 Jan 2016.

BORROW AREA F COORDINATES

Point	Northing	Easting
K	349,000	2,393,658
L	349,000	2,395,758
M	349,856	2,398,560
N	349,282	2,398,735
O	348,400	2,395,847
P	348,400	2,393,658

Note:
See Sheet 11 For Sections

SOUTH CAROLINA
COASTAL SCIENCE & ENGINEERING
No. C01950
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

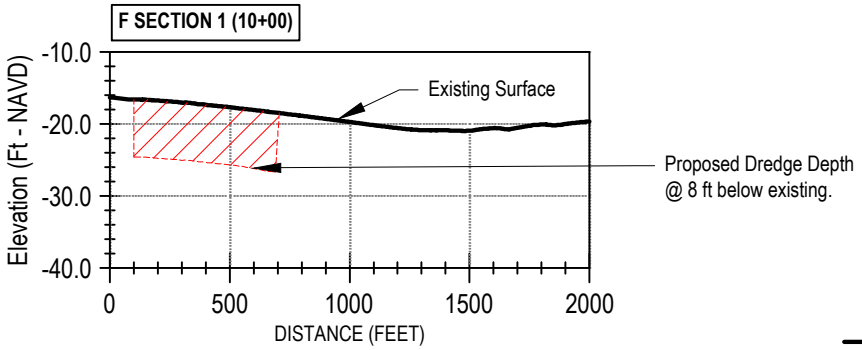
APPLICANT:
CITY OF ISLE OF PALMS
PO DRAWER 508
ISLE OF PALMS SC 29451

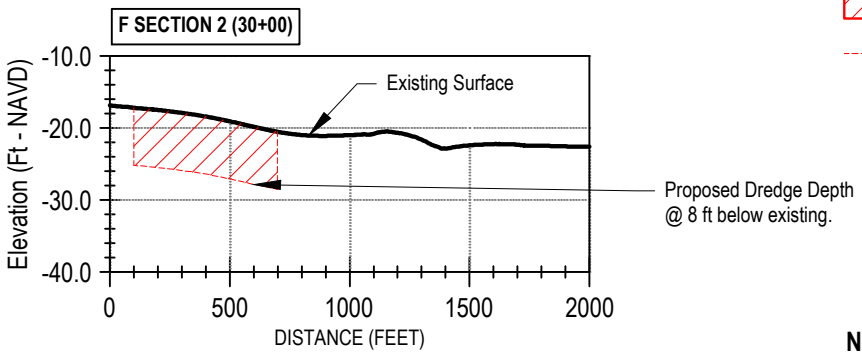
AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

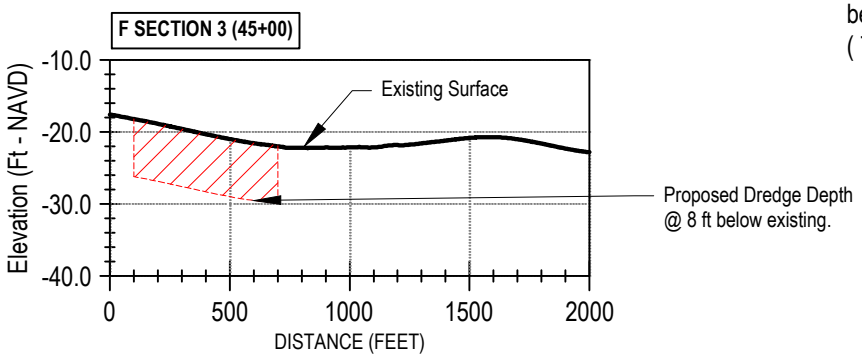
DRAWING TITLE:
PROPOSED OFFSHORE BORROW AREA F

SCALE: As Shown
DATE: Nov 2016
TMS#
PROJECT #: 2453

SHEET #: **12**







Existing Condition (Jan 2016)

Proposed Excavation Area

Excavation Limit

Note:
Proposed dredge depth shall be 8 ft below existing surface.
(7ft + 1 ft overdredge)

SURVEY DATUM:
HORIZONTAL:
SPCS NAD 83 FEET
SC ZONE 3900

VERTICAL:
NAVD 1988 FEET
EXAGGERATION: 30

Elevations Shown based on data collected 14 Jan 2016.

SOUTH CAROLINA
COASTAL SCIENCE & ENGINEERING
No. C01950
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 24737
HAIQING LIU KACZKOWSKI

APPLICANT:
CITY OF ISLE OF PALMS
PO DRAWER 508
ISLE OF PALMS SC 29451

AGENT:
COASTAL SCIENCE & ENGINEERING
PO BOX 8056
COLUMBIA, SC 29202

DRAWING TITLE:
OFFSHORE BORROW AREA E SECTIONS 1-3

SCALE: AS SHOWN
DATE: Nov 2016
TMS#
PROJECT #: 2453

SHEET #: 13

Joint Federal and State Application Form
For Activities Affecting Waters of the United States
Or Critical Areas of the State of South Carolina

This Space for Official Use Only
Application No. _____
Date Received _____
Project Manager _____
Watershed # _____

Authorities: 33 USC 401, 33 USC 403, 33 USC 407, 33 USC 408, 33 USC 1341, 33 USC 1344, 33 USC 1413 and Section 48-39-10 et. Seq of the South Carolina Code of Laws. These laws require permits for activities in, or affecting, navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. The Corps of Engineers and the State of South Carolina have established a joint application process for activities requiring both Federal and State review or approval. Under this joint process, you may use this form, together with the required drawings and supporting information, to apply for both the Federal and/or State permit(s).

Drawings and Supplemental Information Requirements: In addition to the information on this form, you must submit a set of drawings and, in some cases, additional information. A completed application form together with all required drawings and supplemental information is required before an application can be considered complete. See the attached instruction sheets for details regarding these requirements. You may attach additional sheets if necessary to provide complete information.

1. Applicant Last Name: Tucker	11. Agent Last Name (agent is not required): Traynum
2. Applicant First Name: Linda	12. Agent First Name: Steven
3. Applicant Company Name: City of Isle of Palms	13. Agent Company Name: Coastal Science & Engineering
4. Applicant Mailing Address: PO Box 508	14. Agent Mailing Address: PO 8056
5. Applicant City: Isle of Palms	15. Agent City: Columbia
6. Applicant State: SC / 7. Applicant Zip: 29451	16. Agent State: SC / 17. Agent Zip: 29202
8. Applicant Area Code and Phone No.: 843-886-6428	18. Agent Area Code and Phone No.: 803-799-8949
9. Applicant Fax No.: 843-886-8005	19. Agent Fax No.: 803-799-9481
10. Applicant E-mail: ltucker@iop.net	20. Agent E-mail: straynum@coastalscience.com
21. Project Name: Isle of Palms Beach Renourishment Project	22. Project Street Address: Palm Blvd, Isle of Palms, SC
23. Project City: Isle of Palms / 24. Project County: Charleston	25. Project Zip Code: 29451 / 26. Nearest Waterbody: Atlantic Ocean
27. Tax Parcel ID:	28. Property Size (acres): 150 acres
29. Latitude: 32 48'28"N	30. Longitude: 79 43'53"W

31. Directions to Project Site (Include Street Numbers, Street Names, and Landmarks and attach additional sheet if necessary):
From Hwy 17, Take 517 towards Isle of Palms. Turn left onto Palm Blvd and continue to the east to 53rd Avenue vehicular beach access.

32. Description of the Overall Project and of Each Activity in or Affecting U.S. Waters or State Critical Areas (attach additional sheets if needed)
See Additional Sheets.

33. Overall Project Purpose and the Basic Purpose of Each Activity In or Affecting U.S. Waters (attach additional sheets if needed):
See Additional Sheets.

34. Type and quantity of Materials to Be Discharged

Dirt or Topsoil:	_____	☐ cubic yards
Clean Sand:	1,940,000	■ cubic yards
Mud:	<60,000	■ cubic yards
Clay:	_____	☐ cubic yards
Gravel, Rock, or Stone:	_____	☐ cubic yards
Concrete:	_____	☐ cubic yards
Other (describe):	_____	☐ cubic yards
TOTAL:	2,000,000	cubic yards

35. Type and Quantity of Impacts to U.S. Waters (including wetlands).

Filling:	95	■ acres ☐ sq.ft.	2,000,000	■ cubic yards
Backfill & Bedding:	_____	☐ acres ☐ sq.ft	_____	☐ cubic yards
Landclearing:	_____	☐ acres ☐ sq.ft	_____	☐ cubic yards
Dredging:	150	■ acres ☐ sq.ft.	2,000,000	■ cubic yards
Flooding:	_____	☐ acres ☐ sq.ft.	_____	☐ cubic yards
Draining/Excavation:	_____	☐ acres ☐ sq.ft.	_____	☐ cubic yards
Shading:	_____	☐ acres ☐ sq.ft.	_____	☐ cubic yards
TOTALS:	175	acres _____ sq.ft.	1,400,000	cubic yards

36. Individually list wetland impacts including mechanized clearing, fill, excavation, flooding, draining, shading, etc. and attach a site map with location of each impact (attach additional sheets if needed).

Impact No.	Wetland Type	Distance to Receiving Water body (LF)	Purpose of Impact (road crossing, impoundment, flooding, etc)	Impact Size (acres)
1	Subtidal Ocean Bottom	-	Excavation for Borrow Material	150
2	Subtidal Ocean Bottom	-	Beach Nourishment	~45
3	Intertidal Beach	-	Beach Nourishment	~50
			Total Wetland Impacts (acres)	~245

37. Individually list all seasonal and perennial stream impacts and attach a site map with location of each impact (attach additional sheets)

Impact No.	Seasonal or Perennial Flow	Average Stream Width (LF)	Impact Type (road crossing, impoundment, flooding, etc)	Impact Length (LF)
			Total Stream Impacts (Linear Feet)	0

38. Have you commenced work on the project site? ☐ YES ■ NO If yes, describe all work that has occurred and provide dates.

39. Describe measures taken to avoid and minimize impacts to Waters of the United States:

See additional sheets

40. Provide a brief description of the proposed mitigation plan to compensate for impacts to aquatic resources or provide justification as to why mitigation should not be required (Attach a copy of the proposed mitigation plan for review).

See additional sheets

41. See the attached sheet to list the names and addresses of adjacent property owners.

42. List all Corps Permit Authorizations and other Federal , State, or Local Certifications, Approvals, Denials received for work described in this application.

43. Authorization of Agent. I hereby authorize the agent whose name is given on page one of this application to act in my behalf in the processing of this application and to furnish supplemental information in support of this application. [1]

Applicant's Signature — Date: 11/29/2016

44. Certification. Application is hereby made for a permit or permits to authorize the work and uses of the work as described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent for the applicant. [1]

Applicant's Signature — Date: 11/29/2016 | Agent's Signature — Date

[1] **The application must be signed by the person who desires to undertake the proposed activity or it may be signed by a duly authorized agent if the authorization statement in blocks 11 and 43 have been completed and signed. 18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.**