

Texas General Land Office Coastal Management Project – Cycle 22 Final Report

Construction and Enhancement of Artificial Reefs in the Northeastern Gulf of Mexico

GLO Contract # 18-098-000-A609

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13 January 2020

ACRONYMS

CMP	Coastal Management Program
GLO	Texas General Land Office
nm	Nautical Mile (6,280 ft)
THC	Texas Historical Commission
TARP	Texas Artificial Reef Program
TPWD	Texas Parks and Wildlife Department
USACOE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
TAMUG	Texas A&M University - Galveston

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Coastal Management Program Final Report

Construction of Artificial Reefs in the Gulf of Mexico

EXECUTIVE SUMMARY

The Texas Artificial Reef Program Coastal Management Plan grant extended from 1 October 2017 through 31 December 2019. Two specific tasks were completed for \$581,604.86 that included the reefing of fabricated pyramid reefs and creating low relief habitat at the Big Man's Nearshore Reef Site (GA-220). On 23 May 2018, a total of 180 mid relief pyramids were reefed by Callan Marine and 180 low relief reef plates were reefed by Walter Marine on 23 September 2019. The CMP grant was essential in facilitating this work and allowed the Texas Artificial Reef Program to direct its efforts in a manner to maximize the deployment of reef materials for further scientific studies.

PART 1.0 INTRODUCTION

1.1 Overview of the Texas Artificial Reef Program

Texas is very active in the creation and enhancement of artificial reefs in the Gulf of Mexico and has one of the strongest reef programs in the nation. The Texas Artificial Reef Program (TARP) is managed by the Texas Parks and Wildlife Department, Coastal Fisheries Division (TPWD). The program's strengths are derived from its flexibility in creating reef sites, the process used for evaluating reef material and placement location, and the support it has received from the leaders and citizens of Texas.

Resource managers have been involved in artificial reef development off the Texas coast for over 60 years. The donation of 12 Liberty Ships in 1975-76

formed the foundation of the current Artificial Reef Program and represented the first successful reef development activity by TPWD utilizing stable, durable, and complex material. In 1989, the Texas Legislature directed TPWD to develop the artificial reef potential off Texas. The TPWD Artificial Reef Plan was adopted by the Legislature in 1990 creating the TARP (TPWD 1990). The main component of the Texas legislation was to allow the oil and gas industry to donate their obsolete petroleum structures as artificial reefs in the Rigs-to-Reefs Program in lieu of the standard salvage removal option required by federal law.

The mission of the Texas Artificial Reef Program is to enhance and preserve marine habitat in the Gulf of Mexico (TPWD 2010). To do this, TARP has several sub-programs. The Rigs-to-Reefs program negotiates the retention of obsolete

petroleum platforms from companies who must remove them from the Gulf and preserves them in place or arranges for them to be towed to existing reef sites. The Ships-to-Reefs program utilizes derelict shrimp vessels, barges, tugboats, and ships as reefing material. The Nearshore Reefing Program uses materials of opportunity (concrete culverts, bridge material, etc.) and prefabricated materials (limestone pyramids and reef balls) for enhancing reef sites inside Texas state waters (shoreline to 9 nm).

Each subprogram has its own priorities but overall, maintaining and preserving marine habitat is of primary concern. Rigs-to-Reefs projects preserve large amounts of steel that have been encrusted with marine life for years (e.g. average age of a platform before removal is 30 years). These reefs provide excellent fishing opportunities for anglers but most are located 30 – 100 nm offshore. Divers use the platforms also but since the majority are cut at -85ft or deeper, only experienced divers tend to visit them. The Ships-to-Reefs program provides additional diving and angling opportunities around large metal vessels in waters closer to Texas. Some reefs are designed mainly for divers (e.g. Texas Clipper Reef PS-1122) while others are in waters of limited visibility and attract mostly anglers. The Nearshore Reef Program was designed to provide fishing and diving opportunities to the public outside major Texas ports using smaller types of materials due to water depth. Anglers and divers can visit these sites in smaller vessels and return to port in a reasonable period of time. In

addition, the program allows the public to reef its own approved materials under the guidance of TARP at these reefs.

The TARP develops new reef sites and enhances existing reefs in the Gulf off the Texas coast. Currently, the program has 92 individual reef sites ranging from 20 – 1650 acres in size and from 5 – 113 nm off the coast. Current reef sites are shown in Figure 1. and can be found at TARP's interactive Google map: <http://www.tpwd.state.tx.us/gis/ris/artificialreefs> or on its internet home page: http://www.tpwd.state.tx.us/landwater/water/habitats/artificial_reef/

To date, the Texas Artificial Reef Program has over 150 obsolete petroleum structures and components in its Rigs-to-Reefs program. Other materials used in the construction of reefs include: the 473-ft *Texas Clipper*, the 371-ft *MV Kraken*, over 23 other vessels and boats, and thousands of other land-based materials such as concrete culverts, concrete reef balls, bridge spans and columns, predesigned reef pyramids, and one-ton quarry rock. The Program continues to obtain material and assesses each donation on a case-by-case basis to determine its appropriateness to the program.

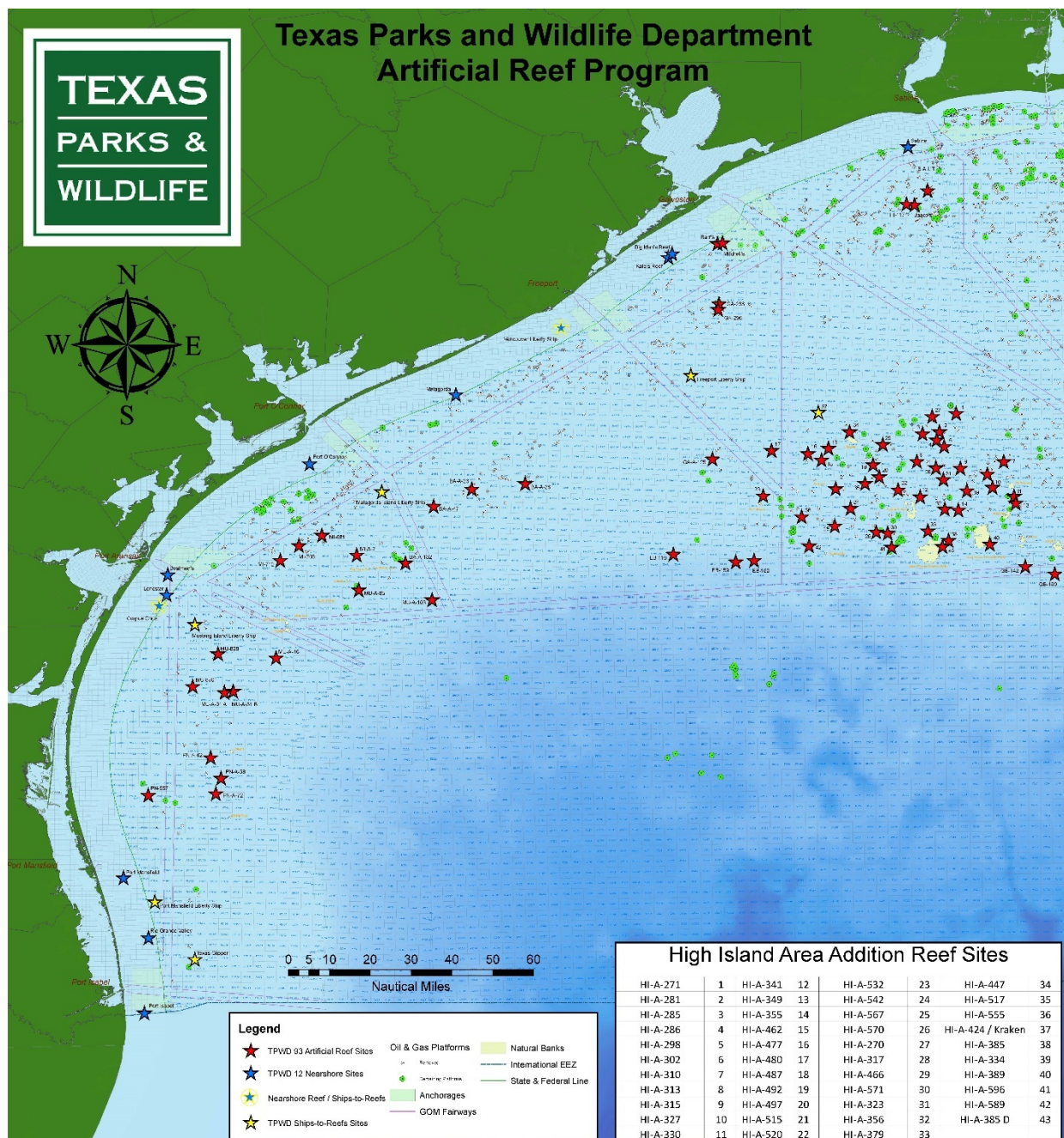


Figure 1. Map of Texas Artificial Reef Sites in the Gulf of Mexico offshore Texas.

1.2 Biological Importance of Artificial Reefs

Artificial reef habitats protect and conserve marine life by providing shelter and substrate for the attachment of sessile organisms. The reef structure and associated sessile organisms, in turn, provide the foundation for complex marine ecosystems and food webs. The food web develops from the numerous invertebrate species communities, comprised of algae, sponges, bivalves, coral, and crabs etc., typically observed on structures at reef sites. Research has shown that marine organisms not only are attracted to artificial structures, but many live and reproduce on them. This is important for reef fishes, such as red snapper (*Lutjanus campechanus*), a highly prized game and commercial fish in the Gulf.

Resident fish species seen on many reef structures that are dependent upon sessile and motile invertebrates as a food source and the structure for protection include blennies (Blenniidae), small grazers such as butterfly fishes (Chaetodontidae) and large grazers such as sheepshead (*Archosargus probatocephalus*). Resident fish species relying on reef sites for cover include the Atlantic spadefish (*Chaetodipterus faber*) and red snapper (*Lutjanus campechanus*). Other fish such as lookdowns (*Selena vomer*), Atlantic moonfish (*Vomer setipinnis*) and creolefish (*Paranthus furcifer*) are frequently seen feeding on macrozooplankton and suspended particulate matter.

In addition, tomtate (*Haemulon aurolineatum*), and various grouper species (Serranidae) are typically found feeding at areas away from the reef at night and returning during the day for cover. Large pelagic predators, such as mackerels (Scombridae) and jacks (*Caranx spp.*), are also present near the reef site in the pursuit

of schools of prey species. Often, divers will see barracuda (*Sphraena barracuda*), almaco jack (*Seriola rivoliana*), hammerhead sharks (*Sphyrna spp.*), and cobia (*Rachycentron canadum*). On occasion sea turtles and marine mammals are observed near artificial reefs.

Adding the numerous invertebrate species observed at reef sites to this mix creates an extensive and productive marine ecosystem at a micro scale.

1.3 Social Benefits of Texas Artificial Reefs

1.3.1 Sport Fishery Benefits

Artificial reefs enhance the fishing opportunities for hook and line anglers targeting fish associated with artificial reefs. There are an estimated 750,000 saltwater recreational anglers in Texas (2018 estimate, 2011 US Fish and Wildlife Service data; last data available). Osburn et al. (1995) found that 73% of all fishing and diving charter boat trips were to artificial substrate habitats. In a 1995 survey, 44% of the total number of trips taken offshore by charter boats (included headboat, party, and diving boats) were to TPWD artificial reefs (Ditton et al. 1995). Trips to artificial reefs accounted for 40% of the total number of trips taken offshore by the survey group (Ditton et al. 1995).

In a study targeting the *Texas Clipper* reef, Malki et al. (2010) conducted an economic assessment of the ship reef and found that from 2008 – 2010 anglers spent an average of \$458.02 per trip, which correlated to an economic impact of over \$1m to the local economy. Through a 2015 study of private boat owners, 57% took 1-5 trips offshore each year and 5% made over 20 trips per year. Over 70% of these boaters made use of artificial structures: 41% went to standing oil and gas platforms, 14% to

TPWD reefed platforms (Rigs-to-Reefs Program), 13% to TPWD reefed Liberty Ships, and 7% to small profile TPWD reef materials (e.g. concrete culvert, reef balls, pyramids, etc.) (Schuett et al. 2016).

With this heavy demand for fishing, the creation of artificial reefs helps meet these demands and aid in increasing optimum yield of finfish and other marine life.

1.3.2 Sport Diving Benefits of Texas Artificial Reefs

Most recreational diving in Gulf of Mexico waters off Texas occurs at the Flower Gardens Banks National Marine Sanctuary, approximately 100 nm to the west of Galveston, Texas. The preferred diving depth for most dive charters is 70-100 ft (Ditton et al. 1995). Artificial reefs, especially those with a 50-ft clearance, can offer various diving opportunities for divers dependent on their level of skill and training. Typical recreational divers may venture down to 120-130 feet, while deeper platform reefs are used by the increasingly popular technical diving community who can exceed depths of 200 feet. A 1999 study utilizing a random sample of 1,059 Texas sport divers indicated that 55% had taken one or more trips to TPWD artificial reefs each year (Ditton and Baker 1999).

Further, Ditton et al. (1995) estimated that 250,000 divers reside in Texas and annual economic impacts to the state are about \$2 million per year. Approximately 50% of diving activities occurs in salt water. Malki et al. (2010) conducted an economic assessment of the Texas Clipper reef and found that from 2008 – 2010 divers spent an average of \$2,020.07 per trip, which correlated to an economic impact of from \$1.4 – over \$2m to the local economy. The most recent diving survey

found that nearly 20% of scuba diving shops utilizing Texas artificial reefs that the removal of offshore platforms have devastated their business and as a result, 49% do not dive (or dive less) in the Gulf anymore (Braddy et al. 2016). Of those surveyed, 83% of dive shops and dive boat operators would prefer to dive a ship wreck (Ships-to-Reefs Program) over an oil platform (Braddy et al. 2016). Even with the decline in dive trips to Texas waters, the average annual expenditure per diver in Gulf was \$1,173. With an estimated 6,000 diver-trips to TPWD artificial reefs, the economic impact was \$1.2m/year (Braddy et al. 2016).

With the utilization of artificial reefs for diving resources and the steady demand for diving opportunities, artificial reefs are critical in providing diving opportunities.

PART 2.0 PROJECT GRANT AND TASKS

2.1 Project Goals

The goals of the project were the:

- Design, Permitting and Bidding of Relief Materials;
- Construction and Deployment of Relief Materials,
- And Project Monitoring and Reporting.

Reefing materials included: fabricated mid relief pyramids and low relief structures. All reef materials were inspected to ensure that they were free of hazardous substances and met TARP guidelines for complexity, stability, and durability. The reef materials were added to the recently permitted reef site, Big Man's Nearshore Reef Site, GA-220, along the northeastern Texas coast to increase the physical complexity of the reef structure in the Gulf of Mexico.

2.2 Specific Project Tasks

TARP applied for the Coastal Management Program (CMP) grant in late 2016 and the approved grant was received by TPWD on 27 January 2017. The contract between TPWD and the GLO included a scope of work, goals of the project, and projected competition times for each task and was officially signed on 6 November 2017. The Special Award Condition was released 1 November 2017. TARP was granted \$300,000 in award costs, with a \$300,000 match from TPWD.

The grant provided for the deployment of materials at the newly permitted TARP reef site in the northeastern Texas coastal waters, the Big Man's Reef Site, GA-220 (Big Man's). The CMP funds were used for the following phased activities: first, the bidding and award of reefing contracts for the

deployment of materials; and second, the deployment of materials to the new reef sites.

The anticipated time frame for completion of the tasks was originally estimated to be 16 months, but was extended twice. The initial project completion was set at 31 March 2019, but delays in submitting the Request for Proposals (RFP) for the construction and deployment of the low relief required an extension to 31 August 2019. Due to the initial delay, a second extension was required later to extend the project closeout deadline to 31 December 2019.

Typical reefing contracts exceed \$100,000, and as such, were reviewed by the Texas Procurement and Support Services before they were open to the public for bidding. After a 30-day public notice (in most cases), bids were evaluated, scored and awarded. The entire process from contract draft to award typically took 2.5 – 3 months. Once awards were made, TARP allowed contractors flexibility in completion to compensate for weather delays. Overall, all contracts were completed, and all reefing objectives met by the end of the amended CMP grant, after the two deadline extensions.

PART 3.0 ACCOMPLISHMENTS BY TASK

3.1 Task 1.0 Design, Permitting and Bidding of Relief Material

Big Man's Nearshore Reef (GA-220)

Description: The Big Man's Nearshore Reef (GA-220) was designed at 160 acres (2,640 ft x 2,640 ft) in size and located approximately 7.8 nm southeast of Galveston Island, Texas in state waters. Water depth is 48 ft (Exhibit A).

Scope of Work: Having already acquired permits from the Texas General Land Office and the US Army Corps of Engineers (USACOE), in addition to correspondence from the US Coast Guard (USCG) negating the need for a Private Aid for Navigation (PATON marker buoy), TARP began discussions with Texas A&M University – Galveston (TAMUG) to determine the placement of reef materials within the permitted reef site. Simultaneously, TARP began development of the Request for Proposals (RFPs) for the deployment of mid and low relief materials at the reef site.

Resolution: With the permits already in hand, the primary tasks were to work with TAMUG to assess possible deployment arrangements in order to provide habitat conducive to both juvenile and sub-adult fish. The proposed arrangement was four deployments of low relief materials to the north of six patches of mid-relief pyramids (Exhibit C). The pyramid patches would be of two different size patches with large patches of 54 pyramids and smaller patches of 6 pyramids.

The initial CMP grant was offered with a Special Award Condition (SAC) attached to it. Within this SAC, it was determined that a Section 7 consultation with NOAA was

required. However, upon providing the USACOE Statement of Findings that was processed during the permit process where NOAA was originally offered a chance to consult, the SAC was removed before the RFP process was completed.

Milestone: Projected completion: 30 November 2017; Actual completion: 19 September 2017.

CMP Contractual Cost: \$0.

3.1.1 Task 1.0 Design, Permitting and Bidding of Mid and Low Relief Material

Description: Drafting the bid package for the construction and deployment of the mid and low relief materials began shortly after receiving the signed work plan. The RFP was to include material specifications and a deployment plan and was to be advertised to the public by 28 February 2018, so that an executed contract might be in place no later than 31 March 2018.

Scope of Work: The initial draft of the RFP was created 22 January 2018. The RFP contained two phases. The first phase was the construction and placement of 180 mid relief pyramid structures. The second phase was the deployment of low relief reef structures.

The initial work plan called for over 3000 tons of oyster shell/rock to be deployed for the low relief materials. However, due to the current status of oyster stocks in Texas, the cost of oyster shell mixed with rock was more than using readily available material options. Given the difficulty in obtaining oyster shell and the availability of concrete

rail ties at no cost, the material for the low relief deployments shifted to the rail ties.

This change in material was the cause for the delay in the initial draft of the RFP. Ultimately, the use of rail ties became another hurdle as prospective bidders chose not to bid on the RFP due to the complexity in deploying the materials and maintaining the required materials profile in the water column. Typically, rail ties are deployed in mounds without a need to stay under a height restriction of 2 feet. With each rail tie having a height of 8 inches, many bidders passed on the opportunity to deploy and those that did place bids were well over the targeted budget. Ultimately, the RFP for the creation and deployment of mid and low relief materials was listed three times and the only bid was 4 times the budgeted amount for the low relief deployments.

Once it became clear that the problem with the RFP was the materials and deployment method for the low relief reef structures, the decision was made to separate the two different material types into different bid packages. While redrafting the RFP for prefabricated low relief structures, the mid-relief deployment a bid was requested from a contracted vendor for the construction and deployment of the 180 mid relief pyramids. After a Final and Best Offer, the contract with the vendor constructing reef structures for CMP 21 17-189-000-9826 was amended to include the 180 pyramids for deployment at the Big Man's Nearshore Reef Site (GA-220). This amendment was signed on 12 March 2018 with a deployment date of 30 September 2018.

After the many set-backs and revisions, a new RFP was redrafted for the construction of low relief reef plates. This RFP was placed out for public notice on 15 November 2018, 9 months behind the contracted timeline.

All bid proposals were due to TPWD by 21 December 2018.

Resolution: The RFP for the construction and deployment of low relief structures closed on 21 December 2018. Three vendors bid on the low relief RFP. The chosen vendor was notified on 31 January 2019 of their successful bid package for the deployment of 180 low relief reef plates (Exhibit C).

The vendor already contracted for the the construction and deployment of mid relief materials at the Rio Grande Valley Nearshore Reef Site bid on the cost of the deployment for the 180 mid relief pyramids at Big Man's. The offer was accepted and the contract was amended on 12 March 2018 to include the deployment at Big Man's (Exhibit D).

Milestone: Projected completion: 31 March 2018. Actual completion: 31 January 2019. While the RFP delays were occurring, TPWD requested an amendment to the CMP work plan for an extension through 31 August 2019. Due to the full extent of the delays in the submission of the RFP, TPWD requested another extension on the workplan and grant contract. The final amended deadline for complete project close out was set as 31 December 2019. All requirements, under the amended timeline, were completed on time.

CMP Contractual Cost: \$0.

3.2 Task 2.0. *Construction and Deployment of Mid and Low Relief Material*

Description: The selected construction contractor for the mid relief pyramids, Callan Marine, was to deploy mid relief pyramids to Big Man's Nearshore Reef Site by 30 September 2018. The selected vendor for the construction and deployment of the low relief reef plates, Walter Marine, was to deploy 180 low relief reef plates by 31 August 2019. Mid relief pyramids and low relief reef plates both consisted of limestone and concrete.

Scope of Work: With the change from oyster shell/rock to low relief reef plates, the deployment plan shifted slightly. The original deployment plan was 4 patches of shell/rock spaced out evenly to the north of the pyramids. The adjusted deployment plan was developed with the contracted vendor to deploy the low relief reef plates in similar fashion to the original concept and to create 4 patches of 45 plates.

Once the purchase order from TPWD to Callan Marine was signed on 12 March 2018 and with Walter Marine on 31 January 2019, the contract manager met with each contracted vendor to ensure that the scope of the project was understood. Technical specifications of the mid relief pyramids (Callan Marine) and the low relief reef plates (Walter Marine) can be found in Exhibits E and F. After construction of the mid relief pyramids was finished, the contract manager visited the yard for inspection of the materials on 10 April 2018. Material inspections for the low relief reef plates were logistically difficult as the contracted vendor is located in Alabama. However, the construction vendor submitted images to the contract manager on 23 July 2019.

Both vendors constructed a few extras just in case something occurred during deployment (Figures 2-3).

Remediation: No remediation was required. All materials reefed were inspected by TARP and met Artificial Reef Program material guidelines.

Reefing: An initial task to complete before the actual deployments could occur was to create temporary CMP signage and acknowledgement of funding on TPWD website. The banners were created, printed and provided to each contracted deployment vessel for displaying on the boat during material deployment and posted CMP funding acknowledgement on the TPWD's Artificial Reef Program's website (Exhibits G and H).

After the final inspections for the mid relief pyramids and a deployment plan finalized, material deployments were slated to begin before the scheduled Rio Grande Valley Nearshore Reef Site deployment (see CMP closeout report for 17-189-000-9826). On 23 May 2018, Callan Marine deployed 180 mid relief pyramids to the Big Man's Nearshore Reef Site (GA-220). The survey from Callan Marine for the deployment of the 180 mid relief pyramids was provided on 25 June 2018 (Exhibit I). The deployment of each piece of material was verified both with the survey and plotting the provided coordinates using ESRI ArcMap.

Construction on the low relief reef plates was to have begun by 31 March 2019. However, the contracted vendor was delayed in the construction and construction did not begin until June. In July, the vendor submitted a request to extend their deadline beyond 31 December 2019. TARP denied the

request and requested them to continue to construct materials with a deadline of 30 September 2019 for the anticipated deployment. By August all low relief reef plates had been constructed and the vendor was looking to head to Texas waters by 26 August 2019. Shortly after that update on 12 August, TARP received news that the captain of the deployment vessel and son of the company owner was hospitalized. Operations were obviously placed on hold until TARP was informed that the gentleman was well enough to continue work. Walter Marine's deployment vessel and crew arrived in Texas ready to deploy right as Tropical Storm Imelda was forming. Operations were again placed on hold until Imelda subsided. After waiting for the seas to calm, the deployment vessel began operations on 23 September 2019. However, the sea states were still too high for the safe transfer of a TPWD observer from a chaser boat to the deployment vessel. Therefore, no TARP staff were able to physically see the deployment operation. Due to this impact, the vendor was requested to take deployment images and relay them to the

contract manager (Figures 4-5). Coordinates were received on 30 September 2019 and plotted through ESRI ArcMap to confirm deployment location (Exhibit J).

Milestone: Projected completion: 31 December 2019; Actual completion: 23 September 2019.

Final CMP Contract Cost: \$581,604.86

Callan Marine invoices for construction and deployment of mid relief pyramid reef materials:

- Construction, deployment and survey of all 180 reef structures: \$342,900 (23 May 2018).

Walter Marine invoices for construction and deployment of low relief reef plates materials:

- Construction, deployment and survey of all 180 reef structures: \$234,000 (23 Sept 2019).



Figure 2. Construction of the mid relief pyramids by Callan Marine for the Big Man's Nearshore Reef Site (GA-220).



Figure 3. Low relief reef plates completed and ready to be loaded on to the Marantha II by Walter Marine.



Figure 4. Deployment image of the mid relief pyramids being placed in the Big Man's Nearshore Reef Site GA-220) on 23 May 2018.



Figure 5. Deployment image of the low relief reef plates being placed in the Big Man's Nearshore Reef Site (GA-220) on 23 September 2019.

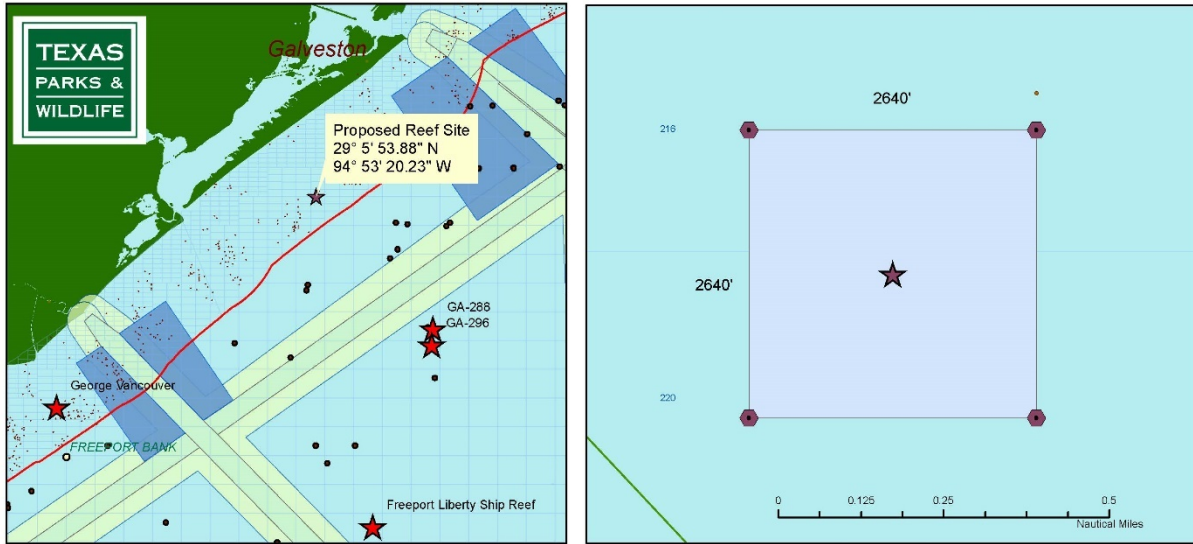
PART 4.0 REFERENCES

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PART 5.0 EXHIBITS

Exhibit A. Big Man's Nearshore Reef Site (GA-220).

Proposed Galveston Nearshore Reef Site (GA-220) - 160 Acres



Coordinates for the Proposed Galveston Nearshore Reef Site

	NAD83 Latitude	NAD83 Longitude	NAD27 Latitude	NAD27 Longitude	NAD83 SPSC X	NAD83 SPSC Y	NAD27 SPSC X	NAD27 SPSC Y
Center	29° 05' 53.88" N	94° 53' 20.23" W	29° 05' 53.01" N	94° 53' 19.51" W	3281039.128	13606351.955	3312631.485	482915.527
NW	29° 06' 07.40" N	94° 53' 34.58" W	29° 06' 06.53" N	94° 53' 33.86" W	3279719.122	13607671.968	3311311.485	484235.527
NE	29° 06' 06.48" N	94° 53' 04.83" W	29° 06' 05.61" N	94° 53' 04.12" W	3282359.148	13607671.969	3313951.485	484235.527
SE	29° 05' 40.36" N	94° 53' 05.88" W	29° 05' 39.49" N	94° 53' 05.16" W	3282359.135	13605031.941	3313951.485	481595.527
SW	29° 05' 41.28" N	94° 53' 35.62" W	29° 05' 40.41" N	94° 53' 34.90" W	3279719.108	13605031.941	3311311.485	481595.527

Geographic Coordinates (Degrees Minutes Seconds) and State Plane Texas South Central FIPS_4204 (feet) in NAD27 and NAD83

Legend	
	Proposed Galveston Nearshore Reef Site
	TPWD ARP 68 Reef Sites
	Natural Banks
	TX RRC Wells
	Platforms in federal water
	GLO Easement
	Pipelines
	Federal State Boundary
	OCS Blocks
	Anchorage
	Shipping Fairways

Water Depth: 48 ft

Estimated Substrate: Sand

Nearest Point to Point Distances

Distance Offshore: 6.55 nm
 Safety Fairways: 10.71 nm
 Anchorage: 10.77 nm
 Oil and Gas Pipelines or Easement: 1402.14 ft
 State and Federal Boundary: 2.46 nm
 Obstruction or Platforms: 350.14 ft

Distance from San Luis Pass: 12.16 nm
 Distance from Galveston Jetties: 16.74 nm

Exhibit B. Texas A&M University - Galveston approved deployment plan for the mid relief pyramids and low relief reef plates at Big Man's Nearshore Reef Site (GA-220).

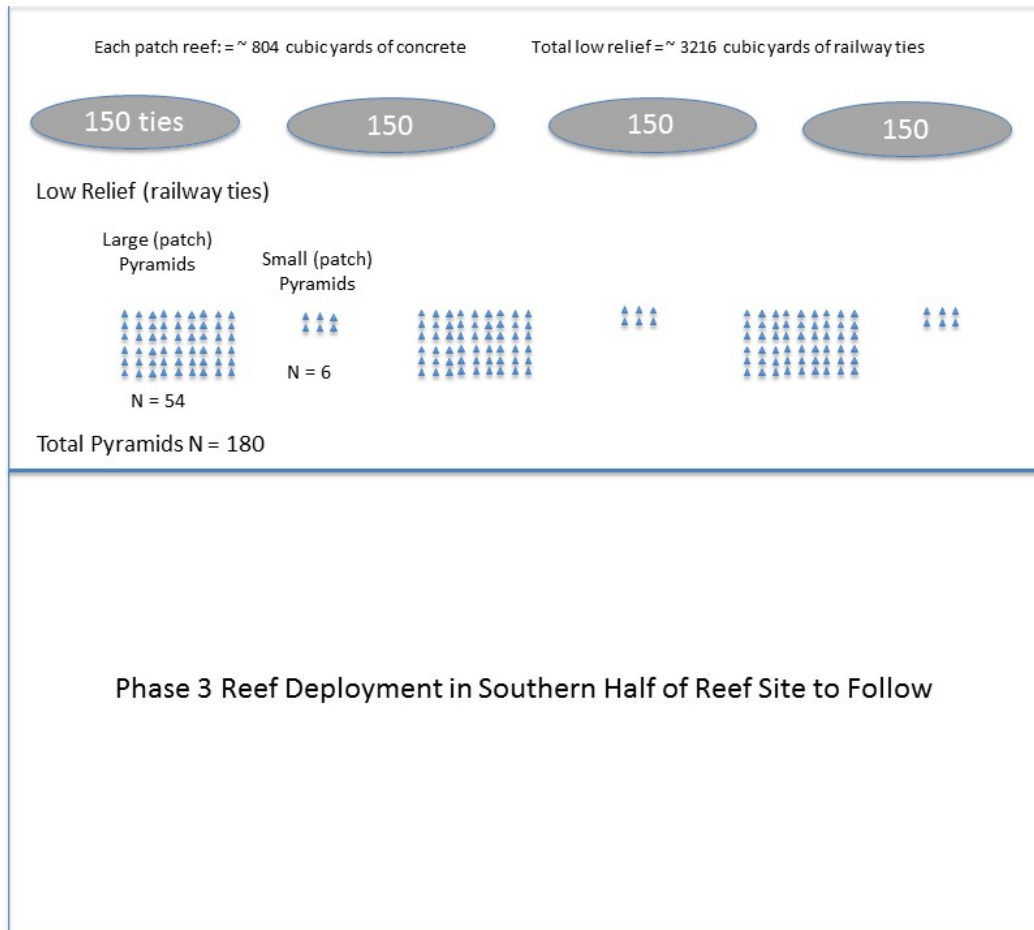


Exhibit C. Notice of Award contracting Walter Marine to construct and deploy reef structures at the Big Man's Nearshore Reef Site (GA-220).

NOTICE OF AWARD

January 31, 2019

Mr. David Walter, Owner
Walter Marine
22605 Andrews Lane
Orange Beach, AL 36561
Re: TPWD Contract Purchaser Order No. 518406

Dear Mr. Walter,

Responses to Request for Proposal 802-19-42999 have been reviewed and Walter Marine is hereby notified that the Texas Parks and Wildlife Department (TPWD) accepts your proposal for artificial reef materials placement at Big Man's Nearshore Reef Site.

Services must be provided in accordance with the following documents incorporated by reference:

- (a) Contract Purchaser Order No. 518406
- (b) Request for Proposal 802-19-42999, including all addenda
- (c) Contractor's Response to RFP 802-19-42999, including all addenda

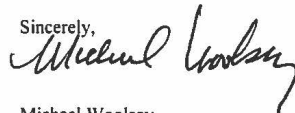
Contract Period: January 31, 2019 through August 31, 2019, unless sooner terminated or extended under the terms of the contract with the option to renew for two (2) additional one (1) year periods.

Contract Administration: Administration of the Contract is a joint responsibility of the TPWD Coastal Fisheries Division and TPWD Purchasing and Contracting Division. TPWD Purchasing staff will be responsible for administering the contractual business relationship with the vendor. The Contract Manager does not have any express or implied authority to vary the terms of the Contract, amend the Contract in any way or waive strict performance of the terms or conditions of the Contract.

TPWD Contract Manager: Amy Ringstaff
amy.ringstaff@tpwd.texas.gov, 512-389-4725

If you have any questions or need additional information please let me know.

Sincerely,



Michael Woolsey
Purchaser

enclosures

Exhibit D. Purchase Order contracting Callan Marine to construct and deploy reef structures at the Big Man's Nearshore Reef Site (GA-220).

AMENDMENT TO CONTRACT

- | | |
|--|--|
| 1. Owner
<u>Texas Parks and Wildlife Department</u>
<u>4200 Smith School Road</u>
<u>Austin, TX 78744</u> | 2. Contractor (Name and Address)
<u>Callan Marine Ltd</u>
<u>P.O. Box 17017</u>
<u>Galveston, TX 77552-7017</u> |
| 3. Contract <u>500927</u>
Solicitation <u>802-17-39430</u>
Description <u>Manufacture and Deploy Artificial Reef Units</u> | 4. Amendment No. <u>1</u>
Effective Date <u>Upon Signature</u> |

5. The above numbered contract is amended as follows:

In accordance with the contract terms (Request for Proposals, Section 1, paragraph 9, Adding New Products/Services to Contract After Award), the parties hereby agree to add additional reef construction services of the same nature at an additional location to the contract (Construction and Placement of Artificial Reef Structures and Materials at Rio Grande Valley Nearshore Reef Site (PS-1105)).

Services to be completed no later than: 09/30/2018

Except as provided herein, all terms and conditions of the contract number referenced above, as heretofore changed, remain unchanged and in full force and effect.

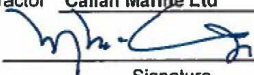

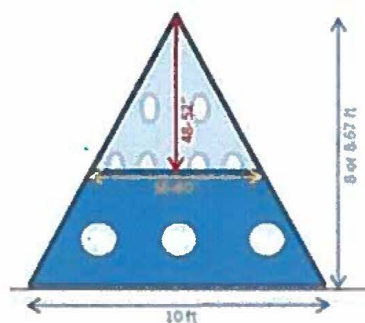
- | | |
|---|--|
| 6. Contractor <u>Callan Marine Ltd</u>
By <u></u>
Signature
<u>Maxie J. McGuire, Jr., President</u>
TYPE or PRINT signer's name & title
Date Signed <u>3/9/18</u> | 8. Owner <u>Texas Parks & Wildlife Department</u>
By <u></u>
Signature
<u>Ann Bright, Chief of Staff</u>
TYPE or PRINT signer's name & title
Date Signed <u>3-12-18</u> |
|---|--|

Exhibit E. Technical specifications for the mid relief pyramids to be deployed at Big Man's Nearshore Reef Site (GA-220).

- 2.5.3. Deploy the materials on the sea floor per specifications. See *Deployment Specifications* in Paragraph 2.8 below.
- 2.5.4. Verify the depth of the materials placed on the sea floor and ensure clearance requirements are met. See *Deployment Specifications* in Paragraph 2.8 below.
- 2.5.5. The location of each reef unit deployed must be documented by Global Positioning Data (GPS) in NAD83 or WGS84 format by the contractor and certified by a marine surveyor/hydrographer/land surveyor. Acquisition of the survey data may require repositioning of the vessel and/or making passes over the deployment site to document the location of each individual reef unit. The time required to obtain the survey data is included in the contractor's lump sum price in Bid Schedule. See *Survey and Certification Requirements* in Paragraph 4 below.
- 2.5.6. Contractor must follow Additional Requirements as found in Appendix 3.
- 2.5.7. Deliver to TPWD's location all required deliverables no later than 5:00 P.M. Central Time, **30 September 2018**. See *Deliverables* in Paragraph 5 below.

2.6. DESCRIPTION OF MATERIALS

- 2.6.1. The designed reef unit shall be constructed of concrete, supported by rebar or other support, and be of semi- enclosed design. **Preference will be given to designs that have a Patent.**
- 2.6.2. Design shall be 3-4 sided, stable on the bottom, shall not fall over in strong currents, and can be easily placed on the bottom in an upright position.
- 2.6.3. Reef shall be comprised of concrete and rebar (or similar support) for a long lifespan, have limestone rock embedded in the concrete for attachment by sessile marine organisms, have openings or windows on each side and have a sufficient footprint design to prevent it from sinking significantly into the bottom over time.
- 2.6.4. Have a cutout at the top of one side to allow for escapement of sea turtles with approximate dimensions of 56-60" wide by 48-52" tall, as seen in diagram below:



- 2.6.5. Dimensions shall be approximately ten (10) feet wide by eight (8) feet tall. Wall thickness must be at least three (3) inches.
- 2.6.6. Designs proven to be successfully used by TPWD ARP, other agencies, or other organizations will take priority.

2.7. REEF SITE DESCRIPTION AND LOCATION

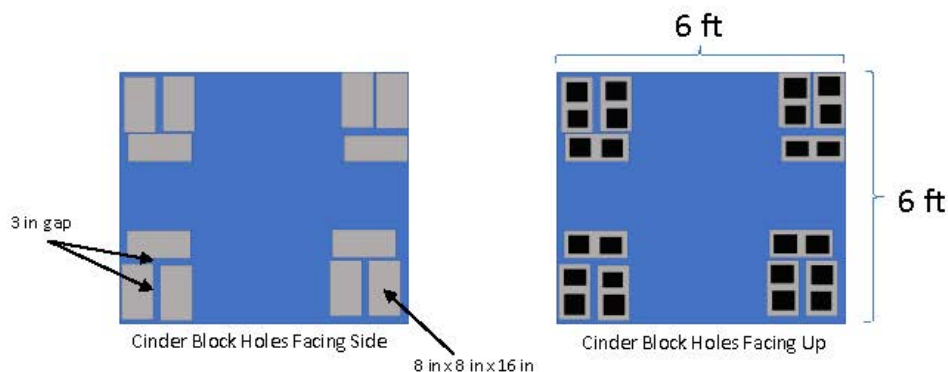
- 2.7.1. The Big Man's Nearshore Reef, a component of the TPWD ARP, is located approximately 16.7

Exhibit F. Technical specifications for the low relief reef plates to be deployed at Big Man's Nearshore Reef Site (GA-220).

inch rock adhered to the plate by concrete to create a rough area for the settlement of juvenile red snapper fish.

- 6.4.6. Designs proven to be successfully used by other agencies and organizations evaluated accordingly and award made as determined to be best value to the State.

6.5. **REEF SITE DESCRIPTION AND LOCATION:**

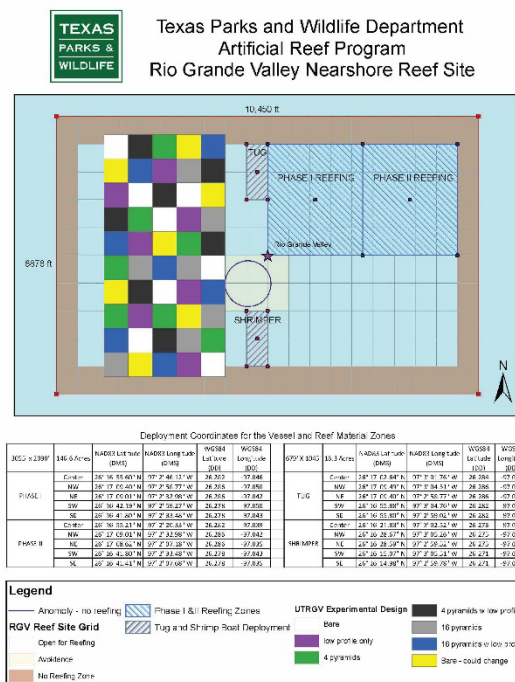


- 6.5.1. The Big Man's Nearshore Reef, a component of the TPWD ARP, is located approximately 16.7 nautical miles from the Galveston Island Jetty, Texas within the boundary of OCS Block Galveston Area 220. The center of Big Man's Nearshore Reef is located at Latitude 29° 05' 53.88" N, Longitude 94° 53' 20.23" W (NAD83 Datum). The reef site is a 160 acre rectangle of 2640-ft by 2640-ft.
- 6.5.2. The boundaries of the Big Man's Nearshore Reef (GA-220) site are listed below and shown on Attachment 1.

NAD83 DATUM	LATITUDE	LONGITUDE
PERMITTED CENTER	29° 05' 53.88" N	94° 53' 20.23" W
NW CORNER	29° 06' 07.40" N	94° 53' 34.58" W
NE CORNER	29° 06' 06.48" N	94° 53' 04.83" W
SE CORNER	29° 05' 40.36" N	94° 53' 05.88" W
SW CORNER	29° 05' 41.28" N	94° 53' 35.62" W

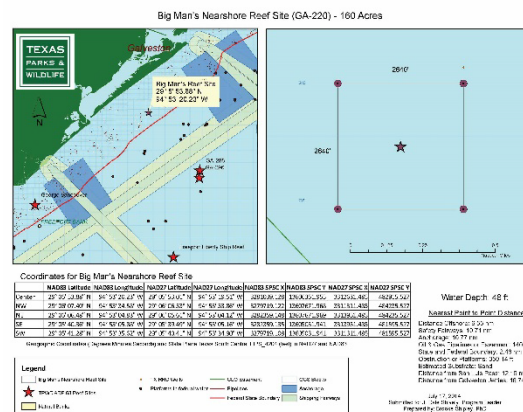
- 6.5.3. The Deployment Zone for these reef units shall be designated by TPWD ARP upon award but will generally be defined within the 160 acre Big Man's Nearshore Reef (GA-220; 1320-ft wide by 1320-ft long). The zone will be consist of four different configurations throughout the deployment region (**SEE ATTACHMENTS 1 AND 2**). The water depth at Big Man's Nearshore Reef (GA-220) is approximately 48 feet (ft.) at the center and ranges between 46 and 54 feet (ft.)

Cycle 21 – Construction and Enhancement of Artificial Reefs in the Western Gulf of Mexico In September 2015, the Artificial Reef Program submitted a request for grant funding to the Texas General Land Office under the Coastal Management Program – Cycle 21. The proposal was to create low-relief and mid-relief patches of structures at the Rio Grande Valley Nearshore Reef Site. These structure patches would consist of pyramids and concrete blocks placed strategically within the deployment region. Texas Parks and Wildlife Department received notification in February 2016 and signed a working contract with the Texas General Land Office in December 2016. Federal monies could be passed through to the Texas General Land Office and released for our use by October 2017. The TPWD request for Bids for the construction and deployment of the reef materials was closed in July 2017. Deployment is expected to begin in early 2018.



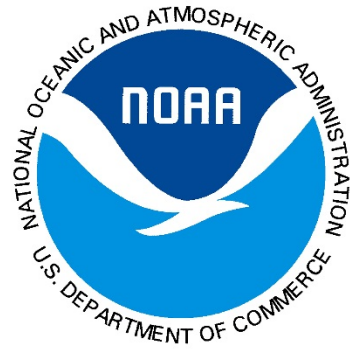
Rio Grande Valley Nearshore Reef Site

Cycle 22 - Construction and Enhancement of Artificial Reefs in the Northeastern Gulf of Mexico. In September 2016, the Artificial Reef Program submitted a request for grant funding to the Texas General Land Office under the Coastal Management Program – Cycle 22. The proposal was to create low-relief and mid-relief patches of structures at the Big Man’s Nearshore Reef Site. These structure patches would consist of pyramids and concrete blocks or rubble placed strategically within the deployment region. We received notification of the acceptance of the grant proposal in January 2017. Deployment is expected to begin in late 2019.



Big Man's Nearshore Reef Site map

Exhibit H: Deployment banner drafted and displayed during the deployment of the reef structures at the Rio Grande Nearshore Reef Site (PS-1105).



CONSTRUCTION OF THIS MATERIAL WAS MADE POSSIBLE BY A GRANT UNDER THE COASTAL ZONE MANAGEMENT ACT OF 1972, AS AMENDED, AND AWARDED BY THE OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE, AND APPROVED BY THE TEXAS LAND COMMISSIONER AND THE TEXAS COASTAL MANAGEMENT PROGRAM.

THIS PROJECT IS FUNDED BY A TEXAS COASTAL MANAGEMENT PROGRAM GRANT APPROVED BY THE TEXAS LAND COMMISSIONER PURSUANT TO NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION AWARD NO. NA16NOS4190174 AND NA17NOS4190139.

Exhibit I. Side-scan survey showing final placement of mid relief pyramid reef structures within the Big Man's Nearshore Reef Site (GA-220).

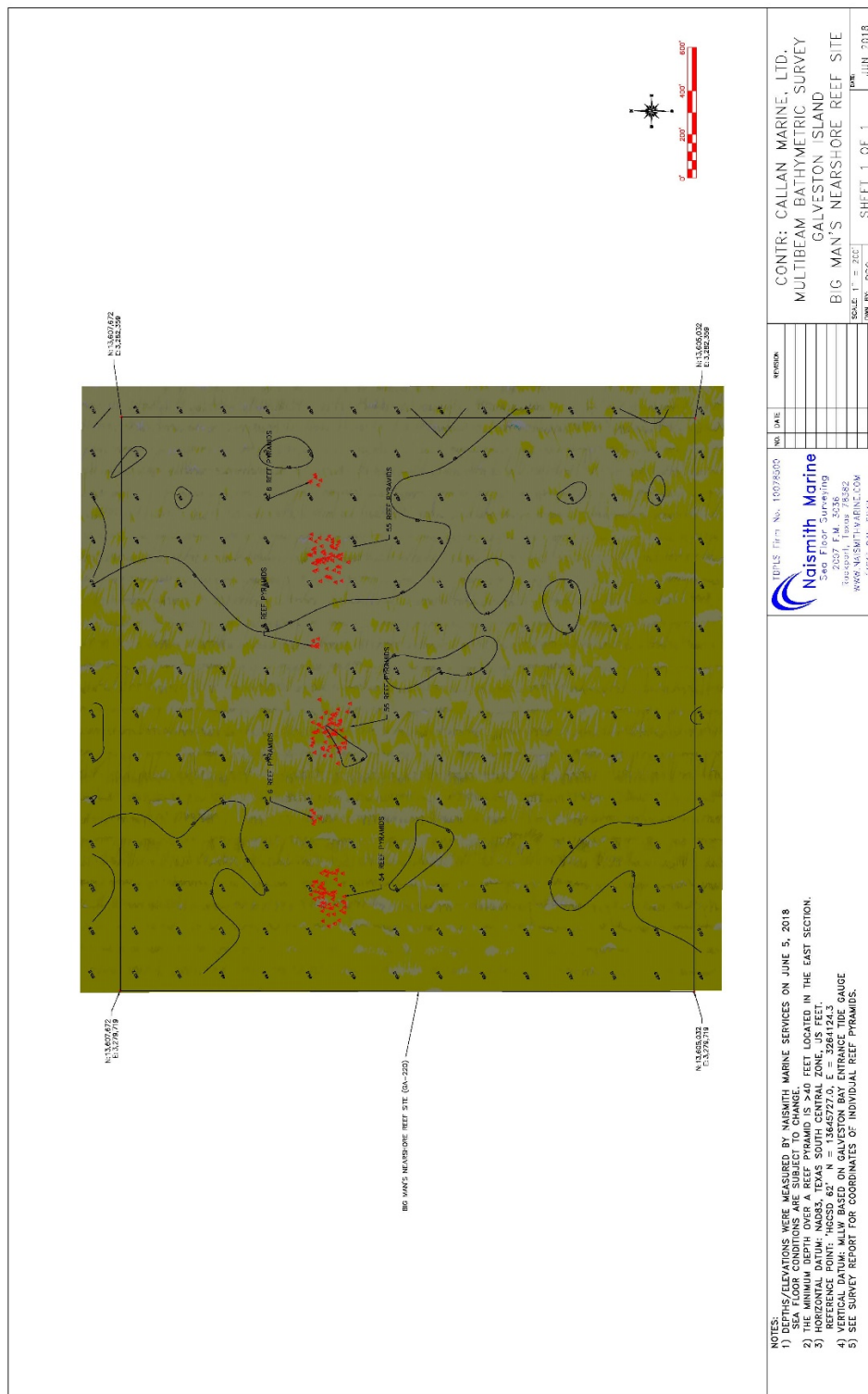


Exhibit J. Charted coordinates showing final placement of mid and low relief reef structures within the Big Man's Nearshore Reef Site (GA-220).

