

Sonoma County Agricultural Commissioner's Best Management Practices for Agricultural Cultivation Within The Riparian Corridor

The following Best Management Practices (BMPs) apply to all existing cropland within the Streamside Conservation Area (SCA). The following BMPs apply to agricultural uses within the Streamside Conservation Area, including those areas that undergo *agricultural cultivation* (See the Glossary in *Appendix A*), and associated uses including turn-around areas.

The intent of these BMPs is to prevent controllable sources of sediment, nutrients, pathogens and pesticides from discharging into streams in Sonoma County. Not every BMP will apply to each operation, but should be selected by the grower as necessary to reduce the environmental impact of farming in the setback area. While BMPs must only be implemented within the SCA, good stewardship of upslope areas is critical for riparian protection, and these BMPs may be applied to the upslope areas to good effect.

Note that areas of the SCA not undergoing agricultural cultivation may be subject to other rules and limitations by Sonoma County, Regional Water Quality Control Boards, or other resource agency regulations. It is your responsibility to ensure that your activities in the setback are in compliance with these standards.

1. Farms in the Baylands

Farms in the Baylands Region are affected by an inundation of water from San Pablo Bay (identified by the map provided in *Appendix B*. For more detailed information about delineation of the Baylands contact the Agricultural Commissioner's Office). Given the levee system that is currently in place, and the fact that these are tidally influenced estuarine areas with relatively flat topography, **ONLY** the following BMP will apply in these areas:

- The water table and surface water in the setback area must be managed in such a way that avoids erosion and pollution discharges to waterways. Additionally, any pesticide applications occurring within the setback must be in accordance with the pesticide's registered label and all applicable laws and regulations.

2. Soil disturbance during the non-rainy season (April 16 – October 14)

In the event that a storm likely to produce runoff from the disturbed area is forecast to occur (30 percent or more chance of rain by National Oceanic and Atmosphere Administration and National Weather Service: <http://www.spc.noaa.gov/> within 48 hours),

Growers shall:

- Ensure sufficient vegetative cover such as planted cover-crop, or native recruitment of size and density to prevent erosion, **or**
- Apply straw mulch at a rate of 2 tons per acre, wood chips at 5 to 6 tons per acre, or another non-leaching material (use of pomace not permitted) at a rate protective of water quality over all disturbed soils within the setback. Mulch must be in place prior to any rain event forecast by: NOAA/NWS: <http://www.spc.noaa.gov/> that is likely to produce runoff, **or**
- Construct and maintain perimeter controls sufficient to prevent eroded materials in storm water from entering the waterway.

See attached *Appendix C* for examples of sufficient and correctly installed cover crop, straw mulch application, and perimeter controls.

3. Soil disturbance during the rainy season (*October 15 to April 15*) is allowed only if:

- Perimeter controls sufficient to prevent eroded materials in storm water from entering the waterway are in place.

Appropriate examples of perimeter control may include, **but are not limited to:**

- Silt fencing
- Straw wattles/ fiber rolls
- Vegetated berms
- Straw bale sediment barriers

OR,

- Sufficient materials are available onsite to apply straw mulch at a rate of 2 tons per acre, wood chips at 5 to 6 tons per acre, or some other non-leaching material (use of pomace not permitted) at a rate protective of water quality over all disturbed soils within the setback. Mulch must be in place prior to any rain event forecast by NOAA/NWS: <http://www.spc.noaa.gov/> that is likely to produce runoff.

See attached *Appendix C* for examples of sufficient and correctly installed cover crop, straw mulch/wood chip application, and perimeter controls.

4. Roads within the setback

All weather roads are **NOT** allowed in the setback. Agricultural setback areas in use as equipment turnarounds are allowed **ONLY** if the following conditions are met:

- Agricultural turnarounds shall be maintained as grassy avenues/ filter strips during the entirety of the rainy season with planted cover-crop sufficient to prevent erosion of the avenue, **and**

- Grassy avenues shall not be tilled except for the infrequent need to reduce compaction or as necessary to re-seed with cover-crop. In this case, promptly cover the soil with 2 tons per acre straw and replant with a cover-crop before the rainy season.

5. Other Applicable BMPs

- a. Check temporary erosion control measures and repair as needed before, during and after storms. Remove sediment as needed from silt fences, sandbags, straw wattles, and sediment traps. Permanent measures, such as seeding, planting, and rocking, are preferred once the source of any runoff problem is corrected.
- b. Use of a no-till drill (or similar equipment approved by the Agricultural Commissioner), will not constitute soil disturbance and may be utilized at all times of the year when soil moisture conditions allow without installing other BMPs.
- c. Manure and compost that is surface applied to disturbed soil must be tilled-in when a storm event is forecast to occur (30 percent or more chance of rain) by NOAA or NWS within 48 hours and is likely to produce runoff from the treated area.
- d. Where storm water runoff is conveyed to the stream by swales, ditches, or piped drainage systems, appropriate erosion and sedimentation controls shall be utilized at the drainage inlets (if applicable) and points of discharge to the stream in addition to any other necessary controls within the setback.

Appropriate erosion and sediment controls may include, **but are not limited to:**

- Vegetated filter strips
- Trash racks and sediment traps at drainage inlets
- Rocked energy dissipaters at drainage outlets
- Vegetated check dams or straw bale sediment barriers along ditches or swales
- Daylighting of underground outlets to rocked ditches or vegetated swales
- Sediment or infiltration basins

Alternatively, drainage pipes may be discharged upslope of riparian areas and stream banks. See attached *Appendix A* for examples of correctly designed and installed drainage controls.

- e. Pesticide storage and applications must be in accordance with the pesticide's registered label and all applicable laws and regulations.
- f. Trimming of trees whose trunks are located partially or wholly within the setback, and whose branches encroach beyond the setback, may occur **ONLY** under the following conditions:
 - Trimming shall not encroach into the agricultural setback, **and**

- Trimming shall be the minimum necessary to allow equipment to safely operate, **and**
 - The tree roots shall not be cut, uprooted, or in any way destroyed.
- g. Soil amendments, fuel, and motorized equipment must be properly stored to prevent pollution discharge from these sources into streams.

6. Recommended practices

- Conservation Tillage Practices are strongly encouraged especially if slopes are greater than nominal (>5-10%) or if soils are highly erodible. See the referenced document (UC ANR Publication 8364: <http://anrcatalog.ucdavis.edu/pdf/8364.pdf>) for more information on how conservation tillage is protective of soil resources.
- It is recommended to use equipment or specialty tires that minimize soil compaction.
- It is recommended to avoid cultivation of soil that may accelerate erosion of unstable areas.

7. *New agricultural property*

If existing vegetative cover in the setback is in poor condition, the setback area may be improved with a vegetative filter strip for use as an agricultural avenue/turnaround area **ONLY** if the following conditions are met:

- Riparian vegetation is not removed, **and**
- Agricultural turnarounds shall be maintained as grassy avenues/filter strips during the entirety of the rainy season with planted cover-crop sufficient to prevent erosion of the avenue, **and**
- Grassy avenues shall not be tilled except for the infrequent need to reduce compaction or as necessary to re-seed with cover-crop. In this case, promptly cover the soil with 2 tons per acre straw and replant with a cover-crop before the rainy season.

Proposed Fencing BMP:

Agricultural fencing located within the Streamside Conservation Area shall not exceed eight feet in height. Concrete, masonry, and fences composed of all wood are prohibited. Only the minimum number of post holes required to provide structural stability shall be allowed. The minimum amount of trimming of perennial vegetation as necessary to install and maintain fence shall be allowed. The following vegetation shall **not** be removed to install fencing:

- Perennial, woody vegetation with a single trunk greater than 2-inches in diameter (or multi-trunk trees cumulatively greater than 5 inches in diameter) measured at a height of 4.5 feet, **AND**
- Vegetation providing direct shade to any portion of the water course.

Any ground disturbance resulting from the installation shall immediately be seeded with native grass species and mulched.

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Appendix A: Glossary of Terms

Actively Farmed: Land that has been consistently utilized for the raising of agricultural crops, including periods of fallowing and cover-cropping.

Agricultural Crop: Any cultivated crop grown and harvested for commercial purposes.

Agricultural Cultivation: The act of preparing the soil for the raising of agricultural crops.

Cropland: Land used for the production of agricultural crops for harvest, alone or in rotation with grasses, legumes, and/or fallowing.

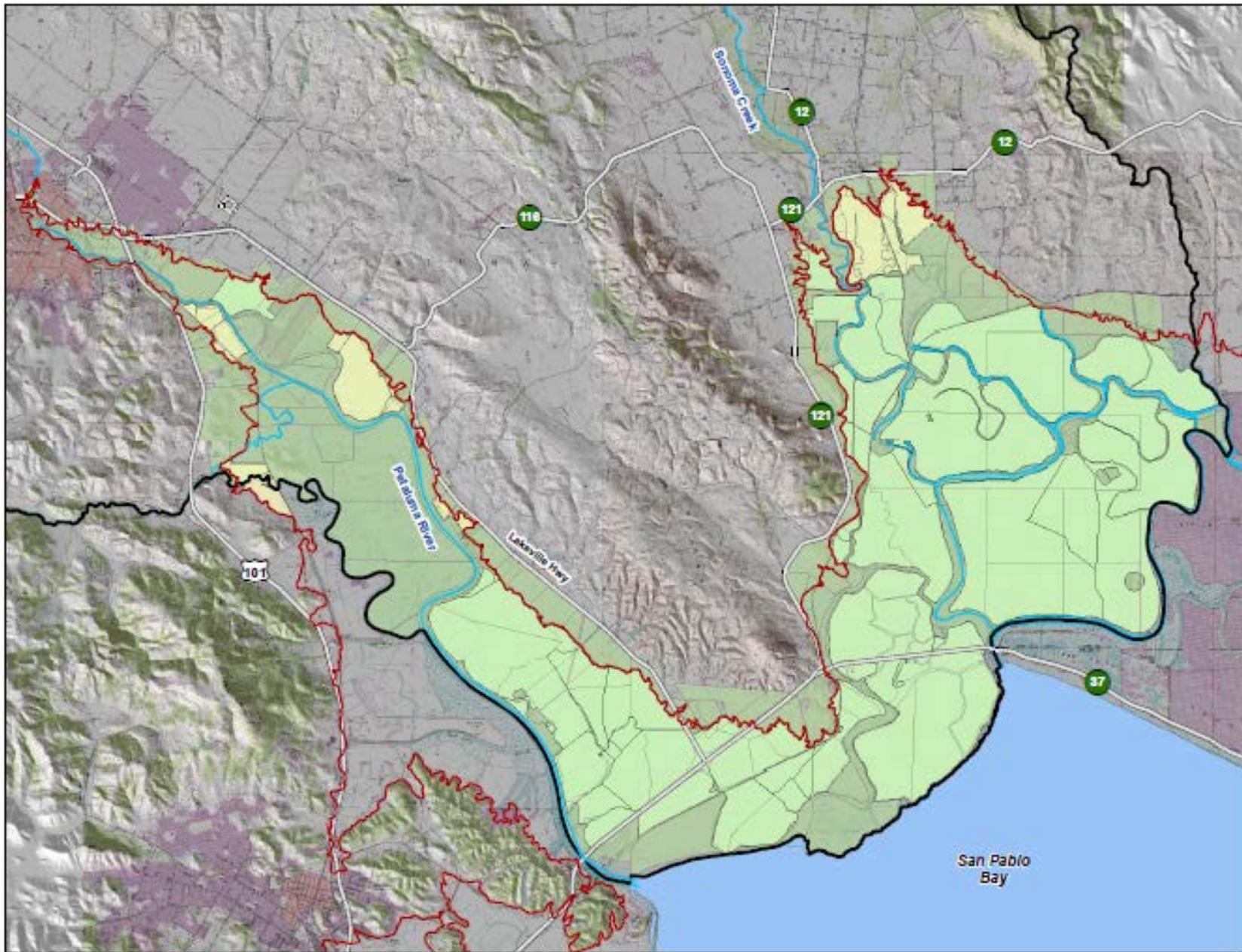
Perimeter Control: Management practice designed to slow down runoff to reduce erosion and/or filter and trap sediment before runoff gets into a watercourse.

Rainy Season: The time of year that most of a region's average rainfall occurs. In Sonoma County, the rainy season is considered to be the period of October 15 through April 15.

Riparian Tree: A woody perennial plant growing in a riparian corridor, typically larger than 14 feet at maturity with a well defined stem and definite crown having a single or multi-trunk structure, with a minimum diameter at breast height of two (2) inches for a single stem or aggregate of multi-trunk stems of five (5) inches, and minimum height of ten (10) feet.

Soil Disturbance: Any alteration to the natural surface of the ground through the use of construction equipment, tractors, and similar equipment.

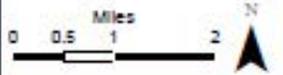
Appendix B: Map of the Baylands in Sonoma County



Baylands Region

Note: The Baylands Region for the purposes of this map is the area of land that is affected by the historical tidal influence of the San Pablo Bay.

- Historic Bay Boundary, Tidally Influenced Parcels
- Cultivated Bayland
- Grazed Bayland
- Other Bayland Parcels
- Major Roads
- Major Streams
- Sonoma County Boundary



Historic Bay Boundary Sources:
 US Coast Survey, US Geological Survey,
 US Department of Agriculture, Spanish deefos,
 explorers' journals, and local archives.
 Compiled by the San Francisco Bay Estuary
 Institute, EcoAtlas 1.5 © 1996 SFBI

Map created October 1, 2014 by:



Appendix C: BMP Examples and Installation Methods

Cover Crops



Protecting bare soil surfaces is one of the best ways to prevent soil loss. Grasses, depending on the type, provide short-term soil stabilization for disturbed areas during construction of your project and can serve as long-term permanent soil stabilization for disturbed areas. There are many different seed mixtures you can choose from. Here are some key things to consider when choosing and planting a cover crop:

- Most important, be sure that your seed mixture provides overstory (tall fast growing plants like rye grass, or barley) and understory (low growing broadleaf plants like clover) protection. For example, a mixture of oats and barley will only provide overstory protection and will only be slightly more effective than if you did nothing. The raindrops can still fall down between the tall plant stalks and dislodge soil particles. If you mix in some clover and blando brome or zorro fescue, you will get understory protection and the soil will have better protection.
- The amount of seed you will need depends on the mix you choose. It can range from 30 lbs per acre for a more permanent type of cover crop to 90 lbs per acre for a quick erosion control soil builder mix. Your seed company will be able to help you determine what mix is best for your project and give you the recommended seed rate.
- Broadcast your seed in the fall. In order to have adequate protection by the start of the rainy season (October 15), the seed should be planted by mid-September. Initial irrigation will be required for most grasses with follow-up irrigation and fertilization. The cover crop should look like a lawn by October 15 (for new

plantings and November 15 for existing operations) in order to provide adequate protection for the soil during the first heavy rains. If you cannot plant by mid-September and irrigate the seed, then you may plant your seed in October **and** cover it with straw mulch applied at the rate of two tons per acre.

The following section will give you guidelines on seed mixes for cover crops and application rates.

Example Cover Crop Seed Mix



**Hillside- Shallow Soils
"Erosion Control"**

"Zorro" annual fescue	40%
"Blando" brome	27%
"Hykon" rose clover	23%
(seeding rate: 25lbs. per acre)	

**Hillside Soils
-Frequent Mowing-**

"Zorro" annual fescue	40%
Subterranean clover	35%
"Hykon" rose clover	25%
(seeding rate: 30 lbs. per acre)	

**Hillside Quick Erosion Control
"Soil Builder"**

Red Oats	65%
Crimson clover	13%
Austrian winter pea	22%
(seeding rate: 90 lbs. per acre)	

**Quick Erosion Control
-Cold Soils-**

Cereal rye	83%
Crimson clover	17%
(seeding rate: 90 lbs. per acre)	

**Vineyard Terrace
"Slope Stabilizer"**

"Blando" brome	45%
"Molate" red fescue	55%
(seeding rate: 25 lbs. per acre)	

**Native, No-till Blend
(Mature vineyards)**

California meadow barley	36%
"Molate" red fescue	38%
California brome	26%
(seeding rate: 39 lbs. per acre)	



**Emergency Winter Mix
"Quick Cover"**

Common barley	85%
Annual ryegrass	15%

(seeding rate: 100 lbs. per acre)

**Heavy Use Areas
-Vineyard Headlands-**

Bluebunch wildrye	40%
Cal.meadow barley	27%
California brome	33%

(seeding rate: 45 lbs. per acre)

Grassed Waterways**

Meadow Barley	41%
California brome	33%
"Blando" brome	26%

(seeding rate: 39 lbs. per acre)

** *straw mulch and irrigate to germinate before fall rains.*

"Showboat"

Crimson clover	44%
"Hykon rose clover	44%
Wildflower blend-	12%
Yarrow	
Calif. Poppy	
Paper poppy	
Tidy tips	

(seeding rate: 27 lbs. per acre)



Straw Mulch



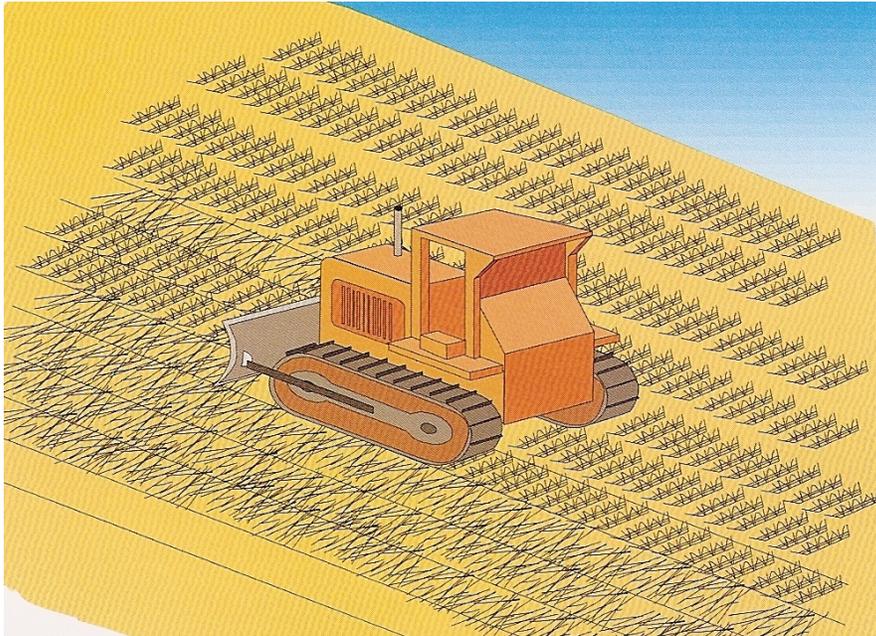
The most effective erosion control practice (both in terms of protection and cost) is the use of cover crop and straw mulch. Straw provides a cushion between the disturbed soil and the velocity of the raindrop. It's the best insurance for **protection** from the early rains if you cannot plant your cover crop in mid-September and irrigate it.

- In order for straw to be effective, you must apply it at the rate of two tons per acre (about 42 bales per acre). You should not be able to see any soil once the straw is applied.
- Rice straw is the cleanest straw in terms of other weed seeds, but it is a coarse straw and therefore takes longer to degrade. Any straw or grass hay will work provided it's applied at the rate of two tons per acre.
- If you are in an area that has high winds in the fall you must anchor your straw into the ground. You can do this by tracking it in (see example) or by crimping it. Otherwise, be prepared to replace the straw that gets blown away.
- Keep extra straw bales stored for emergency erosion control repairs. If you have an area that starts to gully you can stuff the gully with straw. You can also build emergency dikes to control drainage (see sediment barrier example).

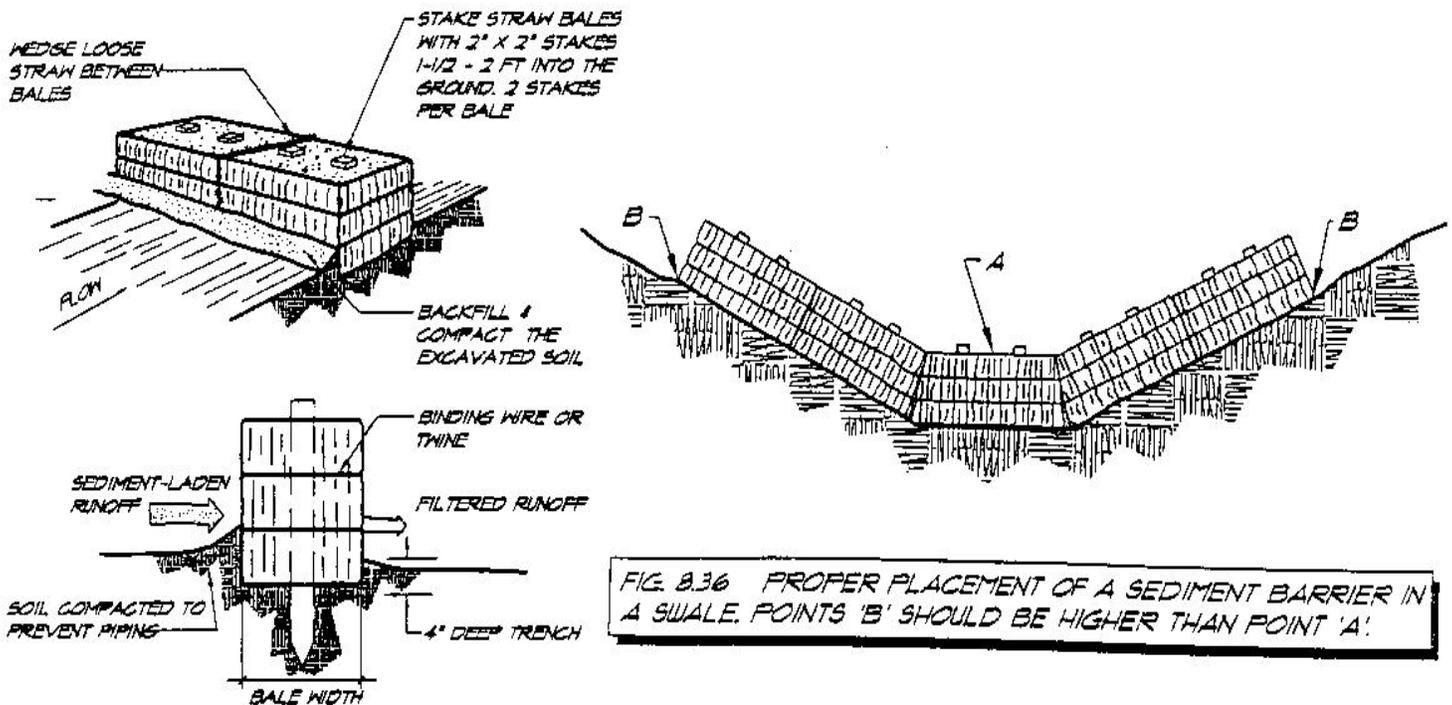
Example Tracking In Straw Mulch

Notes:

1. Roughen slope with bulldozer.
2. Broadcast seed and fertilizer.
3. Spread straw mulch 3" thick (2 tons/acre).
4. Punch straw mulch into slope by running bulldozer up and down the slope.
5. Tracking with machinery on sandy soil provides roughening without undue compaction.



Example Straw Bale Sediment Barrier



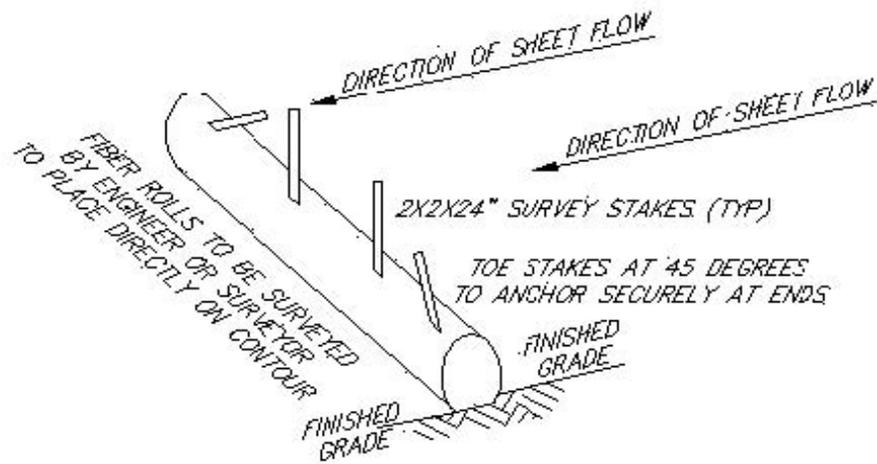
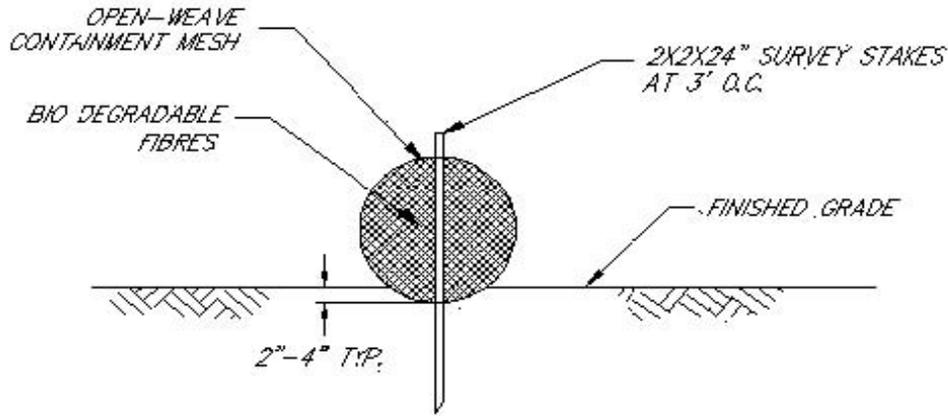
Straw Wattles



Straw wattles or fiber rolls are designed to slow down runoff, filter and trap sediment before the runoff gets into watercourses. Straw wattles are porous and allow water to filter through fibers and trap sediment. They also slow down runoff thereby reducing sheet and rill erosion.

- Straw wattles are effective on slopes to shorten the slope length. They are designed for short slopes or slopes flatter than 3:1 and low surface flows not to exceed 1 c.f.s. for small areas.
- Straw wattles can also be used along stream banks for extra protection.
- They come in several sizes ranging from 8 to 20 inches in diameter.
- It's very important that straw wattles are installed properly. If they're not installed properly, they will not work. Straw wattles must be installed on contour. You may need to have a surveyor help you to be sure you find the contours of your area.
- A good rule of thumb for vertical spacing is: 3:1 slopes = 30 feet apart, 4:1 slopes = 40 feet apart, or as the project engineer dictates.
- Cover Crop should be seeded prior to installation. You will then need to dig a concave key trench 2 to 4 inches deep along the contour. Place the roll in the trench and stake (see example). You must backfill the trench on the uphill or flow side of the roll to prevent water from undercutting the roll. When more than one fiber roll is placed in a row, the roll should be abutted securely to one another with stakes to provide a tight joint. **Do not overlap the joint.**
- After your fiber rolls are in place, the straw mulch can be applied at the rate of 2 tons per acre. Do not drive over the straw wattles.

Example Straw Wattle

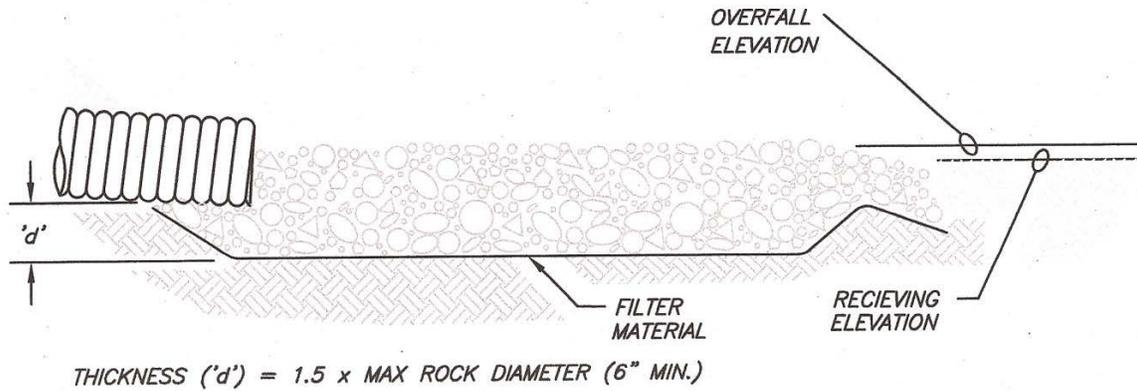


FIBER ROLL INSTALLATION

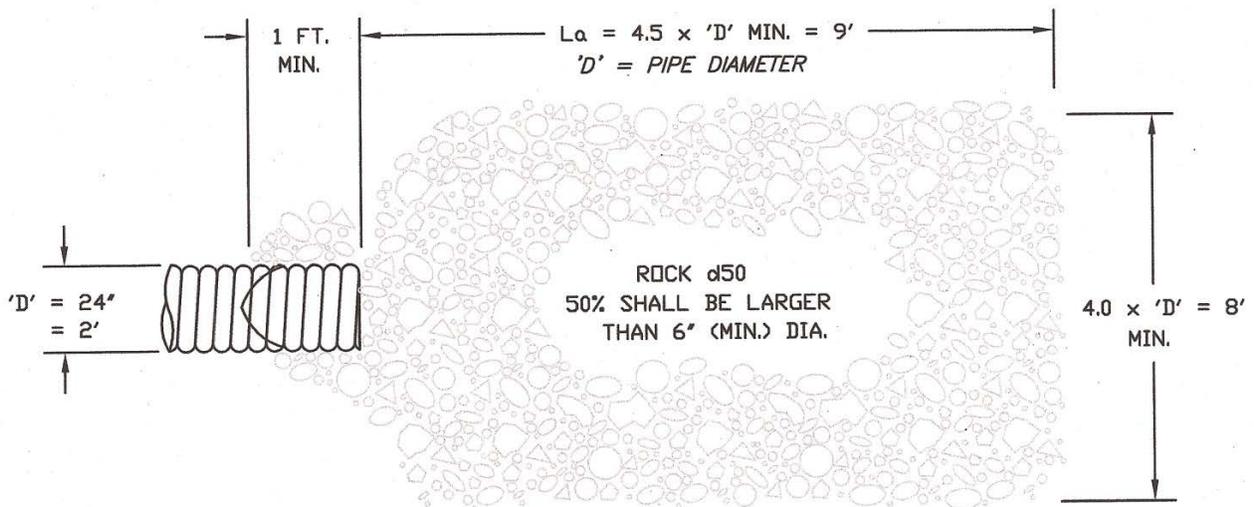
NO SCALE

Example of Rock Outlet for Storm Drains

All pipe outfalls should have scour protection to minimize sediment delivery downstream. The size of the dissipater is dependent on the size of the pipe. Rock protection can be easily added to existing pipe outfalls. Do not outfall the pipe directly into a creek.



SECTION



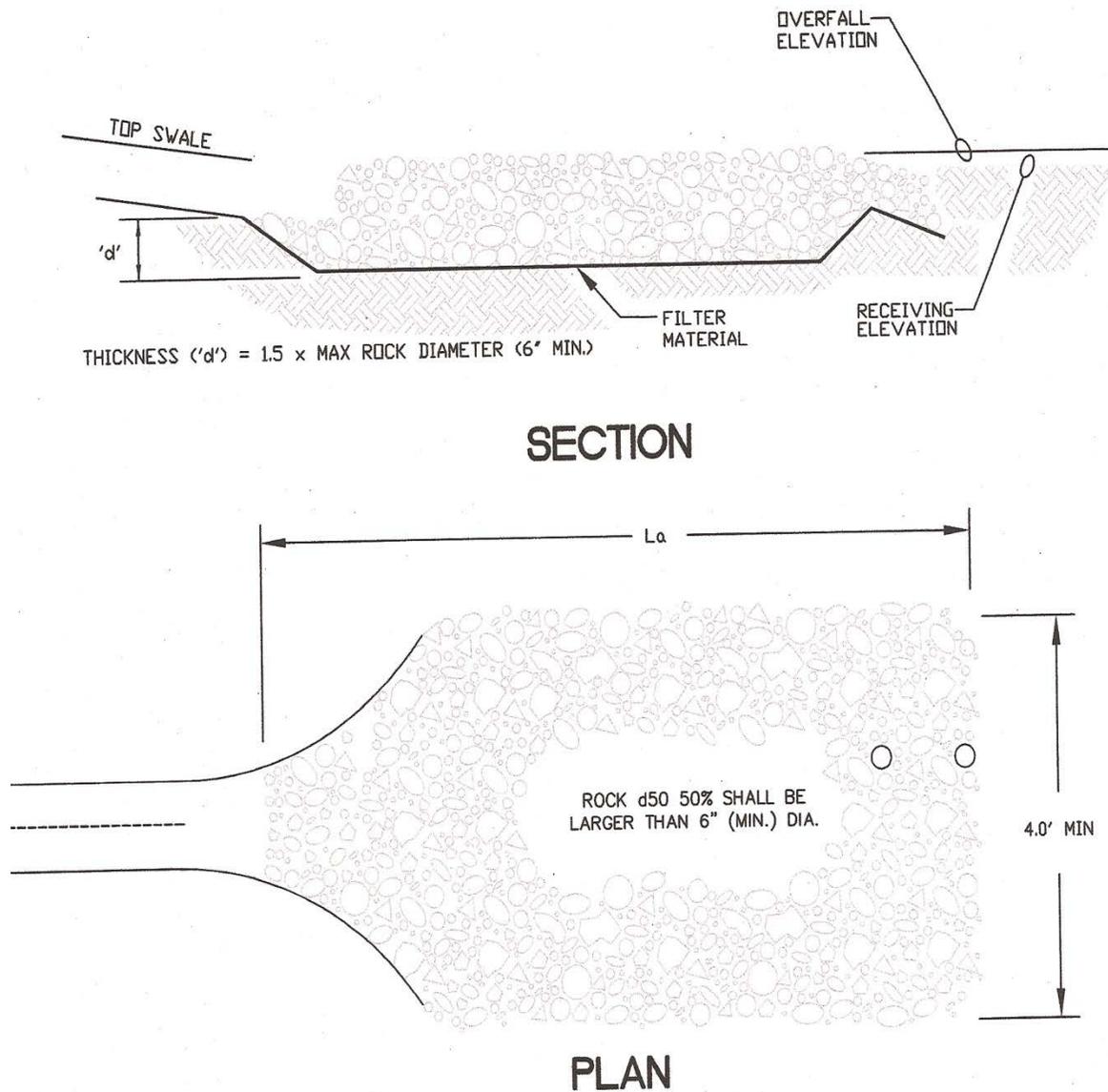
PLAN

NOTES:

1. 'L_a' = LENGTH OF APRON. DISTANCE 'L_a' SHALL BE OF SUFFICIENT LENGTH TO DISSIPATE ENERGY.
2. APRON SHALL BE SET AT A ZERO GRADE AND ALIGNED STRAIGHT.
3. FILTER MATERIAL SHALL BE FILTER FABRIC OR 6" THICK (MIN.) GRADED GRAVEL LAYER.

Example of Rock Outlet for Swales

All swale outfalls should have scour protection to minimize sediment delivery downstream. Rock protection can be easily added to existing swales.



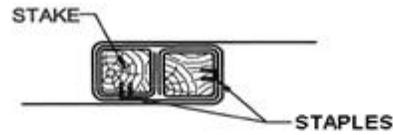
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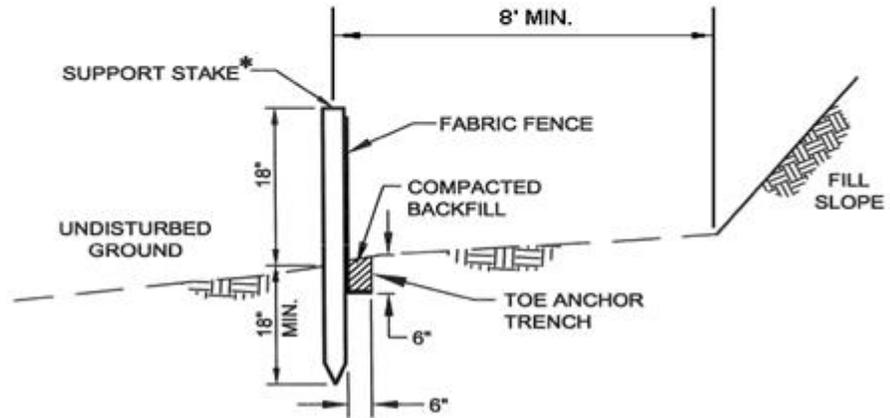
Example Silt Fence

STANDARD CONSTRUCTION DETAIL #4-7 Standard Filter Fabric Fence (18" High)

*STAKES SPACED @ 8' MAX.
USE 2" x 2" ($\pm 3/8$ ") WOOD
OR EQUIVALENT STEEL
(U OR T) STAKES



JOINING FENCE SECTIONS



ELEVATION VIEW

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