

**PRICING SHEET FOR EMERGENCY PROJECT
Phases 9 through 18**

Lump Sum Bid Price:

_____ (Written) \$ _____

Work Phasing Chart

Work	Not-To-Exceed Amount	Completion Date
<i>Phase 9 (Rip Rap or Alternative New Wall)</i>	Rip Rap: New Wall:	
<i>Phase 10 (Rip Rap or Alternative New Wall)</i>	Rip Rap: New Wall:	
<i>Phase 11 (New Wall)</i>	New Wall Only:	
<i>Phase 12 (Rip Rap or Alternative New Wall)</i>	Rip Rap: New Wall:	
<i>Phase 13 (New Wall)</i>	New Wall Only:	
<i>Phase 14 (Rip Rap or Alternative New Wall)</i>	Rip Rap: New Wall:	
<i>Phase 15 (New Wall)</i>	New Wall Only:	
<i>Phase 16 (Rip Rap or Alternative New Wall)</i>	Rip Rap: New Wall:	
<i>Phase 17 (New Wall)</i>	New Wall Only:	
<i>Phase 18 (New Wall)</i>	New Wall Only:	

Unit Pricing Schedule

Task	Unit	Unit Cost
NEW WALL OPTION		
Mobilization	lumpsum	
Equipment	lumpsum	
Sheet Piling Material	Per linear ft	
Installation of Sheet Piles	Per linear ft	
Flowable Fill Installation	Per linear ft	
Sand Drain System	Per linear ft	
Fill / Sod / Swale / Restore Irrigation	Per linear ft	
Form / Pour Concrete Cap	Per linear ft	
Additional Anchor Tie-Back System	Per linear ft	
Restore Dock(s) / Misc.¹	Per linear ft	
Pre-punching/Temping	Per linear ft	
RIP-RAP OPTION		
Mobilization	lumpsum	
Equipment	lumpsum	
RIP-RAP Material	Per linear ft	
RIP-RAP Installation	Per linear ft	
RIP-RAP Removal & Relocation³	Per linear ft	

¹ Contractor will install conduit for water and electrical pass-throughs, which cost is included in the prices stated above, but Contractor will not be responsible for re-connection of water and electrical utility lines. Contractor will supply a shop drawing of any utility pass-through work.

² Refer to the specifications for sheet piling, section 3.0-3.

³ If Rip-Rap needs to be removed and relocated to allow for future new wall installation, assume to be reused elsewhere in Mirabay waterway complex.

Contractor's Authorized Representative	Date

Scope of Services

Contractor shall conduct emergency repairs of existing PVC sheetpile retaining wall, substantially consistent with the plans attached hereto, and at the locations identified on the phasing chart that follows. This work includes the following:

For New Wall Option:

- Obtaining and installing new fiberglass reinforced polymer (FRP) sheetpiles approved by the seawall engineer in front of the existing PVC sheetpile retaining wall. Pre-punching may be required at certain locations. (Plans and Specifications are attached hereto as **Exhibit A.**)
- Constructing a new reinforced concrete pile cap, enveloping the old pile cap.
- Applying corrosion resistance protection to the tie-rod bars within 2 ft of the old cap, consistent with the drawings.
- Installation of manta ray anchors in lieu of waterside stabilization.
- Enhancing the weep holes with 1 ¼ inch diameter perforated PVC pipe, 5 ft long, as shown on the plans. In addition, placing filter-sand backfill near the surface on the landside of the retaining wall to enhance drainage, as shown on the plans.
- Bringing landside surface, including swale, irrigation lines, etc., back to its original condition.
- Performing partial demolition of a portion of the perpendicular dock to allow for new sheetpile installation and cap construction. Correspondingly, repairing dock to its former use.

For Rip-Rap Option:

- Placing Rip Rap in accordance with the specifications and geometry on the design drawings.

Contractor agrees to coordinate all work with the District's project engineer, Langan Engineering & Environmental Services, Inc. ("**Seawall Engineer**"); to obtain prior written approval of the Seawall Engineer for all work and the ordering of materials; and to stop work at any time at the direction of the Seawall Engineer or the CDD Engineer.

Additionally, all work shall be done consistent with the Seawall Engineer's plans and specifications attached as **Exhibit A.**

EXHIBIT A

SPECIFICATIONS FOR SHEET PILING

SPECIFICATION FOR FIBER REINFORCED POLYMER (FRP) COMPOSITE SHEET PILE

1.0 SCOPE

This document addresses the use of fiber reinforced polymer (FRP) composite sheet pile for the Mirabay emergency repairs seawall stabilization project (“Emergency Repair Project”). Information regarding the scope of the seawall rehabilitation project is available through the Harbor Bay Community Development District (CDD), and their project seawall engineer Langan Engineering and Environmental Services, Inc. (Langan).

1.1 REFERENCES

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) TEST REFERENCES:

ASTM D3039 Tensile Properties of Plastics

ASTM D638 Standard Test Method for Tensile Properties of Plastics

ASTM D790 Flexural Properties of Unreinforced and Reinforced Plastics

ASTM D7290 Standard Practice for Evaluating Material Property Characteristic Values for Polymeric Composites for Civil Engineering Structural Applications

1.2 TERMINOLOGY

Fiber Reinforced Polymer (FRP) — A thermoset polymer matrix reinforced with a fiber or other material with a sufficient aspect ratio (length to thickness) to provide a discernable reinforcing function in one or more directions.

1.3 SUBMITTALS

The contractor shall submit to the CDD and Langan copies of the manufacturers most recent product brochure for the FRP sheet pile product covered by this specification and five most recent projects where the FRP sheet pile wall was used for seawall applications.

The submitted FRP sheet pile shall be manufactured in accordance with the requirements of this specification and shall be a standard commercial product. Additional or better features which are not specifically prohibited by this specification, but which are a part of manufacturer's product, shall be included in the FRP sheet pile being furnished.

1.4 QUALITY ASSURANCE

The manufacturer shall have in place a Quality Assurance Program that will ensure the FRP sheet pile is in conformance the intent of this specification. Each delivered section of FRP sheet pile shall be examined by Langan for compliance with the appropriate requirements of this specification. The seawall engineer will have five days from the receipt of delivery to the site to complete the inspection of the FRP sheet pile. This inspection shall

encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more major defects preventing or lessening maximum efficiency including significant discoloration shall constitute cause for rejection.

2.0 MATERIALS

Polymer (resin) — The resin for the FRP sheet pile can be polyester, vinyl ester, polyurethane, or a polyester-polyurethane hybrid. The polymer resin system for the FRP sheet pile shall be high performance resins that contain ultra violet (U.V.) stabilizers to provide sufficient resistance to ultra violet light degradation, high heat distortion resistance, high elongation and impact strength and low water absorption. The FRP sheet piles must have a useful life of at least 25 years, be of merchantable quality, and be fit for use in the District’s Master Project.

Reinforcement — The glass fiber reinforcement shall be in the form of continuous roving, woven roving or stitched fabrics, and surface matting. The finished FRP sheet pile product shall meet the minimum section properties shown in Table 1.

General Configuration — The FRP sheet pile shall be pultruded Z-shaped sections with a ball and socket interlock with nominal dimensions shown in Table 2. The FRP sheet pile shall be gray in color unless otherwise approved by the seawall engineer.

Defects — The sheet pile transported to the project shall be free from visible crack, indentations and other noticeable defects.

Approved FRP sheet piles include Everlast Evercomp 26.1 and Creative Pultrusions SuperLoc 1580 Series or approved equivalent.

2.1 MANUFACTURING PROCESS

FRP sheet pile shall be manufactured using the pultrusion process. Pultrusion is defined as the continuous processing of raw materials by pulling resin-rich reinforcements through a heated steel die to form profiles of constant cross section of continuous length.

2.2 PROPERTIES

Table 1 — Section Properties

Property	Minimum
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Average Full Section Modulus of Elasticity (ASTM D638)	4,000 ksi
Characteristic Value Full Section Modulus of Elasticity (ASTM D7290-06)	3,460 ksi
Moment of Inertia	52 in ⁴ /ft
Section Modulus	13 in ³ /ft
Cross Sectional Area	4.9 in ² /ft

Table 2 — Dimensions/Tolerances and Weight

Specification	Minimum Value
Length	16 ft ⁽¹⁾
Width	18 in ⁽²⁾
Depth	8 in
Thickness	0.25 in
Weight (pound per linear ft - per vertical ft)	6 lbs/ft ⁽³⁾

(1) Minimum embedment requirement is 10 ft below the existing mud lines adjacent to the existing vinyl sheet pile walls at the project.

(2) Measured from center of interlock to center of interlock.

(3) The weight of sheet pile is approximate and expressed in pounds per linear ft per vertical ft.

2.3 SHIPPING AND HANDLING

2.3-1 The FRP sheet pile manufacturer/ supplier shall have no more than 30 days from the time the Contractor places their order to delivery to the site.

2.3-2 FRP sheet pile shall be shipped in such a manner as to minimize scratching and damage. FRP sheet pile shall be delivered such that they can be moved using traditional lifting and handling methods.

3.0 INSTALLATION

Installation shall be in accordance with seawall engineer's embedment and driving requirements as well as manufacturer's guidelines.

3.0-1 FRP sheet piles to be installed at the project must have a minimum length of 16 ft such that a minimum embedment length of 10 ft below the existing mud lines at the project can be achieved.

3.0-2 FRP sheet pile shall be installed using traditional driving methods including vibratory hammers or approved impact hammers.

3.0-3 Where localized hard or impenetrable zones prevent traditional sheet piling installation without sheet pile damage, "prepunching" of the alignment shall be performed using a steel sheet pile with similar cross-sectional dimensions to the selected FRP sheet pile. The FRP sheet pile shall be extracted from the refusal depth and the steel template sheet shall be used by the contractor to pre-punch the refusal material such that the FRP sheet pile can be re-installed to the design tip elevation of el -10. The prepunching and FRP sheet pile reinstallation shall be observed and approved by Langan's field engineer.

3.0-4 Cutting and Drilling — FRP sheet pile can be cut using carbide edged masonry blades and drilled with carbide or cobalt tipped bits. Any required sheet pile cutting shall be approved by Langan’s field engineer.

3.0-5 Workmanship, Finish, and Appearance — FRP sheet pile shall be furnished in accordance with this specification shall be an acceptable match to approved samples in color and surface appearance. The product shall be free of defects that adversely affect performance or appearance.

3.0-6 The interlocking system of the FRP sheet pile must be capable of interlocking with the Everlast Evercomp 26.1 sheet pile, which have been installed for the Phase 1 through 8 emergency repairs for the existing vinyl sheet pile wall.

3.0-7 Monitoring of the sheet pile installation will be performed by Langan, on behalf of the CDD.

4.0 METHOD OF MEASUREMENT

The quantity of FRP sheet pile to be paid for under the work specified will be the number of linear feet of at least 16 ft long, 18-inch-wide installed in accordance with the project seawall construction plans and this specification, approved by the seawall engineer.

5.0 BASIS OF PAYMENT

The unit price bid per linear feet of at least 16 ft long and 18-inch-wide FRP sheet pile, meeting the properties in Section 2.3, shall include all costs for material and freight to the site.

END OF SECTION