American Excelsior Company®
Earth Science Division

Proud Participant in NTPEP and Proud Member of:

Curlex® Bloc
An American Made Alternative to Coir Logs
SPECIFICATION

PART I - GENERAL

1.01 Summary

A. Curlex Blocs contain excelsior fibers, which are unique, filters of contaminated water in a variety of applications. In addition to their filtering capabilities, Curlex Blocs provide initial stability of shorelines and streambanks by buffering low energy wave action and flow velocity, installation around inlets and outlets, around job sites for perimeter control, runoff diversion.

B. This work shall consist of furnishing and installing the Curlex Bloc; including fine grading, installing, staking, and miscellaneous related work, in accordance with these standard specifications and at the locations identified on drawings or designated by the owner's representative. This work shall include all necessary materials, labor, supervision, and equipment for installation of a complete system.

C. All work of this section shall be performed in accordance with the conditions and requirements of the contract documents.

D. The Curlex Bloc shall be used to stabilize shoreline/streambank areas, create area for live planting, aide in job site perimeter control, and divert construction site runoff. Based on a project-by-project engineering analysis, the Curlex Bloc shall be suitable for the following applications:

1. Filter contaminated water
2. Shoreline and streambank stability
3. Inlet and outlet protections
4. Runoff diversion
5. Perimeter control
6. Channels, swales, and ditches

1.02 Performance Requirements

A. Curlex Bloc shall provide initial stability of shorelines and streambanks by buffering wave action and flow velocity. Secondary applications for Curlex Blocs include around inlets and outlets, around jobsites for perimeter control, runoff diversion, or in other applications when a filtering product is desired.

B. Curlex Bloc performance requirements:

Property	Value	Method
Flow Rate (GPM/ft^2)	≥35	ASTM D5141
Slope Soil Loss Reduction (%)	≥70	Quantified research[a]
Removal of Polynuclear Aromatic Hydrocarbons (PAHs)	≥ 95%	Quantified research[b]
pH Buffering	8 ± 3	ASTM D1117, modified
Functional Longevity[c]	≥ 36 Months	Documented laboratory and field studies
Fly Ash Filtration (TSS)	≥ 95%	Quantified research[d]
Fly Ash Filtration (NTU)	≥ 88%	Quantified research[d]

[a] Kelsey, K., T. Johnson, and R. Vavra. 2006. "Needed Information: Testing, Analyses, and Performance Values for Slope Interruption and Perimeter Control BMPs." IECA Conference Proceedings. P. 171-181.

[b] Boving and Zhang, Chemosphere 54 (2004) 831-839.

[c] Functional Longevity varies from region to region because of differences in climatic conditions.

[d] Kelsey, K. and M. Murley. (2017, January). Fly Ash Slurry Filtration Using Curlex® Blocs - Quantifying Total Suspended Solids and Turbidity Reduction. Unpublished internal document, ErosionLab.

1.03 Submittals

A. Submittals shall include complete design data, SDS, Installation Guidelines, Manufacturing Material Specifications, Manufacturing Certifications, CAD details, and a Manufacturing Quality Control Program.

1.04 Delivery, Storage, and Handling

C. Curlex Bloc shall be furnished on pallets to minimize handling.

D. Curlex Bloc shall be free of defects and voids that would interfere with proper installation or impair performance.

E. Curlex Bloc shall be stored by the Contractor in a manner that protects them from damage by construction activities.

PART II - PRODUCTS

2.01 Curlex Bloc

A. Product shall be Curlex Blocs, as manufactured by American Excelsior Company, Arlington, TX (800-777-7645).

B. Curlex Blocs consist of a specific cut of naturally seed free, nontoxic Great Lakes Aspen wood excelsior with 80% of the fibers ≥ 6 inches in length inside a durable, flexible tubular netting with metal clips or knotted ends. Curlex Blocs are unique, natural filters of contaminated water in a variety of applications. In addition to their filtering capabilities, Curlex Blocs provide initial stability of shorelines and streambanks by buffering low energy wave action and flow velocity. Secondary applications for Curlex Blocs include around inlets and outlets, around jobsites for perimeter control, runoff diversion, or in other applications when a filtering product is desired. Curlex Blocs may be installed over bare soil or over rolled erosion control products. Curlex Blocs' unique flat footprint provides more intimate contact with subgrade as compared to traditional tubular products such as coir logs and compost socks. In addition, Curlex Blocs are manufactured in the U.S.A. with American fibers as compared to coir fibers that are typically imported from half way across the planet. Products not native to North America shall not be accepted. Curlex Blocs (with biodegradable containment material) are easily abutted with a seamless joint as one end of each Curlex Bloc has an extra flap of containment material to pull over the end of the adjacent Curlex Bloc after placement. If the flaps will not be used, remove the excess material without damaging the secured end of the Curlex Bloc, then abut adjoining ends tightly.

C. Curlex Blocs shall have the following nominal material characteristics:

Product Name	Curlex Bloc	Curlex Bloc HD
Nominal Dimensions	18 in x 16 in (45.7 cm x 40.6 cm)	18 in x 16 in (45.7 cm x 40.6 cm)
Length (+ 10%, -0%)	4.0 ft or 8.0 ft (1.2 m or 2.4 m)	4.0 ft or 8.0 ft (1.2 m or 2.4 m)
Unit Weight [e] (± 10%)	14.0 lb/ft (20.8 kg/m)	18.0 lb/ft (26.8 kg/m)
Unit Ground Contact (minimum)	192 in^2/ft (4,064.0 cm^2/m)	192 in^2/ft (4,064.0 cm^2/m)
Density [e] (± 10%)	7.0 lb/ft^3 (112.1 kg/m^3)	9.0 lb/ft^3 (144.1 kg/m^3)
Containment Material [f]	Synthetic or Biodegradable	Synthetic or Biodegradable

[e] Weight and density are based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

[f] The optional biodegradable containment material is designed to start degrading during the first year to allow voluntary seed and sediment into the Curlex fiber matrix. The matrix of the Curlex Bloc is the key to the product's performance capabilities. The containment material is a carrier to assist with product shipping and placement into the field.

2.02 Stakes

A. 1 1/8 in wide x 1 1/8 in thick x 48 in long wooden stakes are recommended for Curlex Bloc installation.

B. Each wooden stake shall be notched to secure the rope to the Curlex Bloc. The notch shall be located at a minimum 2 in below the top of the stake with the notch opening a minimum of 1 in. See Curlex Bloc CAD Detail for additional installation techniques.

PART III - EXECUTION

3.01 Curlex Bloc Supplier Representation

A. Contractor shall coordinate with the Curlex Bloc supplier for a qualified representative to be present on the job site at the start of installation to provide technical assistance as needed. Contractor shall remain solely responsible for the quality of installation.

3.02 Site Preparation

A. Before placing Curlex Blocs, the Contractor shall certify that the installation site has been properly formed, graded smooth, has no depressions, voids, soft or uncompacted areas, is free from obstructions such as tree roots, protruding stones or other foreign matter, and is seeded and fertilized according to project specifications where applicable. The Contractor shall not proceed until all unsatisfactory conditions have been remedied. By beginning construction, Contractor signifies that the preceding work is in conformance with this specification.

B. Contractor shall fine grade the subgrade by hand dressing where necessary to remove local deviations.

C. No vehicular traffic shall be permitted directly on the Curlex Bloc.

3.03 Installation

A. Curlex Bloc shall be installed as directed by the owner's representative in accordance to manufacturer's Installation Guidelines and CAD details. The extent of Curlex Blocs shall be as shown on the project drawings.

B. Curlex Blocs shall be installed parallel to water flow and perpendicular to potential wave action. Applications of Curlex Blocs include natural filters of contaminated runoff, around inlets and outlets, around jobsites for perimeter control, runoff diversion, or other applications when a filtering product is desired.

C. They may be installed over bare soil or over rolled erosion control products.

D. On Shorelines and other applications determined by the Engineer, they shall be secured to the subgrade within a trench by a minimum 1 in by 1 in wood stake every two lineal feet across the length of both sides of the Curlex Bloc in an alternating pattern. Pound stakes tightly next to Curlex Bloc leaving approximately 4 in of stake above surface of Curlex Bloc. Notch stakes deep enough to fit rope to be used. Weave rope from stake-to-stake, front-to-back along the length of the Curlex Bloc to secure the Curlex Bloc in place. Pound down stakes flush with surface of Curlex Bloc after rope has been tightly installed. The stakes shall be driven into the subgrade a minimum of 24 in.

E. Adjoining Curlex Blocs shall be abutted tightly. Curlex Blocs (with biodegradable containment material) are easily abutted with a seamless joint as one end of each Curlex Bloc has an extra flap of containment material to pull over the end of the adjacent Curlex Bloc after placement. Note that each Curlex Bloc with biodegradable containment material contains one end with an extra flap for the abutment joint and one end without the extra flap that will be covered using the extra flap on the adjoining Curlex Bloc. If the flaps will not be used, remove the excess material without damaging the secured end of the Curlex Bloc, then abut adjoining ends tightly.

F. Multiple rows of Curlex Blocs may be needed to reach mean high water mark. Check with Engineer for placement details. Project specifications should be reviewed for any unique installation requirements.

G. Incorporation of live plants through and around Curlex Blocs is common. Ensure sufficient moisture is available for target species selected. Use planting iron to create hole in Curlex Bloc then place plug deep into Curlex Bloc. Typically, plugs are installed in a staggered pattern along the length of the Curlex Bloc.

3.04 Quality Assurance

A. Curlex Bloc shall not be defective or damaged. Damaged or defective materials shall be replaced at no additional cost to the owner.

B. Product shall be manufactured in accordance to a documented Quality Control Program. At a minimum, the following procedures and documentation shall be provided upon request:
   1. Manufacturing Quality Control Program Manual.
   2. Additional inspections for product conformance shall be conducted during the run after the first piece inspection.
   3. Moisture content readings recorded for each manufacturing day.
   4. Each individual Curlex Bloc shall be inspected, weighed, and documented prior to packaging for conformance to manufacturing specifications.
   5. Certification that fibers' raw material source is native to North America.
   6. Documentation and record retention for at least two years.

3.05 Clean-up

A. At the completion of this scope of work, Contractor shall remove from the job site and properly dispose of all remaining debris, waste materials, excess materials, and equipment required of or created by Contractor. Disposal of waste materials shall be solely the responsibility of Contractor and shall be done in accordance with applicable waste disposal regulations.

3.06 Method of Measurement

A. Curlex Bloc shall be measured for payment as individual items and the unit of measure shall be each.

3.07 Basis of Payment

A. The accepted quantities of Curlex Bloc shall be paid for at the contract unit price per each unit, complete in place.

Payment shall be made under:

Pay Item	**Pay Unit**
Curlex Bloc	Individual Item

Disclaimer: Curlex Bloc is a system for shoreline and streambank stabilization, contaminated water filtering applications, and for sediment control in channels and on slopes. American Excelsior Company (AEC) believes that the information contained herein to be reliable and accurate for use in erosion and sediment control applications. However, since physical conditions vary from job site to job site and even within a given job site, AEC makes no performance guarantees and assumes no obligation or liability for the reliability or accuracy of information contained herein, for the results, safety, or suitability of using Curlex Blocs, or for damages occurring in connection with the installation of any erosion control product whether or not made by AEC or its affiliates, except as separately and specifically made in writing by AEC. These guidelines are subject to change without notice.