Mandalay Inspection Services TE-41

LDNR CONTRACT NO. 2503-03-21
SCI PROJECT NO. 1942

PROJECT COMPLETION REPORT

MARCH 2004

STATE OF LOUISIANA
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PROJECT COMPLETION REPORT

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PROJECT COMPLETION REPORT

PROJECT NAME Mandalay Bank Protection Demonstration
CWPPRA/STATE PROJECT NO. TE-41

Report Date: February, 2004 **By:** Shaw Coastal, Inc.

1. Project Managers/Contracting Officer:

DNR Project Manager	Ralph Libersat	Telephone	(225) 342-1952
DNR Construction Project Manager	Daniel Dearmond	Telephone	(985) 449-5103
DNR Monitoring Manager	Elaine Lear	Telephone	(985) 447-0974
USFWS Project Manager	Martha Segura	Telephone	(337) 291-3110
Construction Administrator/Inspection	Jeffery Peña -SCI	Telephone	(985) 868-3434

2. Location and Description of Projects as Approved for Construction by Task Force.

The Mandalay Bank Protection Demonstration (TE-41) project is located along a 3.4 mi (5.5 km) stretch of the Gulf Intracoastal Waterway (GIWW). It is approximately 6 mi (9.7 km) southwest of Houma, Louisiana in the northeast portion of Terrebonne Parish. The project lies in the northern portion of the Penchant sub-basin in the Terrebonne hydrologic basin between Latitude 29°32'10" east Longitude 90°40'49" north, and Latitude 29 °32'06" east Longitude 90 °46'16" north. A permanent benchmark (PBM) has been installed in the project area as part of the secondary GPS network.

Fifteen sites were considered along the GIWW, along the Mandalay Refugee to demonstrate Five (5) treatments to protect the shoreline banks from additional erosion and to restore the marshes by promoting sedimentation and vegetation growth. These proposed treatments were Revetment Mat System, straight walled and fiberglass sheet pile system for the Blowout Treatments; Concrete Armor Units with Giant Cutgrass and Fencing with Giant Cutgrass for the Off-Bank Treatments; and the Armored Plug Treatment.

(Refer to Appendix E for fact sheet and project site map.)

3. Final, As-Built Features, Boundaries and Resulting Acreage (use attachments if necessary).

The project was constructed as described above. For additional information see attached "AS BUILT" Plans.

Actual Benefited Acres N/A

Key Project Cost Elements

	CWPPRA Project Cost Estimates**	Cost Incurred as of January 31, 2004.
Construction	$1,434,445	$1,274,186.74
E & D	$251,758	$201,401.37
Land rights	$93,750	$23,317.58
Monitoring	$77,237	$44,511.82
O & M	$12,469	$0
Total	$1,869,659	$1,543,417.51

**Most recent estimate from CWPPRA Project estimates Report produced by USACOE.

** See Appendix A, CWPPRA Report.

5. Items of Work

Schedule of Items								
Item No.	Work	Est. Quan.	Unit	Estimated Unit Price	Estimated Amount	Final Quan.	Bid Unit Price	Final Amount
Base Price								
1	Mobilization and Demobilization	1	LS	$75,000.00	$75,000.00	1	$3,000.00	$3,000.00
2	Clearing and Grubbing	1	LS	$25,000.00	$25,000.00	1	$5,000.00	$5,000.00
3	Concrete Revetment Mats	220	EA	$1,300.00	$286,000.00	255	$1,300.00	$331,500.00
4	Elevated Shoreline System	1,080	LF	$45.00	$48,600.00	1,129	$45.00	$50,805.00
5	Anchors (Type I)	348	EA	$245.00	$85,260.00	364	$200.00	$72,800.00
6	Dredge Material	2,058	CY	$3.00	$6,174.00	2,356	$5.00	$11,780.00
7	Fiberglass Sheet Pile	69,960	SF	$7.70	$538,692.00	72,960	$5.95	$434,112.00
8	24" Concrete Armor Units	1,325	LF	$70.00	$92,750.00	1,283	$45.00	$57,735.00
9	Geotextile Fabric	5,211	SY	$4.50	$23,449.50	5,770	$3.00	$17,310.00
10	Giant Cutgrass	908	EA	$7.50	$6,810.00	908	$6.00	$5,448.00
11	Timber Fence	1,910	LF	$55.00	$105,050.00	1,910	$27.50	$52,525.00
12	Warning Signs	15	EA	$2000.00	$30,000.00	15	$750.00	$11,250.00
13	Settlement Plates	3	EA	$500.00	$1,500.00	3	$750.00	$2,250.00
14	Anchors (Type II)	206	EA	$210.00	$43,260.00	206	$250.00	$51,500.00
15	Geogrid	4,168	SY	$8.50	$35,428.00	4,002	$5.00	$20,010.00
				Total	**$1,402,973.50**		**Total**	**$1,127,025.00**

Construction and Construction Oversight

Prime construction contractor	**Bertucci Contracting Corporation**
Subcontractor	
Subcontractor	
Original construction contract	**$1,057,823.00**
Change orders (final costs)	**$95,358.00**
Over/Under runs (from original bid items)	**$26,156.00**
Final construction contract	**$1,127,025.00**

Construction Oversight Contractor: Shaw Coastal, Inc.

Construction Oversight Amount: $77,004.20 (As of January 31, 2004)

7. Major Equipment Used

Quarter Boats:	AB-11, and AB 4
Cranes:	71 B, and 88 B
Spud Barges:	KS-113, and RG-410
Excavators:	9030b (40' boom), and 240x (60' boom)
Tug Boats:	Capt Mack, and Julie Marie

8. Discuss Construction Sequences and Activities, Problems Encountered, Solutions to Problems, etc.

Armored Plugs Sites:

A1, A2 and A3 sites were filled with dredged material from the middle of the GIWW borrow area. The material was of good clay type material. The material set up and dried before placing on the geogrid. The geogrid was sewn with overlays and placed on bottom of the treatment sites before the material was placed. This procedure was followed for all three treatments sites. Upon placing the material in the three sites, the sites were shaped, sloped and permitted to dry and settle. Upon verifying the elevation on each, the engineer was informed and authorized the placement of the fabric and revetment mats on the armored plug. This fabric was placed with overlays and sewing and adjusted to the site. Then followed the placement of the revetment mats. Each revetment mat was anchored and secured together with a minimum of eight (8) ss straps. The elevation and alignment was checked and monitored as the mats were placed and periodically thereafter. There were no problems encountered at any of the armored plug sites.

Concrete Armor Units with Giant Cutgrass Off-Bank Sites:

J1 and J2 sites were re-aligned from the banks edge due to the existing water depth and to maintain the required water depth for the placement of the concrete armored units (A-Jacks). The alignment was staked out and verified before placing the geogrid and the A-Jacks. Upon verifying the alignment, the geogrid was placed and pinned at both sites. The A-Jacks was then placed onto the geogrid. A special hanger was made by the Contractor to accommodate ten (10) feet of A-Jack when placing on the site. Upon the first few placements of A-Jacks, they were settling and parting from the intended set up. After a few trials, the A-Jacks were placed in a uniform manner with little settling and parting. These areas were a rather soft humus material (i.e., loose). An excavator with a special rack was used to place the A-Jacks in the three (3) sites.

The J3 site was re-aligned ten (10) feet from the banks edge due to the existing condition of the depth of water. This site placement was a little deeper than sites J1 and J2. The geogrid was placed within the proper overlays and sewn and alignment was checked and verified before placing the geogrid and A-Jacks. Upon verification of the alignment, the geogrid was placed and pinned as in J1 and J2 sites. Wave action was encountered, which made it more difficult for the geogrid to stay in place. The A-Jacks were placed onto

geogrid by the same method as in J1 and J2. Being this site was in deeper water, it took a little more time to place and secure the geogrid and A-Jacks. Upon completion of the geogrid and A-Jacks in all three (3) sites, the anchors were placed and secured.

Straight Walled Fiberglass Sheetpile System Sites:

V1, V2 and V3. Sites V2 and V3 were driven without major encounters. The only encounters for these two (2) sites were striking roots, logs on the bank at each end of the sites. A special flat head hydraulic vibrator was used to drive the sheet pile. A wooden templet was first made to use for alignment, an iron templet was them made to use for alignment and was used at sites V1, V2 and V3. Site V1 encountered the most problems. A stiff clay material was encountered preventing the 20 foot sheets from being driven no more than 3 to 5 feet into the ground. Upon further evaluation, a steel cap was made to fit over the end of the sheet pile to be driven. Even with this cap, the sheet pile continued to meet heavy resistance and a number of the 20 foot sheets were not driven to the full depth. With the use of the steel cap, an extra 5 to 6 feet of driving ability was observed. In some of the area, 10 foot sheets were allowed to be driven instead of the required 20 foot sheets. This site by far was the most difficult and time consuming. The whalers were placed in all three (3) sites, secured as specified. All three (3) sites were backfilled with a clay type material, dredged for the GIWW.

Revetment Mat Blowout Sites:

R1, R2 and R3. The Contractor chose to stagger the pipe while banding the pipe together. By staggering the pipe, this method helped in the placement of the pipe and alignment of the pipe. It also lessened the pipe movement with the wave action and water movements as the vessels would pass. Alignment was staked, checked and verified before placement of fabric, pipe, revetment mats and anchors. Upon verifying the alignment, the fabric was placed and secured. Then the bundles of pipe were placed. A special spreader bar with a harness was used to place the pipes and mats. A crane barge did the placement. Upon placement of the pipe, the mats were placed on top of the pipe. Upon completion of each site with the fabric, pipe and mats, the anchors and straps were installed to secure the same. The straps are as recommended by the manufacturer.

R2 site had two (2) areas which fill material to was placed to level the bottom before placement of the fabric, pipe, and mats. R1 site has several areas of settlement. There is a settlement plate installed in the middle of each of the sites.

Fencing with Giant Cutgrass:

F1, F2 and F3. These sites were the least difficult. The material was transported on a barge and the crew fabricated the sections to be installed. An excavator barge was used to set in place each section of wooden fence and drive down to grade. The alignment was staked and checked and verified before any sections were set in place. There were no major difficulties encountered at these sites. Adjustments in the alignment were verified due to the existing conditions. The cutgrass was placed in these sites and in the concrete armor unit sites (J1, J2 and J3).

9. Construction Change Orders and Field Changes.

1. Change Order No.1 – The quantities of the items were modified in order to construct the treatments and the tie-ins as per the construction contract drawings. The change order cost is **$95,358.00** and increased the total construction cost to **$1,153,181.00** from **$1,057,823.00.** This change order did not increase the construction time. (See Appendix B.)

2. Change Order No.2 – This change order increased the construction time by 20 days, from 180 to 200 days, with no change in project construction cost. The increase in construction time is due to the issuance of an advanced Notice to Proceed and construction down time due to inclement weather. (See Appendix C.)

3. Balancing Change Order – This change order constituted a decrease in Construction Cost of $26,156.00 due to under runs on the contract. (See Appendix D.)

. Pipeline and Other Utility Crossings.

	Structure	Owner	Rep. To Contact
1.	Pipeline	Mandalay Oil Co.	Ms. Debbie Bashnell (337-232-7665)
2.			
3.			

11. Safety and Accidents.

None

12. Additional Comments Pertaining to Construction, Completed Projects, etc.

1. The limits for the sites were increased due to the time between the original survey, the bidding and the start of construction.
2. The dredged material for the sites was a better material than expected. The material set up with good consistency. The anticipated two feet of fluff in the dredge location was not encountered.
3. The J sites were altered due to the existing conditions of bank and water depth.
4. The securing of the anchors at the J sites should be re-evaluated before the next project. The material (tie wraps), used to secure the geogrid to the anchors, were stronger than the geogrid. In these sites, with the wave action, the geogrid pulled away from the anchors, causing a bunching effect.

The V sites were more time consuming than the other sites due to the resistance and method used in aligning, setting and driving the fiberglass sheet pile in place to the proper grade. Site V1 met greatest resistance due to the stiff clays in which the sheet piles were driven.

6. At site R1, a cut in the marsh on the east bank was observed. A clay type dredged material was placed in the site to protect the marsh around the cut.

13. Significant Construction Dates: To be filled out by DNR Construction Project Manager or Contracting Officer for construction for Agency responsible for construction.

SP File No. J24954DL; PO No. 3519448	Date
Bid Opening	12-26-02
Construction Contract	02-18-03
Preconstruction Conference	03-11-03
Notice to Proceed	03-04-03
Mobilization	05-19-03
Construction Start	05-19-03
Construction Completion	08-29-03
Final Acceptance	09-17-03

If different bids are taken, repeat this table to individually reflect each bid and attach tables.
Other significant Project Dates

	Date
Project Implementation closeout**	
Start of Preconstruction Monitoring***	
Preconstruction Aerial Photography Acquisition***	
Monitoring Plan Completion***	

** Final implementation closeout is made by either the DNR Project Manager or the Federal Agency Contracting Officer depending on which organization had lead role for construction of project.

*** To be completed by DNR Project Manager.