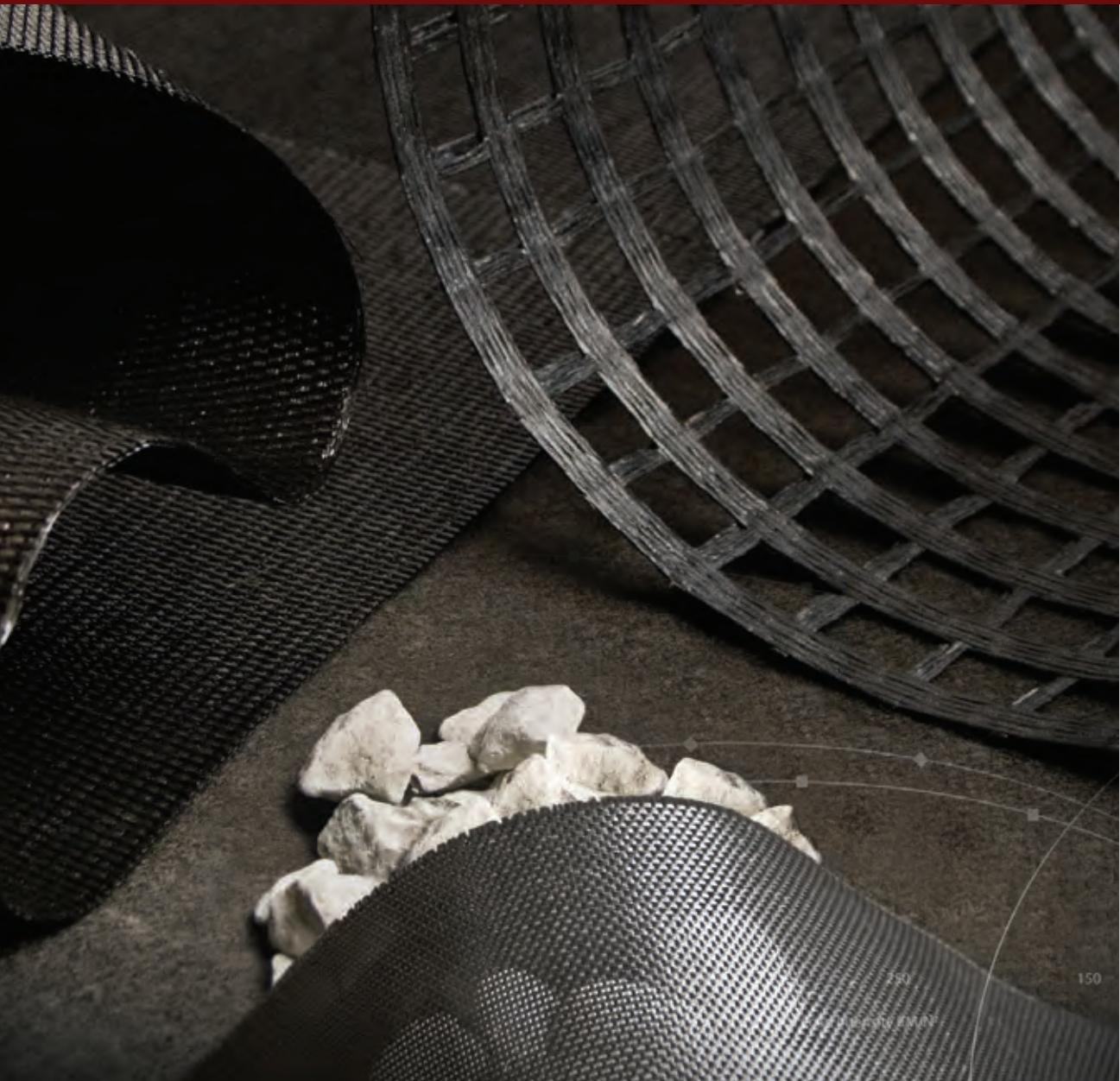


THE PRODUCTS YOU NEED WITH SUPPORT THAT MAKES A DIFFERENCE



Carthage Mills



► America's First Geotextile Company

Beginning in **1958**, Carthage Mills set out to pioneer the development, manufacture and application of an innovative 'woven synthetic filter cloth', as the first alternative to costly, and largely ineffective, 'graded granular filters' under riprap in shoreline protection. Those early 'plastic filter cloths' eventually became known as "Geotextiles"; the industry that followed as "Geosynthetics"; and Carthage Mills – America's *FIRST* Geotextile Company!!

Key Factors

Working with the USACOE in the United States and others abroad, it was essentially three things that helped to launch the geosynthetics industry as we know it today:

1. Carthage Mills' innovative designs and techniques of construction ultimately led to the world's first "**Filter Handbook**" – used for decades by thousands of design engineers and contractors worldwide.
2. The successful performance of those first applications of plastic filter cloths for the USACOE that culminated in their first comprehensive Specification for Filter Fabrics.
3. The unyielding determination of the late Robert J. Barrett, VP and Director - Erosion Control Division (the "Father of Filter Fabrics").

Over the years, Carthage Mills continued developing new applications for their fabrics, and is responsible for many

of the innovative uses of these materials today. This historic journey, including many of the events that helped shape the future of the geosynthetic industry, can be found at www.carthagemills.com.



Over a Half-Century Later

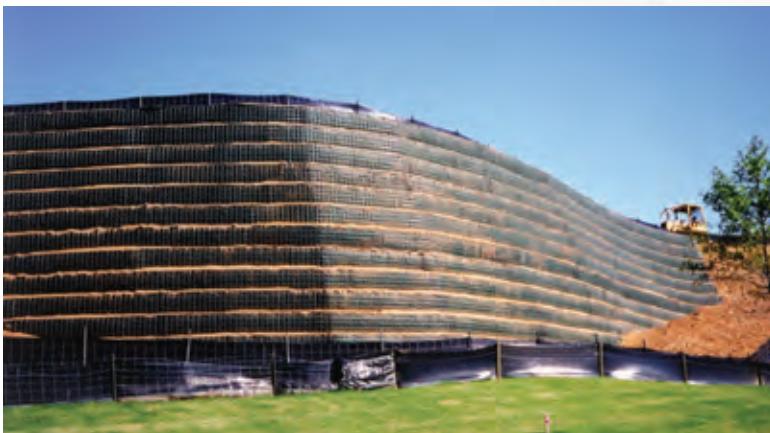
Today, Carthage Mills is still headquartered in Cincinnati, Ohio, and offers one of the most comprehensive lines of geosynthetics available from a single source. All of our products are readily available through a nationwide network of Carthage Mills Distributors and Regional Warehouses strategically located across the country. This facilitates our ability to provide customers who need less-than-truckload (LTL) quantities with same or next day *pick-up*, or *delivery* from almost any point in the country, and all at very competitive prices.



I don't know who else would have been foolish enough—or idealistic enough—to push on in those early years when there was so little money coming in. What kept us going was our firm belief that the 'filter fabric' was a tremendous concept.

Robert J. Barrett (1924-1990)
Vice President & Director of Erosion Control Division





The Products You Need with Support that Makes a Difference

As all costs related to construction continually rise, the value added services and cost saving products offered by Carthage Mills play heavily in your ability to win projects and increase profits.

At Carthage Mills You'll Experience:

- Accurate interpretation of specifications.
- Recognized opportunities for *value engineered alternatives*.
- Reliable quotes, proper submittals and certifications for quick product approvals.
- Extensive product selection and availability at competitive prices with timely deliveries.
- And *always* a live voice to get you answers you need now – because that's why you called.

The end results for you are increased business and profits, and a customer base with stronger loyalties and trust.



SINCE 1958:
AMERICA'S *FIRST*
GEOTEXTILE
COMPANY

► APPLICATIONS of Geosynthetics

Roads

ACCESS/HAUL ROADS - PARKING LOTS - HIGHWAYS & STREETS (BASE REINFORCEMENT)



For low cost, geosynthetics can significantly extend the life of everyday structures by preventing the intermixing of subgrade soils and the aggregate base, and/or stabilizing poor subgrades.

- **FX®—Woven Slit-Film Geotextiles**
- **FX®—MF & TF High-Performance Geotextiles**
- **FX®—HS Series of Nonwoven Geotextiles**
- **CX™ Geocells**
- **GBX® Geogrids (Rigid Polypropylene)**

Erosion

SHORELINES - SLOPES - SWALES



These were the very first applications of a geotextile in 1958. The fabric, which lies beneath various forms of riprap cover (i.e. rock, gabions and mattresses, concrete pattern-placed units, etc.), allows for free drainage of water while holding back fines thereby preventing shoreline and other erosion.

- **Carthage % Open Area Woven Monofilament Geotextiles**
- **FX®—MF High-Performance Geotextiles**
- **FX®—HS Nonwoven Geotextiles**
- **FX®—PET High-Strength Geotextiles**

Drainage

SUBSURFACE DRAINAGE



This is one of the most common applications of geotextiles in the construction of roadways, landfills, athletic fields etc, allowing for rapid removal of water or other fluids while providing excellent soil retention, assuring long-term free flowing drainage.

- **Carthage % Open Area Woven Monofilament Geotextiles**
- **FX®—HS Nonwoven Geotextiles**

APPLICATIONS of Geosynthetics ◀

Embankments

REINFORCED EMBANKMENTS - STEEPENED SLOPES

Common applications include earth dams, embankments on soft foundation soils, levees, highway embankments, landslide repair, landfills, dikes and levees.

- FX®-PET High-Strength Geotextiles
- GX® Geogrids (Polyester)
- FX®-MF & TF High-Performance Geotextiles
- MSE Earth Retention Systems



SRW Walls

SEGMENTAL RETAINING WALLS

In 2006, the GX® Geogrid product line was developed specifically for this application, and delivers the most efficient Long-Term Design Strengths (LTDS) in the industry. Visit our website for full technical data including block connection test results.

- GX® Geogrids (Polyester)
- FX®-HS Nonwoven Geotextiles
- Carthage % Open Area Woven Monofilament Geotextiles



Alternative Walls

OTHER PERMANENT AND TEMPORARY MSE WALLS

Several examples of cost-effective Mechanically Stabilized Earth (MSE) structures are temporary roadway detours, wrapped faced walls, highway bridge construction.

- MSE Earth Retention Systems
- CX™ & CXW™ Geocell Systems
- GX® Geogrids (Polyester)
- FX®-MF & TF High-Performance Geotextiles
- FX®-PET High-Strength Geotextiles



► APPLICATIONS of Geosynthetics

Pavements

PAVEMENT RESTORATION



Asphalt overlay fabrics can extend the life of all existing paved areas. These specially manufactured nonwoven geotextiles are first saturated with heated liquid asphalt during installation, and creates a moisture barrier between old and new pavement. In addition, they absorb stresses to retard reflective cracking, thereby improving and extending the overall performance of the new overlay.

- FX®-A/O Asphalt Overlay Geotextiles

Geomembranes / Covers

ENVIRONMENTAL – PONDS – CONTAINMENT – LANDFILLS – LAGOONS

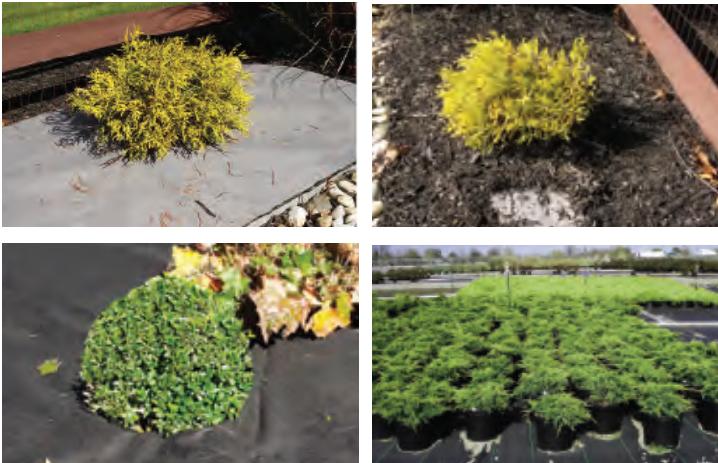


Containment projects utilize a wide variety of geosynthetics for veneer reinforcement, geomembrane protection, drainage, steepened slopes, vegetation/erosion control, gas venting and capping/closures.

- Carthage Geomembranes / Liners
- Carthage % Open Area Woven Monofilament Geotextiles
- FX®-HS & HSE Nonwoven Geotextiles
- FX®-MF & TF High-Performance Geotextiles
- FX®-PET High-Strength Geotextiles
- GX® & GBX® Geogrids
- MSE Earth Retention Systems

Landscape

LANDSCAPE - GROUND COVER FABRICS



Landscape fabrics come in a variety of weights and types, from DIY all-purpose to the professional landscaper and nurseries. Their primary functions are separation and friction, weed block, moisture retention, patio/paver underlayment, and drainage filter fabric.

- LX™-WC Premium Woven/Capped
- LX™-SB Spunbond Polyester
- LX™-GC High-UV Ground Cover

APPLICATIONS of Geosynthetics ◀

Stormwater Management

Stormwater Management; Phase II Compliance; BMPs - EPA mandated and locally enforced, this complex mix of products protect existing drains, storm water collection systems, streams, rivers, etc. from runoff associated with construction sites.

- Silt Fence; Wattles; Inlet Protection & Collection

INLET PROTECTION - EROSION AND SEDIMENT CONTROL



Dewatering / Containment

These products provide economical solutions for contractors faced with dewatering their construction sites while protecting the environment from silt, sand, and other sediment fines. Larger applications include dewatering of lakes/ponds and land reclamation.

- FBX™ Filter Bags / Tubes

SITE Dewatering FILTER BAGS AND CONTAINMENT TUBES



Erosion Blankets

EROSION CONTROL BLANKETS (Temporary) – EROSION APPLICATIONS

Erosion Control Blankets (ECBs) are ideal solutions for the short-term challenges of establishing vegetation in low to moderate erosion applications such as: subtle grades to steep 1:1 slopes; swales; moderate flow channels.

- Erosion Control Blankets (ECBs)



Turf Reinforcement

TURF REINFORCEMENT MATS (Permanent) and ANCHOR-REINFORCED VEGETATION SYSTEM (Permanent/Severe Applications)

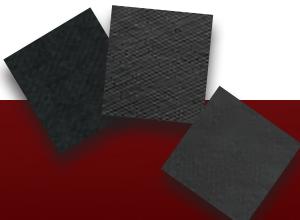
Turf Reinforcement Mats (TRMs) and Anchored Vegetated Armor Systems are for moderate to severe applications that require permanent and/or reinforced-vegetation.

- Turf Reinforcement Mats (TRMs)

- RVX™ Armor (ARVS)

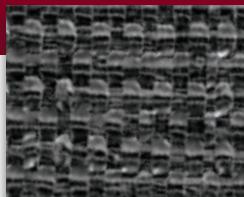


(1978-1979) Carthage Mills works with the USACOE for development of the *first* effective Design Criteria for Fabric-Reinforced Embankments on Soft Soil. –Pinto Pass Mobile, AL.



For assistance in product selection or interpreting a specification see our Selection Guide on the following pages or call us at **800-543-4430**.

► Carthage Mills' **PRODUCTS**



FX® Slit-Film Geotextiles

Carthage FX® Slit-film polypropylene geotextiles provide immediate and cost effective solutions for everyday **SEPARATION** and **STABILIZATION** and are among the most frequently used geotextiles in the industry.

- Parking Lots; Driveways; Streets; Railways; Roadways; Storage and Staging Areas; Board Roads; Construction Site Access/Haul Road

■ FX®-22 ■ FX®-44 ■ FX®-50 ■ FX®-55 ■ FX®-60 ■ FX®-65 ■ FX®-66



FX®-MF & TF High-Performance Geotextiles

Carthage FX®-MF & TF High-Performance polypropylene geotextiles for **SEPARATION**, **STABILIZATION**, **FILTRATION**, **CONTAINMENT** and moderate to severe **REINFORCEMENT**.

- MSE Walls (Temporary and Permanent); Base Reinforcement; Land Reclamation; Landfill Capping/Closures; Reinforced Slopes; Roadway/Railway Construction; Dikes and Embankments on Soft Foundations; Voids Bridging; Airport Runways

■ FX®-200MF ■ FX®-270MF ■ FX®-300MF ■ FX®-370MF ■ FX®-400MF ■ FX®-425MF
■ FX®-465MF ■ FX®-570MF ■ FX®-400/550MF ■ FX®-400/600MF ■ FX®-600/400MF

■ FX®-270TF ■ FX®-320TF ■ FX®-400TF ■ FX®-600/525TF

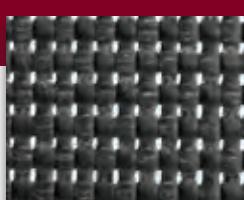


FX®-PET High-Strength Geotextiles

FX®-PET High-Strength polyester geotextiles for the most demanding applications of **REINFORCEMENT** and **CONFINEMENT**.

- Embankments on Soft Soils; Voids Bridging; Waste Lagoon Closures; MSE Structures; Reinforcement Applications that require: Creep Resistance, High Tensile and Long-Term Design Strength (LTDS)

■ FX®-400PET ■ FX®-600PET ■ FX®-800PET ■ FX®-1200PET
■ FX®-2300PET ■ FX®-5800PET



Carthage _%™ (PERCENT OPEN AREA) Monofilament Geotextiles

Carthage _%™ Monofilament polypropylene geotextiles feature effective levels of *Percent Open Area* (POA) – critical for resistance to clogging thus assuring **LONG-TERM FILTRATION** in **DRAINAGE**, **SEPARATION** and **EROSION CONTROL** applications.

- Bulkheads; Subsurface Drainage Systems; Under Riprap or Concrete Revetment Systems; Land Reclamation; Drainage/Filtration/Collection Systems in Landfills

■ Carthage 6%™, 15%™, 20%™ and 30%™ ■ Carthage 4%HD™, 10%HD™ and 12%HD™



Geomembranes / Liners

Carthage Mills can supply geomembranes that are either reinforced or unreinforced; in materials of LDPE, LLDPE, HDPE, PP, PVC, EVOH and other specialty resins; and in thicknesses ranging from 6 to 120 mil. Large factory-fabricated panels can minimize or eliminate field seams.





FX®-HS and HSE Geotextiles

Carthage FX®-HS and FX®-HSE nonwoven polypropylene geotextiles for **SEPARATION**, **FILTRATION**, **DRAINAGE** and **LINER PROTECTION**.

- Subsurface Drainage Systems; Under Riprap/Hard Armor in Erosion Control; Separation under Streets, Railways, Roadways and Pavers; Swales; Geomembrane/Liner Protection (HSE Series)

▪ FX®-35HS thru FX®-200HS (Civil) ▪ FX®-40HSE thru FX®-200HSE (Environmental)



FX®-A/O Asphalt Overlay Geotextiles

Carthage FX®-A/O nonwoven polypropylene Asphalt Overlay geotextiles for **PAVEMENT RESTORATION**, **SEALING**, **STRESS RELIEF** and **ASPHALT ADHESIVE BONDING**.

- Parking Lots; Highways; Streets; Airports; Bridges; Basketball Courts; Tennis Courts

▪ FX®-38A/O ▪ FX®-42A/O ▪ FX®-46A/O



GX® Geogrids

Carthage GX® Geogrids are uniaxial, woven of high tenacity polyester (PET) yarns, PVC coated and provide industry leading Long-Term Design Strengths (LTDS) for **SOIL REINFORCEMENT**.

- Segmental Retaining Wall (SRW) Reinforcement; Steepened Slopes; Landfills; Most MSE Structures (Temporary and Permanent); Dikes and Levees; Voids Bridging; Veneer Reinforcement

▪ GX®-150 ▪ GX®-300 ▪ GX®-500 ▪ GX®-800 ▪ GX®-1000 ▪ Manufactured to Specs



GBX® Geogrids

Carthage GBX® Geogrids - including Type 1 and Type 2 - are rigid, biaxial, polypropylene geogrids and proudly Made in the USA! The biaxial staple of the industry, the GBX® Series of Geogrids provides the confidence of performance and reliability that the industry has trusted for over 20 years for **BASE COURSE REINFORCEMENT**, **WORKING PLATFORMS AND FOUNDATION REINFORCEMENT**.

- Paved and unpaved Roads; Parking Lots; Equipment and Staging Yards; Railways; Haul/Access Roads

▪ GBX® 11 (Type 1) ▪ GBX® 12 (Type 2) ▪ GBX® 41 ▪ GBX® 42 ▪ GBX® 13 ▪ GBX® 15



CX™ & CXW™ Geocells

Carthage CX™ Geocells are comprised of 100% HDPE, come in a wide range of cell depths, and provide **MSE RETAINING WALLS**, **CONTAINMENT**, **EROSION/SLOPE PROTECTION**, and **LOAD SUPPORT**.

- Load Support for Roadways and Access Lanes over Unstable Soils; Vegetated Retaining Walls; Green Roofs; Vegetated or Stone-filled Slope Protection; Vegetated, Stone or Concrete-filled Channel Revertments

▪ CX™-20 ▪ CX™-30 ▪ CX™-40 ▪ CXW™-30

► Carthage Mills' **PRODUCTS**



LX™-WC Premium Woven/Capped Landscape Fabric

Carthage LX™-WC Landscape Fabrics are woven slit-film, Hi-UV resistant, polypropylene geotextiles with polypropylene fibers needle-punched into the fabric (woven/capped) for **INCREASED FRICTION WITH MULCH** and **WEED PREVENTION**.

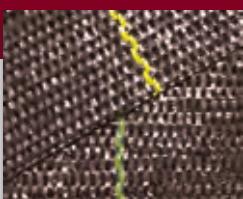
- Professional-Grade Applications; Weed Control



LX™-SB Spunbond Landscape Fabrics

Carthage LX™-SB Spunbond Landscape Fabrics are composed of continuous 100% polyester fibers for **MULCH RETENTION** and **WEED PREVENTION**. Available in black or gray.

- Mulch/Soil Separation; Weed Control; Patio/Paver Underlayment; Drainage Filter



LX™-GC High-UV Ground Cover Fabrics

Carthage LX™-GC High-UV Ground Cover Fabrics with marker yarns every 12" for **SEPARATION**, **PLANT ALIGNMENT**, **WEED CONTROL**, **FILTRATION**, **SUN & WIND PROTECTION**, **FOOT-TRAFFIC AREAS**.

- Retail Nursery Displays; Clean Foot-Traffic and Display Areas; Weed Control; Protective Cover of Bulk Materials



Erosion Control Blankets (ECBs)

Carthage Erosion Control Blankets are available in combinations of straw and/or coconut fibers; single or double-sided Polypropylene or Jute Netting; for **VEGETATION** and **SOIL/SEED RETENTION** in low to moderate **EROSION CONTROL** applications.

- Moderate Slopes; Low-Flow Channels



Turf Reinforcement Mats (TRMs)

Carthage Turf Reinforcement Mats are a dense matrix of polypropylene (PP) fibers between netting for **REINFORCED TURF** and immediate **EROSION CONTROL**, for moderate to high-flow conditions:

- Moderate to High-Flow Channels; Swales; Steep Slopes; Banks and Shorelines with Heavy Runoff



RVX™ Armor (Anchor-Reinforced Vegetation System)

Carthage Mills' RVX™ Armor System represents the latest in advanced flexible armoring technology. Consisting of an HPTRM with 3,000 lb/ft Ultimate Tensile and percussion driven anchors. It was designed to meet the challenges of the **MOST SEVERE OF EROSION EVENTS**.

- Armoring and Vegetation of Earthen Levees; Steep Slopes: $\leq 0.25H:1V$; Shorelines of Large Bodies of Moving Water



■ **FBX™ Filter Bags / Tubes**

Carthage Mills' FBX™ Filter Bags/Tubes are designed to trap silt, sand, and other sediment fines from construction sites before they can do damage to the environment; and to assist the contractor with an economical means of avoiding the costly clean-up of storm water systems (i.e. **SITE DEWATERING** and **SEDIMENT CONTAINMENT**).

■ Removal of dirty/muddy water from low-lying areas around construction sites; Dewatering of ponds and lakes; Draining trenches around pipelines and during municipal water/sewer line repair; around building foundations; highway and Marine construction

■ **FBX™ 80** ■ **FBX™ 100** ■ Custom Fabricated Tubes



■ **Stormwater Management / BMPs**

NOTE: NOT ALL AVAILABLE PRODUCTS ARE PICTURED BELOW. Please call for specific product information, pricing and delivery to your area of the country (i.e. Wattles, Inlet Protection, Silt Fence, etc.).



■ **Custom Fabrication, Factory Seaming, Off-line Slitting & Rerolling**

Carthage Mills offers in-house **FACTORY SEAMING** of geotextiles to **CUSTOM WIDE WIDTHS x LENGTHS** that can meet most specified wide width seam strengths and seam types. Seaming capabilities range from Light to Heavy Weight Slit-films, Nonwovens and Monofilaments, to the High-Performance polypropylene (PP) and High-Strength polyester (PET) geotextiles that demand the highest quality of seams, consistently passing stringent lab testing for project acceptance.

Off-line **SLITTING**, **REROLLING**, and **CUSTOM FABRICATION** are expertly done and delivered fast for your convenience.





Carthage Mills

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