

Ultimate Turbidity Curtain Guide

What is a Turbidity Curtain?

Floating turbidity curtains (a.k.a. turbidity barriers, silt booms, sediment curtains) are a temporary in-water sediment barrier consisting of a continuous geotextile fabric curtain suspended from a flotation device on the water surface and held in a vertical position by ballast weight at the bottom.

What Are Turbidity Curtains Used For?

To provide erosion and sediment control from an up-slope land disturbance, or within a body of water during marine construction projects, thereby preventing anything from floating downstream and affecting marine life.



Anatomy of a Turbidity Curtain

A turbidity curtain is built from several components that work together to float, hold shape, and contain sediment.



Flotation System: Buoyant units in a sleeve along the top of the curtain, sized to keep at least 3 inches of freeboard above water.

Curtain Skirt: The fabric wall that hangs below the float. Permeable skirts let water pass while trapping sediment; impermeable skirts block flow entirely for still-water containment.

Top Load Line: A vinyl-sheathed steel cable (10,000+ lb break strength) running along the top of the curtain, required on Type 2 and 3 curtains to handle current and wave loads.

Bottom Load Line (Ballast Chain): A chain sewn into the bottom hem that weighs the skirt down and keeps it hanging vertically.

Seams and Connectors: Thermally welded or sewn seams, joined between sections with ASTM universal connectors, pins, and shackles.

Anchoring Hardware: Land anchors (auger, rope, connector) for calm water; water anchors (grappling/plow/fluke anchor, chain, buoy) for moving or tidal water.

Tidal Compensators: Manage anchor line slack so the skirt stays at a consistent depth as tide rises and falls.

Marker Lights and Buoys: Bright colors and, where required, lights and buoys for boater visibility and safety.

Conditions Where Practice Applies

Erosion and sediment control practices are used whenever construction activities in tidal or non-tidal bodies of water lead to unavoidable silt and sediment movement.

Planning Considerations

Marine construction, installing a pier, dredging, repairing a seawall, etc, typically causes soil erosion into a body of water, as can land-based runoff from hill erosion, which leads to suspended particles in the water. Depending on the current or wave action, this suspended sediment can travel small or large distances and affect water turbidity and marine life, including fish feeding behavior. For one example, salmon need clear water to see their prey, such as aquatic insects, yet many of these prey feed on suspended organic particles that cloud the water. Additionally, high turbidity blocks sunlight, preventing seaweed and algae, the primary producers of the entire aquatic ecosystem, from photosynthesizing. This can destroy entire food chains. The purpose of a turbidity curtain, then, is to deflect and contain sediment within the immediate designated area.

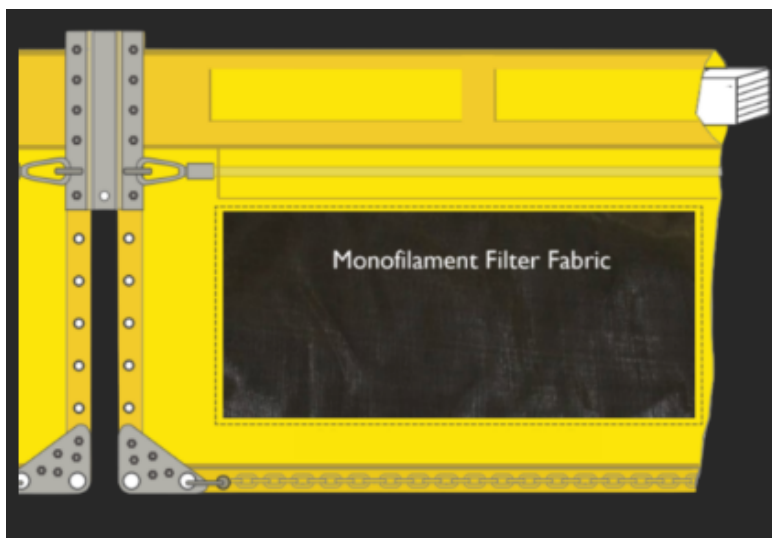


During the planning phase, one of the key factors in designing the correct turbidity curtain is water flow conditions. This guide pertains mostly to minimal or moderate flow conditions, such as 5 feet per second (approximately a 3 knot current). It is recommended to consult Enviro-USA for situations with water flow exceeding 5 feet per second.



Another critical element is the water direction. Because turbidity curtains are not dams and are not designed to stop water flow, but are instead designed to trap sediment, they should rarely be installed across channel flows.

Whenever a turbidity curtain is to be used in moving water conditions such as a river, shoreline or offshore, special attention must be given to allow the volume of water contained within the barrier to fluctuate. Because the containment system includes land and/or water anchors, it is important to take into account tides and/or rising water situations in order to ensure the floating barrier does not submerge. Also, a permeable curtain should be used



if the curtain is to remain in roughly the same location. The permeable woven filter fabric allows the water to pass through the curtain and keep sediment confined to the work area. Water flow and sediment particle size should therefore be taken into consideration when designing a turbidity curtain.

When the project is complete and the turbidity curtain needs to be removed, soil particles should be allowed to settle for at least 12-24 hours prior to the removal of the equipment.



Inspection and Maintenance of a Turbidity Curtain

Regular inspections and preventative maintenance are essential to keeping turbidity curtain systems secure, effective, and ready for changing site conditions. Before a major storm or severe weather event, inspect the curtain, floats, ballast chain, anchors, connections, and other components to identify existing damage or weak points. Confirm that anchoring systems are secure and that the curtain is properly positioned, and remove debris or other materials that could create additional stress during high winds, strong currents, flooding, or heavy wave action. Check load-bearing components such as cables, shackles, anchors, and connectors for corrosion, buildup, wear, or damage. Cables and anchor lines may require periodic retensioning or adjustment to maintain the intended curtain position.

After a storm, the system should be inspected again for damage, displacement, excessive wear, debris buildup, or compromised anchors and connections before normal operations resume. Addressing issues before and after severe weather can help reduce unexpected failures, costly repairs, and project downtime.

Marine growth, sediment, and debris can add weight to the curtain and reduce freeboard or system performance. Regularly remove algae, barnacles, and other buildup using a stiff PVC-bristled broom or appropriate pressure-washing methods. When possible, clean curtain sections on shore and avoid dragging them across rocks, concrete, or other abrasive surfaces. Rinse the curtain thoroughly and allow it to dry completely before redeployment or storage.

For a more detailed step-by-step inspection process, check out our Storm Turbidity Curtain Checklists. For additional guidance on preparing turbidity curtains for severe weather and protecting your system during storm conditions, see our Storm Guide. For routine inspections and ongoing maintenance, the Turbidity Curtain Inspection Log is provided on the following page for easy reference throughout the project.





PROJECT NAME:

Location:

Inspection Date:

Inspector's Name:

Contact Information:

Present Phase of Construction:

Type of Inspection:

☐

Regular

☐

Pre-storm event:

☐

During Storm event:

☐

Post-storm event:

Signature
of Inspector:



Fig 1

Check curtain for marine growth, clean if necessary. Ensure skirt has not become buried in debris or sediment. Properly functioning curtain should be approximately 1 foot from the bottom sediment at all times. Check connections, buoys and mooring lines for marine growth, clean if needed. Re-positioning or re-tensioning of anchors may be required periodically.

Fig 1

Curtain should be deployed and anchored according to current and site conditions. In the case of deployment at typical pipeline disposal operations, the curtain provides an enclosure where some of the fine-grained material may flocculate and / or settle. The silt curtain does not indefinitely contain turbid water but instead controls the dispersion of turbid water by diverting the flow under the curtain, thereby minimizing the turbidity in the water column outside the silt curtain. Where as properly deployed and maintained silt curtains can effectively control the distribution of turbid water, they are not designed to contain or control fluid mud. When the accumulation of silt, debris, or fluid mud reaches the depth of the ballast chain along the lower edge of the skirt, the curtain must be moved away from the discharge; otherwise sediment accumulation on the lower edge of the skirt can pull the curtain underwater and eventually bury or tear it.

(See Fig 2)

Recommended Frequency:

- DAILY: High marine-traffic, construction, high-current, wind or wave conditions
2-3 WEEKS: Calm water, little traffic and minor wind or wave conditions
* Turbidity Curtains should be removed prior to severe storms, and should be inspected following a weather event.

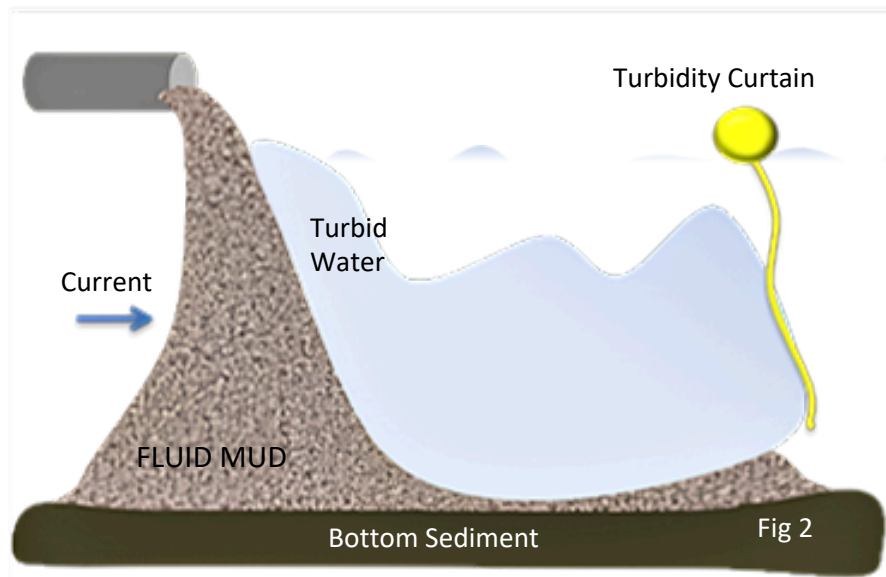


Fig 2

TURBIDITY CURTAIN INSPECTION LOG



Company:	
Date:	
Inspected by:	
Location / Project:	
Curtain Type:	

Section Numer: _____ of _____

Starting at shore or first anchor point - move along each section to final mooring point

Inspection:	Y/N	Condition	Recommended Action	Action Taken
Freeboard as designed is maintained:				
Check skirt, floats and connections for marine growth:				
Sediment Loading on the skirt:				
Skirt is free of debris, not buried in sediment:				
Ballast chain not buried in debris or sediment:				
Floats are free of damage:				
Load bearing components secure:				
* Proper attachment				
* Free of build up				
* No corrosion that will affect performance				
* Cables - free of damage, marine growth or wear				
* Shackles - free of damage, growth or wear				
* Anchors - intended anchoring profile intact?				
* Re-positioning or re-tensioning required?				
* Additional anchoring required?				
* Anchor or mooring lines free from growth, or corrosion?				
* Anchor and mooring lines not submerged?				
* Connectors intact, free from damage?				
* Reefing lines, if applicable, secure?				
* Curtain fabric is free from tears, abrasion, or wear?				
* Fastenings are secure and free from corrosion or marine growth?				
* Turbid water is contained in deployment area?				
* Deflective barrier required to reduce flow and increase settling time?				

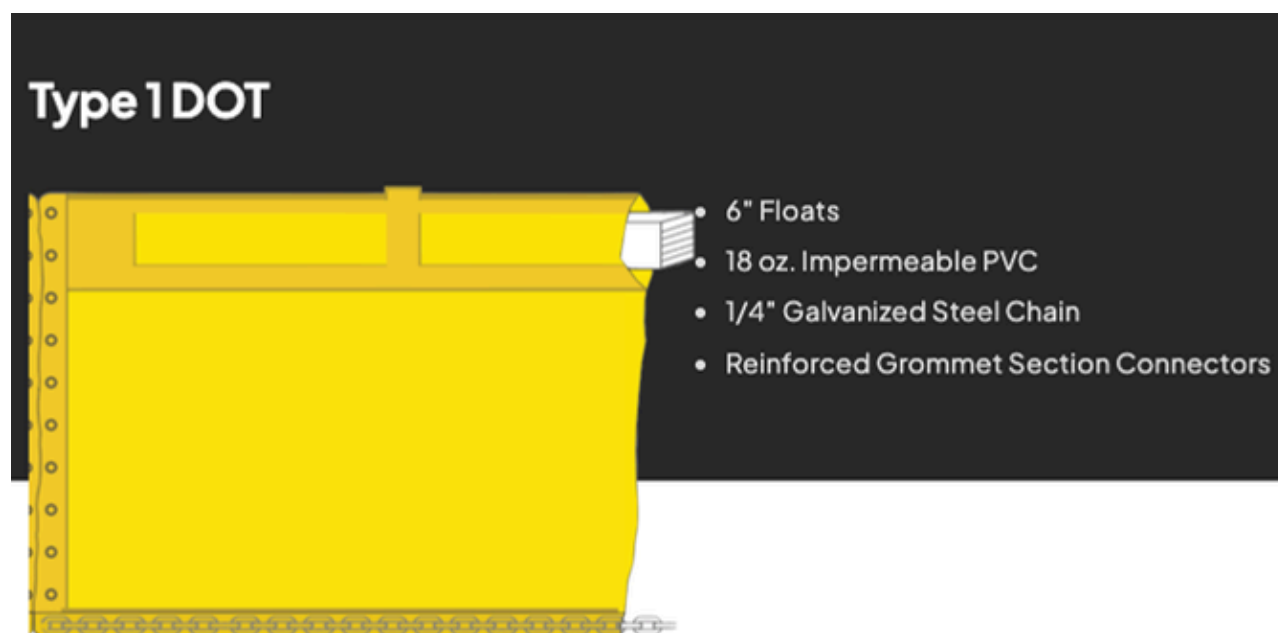
Design Criteria

Types

The industry recognizes three types of turbidity curtains:

Type 1

Type 1 (or type I as referred to by some states) are considered light duty and should be used in protected areas where there is no current and the area is sheltered from wind and waves.



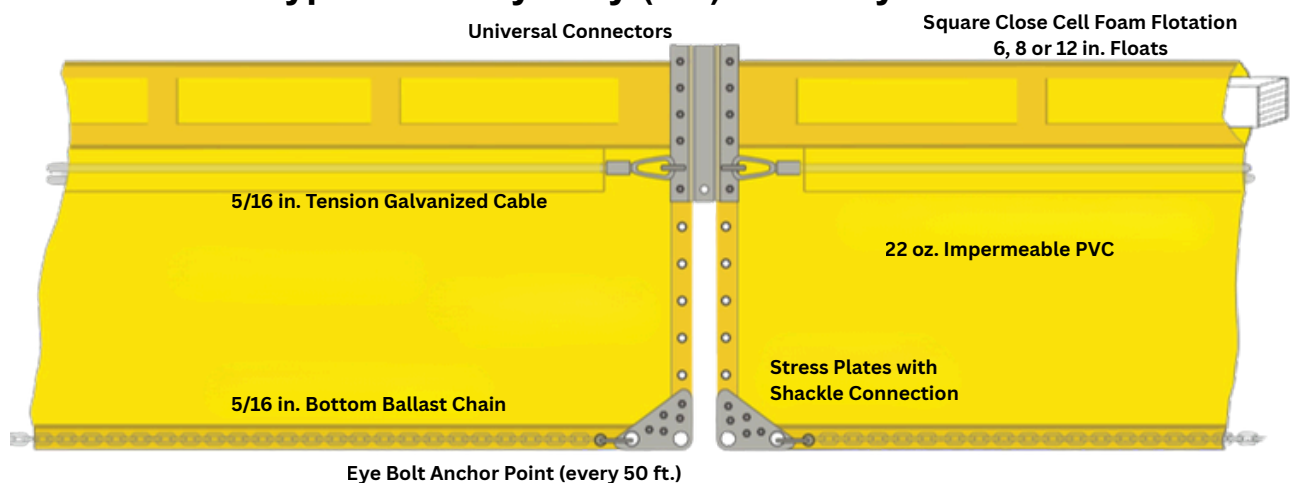
TYPE 1 Turbidity Curtain for calm water applications.



Type 2

Type 2 (type II) are permeable or impermeable barriers that should be used in areas with small or moderate current (up to 2 knots or waves up to 2 feet) and/or wind and wave action can affect the curtain. Common applications include lakes, reservoirs, sheltered bays, marinas, rivers, canals, and protected coastal waters.

Type 2 - Heavy Duty (HD) Turbidity Curtain



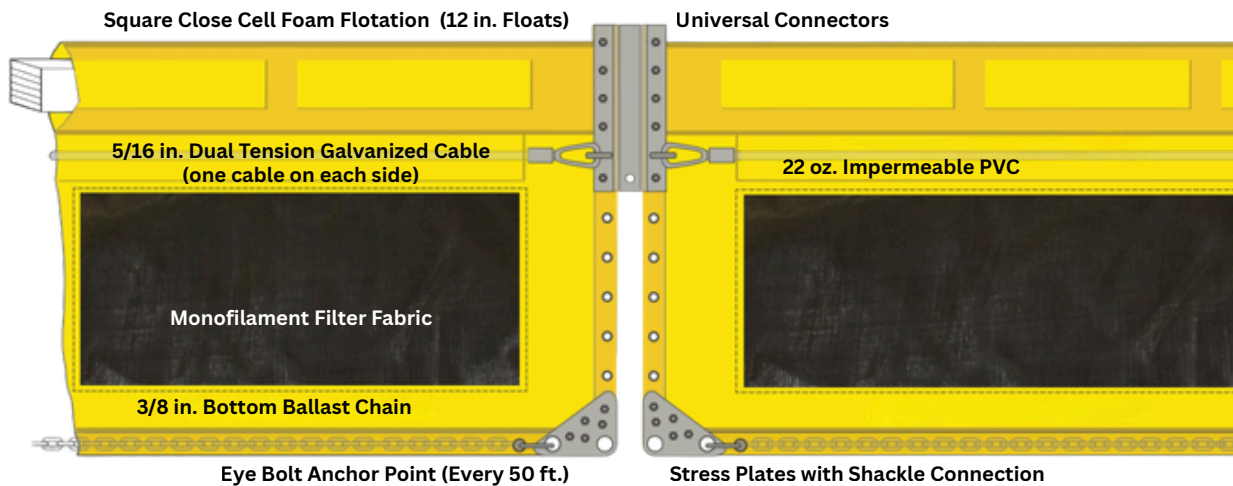
TYPE 2 Turbidity Curtain for moving water applications



Type 3

Type 3 (type III) are permeable or impermeable curtains that should be used in areas where considerable current (up to 3 knots or waves up to 3 feet) is present and/or tidal wave action and wind can affect the floating barrier.

Type 3 - Heavy Duty (HD) Permeable Curtain



TYPE 3 Turbidity Curtain for tidal water applications

Once the current, wind and wave conditions are determined and one of the three types of turbidity barriers is selected, other criteria should be considered to design the system properly:



Depth

In situations where the construction area is not subject to tidal action and/or significant wind and wave forces, the turbidity barrier should extend the entire depth of the body of water.

However, in tidal and/or wind or wave action situations, the curtain should never extend to the bottom. Instead, a minimum of 1 foot between the skirt and the bottom should exist so that the movement of the skirt generated by tidal back and forth motion does not fan or stir sediments. In deep water, the skirt height is usually no more than 10-12 feet. A longer draft increases the load and strain on the mooring system and can also increase the likelihood that the curtain will billow upward towards the surface under the pressure of the moving water. The potential effect is an effective depth which is significantly less than the skirt depth, which would reduce the curtain's effectiveness.



Placement and Layout

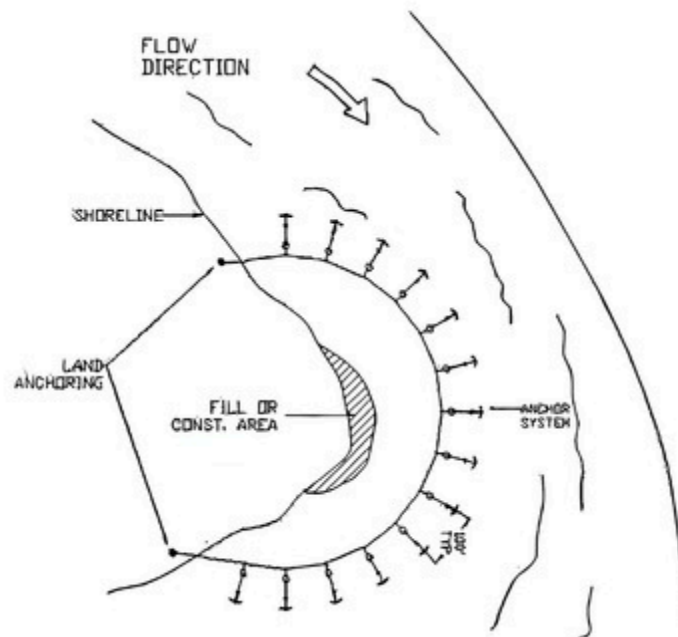
Turbidity curtains should be placed parallel to the direction of flow of a moving body of water to mitigate the load and strain on the system. Figure 1 shows typical layouts for protected bodies of water applications (streams, ponds, lakes, etc.) and tidal waters and/or heavy wind and wave action applications (harbors, shoreline, etc.)



TURBIDITY CURTAIN - TYPICAL LAYOUT AND ANCHORING

TYPICAL CONFIGURATION: PROTECTED AND NON-TIDAL BODIES OF WATER

FIG.1



TYPICAL CONFIGURATION: TIDAL CONDITIONS, HEAVY WIND AND (OR) WAVES.

FIG.2

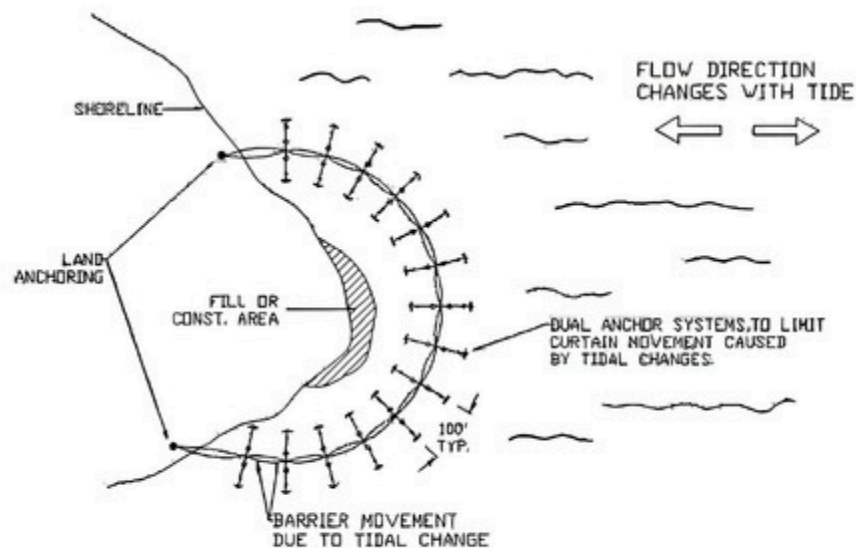


Figure 1 – Turbidity Curtain Layout and Anchoring



Total Length

When sizing the length of the barrier, it is recommended to add 10-20% to allow for measuring errors, facilitate installation and reduce the stress from potential wave and/or current action.

Section Length

Turbidity barrier sections can be connected together but it is good practice to minimize the number of joints. 50-foot sections are the industry minimum benchmark, but sections usually never go beyond 100 foot sections for stability considerations. Enviro-USA's floating turbidity curtains are available with permeable or non-permeable skirt, in 50 & 100 ft sections or any custom length up to 100 feet.



Anchoring

The integrity of a turbidity barrier largely depends on the ends being secured firmly to land and/or water. Both the floating ends and weighted lower ends must extend well into the shoreline so that the work area where sediment may enter the water is fully enclosed. Trees and other large solid objects can be used to attach the ends of the curtain.

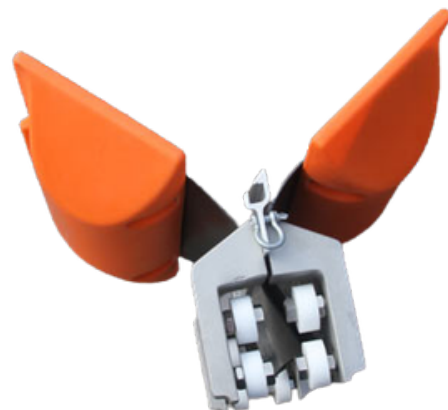


Tidal Compensators: Managing Water Level Fluctuation

Tidal cycles constantly change water depth, and a fixed-length barrier can't keep up. As water rises, a rigid skirt gets pulled taut and may submerge, losing containment at the surface. As water falls, slack material can pool on the bottom and drag in silt. Tidal compensators solve this by letting the barrier float freely with the tide instead of fighting against it.

How Do Tidal Compensators Work?

A tidal compensator is a slack-management system built into the anchor line or float assembly, usually a spring-tensioned cable, a counterweighted pulley, or a sliding collar on an anchor pile. As the tide rises, the compensator pays out line so the barrier can rise with the water. As it falls, tension is taken back up so the skirt doesn't bunch or drag on the bottom. The barrier keeps a consistent freeboard and skirt depth across the full tidal range instead of one sized for a single water level.



Why Do I Need Tidal Compensators?

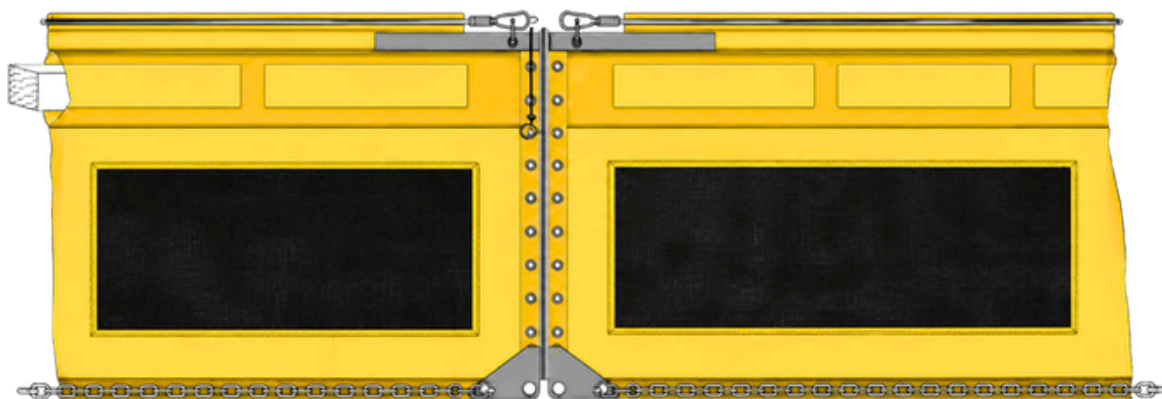
Without compensation, crews often have to manually re-tension or re-stake barriers on a tidal schedule, which adds labor cost and increases the risk of anchor failure. Compensators keep containment consistent around the clock, not just at the tide level the barrier was installed at.



Permeable and Impermeable Skirt

For situations with still water and little or no flow into the containment area, the fabric can be impermeable, creating a containment barrier. However, silt curtains are not designed as water impoundment dams and should not be expected to stop the flow of a significant amount of water. In general, the purpose is to isolate the immediate work area and allow sediment to settle out of suspension. That is why a permeable skirt is typically used. Follow the manufacturer's recommendations to determine the permeability properties of the curtain.

Permeable	Impermeable
Higher Current	Calm Water
Reduces Hydraulic Pressure	Maximum Containment
Deep Water	Protected Areas
Better During Tides	Better in Ponds



Construction Specifications

1. Color: Barriers should be a bright color such as yellow or orange to draw attention of boaters.

2. Curtain Skirt Fabric: Must meet the minimum requirements in terms of thickness, weight, tensile strength and UV inhibitor. See table 1.

3. Seams: All seams are thermally welded or sewn.

4. Floats: Flotation devices shall be flexible, buoyant units contained in an individual flotation sleeve or collar attached to the curtain. Buoyancy provided by the flotation units must be sufficient to support the weight of the curtain and maintain a freeboard of at least 3 inches above the water surface level.

5. Load lines: Must be fabricated into the bottom of all floating turbidity barriers. Type 2 and 3 must also have load lines also fabricated into the top of the fabric. The top load line consists of vinyl-sheathed steel cable and should have a break strength in excess of 10,000 pounds. The bottom load line consists of a chain incorporated into the bottom hem of the barrier of sufficient weight to serve as ballast to hold the curtain in a vertical position. Additional anchorage should be provided as necessary. The load lines should have suitable connecting devices which develop the full breaking strength for connecting to load lines in adjacent sections.



6. Anchors: There are two types of anchoring systems:

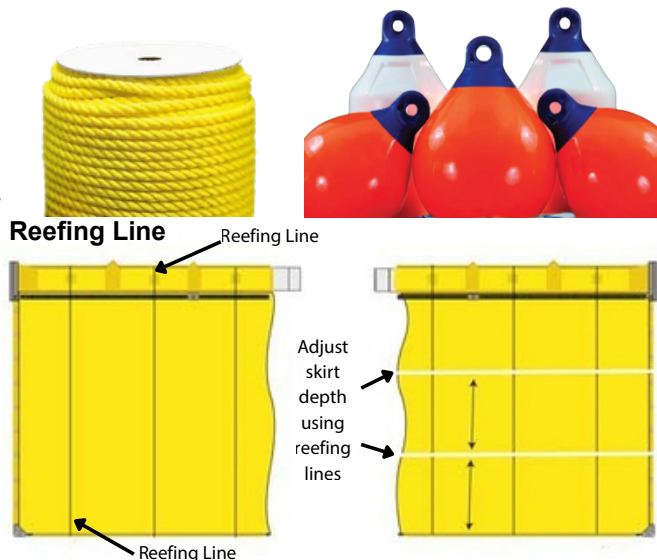
- Land anchors usually consist of a marine-grade grade universal connector, some poly rope and a 15" or 30" ground auger anchor. Typically Type 1 applications require only land anchors.
- Water anchors include an anchor, a leader chain, some nylon rope, a heavy-duty marker buoy and 6 feet of painted line. Typically, water anchors are a requirement for any Type 2 or Type 3 moving water silt curtain. The anchor itself can be a grappling hook, plow or fluke-type and digs into the bottom. The nylon rope acts as an anchor line between the anchor and the buoy. When used with Type 3 applications, the anchor lines must have enough slack to allow the barrier to float freely with tidal changes without pulling the curtain down.



7. Buoys and Marker Lights: High-visibility marker buoys and warning lights must be installed along the barrier perimeter to alert marine traffic, especially at night or during low visibility. Buoys are required at all anchor points, corners, and terminal ends. Solar-powered, flashing LED lights visible for at least one nautical mile must be attached to buoys or top flotation units at required intervals per local regulatory standards. All lighting attachments must be installed without compromising the curtain's buoyancy or freeboard.



8. Reefing Lines: Reefing lines are used to adjust or temporarily raise the depth of the curtain skirt to prevent it from dragging on the bottom during deployment, retrieval, or fluctuating tides. Constructed from UV-resistant rope or heavy-duty webbing, these lines are spaced at regular intervals along the barrier, connecting the flotation collar to the bottom load line. Securing the reefing lines lifts the lower portion of the skirt, protecting the curtain fabric from tearing on underwater debris and avoiding unwanted sediment disturbance.



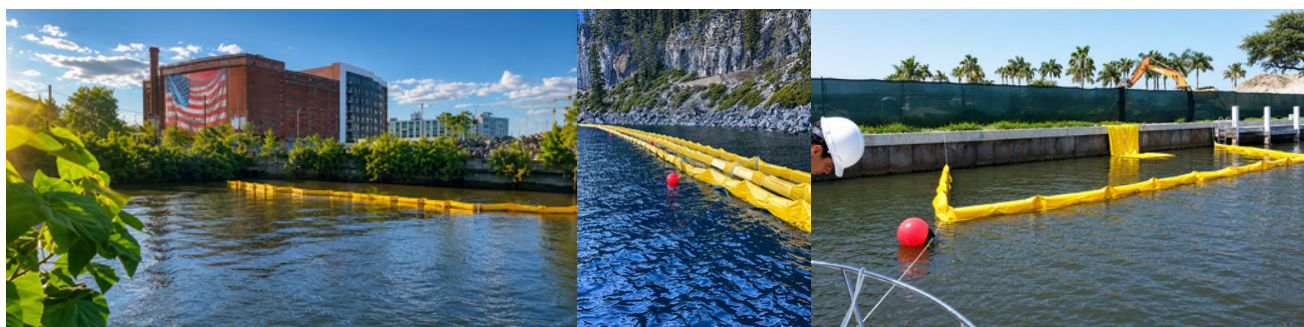


Table 1: **Turbidity Barrier Skirt Fabric Requirements**

Physical Property	Requirement
Thickness	45 mils
Type	Weight in ounces per square yard
– Type 1	18 oz.
– Type 2	18 or 22 oz.
– Type 3	22 oz.
Grab Tensile Strength	300 lbs for 18 oz. and 500 lbs for 22 oz.
UV Inhibitor	Must be included

Installation

Calm water applications typically require a **Type 1 installation**. First, the curtain end stakes and anchors are set. Then, the turbidity barrier is towed in the furled condition and attached to the stakes and anchor points. Once it is determined that the floating barrier is securely attached, the furling lines can be cut to unfurl the skirt and let it drop.

Moving water applications will require a **Type 2 or Type 3 installation**. The first step is to set all the anchors (including anchor buoys) and pay special attention to the holding power of these anchors to retain the barrier under the actual current or tidal conditions. In addition, tidal applications require anchors to be installed on both sides of the curtain to resist currents in both directions. Then, the furled curtain can be put in the water. The furled curtain be towed and secured to the upstream anchor point, then sequentially attached to each next downstream anchor point until the

entire curtain is in position. If the position, buoyancy and anchors are satisfactory, then the furling lines can be cut so that the skirt drops.

When water anchors are used, always attach them to the flotation device and never to the bottom of the curtain skirt as it could damage the curtain.

Maintenance During Your Project

1. Maintaining the curtain will ensure the continuous protection of the watercourse.

2. The turbidity curtain shall be inspected daily, with additional monitoring of performance during storms or increased flow and/or wind events.



3. Any visible plume of cloudy water passing beyond the curtain from the enclosed construction area shall constitute inadequate performance of the turbidity curtain. The Contractor shall immediately modify, adjust, or repair any portion of the turbidity curtain to correct inadequate performance. Consult the manufacturer if necessary as repair kits are available.

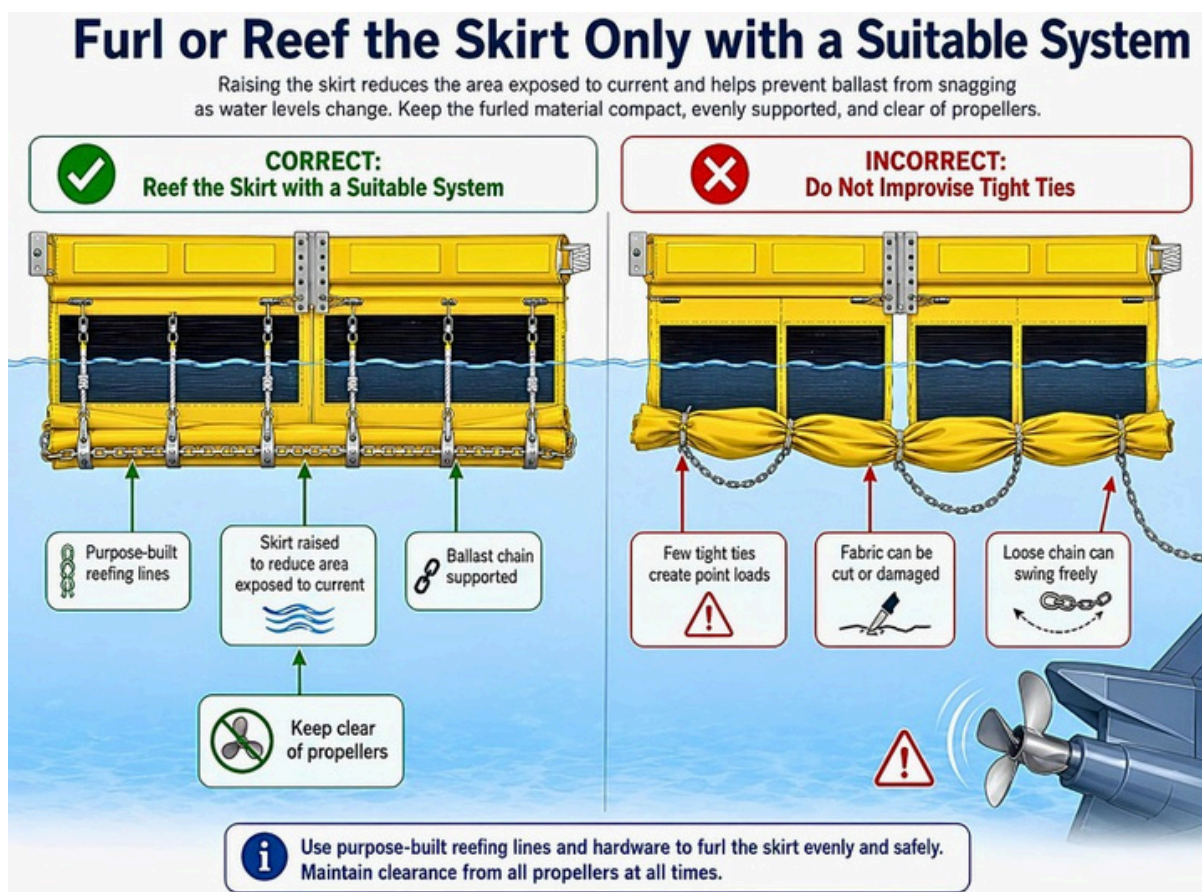
4. The turbidity curtain shall remain in place until the protected construction activities are complete and the turbidity of the water enclosed is reduced to acceptable levels.



Common Mistakes to Avoid

Avoiding these common mistakes can improve barrier performance and reduce costly repairs.

- Installing a barrier perpendicular to strong current.
- Using the wrong curtain type for site conditions.
- Failing to inspect anchors before deployment.
- Allowing the skirt to drag across the bottom in tidal conditions.
- Using damaged connectors or worn load lines.
- Removing the curtain before suspended sediment has settled.



Frequently Asked Questions

What is a turbidity barrier?

A turbidity barrier is a floating sediment containment system used during marine and shoreline construction to prevent suspended sediment from spreading beyond a work area. It consists of flotation, a geotextile skirt, ballast chain, and an anchoring system that allows water to flow while containing sediment.

How does a turbidity barrier work?

Step 1: Floating boom stays on surface

Step 2: Skirt hangs underwater

Step 3: Sediment Settles

Step 4: Cleaner water exits

When should you use a turbidity curtain?

Use a turbidity curtain whenever in-water construction or maintenance may disturb sediment and increase turbidity. They are commonly used for dredging, shoreline work, bridge construction, marina projects, and other activities that require sediment containment.

What's the difference between a turbidity curtain and a silt fence?

A silt fence is a staked, land-based erosion control device used on slopes and disturbed soil before runoff reaches water. A turbidity curtain is a floating, in-water barrier used once work is occurring within or adjacent to a body of water.

How do you choose the right turbidity curtain for your project?

Choose a turbidity curtain based on the water conditions, current speed, wave action, and project requirements. Selecting the correct type, skirt depth, and anchoring system helps ensure effective sediment containment and reliable performance.

What type of turbidity curtain do I need?

The right turbidity curtain depends on your project conditions. Type 1 is designed for calm, protected waters, Type 2 for moderate current and wave action, and Type 3 for stronger currents and tidal environments. Choosing the correct type helps ensure effective sediment containment.

What size turbidity curtain do I need?

The right turbidity curtain depends on water depth, current, wave action, and project conditions. Type 1 is best for calm water, Type 2 for moderate currents, and Type 3 for tidal or high-current environments. Add 10-20% extra length for installation and changing water conditions, and in tidal areas, keep the skirt at least 1 foot above the bottom.



Can turbidity barriers be custom manufactured?

Yes. Turbidity barriers can be custom manufactured to project specs, including skirt depth, permeable or impermeable fabric, section length (standard 50 or 100 ft, or custom up to 100 ft), color, and hardware for fresh or saltwater use. Contact Enviro-USA to discuss requirements for your site.

How much does a turbidity curtain cost?

The cost of a turbidity curtain depends on several factors, including the curtain type, length, skirt depth, fabric weight, anchoring system, and project conditions. Custom configurations and accessories can also affect the overall price.

Do turbidity curtains require a permit?

Often, yes, particularly for tidal waters, wetlands, or navigable waterways. Requirements vary by state and by the governing agency (e.g., Army Corps of Engineers, state DEP/DEQ). Always confirm permit conditions before deployment, as some permits specify curtain type, depth, or monitoring requirements.

How much current can a turbidity curtain withstand?

It depends on the curtain type:

Type 1: No current — calm, protected water only.

Type 2: Up to 2 knots (3.5 ft/sec), with some wind and wave exposure.

Type 3: Up to 3 knots (5 ft/sec), for tidal or higher-current areas.

Above 5 ft/sec, standard curtains aren't recommended, consult a manufacturer for engineered solutions.

What's the minimum water depth for a floating turbidity curtain?

There's no strict minimum, but the skirt should maintain at least 1 foot of clearance above the bottom in tidal/wave conditions to prevent sediment resuspension, meaning the practical minimum depth is the skirt height plus that clearance.

Can you install turbidity curtains in rivers?

Yes, using a Type 2 or Type 3 curtain depending on current speed. Curtains should be placed parallel to the flow direction, never perpendicular, since they're designed to contain sediment, not stop water flow like a dam. For currents above 5 ft/sec, consult the manufacturer for site-specific engineering.

Can turbidity curtains be used in saltwater?

Yes. Marine-grade hardware (stainless or hot-dip galvanized connectors, corrosion-resistant chain) should be specified for saltwater or brackish applications to prevent premature hardware failure.



Can a turbidity curtain stop all sediment?

No. Curtains are designed to contain and settle sediment within a work area, not to filter 100% of suspended particles. A visible plume beyond the curtain can indicate inadequate performance. Check the curtain's positioning, anchors, skirt depth, connections, and sediment loading, then adjust or repair the system as needed. Additional anchoring or a deflective barrier may be required if flow is preventing adequate settling.

Can I connect curtains from different manufacturers?

Not recommended. Connector hardware, load line specs, and grommet spacing vary by manufacturer, and mismatched systems can compromise the barrier's strength rating and watertight integrity at the joint.

What are common causes of turbidity curtain failure?

- Installing the barrier perpendicular to strong current
- Using the wrong curtain type for site conditions
- Anchors that weren't inspected or lack sufficient holding power
- Skirt dragging the bottom in tidal conditions, stirring up sediment
- Damaged connectors, worn load lines, or torn skirt fabric
- Debris buildup adding excess load to the system

What happens if a curtain gets a hole or tear?

Repair kits (fabric patches, thermal welding tools, sewing supplies) should be kept onsite. Minor damage should be repaired immediately; larger failures may require pulling the affected section for shop repair or replacement.

Can turbidity curtains be reused?

Yes. Turbidity curtains can be reused if they are properly cleaned, inspected, repaired when needed, and stored correctly between projects. Regular maintenance helps extend their service life. Before reuse, clean and fully dry the curtain, inspect for damage or worn components, and make any necessary repairs. Curtains exposed to hydrocarbons should also be properly decontaminated before reuse.

How long does a turbidity curtain last?

With proper storage, cleaning, and seasonal inspection, a well-maintained curtain typically lasts several construction seasons. UV exposure, abrasion, and improper furling are the most common causes of premature wear.

How should a turbidity curtain be stored?

Store the curtain under cover, away from direct sunlight, weather, sharp objects, and potential flood or surge levels. Before storage, rinse and clean the curtain, repair damaged components, and allow it to dry completely. If the curtain has been exposed to hydrocarbons, follow appropriate decontamination procedures before reuse.



How to Remove a Turbidity Curtain.

1. The turbidity curtain should be removed in such a way as to minimize release of sediment.

2. Sediment behind the curtain should be removed before removal of the curtain, if directed by the engineer or the authorities. If so, any resulting turbidity should be allowed to settle before removal proceeds.



3. The site selected to bring the curtain ashore should be free of sharp objects such as rocks, construction materials, cement, etc. in order to minimize the risk of damage when pulling it out of the water and hauling over the area.

4. Whenever a curtain has a deep skirt, it is recommended that the skirt be furled before removing the equipment from the water.

5. The curtain shall be removed within 72 hours after the water turbidity has been reduced to acceptable levels.

Please feel free to **contact Enviro-USA™** to ask any questions about floating turbidity curtains. We will be happy to answer any questions or provide DOT specification information for your state.

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