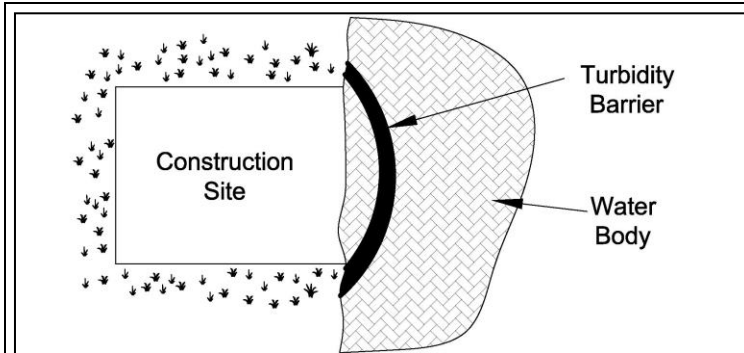


3.14 Turbidity Barrier

Sediment Control



Description: A turbidity barrier is a floating geotextile or PVC curtain that is designed to control sediment within a body of water. It is also known as a floating silt barrier or turbidity/silt curtain. The barrier typically consists of floats, curtain, ballast, and anchor lines. The barrier may be permeable or impermeable. Barriers of 100 feet or longer are constructed of a series of connected panels.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Barrier specified based on depths and velocities in the water body in which the barrier is installed
- Installation and anchoring according to manufacturer's recommendations
- Height of barrier 10 percent greater than design water depth
- Specified length of barrier 10 to 20 percent greater than design length

ADVANTAGES / BENEFITS:

- Controls sediment from construction activities where other types of down slope barriers are infeasible
- Protects sensitive wetlands and water bodies
- May be re-used on different projects

DISADVANTAGES / LIMITATIONS:

- Limited usefulness in water bodies with high velocities
- May be damaged by a large storm event
- Barrier can be difficult to remove when under heavy sediment accumulations

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Repair or replace fabric as needed
- Re-anchor if dislodged

TARGETED POLLUTANTS

- Sediment
- Nutrients & Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.50-0.90

(Depends on soil type)

IMPLEMENTATION CONSIDERATIONS

- Capital Costs
- Maintenance
- Training
- Suitability for Slopes > 5%

Other Considerations:

- *Conflicts with boat traffic*

3.14.1 Primary Use

Turbidity barriers are used when construction activities will disturb the bank of a perennial stream, river, pond, or lake. They are also used when construction activities require construction of a coffer dam, low water crossing, or other activity that will disturb soil within a water body.

3.14.2 Applications

Turbidity barriers are used on development projects that have a perennial water body within or adjacent to the development. The barrier floats in the water and is anchored at the bottom and/or sides depending on the site conditions. Where construction activities extend down a bank of the water body into the water surface, it is installed along the length of disturbed area and functions as a down slope perimeter control.

The barriers are also used where linear projects cross a water body, development extends into a water body, or temporary coffer dams are installed to facilitate construction. In these applications, the turbidity barrier functions as a sediment trap for soil suspended in the water body by construction activities.

Turbidity barriers are most applicable where special aquatic sites or sensitive receiving waters need to be protected. Examples of these types of waters included wetlands regulated under Section 404 of the Clean Water Act, spring-fed water bodies, water bodies with a Total Maximum Daily Load, construction sites with an effluent limit, and water bodies with species protected under the Federal Endangered Species Act or the State of Texas Threatened and Endangered Species Regulations.

3.14.3 Design Criteria

- Specific design information is required for the use of this control. The designer shall specify the manufacturer, type of turbidity barrier, length, and anchoring mechanism based on the site conditions, range of depths and velocities in the water body, and project duration.
- The type of turbidity barrier must be specified in accordance with the manufacturer's guidance for the depth of water, salinity, velocities, wave height, and project duration.
- If the barrier will be used to contain contaminants in addition to sediment, ensure the barrier's material is compatible with the contaminant of concern.
- Fabrics used to construct the curtain shall be woven and coated for UV protection.
- Fabric minimum grab tensile strength shall be 202 pounds using ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles for velocities of 0.5 feet per second or less. Higher velocities require an engineer's design, typically provided by the manufacturer.
- The height of the barrier shall be 10 percent greater than the design water depth to ensure the bottom of the barrier rests on the ground.
- The physical length of the barrier as purchased from the manufacturer shall be 10 to 20 percent longer than the design length to reduce stress on the barrier and make installation easier.
- Panel lengths shall be a maximum of 100 feet in water less than 13 feet and 50 feet in water of 13 feet or deeper.
- Minimize the area to be enclosed by the barrier.
- Provide a means to remove captured trash and sediment from behind the turbidity barrier before the barrier is removed, unless the potential for re-suspending the sediment is greater than the benefit of removing it. Removed sediment will be saturated with water. If possible, reserve a space onsite for the sediment to be spread for drying. Otherwise, provide water-tight containers and disposal procedures for the wet sediment.
- Sediment-laden water may be removed from behind the barrier using dewatering procedures discussed in [Section 3.3 Dewatering Controls](#).

- Barriers shall be designed at a slant to the direction of flow to decrease pressure on the curtain. Barriers should not be installed perpendicular to flow.
- On large lakes where reversing currents may exist, design the barrier to be anchored on both sides of the curtain.
- On lakes or other bodies of water that may have boat traffic, install a buoy marker on any anchors or anchor lines that extend into the water beyond the visible surface of the turbidity barrier.

3.14.4 Design Guidance and Specifications

No specification for construction of turbidity barriers is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.14.5 Inspection and Maintenance Requirements

The turbidity barrier should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for movement or dislodgement of the barrier. Verify that all floats are intact and that anchors are secure. The entire top edge should be visible above the water surface. Re-anchor or re-enforce the anchors if the barrier has moved.

Check for debris that may have floated into the barrier and damaged it. Also look for and remove debris caught in the fabric or sediment collected in pockets of the fabric. The fabric should be free of tears and gaps. Repair and replace fabric where damage has occurred.

Ensure panel connections are secure and in good condition. Repair any tears in the fabric at the connection points.

Remove sediment from folds and pleats in the barrier when there is evidence of the barrier being pulled down by the weight of the sediment. All sediment accumulated behind the barrier shall be removed from the water before the barrier is removed.

3.14.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

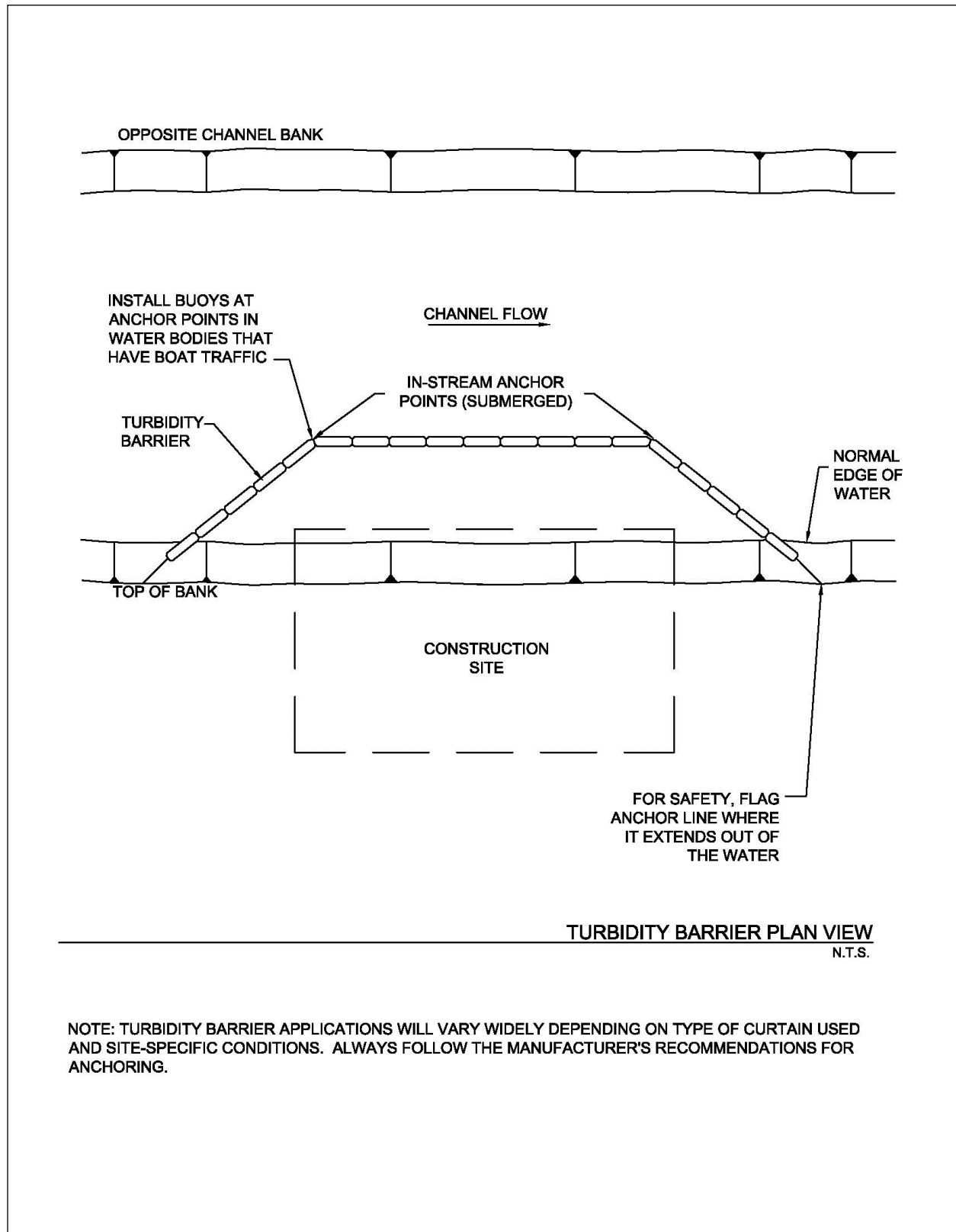


Figure 3.33 Example Application of Turbidity Barrier

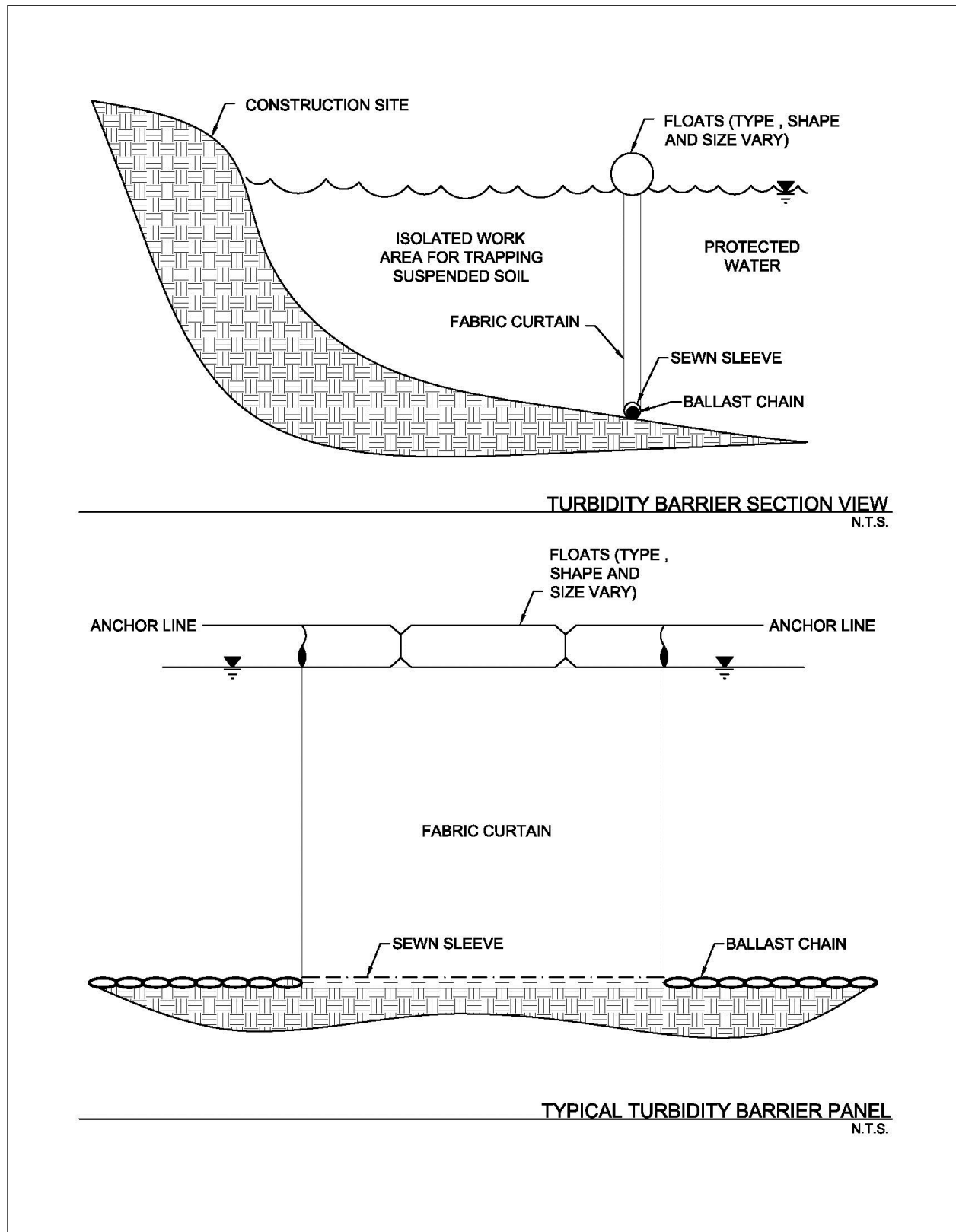


Figure 3.34 Schematics of Turbidity Barrier