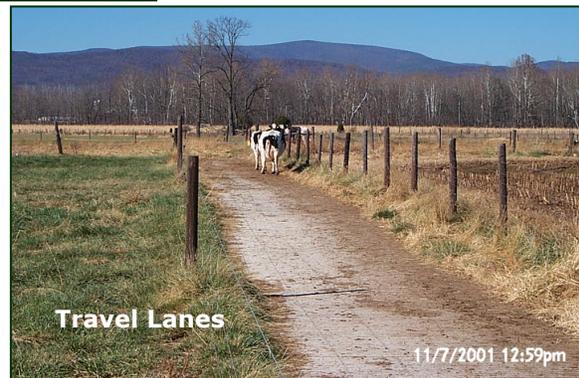


Heavy Use Area Protection

Stabilizing areas frequently and intensively used by livestock



When Applicable

When used on livestock operations, this practice will be completed as a component of a Comprehensive Nutrient Management Plan or Prescribed Grazing Plan.

Heavy Use Area (HUA) Types and Applicable Purposes

- **Feeding Areas** – a stable area to feed livestock supplemental feed during the winter when forage growth is low.
- **Watering Facilities** – stable areas around livestock watering facilities.
- **Travel Lanes** – a frequently used (i.e., daily) stable travel lane area for livestock between rotational pasture system and areas of feeding or milking.
- **Loafing Lots** – areas of wear resistant vegetation used in a rotational pasture scheme.

Materials Used

- **Grass** – use in areas where traffic can be managed to maintain vegetative cover. Use grass species which are wear resistant.
- **Geotextile Fabric and Rock** – use in areas where vegetation cannot be maintained (i.e., around watering facilities, feeding areas, gate openings, animal travel ways, etc.).
- **Concrete** – use in high traffic areas where durability, stability, low maintenance and foot problems are a concern.

January 2004

USDA cost share program participants must comply with contract requirements. This jobsheet may not meet contract requirements. Other job sheets are available from the Natural Resources Conservation Service. For additional information, contact your local USDA Service Center, Natural Resources Conservation Service office or your local County Soil Conservation District office.

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Guidelines for Feeding Area HUAs

The size of HUA feeding areas can range from 50 to 100 square feet per animal (1000 lbs.) in non-confinement. The maximum size of a HUA shall not exceed 2,800 square feet.

HUA feeding areas must be constructed on relatively level areas. They must be mounded with slopes away from feeders a minimum of $\frac{1}{4}$ to $\frac{1}{2}$ inch per foot.

HUA feeding areas located on points or ridges where the immediate down slope away from the HUA is greater than 6 percent must be fenced to prevent animal access to the down slope. The fence must direct animal traffic across the slope to the extent practical. The fence must be located within 2 feet of the HUA.

HUA feeding areas located up slope and within 300 feet of a sensitive area (water source, water conveyance, or sinkhole) shall have one or both of following options listed below installed.

1. A minimum 35-foot filter strip established and maintained adjacent to the water source, water conveyance, or sinkhole. The filter strip shall be established and maintained in permanent vegetation in accordance with NRCS conservation practice standard *Filter Strip (Code 393)* or *Riparian Forest Buffer (Code 391)*, and/or
2. A fence constructed in such a way that livestock must travel a minimum of 50 feet from the edge of the HUA across the slope before being able to turn down the slope to the sensitive area(s) (see Figure 1 to the right). The fence must be located within 2 feet of the HUA and a minimum of 70 feet from the sensitive area. The area below the fence shall be maintained in permanent vegetation. The fence shall be installed in accordance with NRCS conservation practice standard *Fence (Code 382)*.

If runoff from the feeding area HUA has the potential to enter a water facility for the livestock (i.e., water facility or pond down slope of HUA), consider alternatives in addition to those listed above that would minimize the contamination potential of the water source.

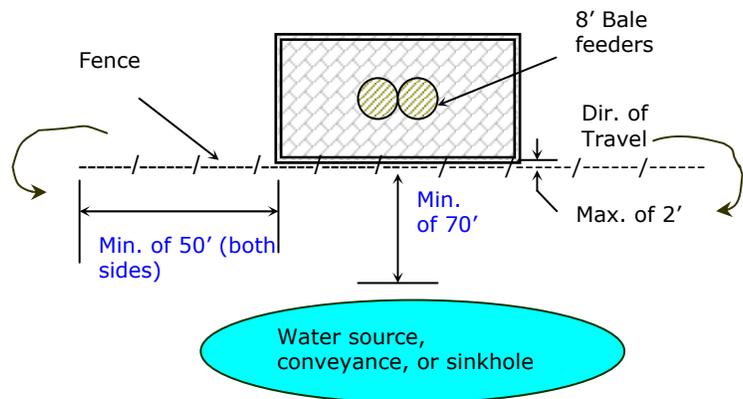


Figure 1 – Plan View of HUA Feeding Area

Guidelines for Watering Facility HUAs

For areas such as watering facilities or mineral boxes, the treatment area shall extend a minimum of 10 feet to a maximum of 16 feet outside the limits of the water facility and should be mounded. A freeze-proof watering facility shall be anchored to a concrete pad.

Any part of the HUA water facility located up slope and within 50 feet of a sensitive area (water source, water conveyance, or sinkhole) shall have measures installed to maintain a vegetative buffer between the water facility and sensitive area. The width of the buffer adjacent to the sensitive area shall be at least 20 feet.

Livestock watering access ramps into water sources shall be fenced and installed in accordance with drawing HUA-561-1 or STR-578-1. The area around the water source shall be protected from access by livestock.

Guidelines for Travel Lane HUAs

Travel lanes shall be located to make the best use of topographic features. Lanes shall generally follow natural contours to the extent practical and minimize disturbance of drainage patterns. A vegetative buffer of at least 20 feet shall be maintained between the trail and all water bodies, perennial and non-perennial streams and sinkholes or other sensitive areas.

Lanes that cross streams shall meet the requirements of *Stream Crossing (Code 578)*

Provisions shall be made for surface and subsurface drainage, as needed, and of disposal of runoff water. The type of drainage structure used will depend on the intended use and runoff conditions. Culverts, bridges, fords, or grade dips for water management shall be provided at all natural drainageways. The capacity and design shall be consistent with sound engineering principles. When a culvert or bridge is installed in a drainageway, its minimum capacity shall convey the 10 year 24 hour design storm runoff without causing erosion or road overtopping.

Lanes shall be constructed in such a manner that accelerated erosion will not occur down or in side ditches along the lane. When necessary, broad based dips, water breaks, or other suitable structures made of rocks or logs shall be provided to control erosion.

Lanes shall be constructed wide enough to accommodate movement of animals and access by operator for management and maintenance.

The cross slope of the lane will not vary more than 3 percent.

Guidelines for Grassed Loafing Lots

Grassed loafing lots are intended for vegetative cover, not grazing. Refer to NRCS conservation practice standard, *Prescribed Grazing (528A)*, to develop a prescribed grazing plan. Establish grassed loafing lots as follows:

- 1) Establish a minimum of four grassed lots. Grassed lots should be sized at no smaller than one acre per 20 cows except on favorable sites. Up to 30 cows may be considered, provided the site has adequate soil fertility, favorable slopes, and four or more lots are planned.
- 2) Avoid slopes that are less than 2% or greater than 12%, unless additional lots are added and/or drainage issues are addressed.
- 3) Lots shall be vegetated by establishing bermuda and/or tall fescue mixtures and managed according to the NRCS Conservation Practice Standard *Critical Area Planting (Code 342)*. Bermuda shall be established first between May 1 and July 1. Tall fescue shall be established between August 15 and October 15. If bermuda is dense, establish tall fescue at the end of the fall recommended seeding date. If vegetation is not appropriate, other measures shall be used to prevent erosion.
- 4) Develop an operation and maintenance plan that addresses frequency of lot rotation, fencing patterns, animal trails and walkways, etc.
- 5) Provide an alternative watering system that meets the needs of the rotational schedule and protects water quality.
- 6) Fencing or limited restricted use by cattle from all sensitive areas such as streams, water bodies, and sinkholes shall be planned.
- 7) Maintain a minimum 35-foot grass buffer between grassed loafing lots and streams unless the runoff is collected and managed by a method outlined in the Comprehensive Nutrient Management Plan. This buffer shall be designed in accordance with the NRCS CPS *Filter Strip (Code 393)*.

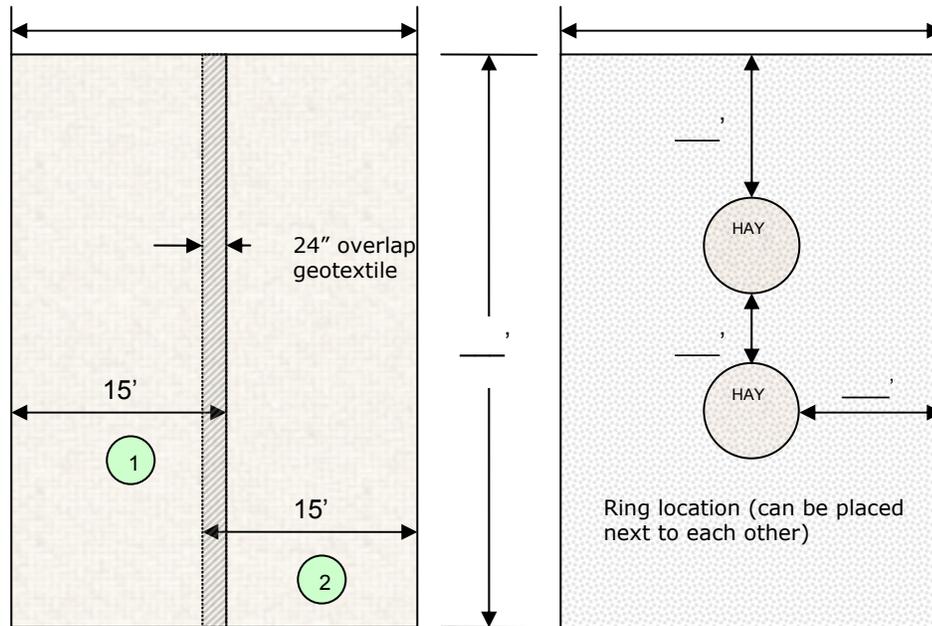
Heavy Use Area Protection

Operation & Maintenance of HUAs

- The HUA shall be maintained to achieve the intended purpose. The treatment area will be inspected annually and after significant storm events to identify repair and maintenance needs. If used to treat a concentrated livestock area (i.e., an area where livestock are confined, fed, or maintained more than a total of 45 days during any 12-month period and crops or vegetation is not sustained over the area), runoff from the area shall be properly filtered and/or collected, stored, and utilized in accordance with development of a Comprehensive Nutrient Management Plan or Prescribed Grazing Plan.
- Periodically scrape/collect material from the HUA and land apply as soon as conditions warrant. Consider weather conditions, field access by spreader equipment, and active growing periods of crops and forages.
- Do not store manure on site unless it is protected from weather, livestock, and runoff.
- When spreading occurs, maintain a 35-foot non-application setback from all sensitive areas such as water sources, water conveyances, and sinkholes.
- Take care to minimize the amount of gravel or lime that comes off with the manure. Replacement of rock or surfacing materials will be needed occasionally.
- Maintain or re-establish vegetation when necessary.

Heavy Use Area Protection

Determining Requirements for Feeding HUA



Plan View - Geotextile Layout

Plan View - Hay Ring Layout

Sizing

Given: One ring feeds 12 mature cows
 Herd size: 24 mature cows
 Rings needed: 2
 Each mature cow needs ~ 50 to 100 square feet
 For this example assume 58' x 28' = 1624 sq. ft..
 Solution: Divide by 24 cows = 68 sq. ft. per cow which is less than 100 sq.ft. which is ok.

Crusher Run Rock

$$\frac{\text{Length (feet)} \times \text{Width (feet)} \times \text{_____ inches thick}^*}{(12 \times 27)} \times 1.9^{**} = \text{_____ tons}$$

For example:

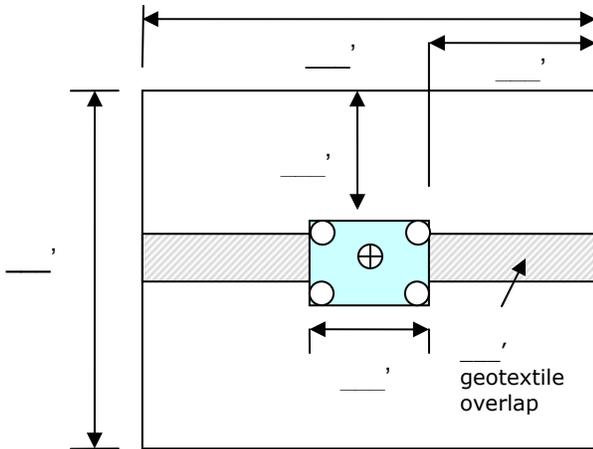
$$\frac{58 \text{ feet} \times 28 \text{ feet} \times (8 + 4) \text{ inches thick}}{324} \times 1.9 = 114 \text{ tons}$$

*NOTE: 6 to 8 inch thickness plus rock needed for mounding in center (approximately 4 inch average). Mound gravel in the middle so that it is approximately 7 inches higher than the outside edges. ** Density factor for crusher run.

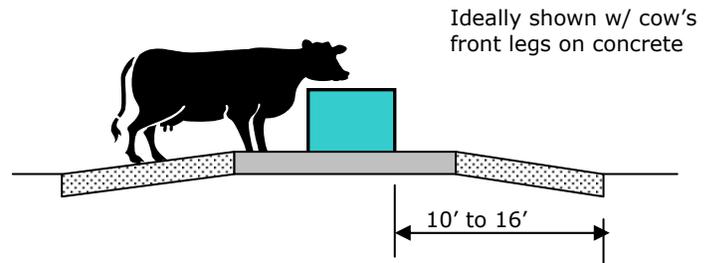
Geotextile Material

Two ((1) & (2)) 58' X 15' pieces of geotextile material (116' total amount needed).
 Overlap pieces 24 inches as shown above.

Determining Requirements for Watering HUA



Plan View - Water Facility



Cross Section - Water Facility

Sizing

Given: Provide minimum 10 to maximum of 16 feet around water facility
 Size Range: Water Facility (4 x 4 feet square) plus 10 to 16 feet border around limits of facility

- 10 feet border (24 feet x 24 feet = 576 sq.ft.)
- 16 feet border (36 feet x 36 feet = 1296 sq.ft.)

Crusher Run Rock

$$\frac{\text{Length (feet)} \times \text{Width (feet)} \times \text{_____ inches thick}^*}{(12 \times 27)} \times 1.9^{**} = \text{_____ tons}$$

Example: Assuming 10-foot border from edge of 4' x 4' water facility, then

$$\frac{24 \text{ feet} \times 24 \text{ feet} \times (8 + 4) \text{ inches thick}}{324} \times 1.9 = 40.5 \text{ tons}$$

*NOTE: 6 to 8 inch thickness plus rock needed for mounding in center (approximately 4 inch average). Mound gravel in the middle so that it is approximately 7 inches higher than the outside edges. ** Density factor for crusher run.

Geotextile Material

Two 24' X 15' pieces of geotextile material (48' total amount needed). Overlap is 36 inches as shown above.

Heavy Use Area Protection

Guidelines for Geotextile & Rock

- 1) Install a geotextile fabric on firm sub-base. Excavate vertical edges around the perimeter. Use a nonwoven needle-punched geotextile fabric with a minimum weight of 6 ounces per square yard installed under all treatment areas, unless foundation is on rock or the surface treatment is concrete. A minimum overlap of geotextile panels shall be 12 inches at all joints.
- 2) Place geotextile fabric loosely over the dug out area. Outside edges and joints should be pinned about every 5' with 6" metal staples made of 8-gauge wire or similar. Minimum lap at all joints is 12 inches. Cut off or fold under any excess fabric.
- 3) Coarse aggregate shall be 2 ½ inches to ¾ inch in size. Fine aggregate can range from ¾ inch to 1/200 inch. Sufficient fines (1/100 inch or less) shall be present in the fine aggregate to promote bonding of the material when compacted. Aggregate (fine or coarse) shall be underlain by nonwoven needle punched geotextile. The layer can consist of **6 to 8 inches** of compacted fine aggregate material.
- 4) Where other surfacing materials are used, such as cinders, tree bark, sawdust, brick chips, shredded rubber, etc., the minimum thickness shall be 6 inches and shall be renewed as animals remove the surface.
- 5) The finished surface of the heavy use area must be slightly mounded (1/4 to 1/2 inch per foot) relative to the surrounding ground surface to promote proper drainage.
- 6) Where concrete is used as the surface treatment, an additional minimum 4-foot wide aggregate transition area not to exceed 10 feet wide shall be provided around the HUA.

Guidelines for Concrete

- 1) Thickness shall be a minimum of 4 inches of concrete for livestock traffic or 5 inches where heavy equipment loading is expected.
- 2) Welded wire mesh, 6" x 6" 10/10 gauge, and/or fabric reinforcing shall be used in the slab. Fiber shall consist of ¾" length virgin homopolymer polypropylene fibers, either the collated fibrillated or monofilament type. The minimum rate of application is 1.5 lbs. of fiber per cubic yard of concrete. If welded wire fabric is omitted from concrete slabs and only fiber additives are used, contraction joint spacing will be reduced from a maximum of 30 feet to a maximum of 10 feet in any direction. Sawn joints shall be one-fourth of the slab's thickness in depth. Formed joints shall be of a keyway type. Smooth vertical joints through the slab are not permitted. Use isolation or expansion joints between a new slab and any other fixed object or different material, such as an existing slab, building foundation, posts or piers, etc.
- 3) Require a design mix where the compressive strength of concrete after 28 days curing is 3500 psi. A few days before the expected pour, contact the concrete supplier with design mix requirements and expected time and day of pour.
- 4) Do not place concrete when the outside temperature is expected to fall below 40°F at the time the concrete is delivered and placed at the work site. Do not expose concrete to freezing temperatures during the curing period.
- 5) During hot weather, do not place concrete with temperature greater than 90°F at the time of placement.
- 6) Prevent concrete from rapid drying for at least 7 days after it is placed. Protect the surface with covering materials to keep it moist such as canvas, cloth mats, straw, sand or other approved material. In lieu of covering, maintain moisture by sprinkling, flooding, or fog spraying. Leave forms in place during curing period.
- 7) Have the appropriate official check and approve the in-place subgrade, forms, reinforcing steel, and any other items before concrete placement.

Heavy Use Area Protection

Site Preparation

The area to be treated will be graded and excavated to a depth of 6 to 8 inches. The excavated area must be free of large rocks or other material that might damage the fabric. All uncompacted, wet, organic or other undesired materials such as mud, hay, or debris shall be removed. The area will be shaped in such a way as to allow for drainage of water away from the site. The finished project surface will not be lower than the surrounding natural ground to reduce risk of ponding.

Placement of Fabric and Fill Material

The geotextile fabric (6 ounce per square yard or heavier, non-woven needle-punched) will be loosely laid over the excavated area. Where the fabric is joined, a minimum of 1-foot overlap will be needed. Pinning of the geotextile on 5-foot centers is preferred. The rock will be spread beginning at one end of the geotextile fabric, being pushed towards the other side, or end, so that the equipment being used travels on the aggregate and not directly on the fabric. Trucks can dump the rock as they back up over the material. Both the base and the surface coarse will be graded, smoothed, and compacted. Box blades work well for smoothing the surface.

Rock Placement for Livestock Area

A 6 to 8 inch layer of crusher-run rock (see figure #1) will be placed over the geotextile fabric. An additional 4 to 7 inches of crusher-run will be mounded in the middle (see figure #2) to slope water away from feeding and watering areas. The edges should be flush with the natural ground after final compaction. Other materials may be used if approved by NRCS.

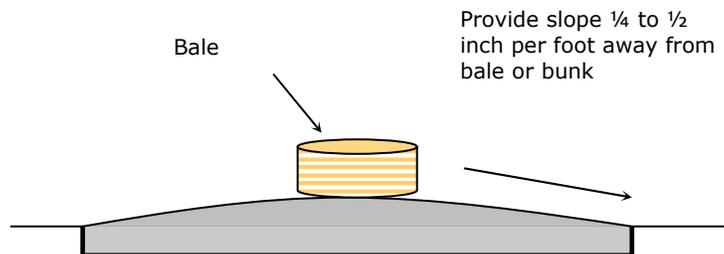
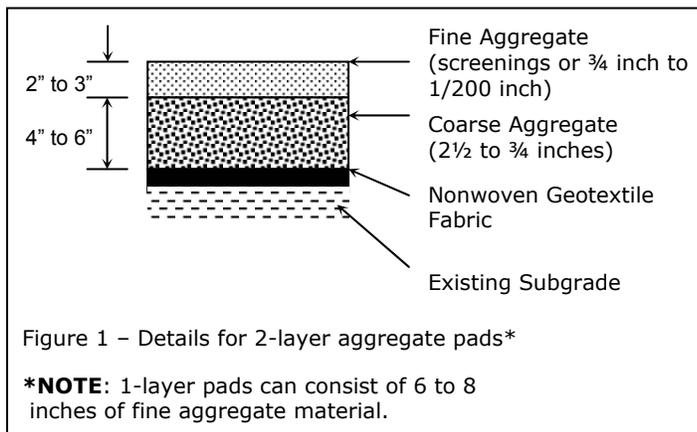


Figure 2 – Cross-section of HUA

Heavy Use Area Protection

HEAVY USE AREA WORKSHEET

Name _____ Farm # _____ Tract # _____ Program _____

Materials

Rock (surface) _____ tons
 Rock (subsurface) _____ tons
 Geotextile _____ sq.yds.
 Concrete _____ cu.yds.

Design Data

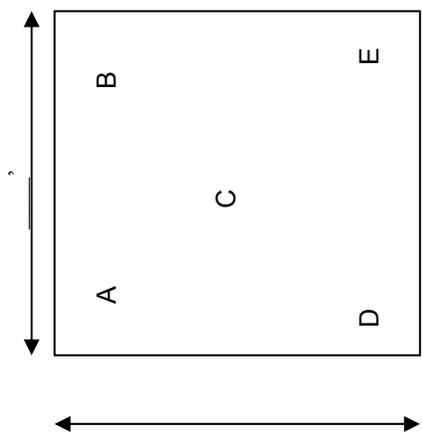
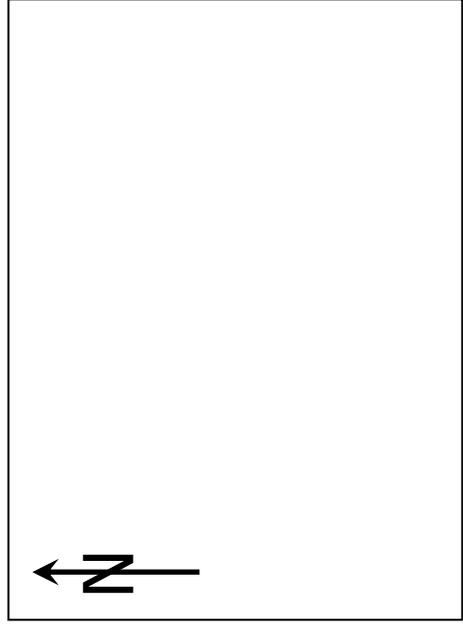
Type of Livestock _____
 Number of Livestock _____
 Purpose of HUA _____
 Soil Type _____

T.B.M. Description: _____

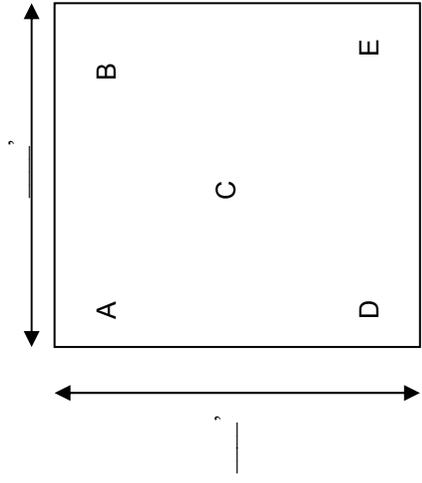
 T.B.M. Elev. = _____
 T.B.M. R.R. = _____

 Height of Instrument = _____

Field Layout Map



Before Construction

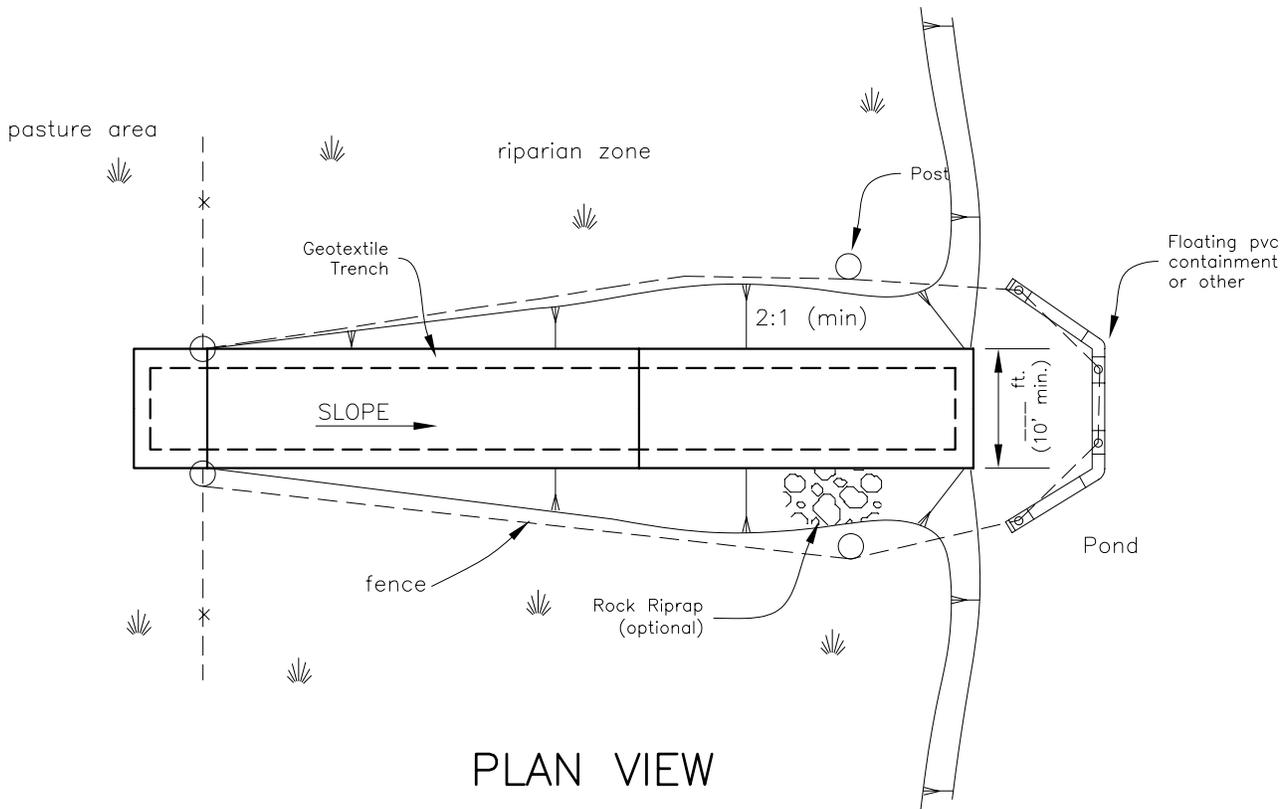


After Construction

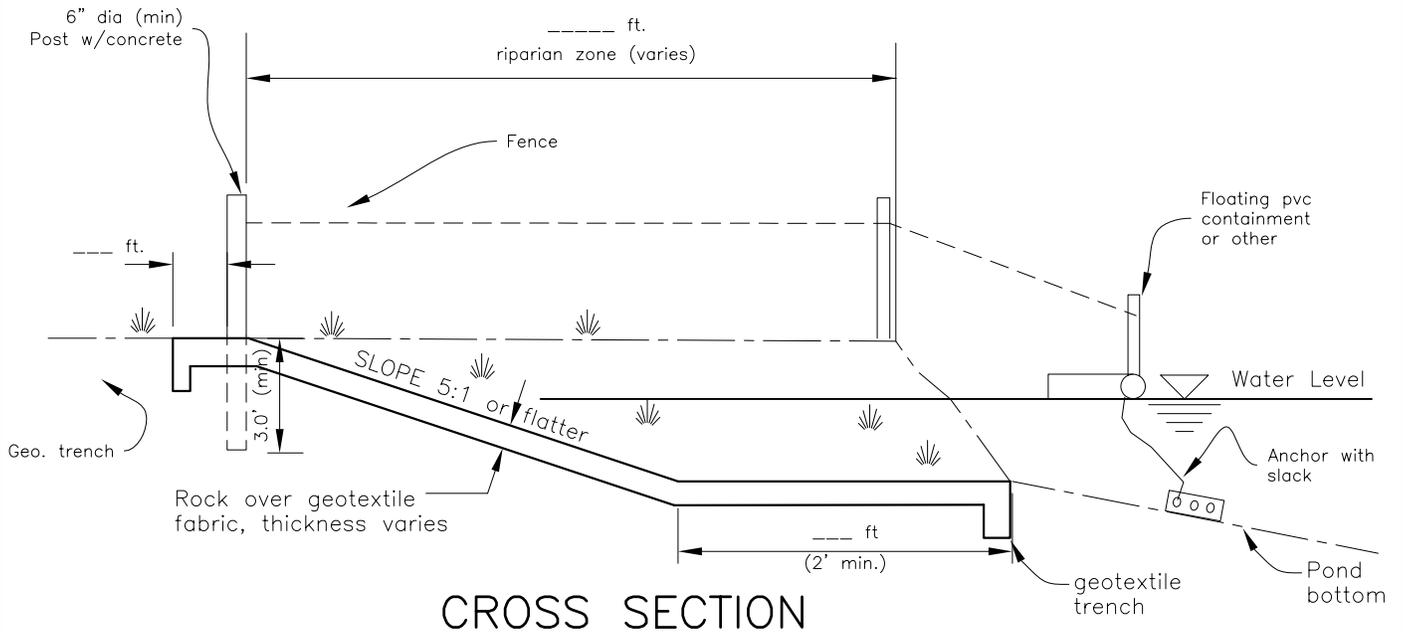
NOTES:

Checkout by: _____
 Date: _____
 Meets NRCS standards: YES NO

CODE 561 – HEAVY USE AREA
 LIVESTOCK WATERING RAMP



PLAN VIEW



CROSS SECTION

SLOPE = _____ ft/ft	Geotextile Length = _____ ft.	Rock Riprap = _____ tons
# Staples = _____	Geotextile width = _____ ft.	Crusher Run = _____ tons
# of ramps = _____	Fence length = _____ ft.	1/2" Minus rock = _____ tons

Drawing not to scale. Standardized drawing must be adapted to the specific site.