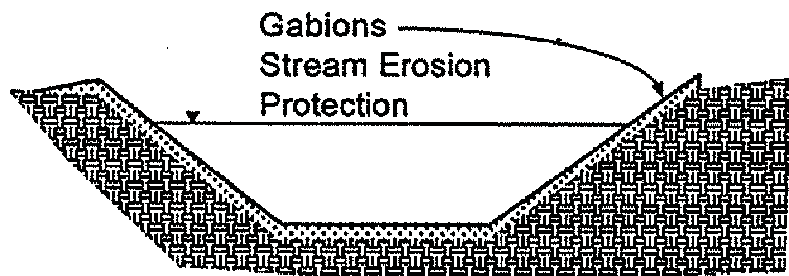


Permanent Structural Controls



DESCRIPTION

Permanent erosion techniques consist of a wide variety of erosion prevention methods including gabions, retaining walls, and rip rap. These are not included as individual BMPs since they go beyond construction phase measures and due to the fact that their use is widespread in the region and the variety of design factors influencing design.

PRIMARY USE

Permanent erosion control is required at the completion of the construction phase of the project. This includes permanent structural methods as well as non-structural methods such as vegetation.

APPLICATIONS

Due to high installation cost and long term maintenance, permanent structural methods should be used only when necessary to address severe erosive conditions. In certain instances however, retaining walls are an effective method to reduce site slopes, reducing runoff velocity. Gabions and concrete rip-rap are effective in reducing stream bank erosion under severe concentrated flow conditions and at pipe outfalls.

DESIGN CRITERIA

Most structural controls such as gabions and rip-rap are designed based on the velocity of flow and the size of the stone used. Project plans will address this as part of standard details. Specifications for rip rap will be provided in design specifications for stone size based on the design velocity of flow across the structure. Manufacturers' information addresses stone size along with basket dimensions for gabions.

Design of retaining walls is based on a variety of structural conditions including soil compressive strength, wall height and water table influence. Tables of dimensions for retaining walls based on site conditions are available from a variety of sources including the Concrete Reinforcing Steel Institute (CRSI).

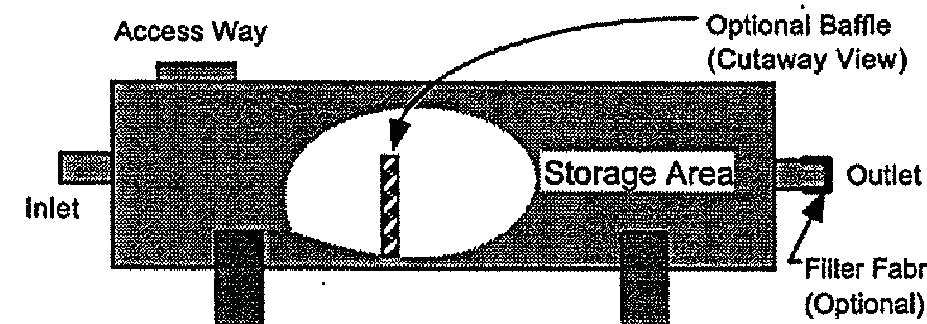
A critical aspect with regards to the design of many permanent controls is adequate anchoring of the structure to prevent undermining of the

Applications
Perimeter Control
Slope Protection
Sediment Trapping
Channel Protection
Temporary Stabilization
Permanent Stabilization
Waste Management
Housekeeping Practices

Targeted Constituents
<input checked="" type="radio"/> Sediment
<input type="radio"/> Nutrients
<input type="radio"/> Toxic Materials
<input type="radio"/> Oil & Grease
<input type="radio"/> Floatable Materials
<input type="radio"/> Other Construction Wastes
Implementation Requirements
<input checked="" type="radio"/> Capital Costs
<input checked="" type="radio"/> Maintenance
<input type="radio"/> Training
<input checked="" type="radio"/> Suitability for Slopes >5%
Legend
<input checked="" type="radio"/> Significant Impact
<input checked="" type="radio"/> Medium Impact
<input type="radio"/> Low Impact
? Unknown or Questionable Impact

BMP
29
City of Baton Rouge Parish of East Baton Rouge
Department of Public Works

Temporary Sediment Tank



DESCRIPTION

A temporary sediment tank (TST) is a large truck mounted tank used to hold sediment laden water to provide for sedimentation and filtration. For smaller applications, 55 gallon drums or other water tight container can be used for storage. Water is pumped into the tank where it is detained. If desired an outlet with a geofabric filter can be provided to release the flow after a period of detention.

PRIMARY USE

A TST is typically used at construction sites in urban areas where conventional methods of sediment removal (e. g., sediment traps, sediment basins) are not practical.

APPLICATIONS

Applications for a TST include utility construction in confined areas (such as a business district or large developed area) or localized construction in which other BMPs are not required such as small, depressed construction (tank farms). This includes pumpage from excavation in heavily developed areas, such as a central business district, with flows due to groundwater or runoff entering the trench or excavated area.

DESIGN CRITERIA

- A TST can be used as either a sedimentation or filtration device. If an oil sheen is present in the runoff, additional treatment will be required before release of runoff.

- For use as a small scale sedimentation basin, de-watering discharge is directed into the TST to a level below the tank midpoint and held for a minimum of 2 hours to allow settlement of a majority of the suspended particles. The tank should be designed for a controlled release when the contents of the tank reach a level higher than the midpoint. When sediment occupies 1/3 the capacity of the TST, it should be removed from the tank.

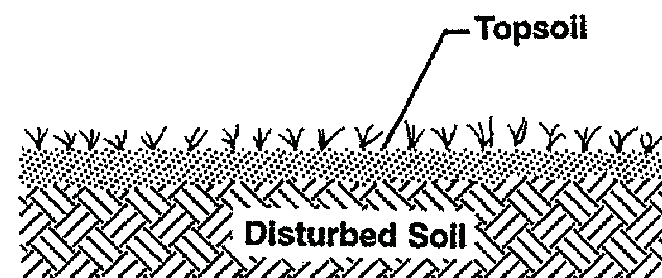
- As a filtration device, a TST is used for collecting de-watering discharge and flowing it through a filtered opening at the outlet of

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30
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Topsailing



STANDARD FOR TOPSAILING¹

TOPSAILING

Definitions: Topsailing is the stripping, storing and spreading of fertile topsoil over disturbed areas.

Purpose: Topsailing will provide a more suitable soil medium if the existing or constructed surface is unfavorable for plant growth. Topsailing will greatly increase the success of establishing good vegetations, help reduce soil erosion, and enhance the beauty of the development.

Conditions Where Practices Applies:

Topsailing is Used Where:

- The texture and quality of the exposed subsoil or parent material are not suitable for producing adequate vegetative growth.
- The soil material is so shallow that the rooting zone is not deep enough to support plants with continuing supplies of moisture and plant nutrients.
- The soil is extremely acidic or contains material toxic to plant growth.
- Design Criteria**
 - Topsoil Materials**
The site should be explored to determine if there is sufficient surface soil of good quality to justify stripping. If

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BMP
31
City of Baton Rouge Parish of East Baton Rouge
Department of Public Works

Permanent Structural Controls

foundation and washout of sediment at the edges of the structure. Where applicable, proper anchoring in the form of embedment or 'toe in' of the structure is required.

LIMITATIONS

The initial cost is an important consideration in selection of permanent structural controls.

Stream bank erosion protection such as rip rap provides limited protection unless used extensively due to the potential for erosion at the edges of the rip rap.

MAINTENANCE REQUIREMENTS

Most stone or concrete structures require little maintenance, but may be subject to vandalism. As mentioned above, erosion around the structure may undermine the integrity of the structure. When maintenance is required, it is typically very extensive and costly.

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29
Department of Public Works

Temporary Sediment Tank

the tank to reduce suspended sediment volume. The filter opening in the TST should have an EOS (see silt fence BMP) of 70 or smaller.

LIMITATIONS

This is a specialized technique for the situations listed. It is not cost effective for normal sediment removal conditions.

The use of a temporary sediment tank is limited by the capacity of the tank, the time required for settlement of suspended material, and disposal of the water and the sediment.

MAINTENANCE REQUIREMENTS

The temporary sediment tank should be inspected periodically during and after use. A tank should be cleaned out when it becomes 1/3 full of sediment.

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30
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Topsailing

additional off-site topsoil is needed, it should meet the following standards as well:

Topsoil should be friable and loamy (loam, sandy loam, silt loam, sandy clay loam, clay loam).

- Topsoil should be free of debris, objectionable weeds and stones, and contain no toxic substances that may be harmful to plant growth.

- Organic matter content should not be less than 0.75 percent by weight; pH range should be from 5.0 - 7.5.

Stripping and Stockpiling
Stripping should be confined to the immediate construction area. A 4-6 inch stripping depth is common, but may vary depending on the particular soil.

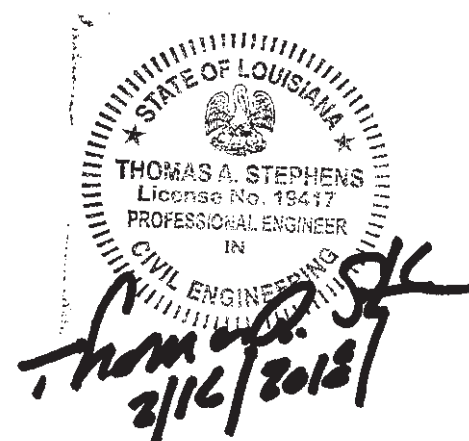
Topsoil should be stockpiled so that natural drainage is not obstructed and off-site sediment damage does not occur. stockpile sideslopes should not exceed 2:1. A perimeter dike with a outlet or straw bale barriers should surround the stockpiles. Temporary seeding should be completed within 15 days of stockpile formation.

Site Preparation
When topsailing, maintain needed erosion control practices such as diversion dikes, sediment basins, waterways, etc.

Grading - Grades on the areas to be topsailed, which have been previously established, should be maintained.

Liming - Where the pH of the subsoil is .0 or less or the soil is composed of heavy clays, agricultural lime be spread in accordance with the soil test on the vegetative establishment practice being used.

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31
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STANDARD PLAN NO.	DATED	SHEET NO.
903-01	FEBRUARY 25, 2008	10 OF 11
STORM WATER POLLUTION PREVENTION PLAN BEST MANAGEMENT PRACTICES		
ENGINEERING DIVISION DEPARTMENT OF PUBLIC WORKS CITY OF BATON ROUGE & PARISH OF EAST BATON ROUGE		
DESIGNED	DRAWN	CHECKED
G. CHENG	G. VANNICE	G. CHENG
APPROVED		T. STEPHENS