



**BARRIER SYSTEMS**

# Flood & Erosion Protection

*“You can’t always predict,  
but you can always prepare”*



Fully Tested by U.S. Army Corp of Engineers



**Cellular Barrier Systems**

# Flooding in California

TrapBag®

BARRIER SYSTEMS



# Immovable Structure



**BARRIER SYSTEMS**



Flood Protection, Fargo-ND



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# Secure and Safe



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**A TrapBag® Barrier for the U.S. Army Corp of Engineers  
on the Mississippi River - Levee for 2 miles**



**Flood Protection: Mississippi River - Baton Rouge, LA**



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# Why TrapBag is the best option



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## Step 1: Pull out like an accordion



## Step 2: Begin filling



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# How It Works

**TrapBag®**

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# Easy to Fill



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**A SMALL MACHINE AND 3 WORKERS CAN EASILY DO THE JOB**



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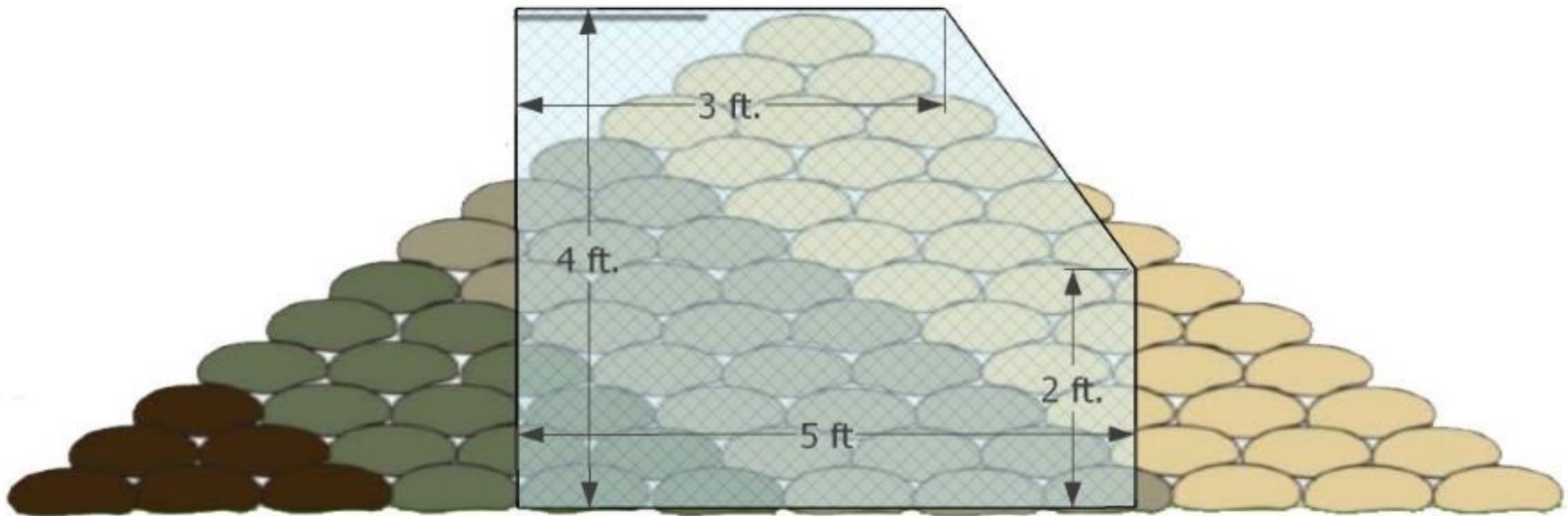
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# Mass



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**60% MASS IN THE BOTTOM 50% OF THE BARRIER**

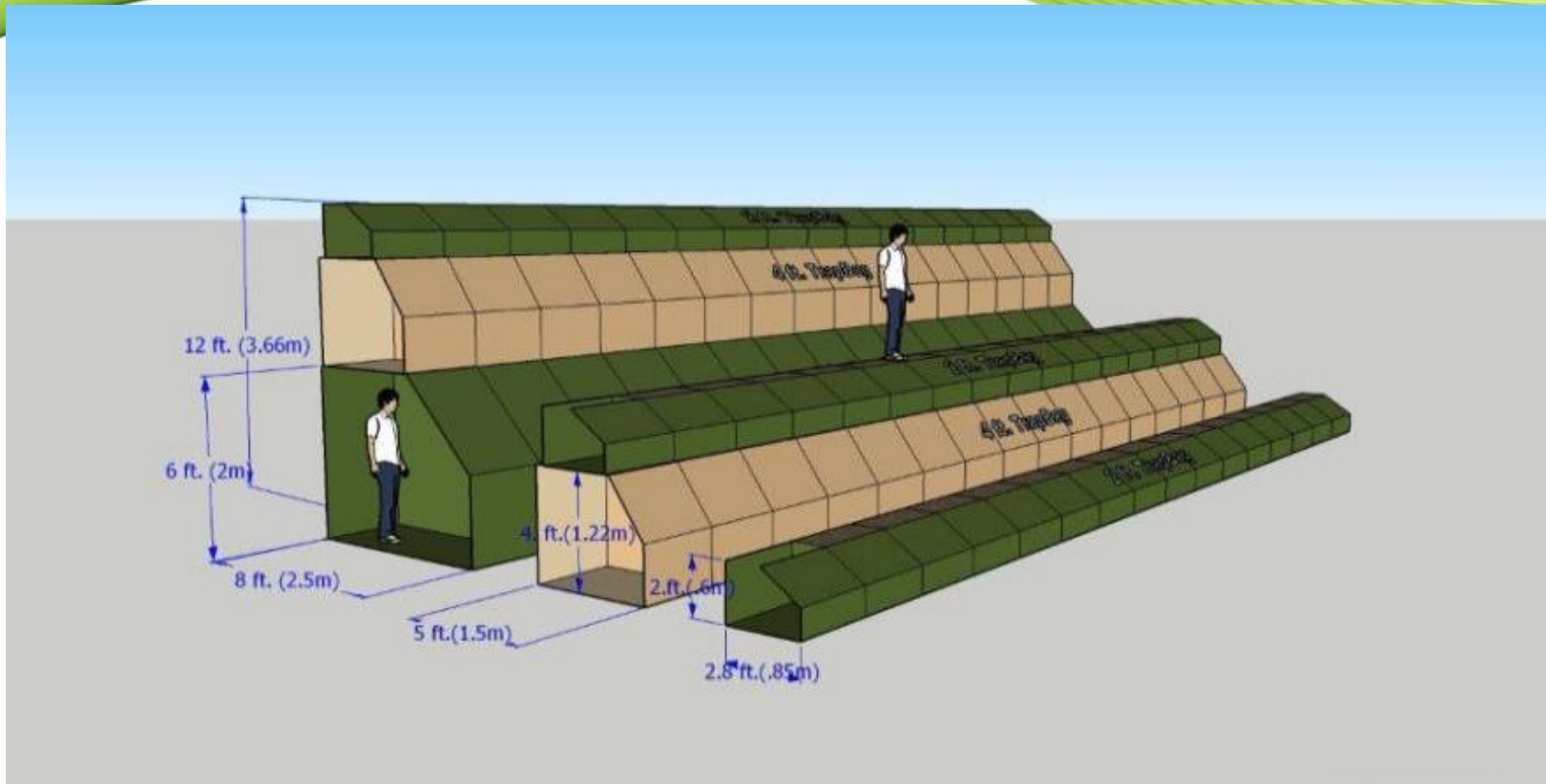




# Stackable Structures



BARRIER SYSTEMS



**2ft**  
**(TBR60)**

**4ft + 2ft**  
**(TBR120 + TBR60)**

**6ft + 4ft + 2ft**  
**(TBR200 + TBR120 + TBR60)**

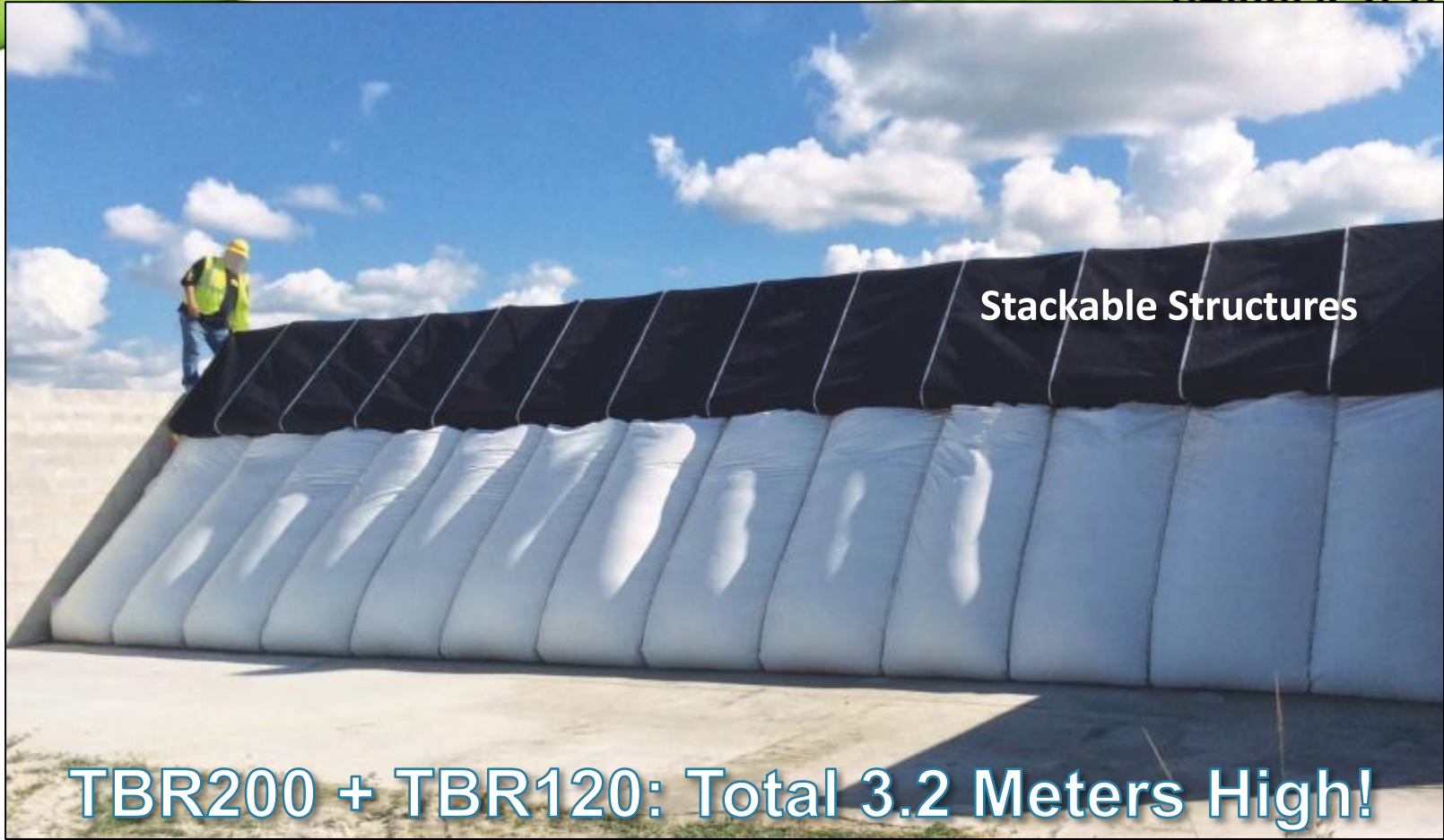


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# Product Configurations



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Stackable Structures

TBR200 + TBR120: Total 3.2 Meters High!



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**TrapBag®**



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# Flood Protection Projects



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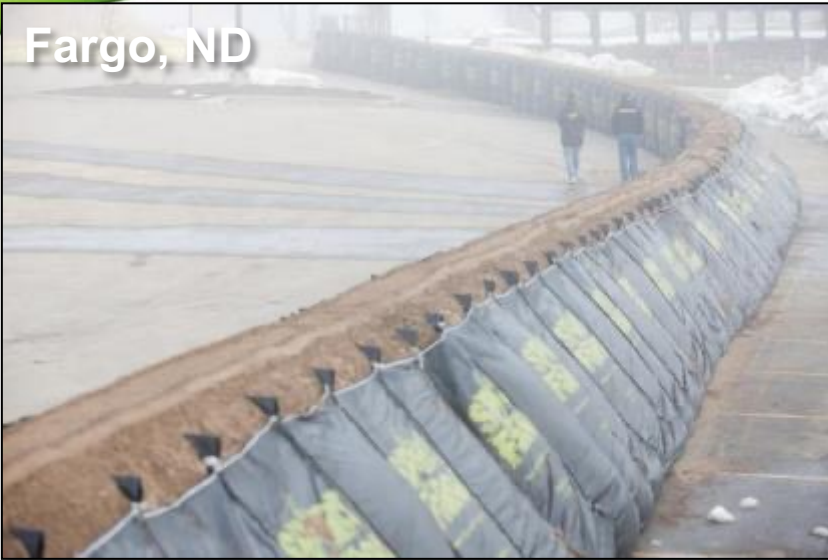
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# City Flood Protection



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Fargo, ND



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# Flood Protection



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**Bismarck - North Dakota**



# Flood Protection



**BARRIER SYSTEMS**

**Bismarck - North Dakota**



**During the Flood**



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# Flood Protection



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**USDOT & Iowa DOT**



**Highway I-29 Iowa/Nebraska**



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# Flood Protection



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# Flood Protection



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**Minot, North Dakota**



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# City Flood Protection



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Grand Rapids, Michigan



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# Infrastructure Flood Protection



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# Infrastructure Protection



**BARRIER SYSTEMS**

NJ Transit



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# Infrastructure Protection



**BARRIER SYSTEMS**



**NJ Transit**



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# Coastal Erosion



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# Coastal Erosion



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Sarasota, FL



**A Cellular Barrier System designed for rapid installation with the highest protection**



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**Cellular Barrier Systems**

# Coastal Protection



**BARRIER SYSTEMS**



Daytona Beach, FL



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**Cellular Barrier Systems**



# Coastal Protection



**BARRIER SYSTEMS**

Daytona Beach, FL



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**Cellular Barrier Systems**

# Coastal Protection



**BARRIER SYSTEMS**

Daytona Beach, FL



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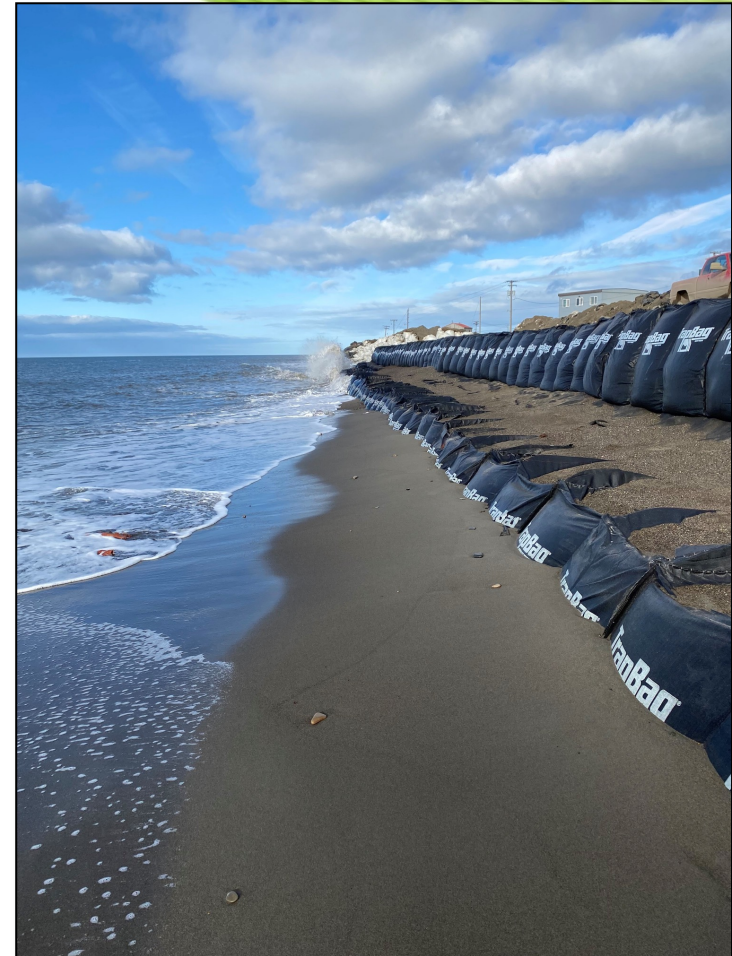
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# Coastal Protection



**BARRIER SYSTEMS**

Barrow, Alaska



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# River Bank Stabilization



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**BEFORE**



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**Cellular Barrier Systems**

# River Bank Stabilization



**BARRIER SYSTEMS**



**AFTER**



# River Bank Stabilization



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**Cellular Barrier Systems**

# Product Comparisons



	Sandbags	Muscle Wall	TrapBag
Flood Protection	✓	✓	✓
Erosion Control	X	X	✓
Mudflow Redirection	X	X	✓
Raise Levees	X	X	✓
Cofferdam	X	X	✓



# Product Comparisons

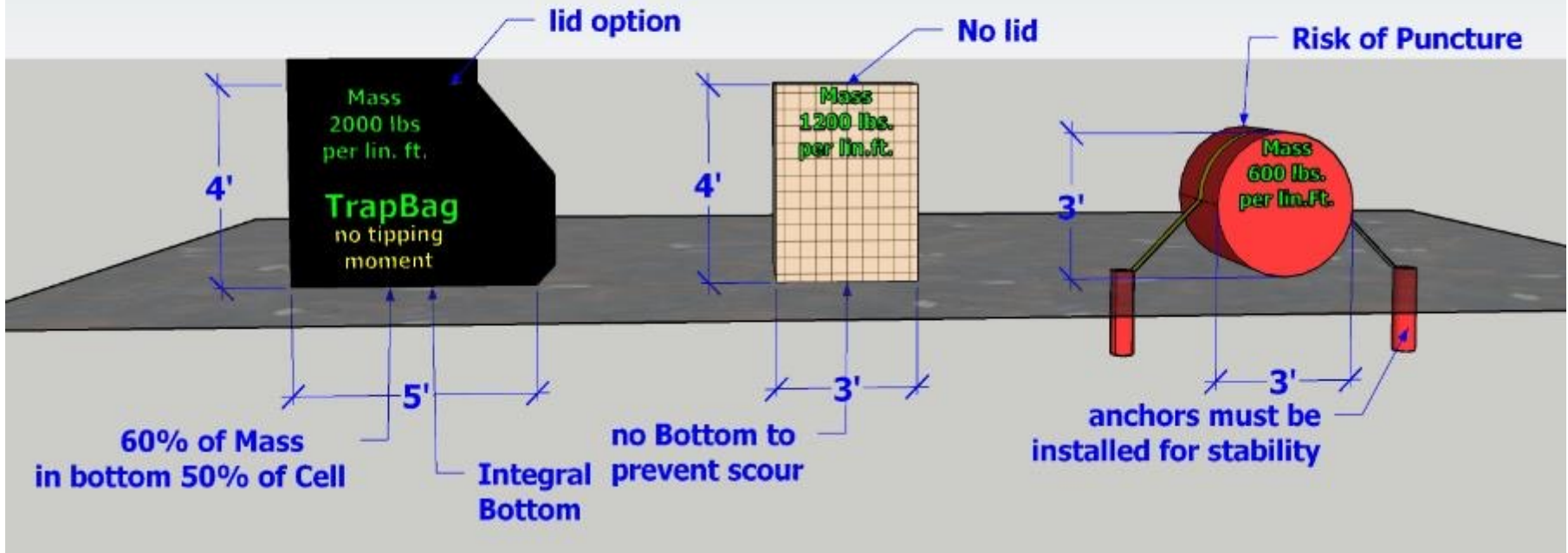


**BARRIER SYSTEMS**

**Safety Factor  
3.66 to 1  
at over topping**

**Safety Factor  
2.4 to 1  
at over topping**

**Safety Factor  
2.2 to 1  
at over topping**





# Cost Comparisons



**Cost Comparison for 1 Mile of Barrier**

	<b>TrapBags</b>	<b>Sandbags</b>
Unit Pricing	\$46.00/Lin. Ft.	\$0.24/bag
Units Needed	5,280	422,400
<b>Product Cost</b>	<b>\$242,880.00</b>	<b>\$101,376.00</b>
Hourly Rate	\$45.00	\$45.00
Laborers Needed	3	3
Install per Hour	250 Lin. Ft.	60 Bags
<b>Total Install Time (Hours)</b>	<b>21</b>	<b>7,040</b>
<b>Labor Cost</b>	<b>\$2,835.00</b>	<b>\$950,400.00</b>
Front End Loader Cost	\$500/day	
Days	3	
<b>Equipment Cost</b>	<b>\$1,500.00</b>	
<b>TOTAL COST</b>	<b>\$247,215.00</b>	<b>\$1,051,776.00</b>

**TrapBags save over 75% in costs and are over 300 times faster to install**

## Time Comparison

Over 330x faster to install  
**(21 hours vs 7,040 hours)**

## Labor Comparison

TrapBag Barriers  
 21 Hours x \$45 = \$945 per employee  
 \$945 x 3 Employees = **\$2,835 TOTAL**

Sandbags  
 7,040 Hours x \$45 = \$316,800 per employee  
 \$316,800 x 3 Employees = **\$950,400 TOTAL**

**Reduced Labor = Reduced Injuries**



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# Customer History



- New York City Parks Department
- Con Edison
- New York Metropolitan Transportation Authority
- New Jersey Transit authority
- State of New York DEP
- New York State DOT
- Long Island Power Authority
- PSEG
- National Grid
- US Department of Agriculture
- US Department of Transportation
- Iowa Department of Transportation
- Nebraska Department of Transportation
- North Dakota Emergency Management
- North Dakota DOT
- North Dakota National Guard
- City of Fargo, ND
- Cass County, ND Emergency Management
- City of Sioux Falls, SD
- City of Hays, KS
- Walsh Construction
- Kiewit Construction
- PCL Bridge
- Northwestern University
- Chicago Parks District
- City of Chicago
- City of Grand Rapids
- City of Colorado Springs
- Colorado DOT
- Shawnee Mission KS, Wastewater Dept.
- US Marine Corps, Okinawa
- US Navy, Spain
- US Air Force, Air Force Academy
- United States Army Corps of Engineers
- State of Louisiana
- Pontchartrain Levee District
- Nebraska Public Power District
- Omaha Public Power District
- Sarasota County
- City of Sarasota
- Kenya Coastal Erosion projects
- Panamá Canal Zone
- UAE Coastal Hotels
- Barrick Gold - Canada, Argentina, California and Nevada
- Vale Mining
- Gold Corp
- Eldorado Gold, Turkey
- North Slope Borough (Barrow, Alaska)
- Province of Saskatchewan
- Alberta, Canada
- Volusia County
- Florida Division of Emergency Management
- Daytona Beach
- Flagler Beach
- Ponte Vedra Beach
- New Smyrna Beach



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# References



## **Florida Department of Emergency Management (FDEM)**

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# Contact Information



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