

The Design Criteria have been categorized for simplicity of discussion as follows:

- I. Southeast Peanut Island Wetland Habitat and Stabilization
 - A. Shallow-Water Reef
 - 1. Habitat Inlet Channels
 - 2. Exterior Reef Stabilization/Breakwater
 - 3. Reef Interior Island
 - B. Shallow-Water Lagoon
 - 1. Connecting Spillways Structures
 - 2. East Shoreline Breakwater
- II. West Peanut Island Wetland Habitat and Stabilization
 - A. Tidal Pond and Flushing Channels
 - 1. Inlet Channel Stabilization
 - B. Mangrove Flushing Channels
- III. Upland Habitat Restoration
 - A. FIND Dike Re-Contour
 - B. Native Habitat
 - 1. Maritime Hammock
 - 2. Beach Dune
 - 3. Coastal Strand
- IV. Exotic Vegetation Removal
- V. Submerged Wetland Resources
- VI. Public Access Features

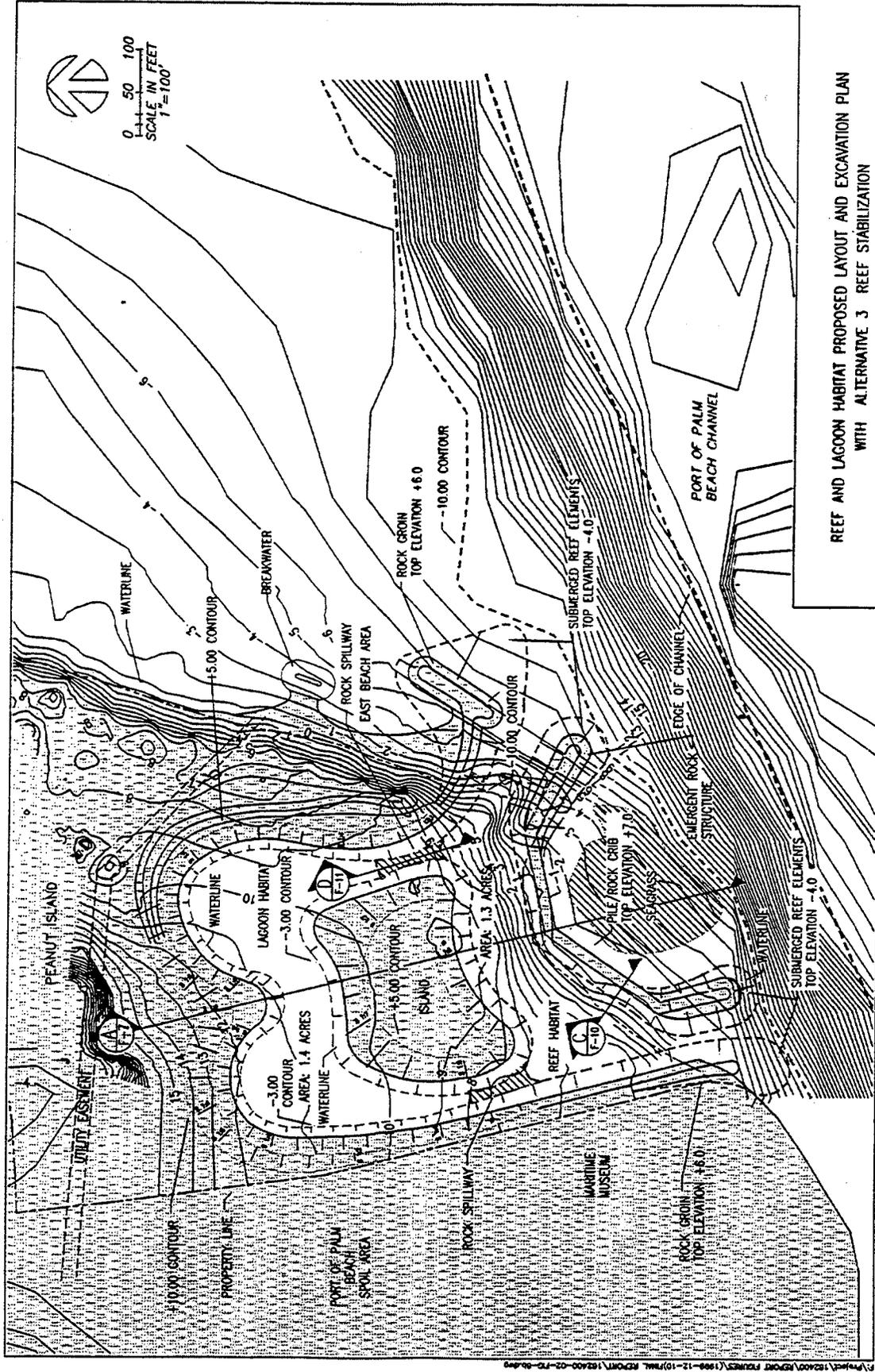
I. Southeast Peanut Island Wetland Habitat and Stabilization (Figures 14 and 15)

I.A Shallow-Water Reef

The shallow-water reef habitat has been designed for the southeast corner of the island. The reef habitat will be cut from existing upland down to an elevation of -10' NGVD and will be protected and enclosed by an exterior breakwater structure. The reef habitat will have a surface area of approximately 1.3 acres at the 0.0 NGVD waterline. The slope of the island descending into the reef habitat will be armored with limestone boulders to prevent erosion.

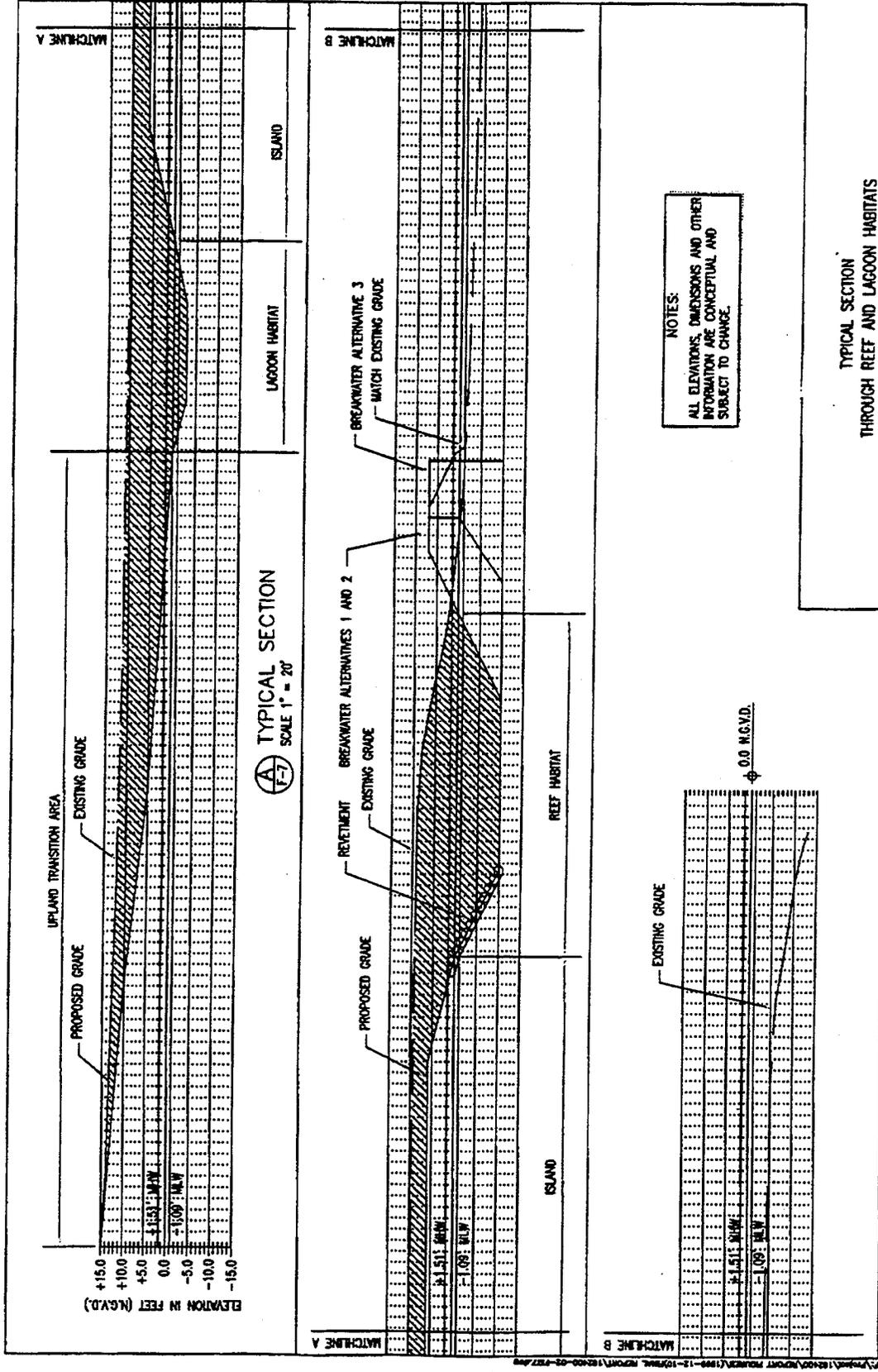
The reef has been located and designed to take maximum advantage of the tidal currents passing the southeastern shore of Peanut Island from Lake Worth Inlet. The tidal flow entrained by the reef habitat features will encourage species recruitment, maintain nutrient and substrate levels, and maintain acceptable water quality within the habitats. The development of a reef system to -10' NGVD will assure that hard corals will have ample area to establish above the zone affected by scouring or sedimentation. Additional rock clusters of various sizes and habitat complexion will be placed along the bottom of the shallow-water habitat, emulating natural reef conditions and promoting recruitment of fish and invertebrates. The exterior groin and breakwater features, as well as proposed interior rip-rap slope armoring, also serve the purpose of providing protection to project integrity from storm wave effects.

FIGURE 14. REEF AND LAGOON HABITAT PROPOSED LAYOUT AND EXCAVATION PLAN



REEF AND LAGOON HABITAT PROPOSED LAYOUT AND EXCAVATION PLAN
WITH ALTERNATIVE 3 REEF STABILIZATION

FIGURE 15. TYPICAL SECTION THROUGH REEF AND LAGOON HABITAT



1.A.1 Habitat Inlet Channels

Peanut Island's proximity to the Lake Worth Inlet provides an opportunity to tap into oceanic waters to maximize the potential fisheries diversity of the shallow-water reef habitat. The deep water access afforded by the Inlet, Intracoastal Waterway (IWW) and the turning basin are unique deepwater features that provide a corridor of ledges and rock outcrops from the Atlantic Ocean into the Lake Worth Lagoon. The shallow-water reef habitat will be connected to the waters of Lake Worth via two inlet channels having a design depth of -10.0 feet NGVD. Each inlet will have a minimum width of approximately 50 feet at the 0.0 NGVD waterline. Also, each inlet channel will be stabilized against erosion utilizing two rock-armored groins.

The inlets will be stabilized using a combination of emergent and submerged structures in order to create a balance between the diversion of tidal flows into the habitat and the prevention of sediment deposition within the inlets. The placement of fully emergent sediment barriers to the design depth of -10 feet NGVD would inhibit flood tidal flow into the inlet. In contrast, fully submerged breakwater structures would allow free entrance to the tidal currents, but would not adequately reduce wave penetration into the reef habitat. The proposed combination will accomplish both goals for the inlet channels. In addition, the submerged reef will add productive habitat areas to the project, serving to attract marine species into the reef habitat area.

In compliance with requirements of the U.S. Army Corps of Engineers with regard to the placement of permanent hard structures near Federal navigation channels, the toes of all four inlet structures will be located at least 100 feet distant from the nearest bank of the Port of Palm Beach shipping channel.

1.A.2 Exterior Reef Stabilization/Breakwater

The south shoreline of the reef habitat will be the most vulnerable to potentially damaging wave energy. This reach of shoreline, approximately 250 feet in length and located between the two inlets, will be enclosed by a rock revetment or similar structure, which will serve a twofold purpose. First, the structure will stabilize the excavated slope from existing grade to the proposed -10.0 foot bottom contour of the reef habitat. Second, the structure will act as a breakwater to dissipate energy from incoming waves.

Three conceptual alternatives are provided for the design of the exterior reef structure in the Coastal Systems International report. Alternative #3 - Pile Crib/Limestone Rock Breakwater, provides the most productive reef habitat in terms of diversity. Utilization of the crib/limestone rock breakwater maximizes area at the -10 NGVD contour. The critical component to the success of this reef system is maintaining permanent deep water access through the channels into the proposed reef system. The designed depth of -10' NGVD provides a deep water component crucial to maximize diversity of oceanic species utilizing the reef habitat. The interior of the crib structure will be filled with limestone boulders to provide reef habitat. The deepwater access is a prime component in driving the reef system into a highly successful fisheries enhancement project as opposed to the marginal success that will be realized without a deepwater element.

I.A.3 Reef Interior Island

The reef habitat will be separated from the proposed shallow-water lagoon habitat by an island having a maximum elevation of +6.0 feet NGVD. The island will be created from existing conditions and elevations, while the water features (reef and lagoon) will be carved around this interior island. The island edges will slope to the -10.0 NGVD contour of the reef habitat at a slope of 2H:1V, and will be stabilized and protected by a limestone rock revetment. The island will provide additional habitat along the slopes into the reef and lagoon and provide protection to the lagoon habitat from waves that may overtop the reef breakwater. The island will serve as an access point for the public to view the reef and lagoon habitats.

I.B Shallow-Water Lagoon

A 1.4 acre shallow-water lagoon (east) shall be constructed contiguous to the shallow-water reef, that will augment the flushing capabilities of the reef system as well as provide unique seagrass/benthic habitat due to the influence of the Lake Worth Inlet. The shallow-water lagoon shall be constructed at -3' NGVD and connected to the shallow-water reef habitat and flooding during incoming tides and draining into the reef habitat during outgoing tides.

I.B.1 Connecting Spillway Structures

The shallow-water lagoon will be hydraulically connected to the reef habitat via two spillways. The proposed spillways will have a gentle slope of approximately 10H:1V to prevent scouring at the crests or toes of the structures. The spillways will be stabilized with a limestone rock revetment.

I.B.2 East Shoreline Breakwater

It is recommended that a rubble-mound breakwater be constructed approximately 80 feet to the north of the eastern reef inlet channel, in order to provide protection against damage from storm-induced waves propagating through Lake Worth Inlet. A storm surge elevation of +7.0 feet, the elevation utilized in the conceptual design of the breakwater and groin structures, would nearly overtop the eastern shoreline and berm enclosing the proposed reef and lagoon habitats. It is anticipated that an emergent rock breakwater, located in a water depth of -3.0 to -4.0 feet NGVD, would serve to dissipate incoming wave energy and reduce storm damage to the protective beach and berm.

II. West Peanut Island Wetland Habitat and Stabilization (Figures 16 and 17)

II.A Tidal Pond and Flushing Channels

Restoration of existing mangroves on the west side of Peanut Island will be facilitated through the creation of a tidal pond and a series of flushing channels. The tidal pond will be excavated to a design depth of -6.0 feet NGVD and will be stabilized by two exterior groin features, which will limit sediment deposition in the tidal pond entrance and

provide protection from storm waves and current erosion. The primary purpose of the tidal pond is to provide flushing to the existing mangrove wetland community. In addition, a shallow-water lagoon shelf and transitional slope encircling the tidal pond basin will promote colonization of the habitat by seagrasses and other marine vegetation and organisms.

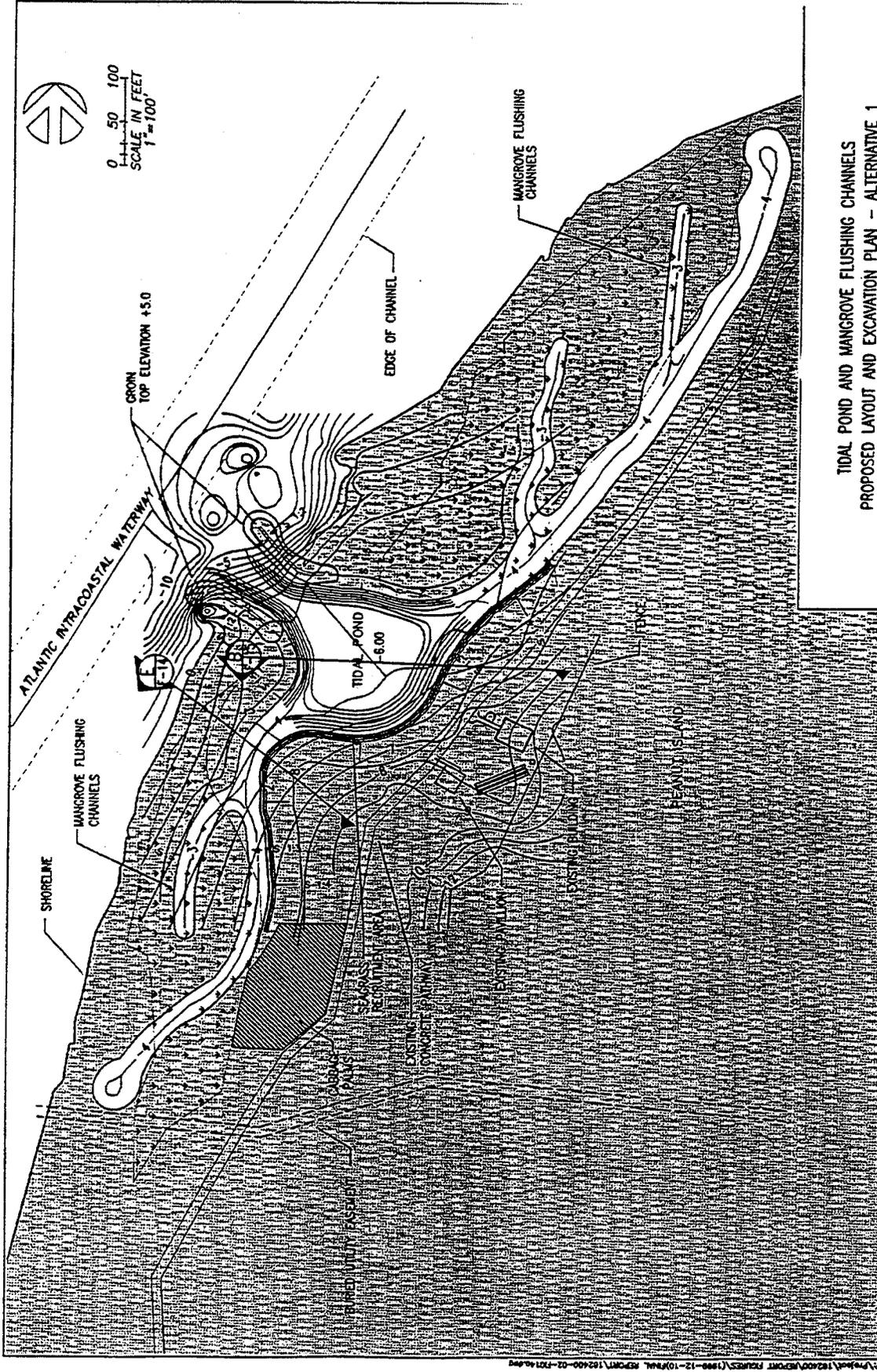
II.A.1 Inlet Channel Stabilization

The proposed tidal pond habitat will be connected to the waters of the Lake Worth Inlet via a single inlet channel having a design depth of -6.0 feet NGVD and a minimum width of approximately 50 feet at the 0.0 NGVD. The channel will be stabilized utilizing two rock-armored groins. The toe locations of the proposed groin structures at the tidal pond are located approximately 45 to 60 feet, respectively, from the edge of the IWW. The U.S. Army Corps of Engineers requires special justification and approval for the placement of permanent hard structures less than 63.5 feet distant from Federal navigation channels such as the IWW.

II.B Mangrove Flushing Channels

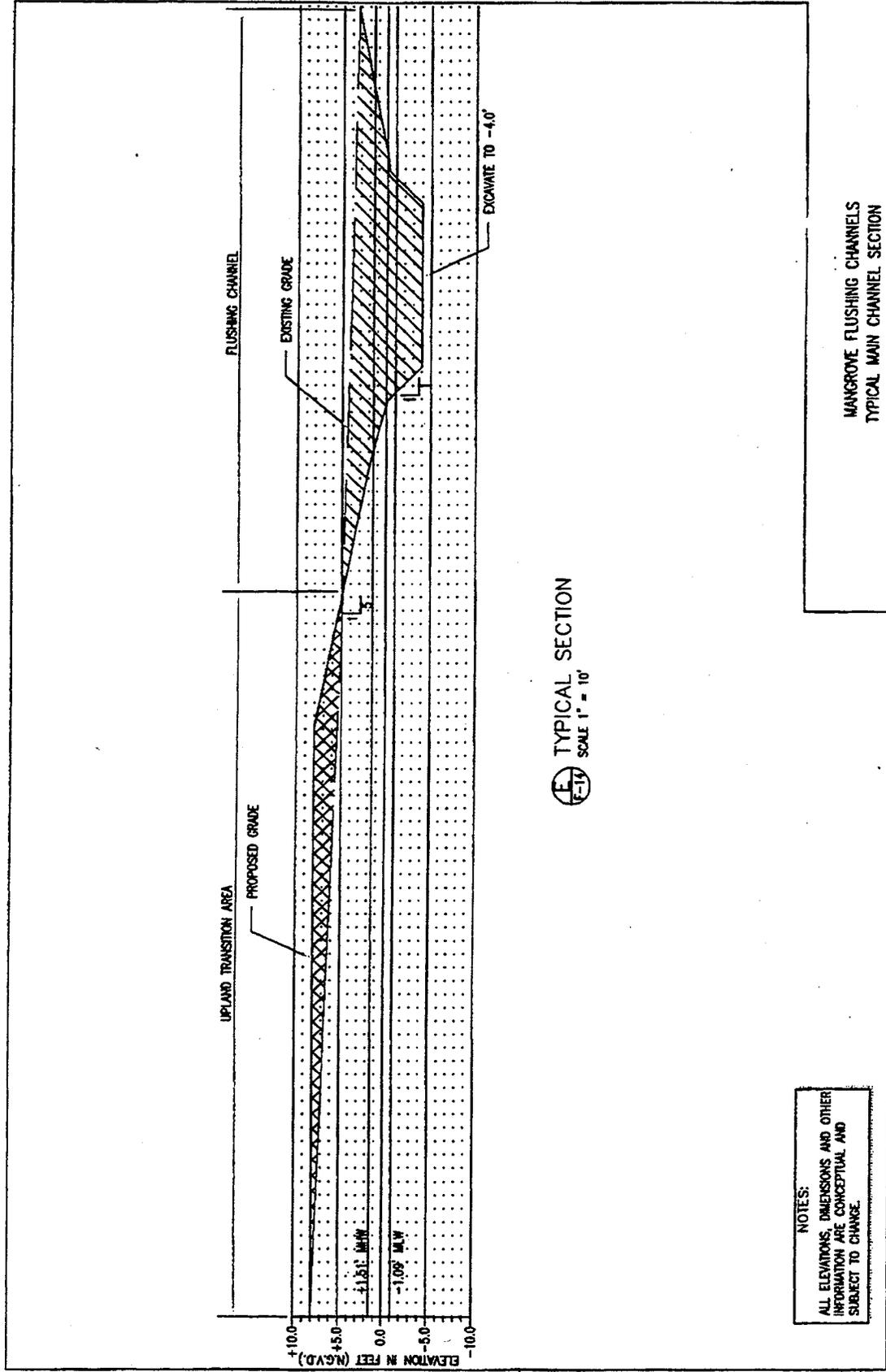
The proposed tidal pond will work in conjunction with flushing channels to provide a connection to tidal waters for the existing mangrove community within the project area. Exotic plant and dredged material removal in the vicinity of the existing mangrove wetland will be carried out with a sensitive removal methodology insuring the protection of the existing native wetland vegetation. The system consists of two main channels, approximately 30 feet wide with a depth of -4.0 feet NGVD and smaller spur channels (-3.0 feet NGVD) cut through the impacted portions of the mangrove system.

FIGURE 16. TIDAL POND AND MANGROVE FLUSHING CHANNELS



TIDAL POND AND MANGROVE FLUSHING CHANNELS
 PROPOSED LAYOUT AND EXCAVATION PLAN - ALTERNATIVE 1

FIGURE 17. MANGROVE FLUSHING CHANNELS TYPICAL MAIN CHANNEL SECTION



III. Upland Habitat Restoration

III.A FIND Spoil Dike Re-Contour

Collaboration between the Florida Inland Navigation District (FIND) and Palm Beach County regarding FIND's spoil disposal area has resulted in a blend of habitat and function that benefits all participating agencies. Currently, the outside toe of FIND's spoil disposal dike lies at approximately the +10' NGVD contour. FIND will allow a 50' (minimum) setback of the dike's outside toe. This 50'+ setback area will be cut to +10' NGVD, thus providing a new toe of slope and an area to be planted as maritime hammock (Figure 18). Beginning at the new toe of slope, the spoil dike will be re-contoured at a 3H:1V slope up to the existing elevations of the spoil area. The resulting slope from +10' NGVD to +22' NGVD will be planted with native beach dune vegetation.

FIND anticipates downloading their spoil disposal area with a proposed final dike height of +22' NGVD. In the event that this Section 1135 project takes place prior to the spoil disposal area download, the re-contoured slope of the dike will be stabilized temporarily with vegetation from +22' NGVD up to existing elevations until FIND is ready to download the spoil area. Re-contouring the FIND spoil disposal dike will require the removal of approximately 200,760 cubic yards of spoil material that will be removed from the island and utilized to fill dredged areas within the Lake Worth Lagoon and subsequently restore submerged wetland resources.

III.B Native Habitat

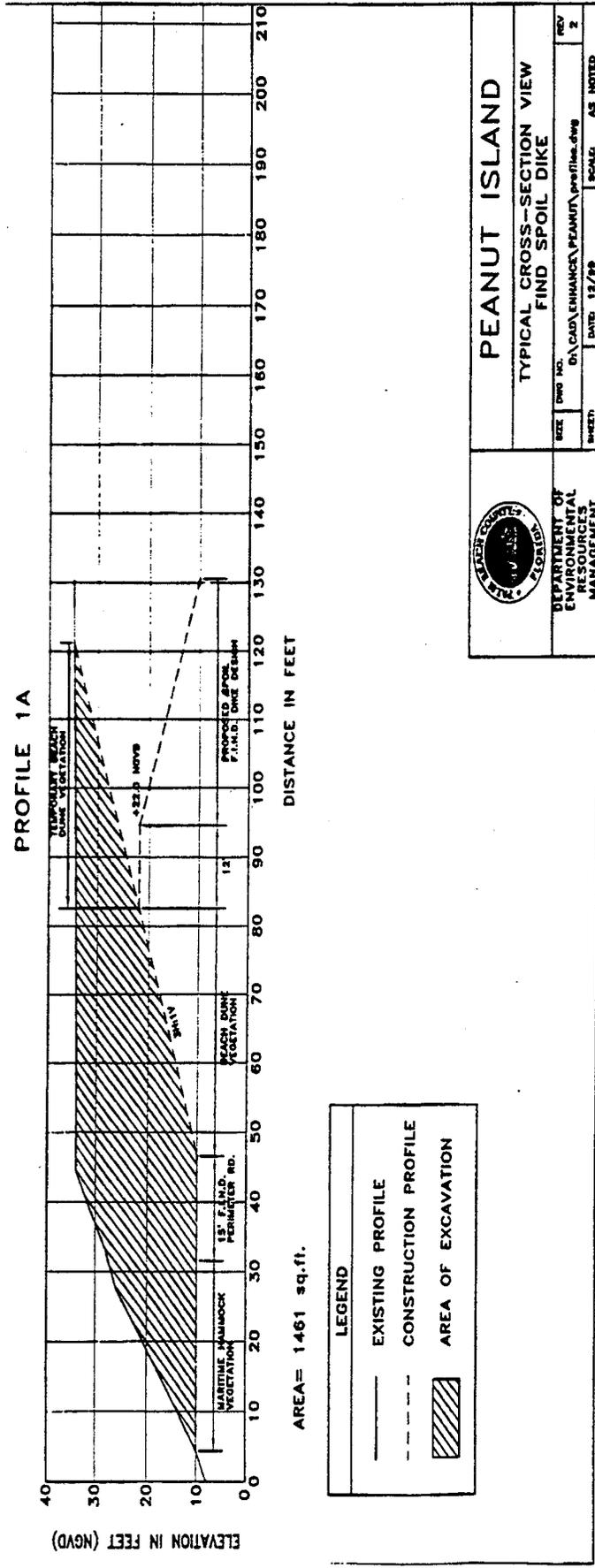
III.B.1 Maritime Hammock

The installation of maritime hammock plant species will restore upland areas currently impacted by a monoculture of Australian pines, which WILL be cleared and chipped on site. The resulting chips WILL be used as mulch to prepare the area for the installation of maritime hammock vegetation as well as to preclude the reoccurrence of exotic vegetation. The maritime hammock habitat will be located at an approximate elevation of +10' NGVD (Figure 18). The native vegetation to be installed is consistent with species indigenous to South Florida maritime hammocks. A species list is provided in Table 6 of the Environmental Assessment.

III.B.2 Beach Dune Habitat

As discussed in the creation of maritime hammock, collaboration with FIND has resulted in additional habitat benefits. Re-contouring the FIND spoil dike will provide a new side slope of 3H:1V which will be vegetated with native beach dune vegetation (Figure 18).

FIGURE 18. TYPICAL CROSS-SECTION VIEW FIND SPOIL DIKE



In addition to the beach dune habitat provided adjacent to FIND's spoil dike, a transitional area planted with beach dune vegetation will begin directly behind the shallow-water lagoon habitats (east and west) at the +1.5 NGVD contour and continue at a 5H:1V slope to existing upland elevations of approximately +8' NGVD. This salt-tolerant vegetation will colonize quickly to hold the slopes between the shallow-water lagoon and coastal strand/maritime hammock habitats. A species list of beach dune plants to be used is provided in Table 6 of the Environmental Assessment.

III.B.3 Coastal Strand Habitat

The coastal strand habitat is characterized by salt-tolerant shrub vegetation that will border beach dune habitat and maritime hammock. The upland limits of the proposed coastal strand habitat is established by the edge of designated dredge material disposal sites, property lines and park pathways. A species list of coastal strand plants to be used is provided in Table 6 of the Environmental Assessment.

IV. Exotic Vegetation Removal

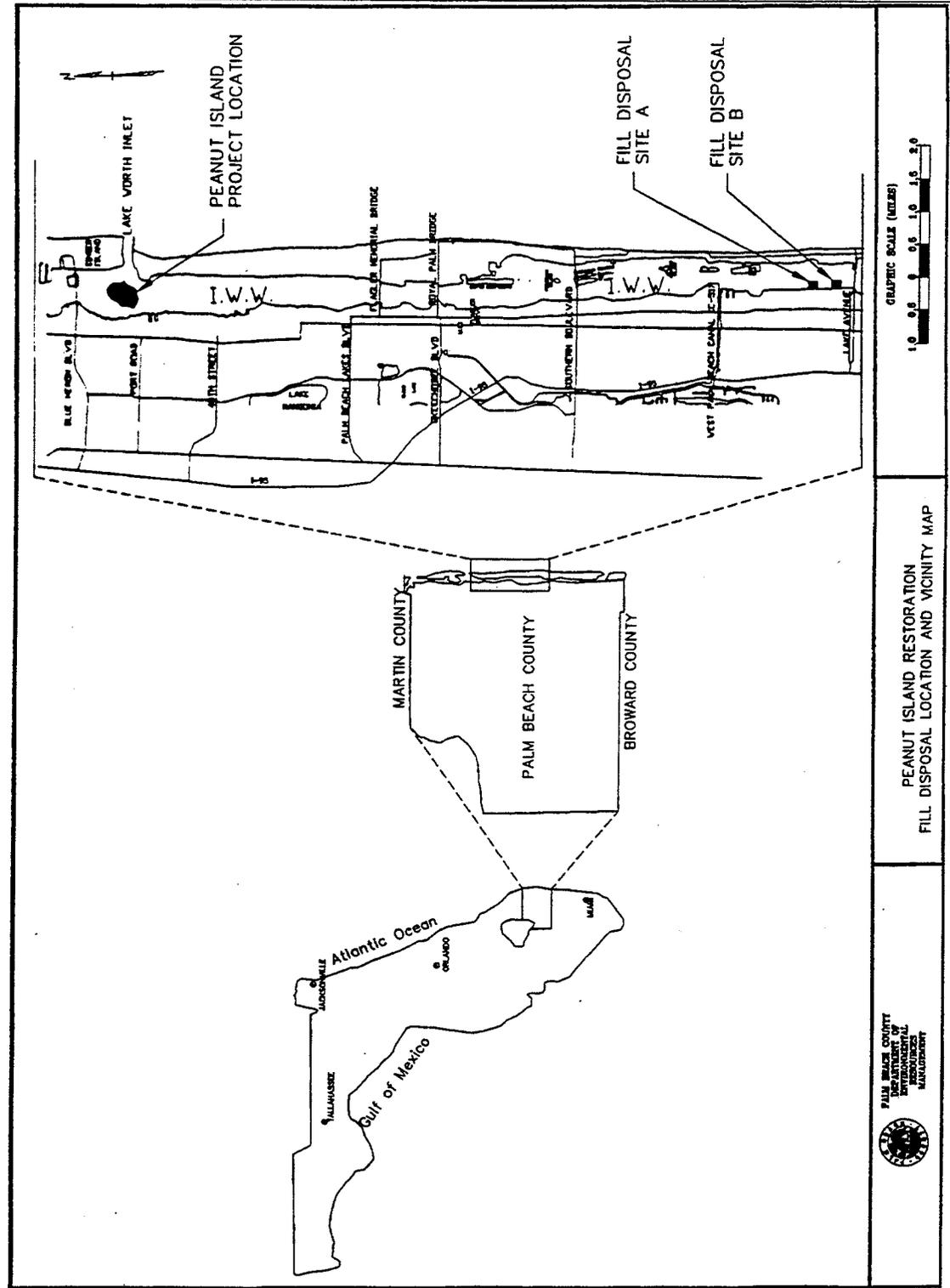
All project areas are currently impacted by exotic vegetation, primarily Australian pine. Due to the presence of native wetland vegetation and existing public facilities, exotic plant removal will be conducted utilizing one of the following three methodologies:

- Method 1. Clearing with Heavy Equipment; least sensitive
- Method 2. Selective Clearing; minimum disturbance of surrounding vegetation by cutting or pulling individual trees from the protected area.
- Method 3. Hack and Squirt; application of herbicides to individual trees, which shall be left in place; no disturbance of soils and protected vegetation; most sensitive method.

V. Submerged Wetland Resources

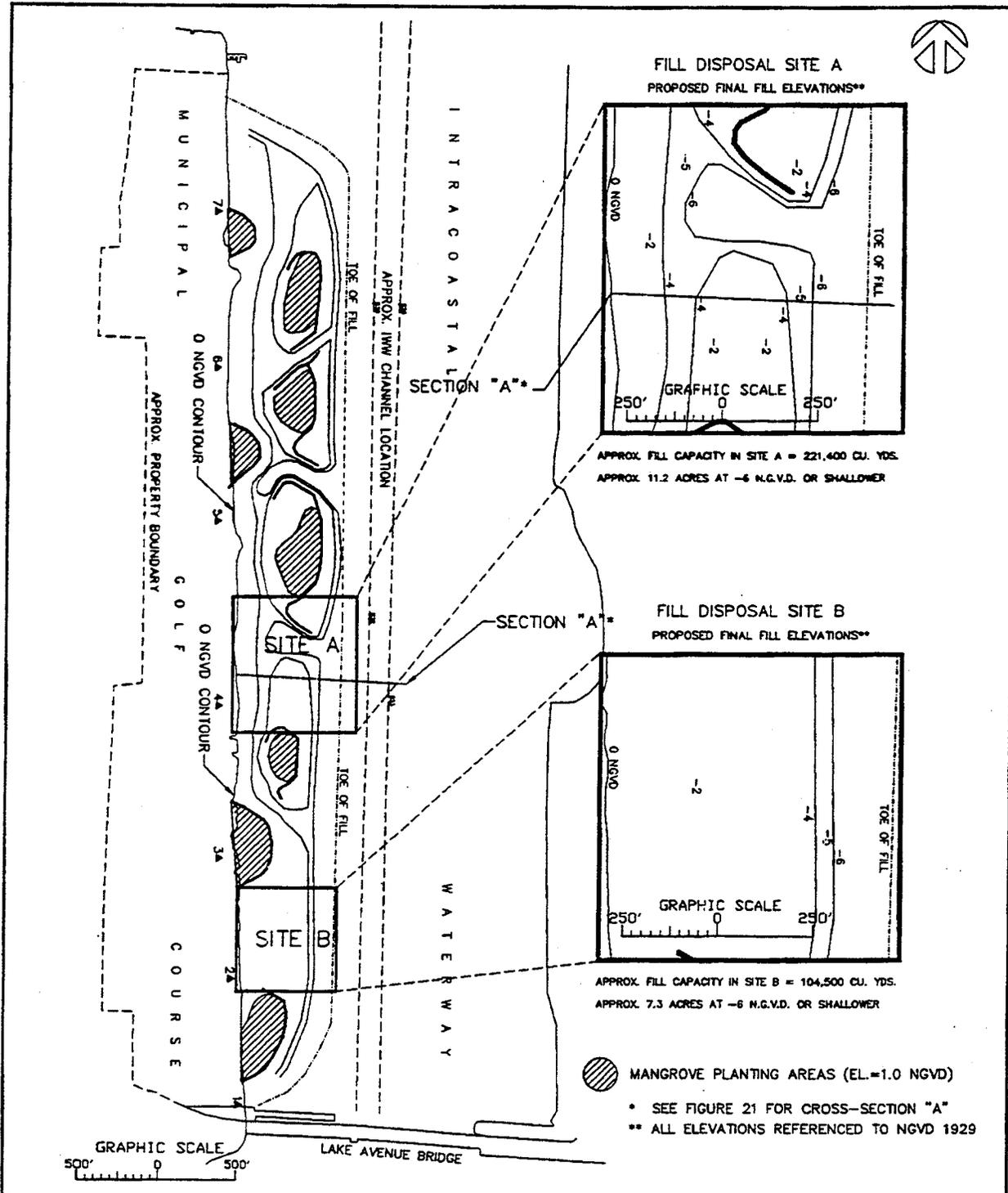
In order to create the aforementioned wetland and upland habitats on Peanut Island, approximately 287,075 cubic yards of dredged spoil material will be generated and removed from the island. The dredged material located on Peanut Island originated in the vicinity of Lake Worth Lagoon and Inlet. While it is recognized there is a need for a sand source for local beaches, this material is known to contain rock and coral and would not be considered 'beach quality' without screening. Analysis of sediment core samples indicate that the material is suitable for placement within the Lake Worth Lagoon. This material presents an opportunity to restore a dredged area located within the Lake Worth Lagoon. An anoxic dredged site known as the City of Lake Worth Wetland Restoration area, has been identified to accommodate this quantity of material and subsequently restore 16.0 acres of submerged wetland resources (Figure 19 and 20). The material will be loaded onto barges at Peanut Island and taken to the dredged area and deposited until elevations up to 0 NGVD are achieved (Figure 21). The proposed design elevation has been selected as the desired depth, which emulates surrounding submerged bottom currently supporting seagrasses and oyster habitat. The dredged material generated from

FIGURE 19. PEANUT ISLAND RESTORATION FILL DISPOSAL LOCATION AND VICINITY MAP



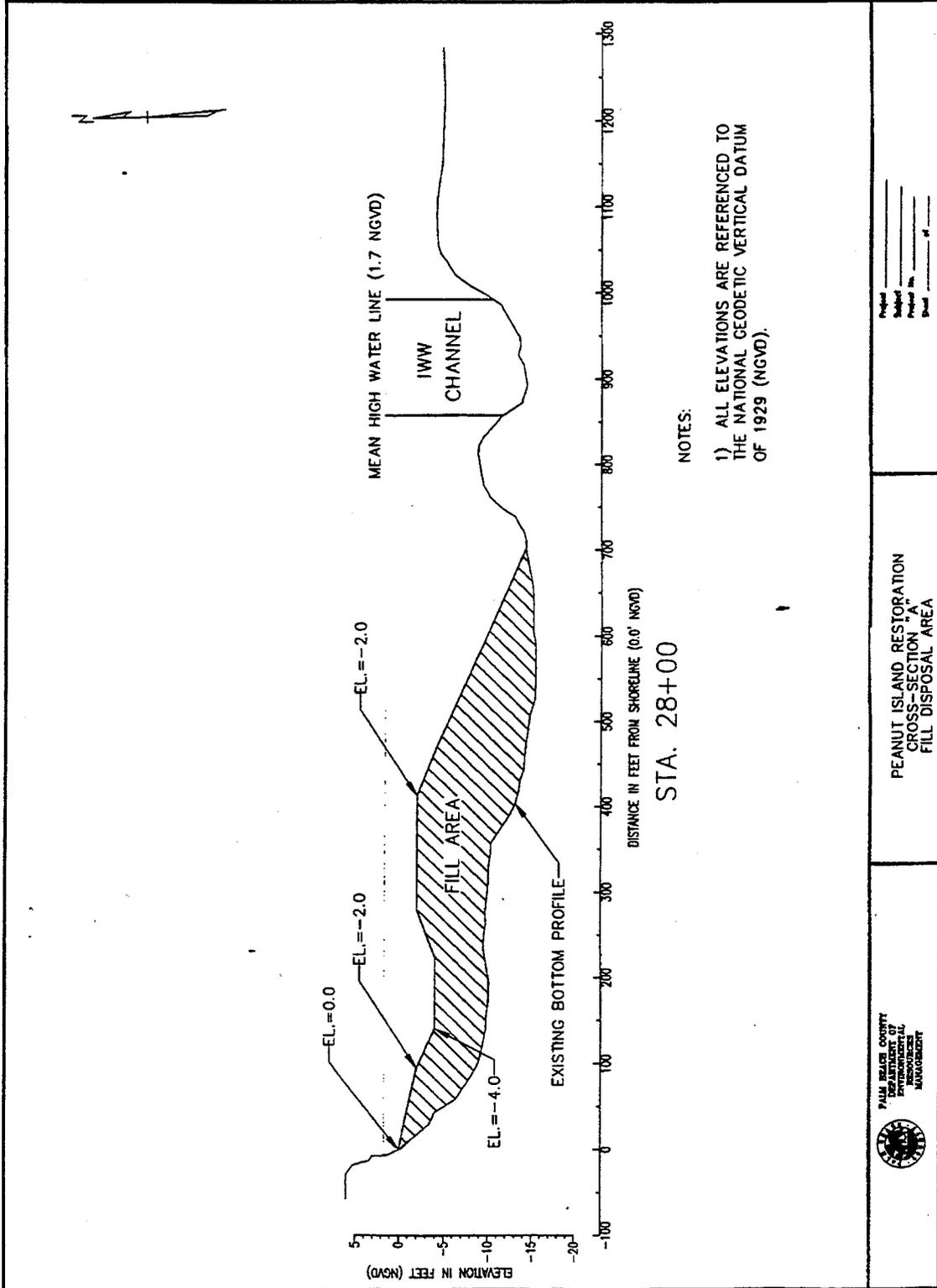
March 2000

FIGURE 20. PEANUT ISLAND RESTORATION PROPOSED FILL DISPOSAL PLAN VIEW



	<p>DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT</p>	<p>PEANUT ISLAND RESTORATION PROPOSED FILL DISPOSAL PLAN VIEW</p>	<p>Project _____ Subject _____ Project No. _____ Sheet _____ of _____</p>
--	---	---	---

FIGURE 21. PEANUT ISLAND RESTORATION CROSS-SECTION "A" FILL DISPOSAL AREA



the Environmental Restoration of Peanut Island will be utilized to restore a portion (16.0 acres) of the dredged area associated with the City of Lake Worth Wetland Restoration Plan. Appendix H details the City of Lake Worth Wetland Restoration Plan.

VI. Recreation Development Features

With the reef and lagoon being connected by the proposed spillways, the interior island will be effectively isolated from the surrounding upland project area. For this reason, it is proposed that two pedestrian bridges should be installed across the spillways described in I.B.1. The bridges would be constructed of treated wood or a less maintenance-intensive material, and would span the 10-15 foot wide spillways, having abutments seated in the stabilized shoreline slopes on either side of the spillways. A walkway should be installed on the island to connect the proposed bridges and maintain the continuous pedestrian path currently encircling Peanut Island. In addition, installation of public viewing platforms over the reef habitat would provide non-swimmers an opportunity to enjoy the wildlife and plant species within the habitat, and could be complimented with educational signage on relevant ecological topics.

Construction Methods

The exotic plant clearing and removal of dredged material from Peanut Island will be conducted using standard equipment and practices. Since this area will be tidally inundated, the tidal pond, flushing channels and shallow-water reef/lagoon habitats will be constructed within an earthen berm, with tidal connections being made only after final elevations have been achieved and designated features are in place. Turbidity curtains will be utilized when making tidal connections per water quality certificate and environmental permits.

Construction Cost Estimate

MCACES was used to calculate the construction cost estimate for the proposed Peanut Island Environmental Restoration Project, see Appendix I. The cost estimate is based on quantities derived from preliminary studies and the local sponsor's successful record of environmental restoration throughout Palm Beach County, including the completion of the 20 acre wetland and 25 acre upland restoration on nearby Munyon Island. In addition, the County has created over 40 reef habitats in the coastal and inshore waters of Palm Beach County. Cost estimates are based on actual construction bids received for construction of local restoration and reef projects, Table 6. The construction costs do not include the related non-construction costs which include permit acquisition, design, bid process, associated surveys, and project management. The costs associated with these non-construction activities, including work completed to date on the proposed project, are compiled in Table 7.

**TABLE 6.
ESTIMATED COST FOR CONSTRUCTION**

EROSION PROTECTION FOR THE SOUTHEAST SIDE OF THE ISLAND

ITEM	QUANTITY	UNIT	UNIT COST	COST
EXTERIOR (GRANITE ROCK)	2,400	TON	\$65.00	\$156,000
OFFSHORE BREAKWATER (GRANITE ROCK)	1,800	TON	\$51.00	\$91,800
CRIB STRUCTURE PILES	5,200	LINEAR FEET	\$44.00	\$228,800
CRIB STRUCTURE PILE CAPS	50	CY	\$636.00	\$31,800
CRIB STRUCTURE BEAMS	75	CY	\$627.00	\$47,000
TOTAL COST				\$555,400
TOTAL COST WITH 20% CONTINGENCY				\$666,480

SHALLOW-WATER REEF SOUTHEAST SIDE OF ISLAND

ITEM	QUANTITY	UNIT	UNIT COST	COST
EAST ENTRANCE (GRANITE)	2,500	TON	\$65.00	\$162,500
SOUTH ENTRANCE (GRANITE)	2,300	TON	\$65.00	\$149,500
CLEARING EXOTICS	1.3	ACREAGE	\$2,197	\$2,856
CHANNELS (EXCAVATION)	2,000	CUBIC YARDS	\$4.00	\$8,000
BASIN (EXCAVATION)	26,000	CUBIC YARDS	\$4.00	\$104,000
INTERIOR (LIMESTONE)	3,000	TON	\$51.00	\$153,000
TOTAL COST				\$579,856
TOTAL COST WITH 20% CONTINGENCY				\$695,872

SHALLOW-WATER LAGOON SOUTHEAST SIDE OF ISLAND

ITEM	QUANTITY	UNIT	UNIT COST	COST
CLEARING EXOTICS	4.1	ACREAGE	\$2,197	\$9,008
PLACEMENT OF MULCH	2.1	ACREAGE	\$6,486	\$13,621
INTERIOR (LIMESTONE)	1,000	TON	\$51.00	\$51,000
EXCAVATION	37,305	CUBIC YARDS	\$4.00	\$149,220
ROCK FLUMES (LIMESTONE)	1,300	TON	\$51.00	\$66,300
DUNE PLANTS	7,623	EACH	\$1.50	\$11,435
COASTAL STRAND	868	EACH	\$87.00	\$75,516
TOTAL COST				\$376,100
TOTAL COST WITH 20% CONTINGENCY				\$451,319

MANGROVE TIDAL PONDS/CHANNELS WEST SIDE OF THE ISLAND

ITEM	QUANTITY	UNIT	UNIT COST	COST
CLEARING EXOTICS	6.4	ACREAGE	\$2,197	\$14,061
PLACEMENT OF MULCH	4.2	ACREAGE	\$6,486	\$27,241
POND (EXCAVATION)	10,000	CUBIC YARDS	\$4.00	\$40,000
CHANNEL (EXCAVATION)	11,000	CUBIC YARDS	\$4.00	\$44,000
ENTRANCE CHANNEL (LIMESTONE)	4,500	TON	\$51.00	\$229,500
DUNE PLANTS	6,534	EACH	\$1.50	\$9,801
COASTAL STRAND	825	EACH	\$87.00	\$71,775
MARITIME HAMMOCK	999	EACH	\$87.00	\$86,913
TOTAL COST				\$523,291
TOTAL COST WITH 20% CONTINGENCY				\$627,949

**TABLE 6.
ESTIMATED COST FOR CONSTRUCTION**

UPLAND RESTORATION

ITEM	QUANTITY	UNIT	UNIT COST	COST
CLEARING EXOTICS	16.6	ACREAGE	\$2,197	\$36,470
PLACEMENT OF MULCH	4.8	ACREAGE	\$6,486	\$31,132
RECONTOURING (EXCAVATION)	200,770	CUBIC YARDS	\$1.90	\$381,100
DUNE PLANTS	35,937	EACH	\$1.50	\$53,906
MARITIME HAMMOCK	2,085	EACH	\$87.00	\$181,395
TOTAL COST				\$684,003
TOTAL COST WITH 20% CONTINGENCY				\$820,804

FILLING AN IWW ANOXIC HOLE WITH DREDGE MATERIAL

ITEM	QUANTITY	UNIT	UNIT COST	COST
TRANSPORTING AND FILL OUTSIDE FIND SITE	86,305	CUBIC YARDS	\$4.00	\$345,220
TRANSPORTING AND FILL INSIDE FIND SITE	200,700	CUBIC YARDS	\$4.00	\$802,800
TOTAL COST				\$1,148,020
TOTAL COST WITH 20% CONTINGENCY				\$1,377,624

RECREATION DEVELOPMENT FEATURES

ITEM	QUANTITY	UNIT	UNIT COST	*COST
Wood Decking on Crib	1,600	SQ. FT.	\$40	\$53,300
Floating Debris Screens	150.	LINEAR FT.	\$50	\$6,250
Groin Obstruction Makers	6	EACH	\$2,000	\$12,000
Floating Platforms	1,800	SQ. FT.	\$50	\$75,000
Pedestrian Bridges	2	EACH	\$35,000	\$58,300
Boating and Swimming Buoys	6	EACH	\$3,500	\$17,500
Mangrove Boardwalk	2,500	SQ. FT.	\$50	\$104,200
TOTAL COST WITH CONTINGENCY				\$389,500

* Cost includes contingency.

TOTAL CONSTRUCTION COST WITH CONTINGENCY

COMPONENT	COST
EROSION PROTECTION ON THE SOUTH EAST SIDE	\$666,480
SHALLOW-WATER REEF	\$695,872
SHALLOW-WATER LAGOON	\$451,319
TIDAL PONDS/CHANNELS ON THE WEST SIDE	\$627,949
UPLAND RESTORATION	\$820,804
FILLING AN IWW ANOXIC HOLE WITH DREDGE MATERIAL	\$1,377,624
RECREATION DEVELOPMENT FEATURES	\$389,500
MOBILIZATION/DEMOBILIZATION	\$131,000
TOTAL	\$5,160,548

EXECUTIVE SUMMARY

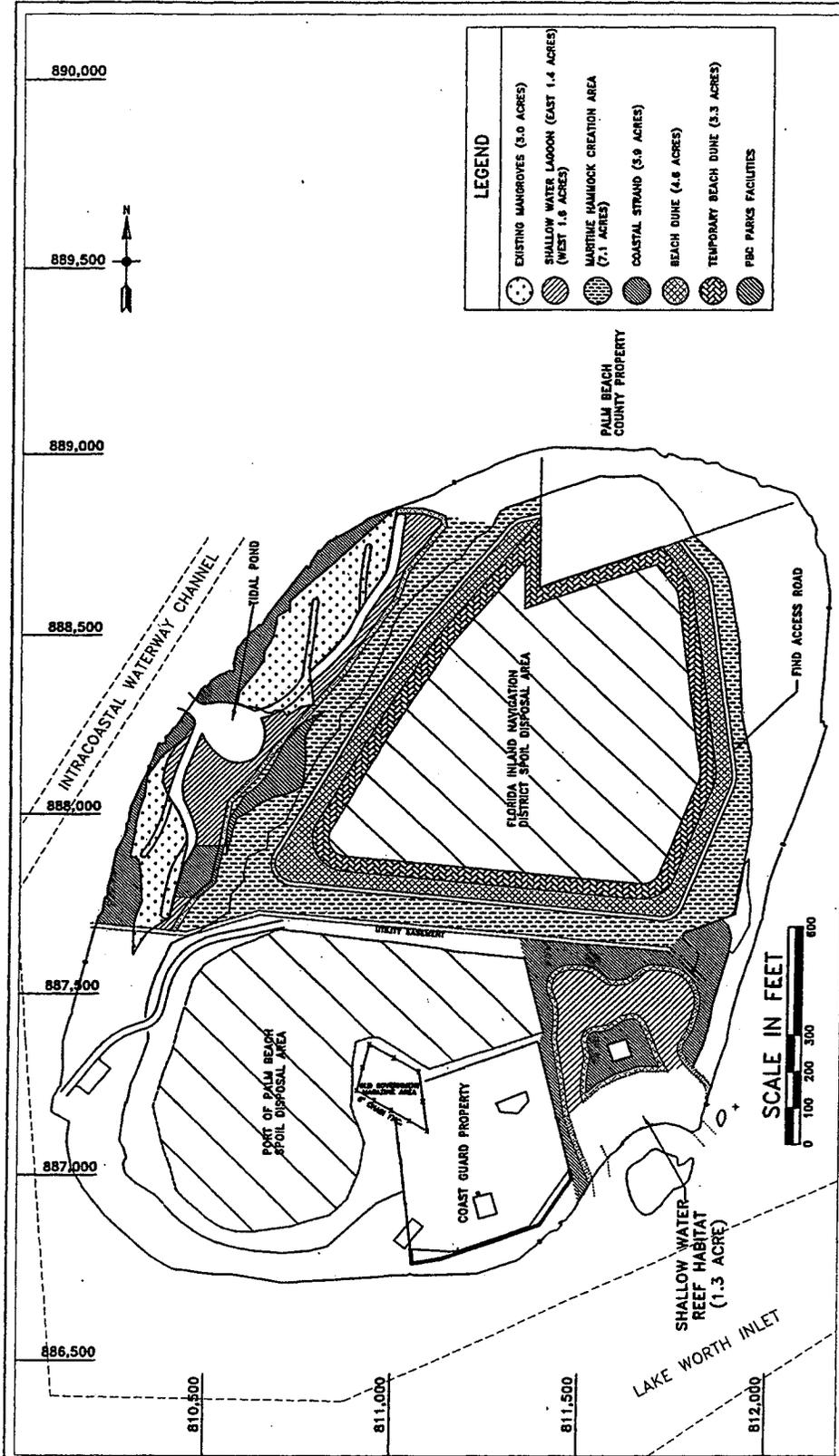
Originally, the area that Peanut Island occupies was a submerged shallow water habitat. As a result of fill placement from numerous dredging projects, the island today comprises 79 acres and has subsequently become dominated by a monoculture of the exotic tree, Australian pine (*Casuarina equisetifolia*). U.S. Army Corps of Engineers' records show that maintenance of the Lake Worth Inlet between 1929 and 1993 has resulted in the disposal of over 1.2 million cubic yards of dredged material on the Peanut Island area, and the disposal of approximately 2.8 million cubic yards at sea (much of the Peanut Island disposal was sand mixed with rock and/or finer sediments, and therefore, was not suitable for beach disposal). Since 1934, the Corps has maintained the Palm Beach Harbor Navigation Project and has used Peanut Island as a disposal site for the maintenance of the Intracoastal Waterway (IWW), turning basin, jetties and inlet revetments.

This report provides the results of engineering and environmental studies for implementing the Section 1135 Peanut Island Environmental Restoration Plan in Palm Beach County, Florida. The following page illustrates the environmental restoration components of the recommended plan. The purpose of the project is to restore the submerged shallow water habitat for fisheries and wildlife. The recommended plan consists of excavation and removal of dredged material deposits, construction of an exterior reef stabilization/breakwater, clearing and chipping of exotic vegetation, revegetation with native plant species, and the addition of recreation development features.

The environmental restoration will result in the creation of a 1.3 acre shallow water reef and 3.0 acres shallow-water lagoon habitat; restoration of 3.0 acres of existing mangrove habitat through the creation of an inlet, tidal pond, and flushing channels (1.5 acres). Creation of 7.1 acres of maritime hammock, 3.9 acres of Coastal Strand, 4.6 acres of Beach Dune, and 22 acres of seagrasses. The environmental restoration and recreation development features have a total estimated cost of \$5,881,608. This project will benefit reef fish, birds, invertebrates, benthic organisms, seagrasses, mangroves, and maritime hammocks. Also, this project will provide environmental education to the public and give the public an unique opportunity to experience a variety of native habitats that have been rapidly depleted in South Florida.



RECOMMENDED PLAN





DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT

PEANUT ISLAND ENVIRONMENTAL RESTORATION RECOMMENDED PLAN

APPROVED: CY	DWG	REV
DRAWN: JFC	D:\CAD\ENHANCE\PEANUT\BLUELAGOON.dwg	9
CHECKED: JB	DATE: 11/99	SCALE: AS NOTED



**TABLE 7.
TOTAL NON-CONSTRUCTION RELATED
ACTIVITIES FOR PEANUT ISLAND RESTORATION PROJECT**

ITEM	ESTIMATED COST
Water Quality Certification	15,000
Design (5% of Construction Costs)*	215,023
Bid Process	25,000
Project Management (8% of Construction Costs)*	344,037
Grand Totals	\$599,060

*Based on Projected Cost without consideration to Contingencies

Total Project Cost.

The total project costs (construction and non-construction) for the recommended plan are shown in Table 8, which includes study costs and implementation costs.

**TABLE 8.
TOTAL PROJECT COST ESTIMATE**

235,000
245,000

ITEM	ESTIMATED COST
Study Cost	102,000
IMPLEMENTATION	
Water Quality Certification	15,000
Real Estate Planning Cost	20,000
Plans and Specifications	215,023
Bid Process	25,000
Construction Management	344,037
Construction	
Environmental Restoration Features	4,771,048
Recreation Development Features*	389,500
Total Project Cost Estimate	\$5,881,608

*Project may cover costs of up to 10% of Federal Share of the Environmental Restoration Project Costs or \$411,908 (not including contingencies)

6,024,608
6,014,608