

PERMANENT FIBER REINFORCED POLYMER (FRP) SHEET PILING

****From Randolph CMG PARK(21)S**

- xx. DESCRIPTION. This work shall consist of designing, fabricating, and installing fiber reinforced polymer (FRP) sheet piling at the locations shown on the Plans, in accordance with the Contract Documents and as directed by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 505 of the Standard Specifications.

- xx. DEFINITIONS.

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.

PULTRUSION 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.

- xx. MATERIALS.

- (a) Polymer. The polymer (resin) shall be either polyester or vinyl ester. The resin shall contain ultraviolet (UV) stabilizers to provide sufficient resistance to UV light degradation. No other resins will be accepted for use.
- (b) Reinforcement. The glass 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 I.

TABLE I - SECTION PROPERTIES

Property	Minimum Value
Modulus of Elasticity	3000 ksi
Moment of Inertia	64 in ⁴ /ft
Section Modulus	16 in ³ /ft
Cross Sectional Area	4.9 in ² /ft

- (c) General Configuration. The FRP sheet pile shall be Z-shaped with a ball and socket interlock and meet the dimensional tolerances shown in Table II. Unless otherwise required in the Contract Documents, the FRP sheet pile shall be gray in color.

TABLE II - DIMENSION/TOLERANCES AND WEIGHT

Property	Value
Width	18.0" (\pm 0.10")
Depth	8.5" (\pm 0.05")
Thickness	0.260" (\pm 0.015")
Weight/ft	6.7 lbs/ft

- (d) Interlock Sealant. Interlock sealant shall be Adeka Ultra Seal A-30, or approved equal.
- xx. SUBMITTALS. The Contractor shall submit to the Engineer three (3) copies of the manufacturer's most recent product brochure for the FRP sheet pile product covered by this specification.
- xx. MANUFACTURING AND QUALITY ASSURANCE. FRP sheet pile shall be manufactured using the pultrusion process.

The manufacturer shall have in place a Quality Assurance Program that will ensure the FRP sheet pile is in conformance with the intent of this specification. Each delivered section of FRP sheet pile shall be examined by an inspector of purchaser's designation for compliance with the appropriate requirements of this specification. 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 constitute cause for rejection.

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 part of the manufacturer's standard commercial product, shall be included in the FRP sheet pile being furnished. A standard commercial product is one that has been sold or is currently offered for sale on the commercial market through advertisements or manufacturer's catalogs or brochures, and represents the latest production model.

The following manufacturers are known to supply FRP sheet piling that complies with the requirements of this specification:

Composite Components, Inc.
P.O. Box 14925
North Palm Beach, FL 33408
Tel.: 561-848-2050
Fax: 561-842-7209

Crane Materials International
Tel.: 866-867-3762
Fax: 770-933-8363

10/2/2012

Everlast Synthetic Products, LLC
1000 Wyngate Parkway Suite 100
Woodstock, GA 30189
Tel.: 800-687-0036
Fax: 800-687-0048

Northstar Vinyl Products, LLC
1 N. Tennessee St.
Cartersville, GA 30120
Tel.: 800-558-6702
Fax: 770-794-1105

- xx. SHIPPING, STORAGE, AND HANDLING. FRP sheet piling shall be shipped and stored in such a manner as to minimize scratching and other damage.

FRP sheet piling may be moved using traditional lifting and handling methods.

- xx. INSTALLATION. Sheet piling and interlock sealant shall be installed in accordance with the manufacturer's recommendations.

(a) Driving. FRP sheet piling shall be installed using traditional driving methods including vibratory hammers, impact hammers, or water jets. The Contract should contact the manufacturer for specific hammer recommendations.

(b) Cutting and Drilling. FRP sheet piling may be cut using carbide edged masonry blades and drilled with carbide or cobalt tipped bits.

(c) Repairability. If damaged, the FRP sheet pile shall be repaired as per the manufacturer's recommendations.

(d) Workmanship, Finish, and Appearance. FRP sheet piling shall be furnished in accordance with this specification and 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.

- xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Cut-off Wall) to be measured for payment will be the number of square meters (square feet) of piling driven and left in place after cut-off in the complete and accepted work.

- xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Cut-off Wall) will be paid for at the Contract unit price per square meter (square foot). Payment will be full compensation for furnishing, transporting, storing, handling, and placing the material specified, including interlock sealant, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item

Pay Unit

10/2/2012

900.670	Special Provision (Permanent FRP Sheet Piling)	Square Foot
900.675	Special Provision (Permanent FRP Sheet Piling)	Square Meter