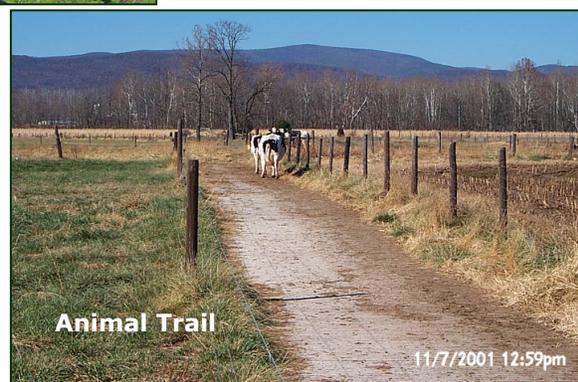




Heavy Use Area Protection

561

Stabilizing areas frequently and intensively used by livestock



When Applicable

When used on livestock operations, this practice is 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.
- **Animal Trail** – a frequently used (i.e., daily) stable area for livestock travel between rotational pasture systems 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

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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 is 2,800 square feet.

HUA feeding areas are constructed on relatively level areas. Slopes away from feeders are a minimum of ¼ to ½ inch per foot.

HUA feeding areas located on points or ridges where the immediate down slope away from the HUA is greater than 10 percent need to be fenced to prevent animal access to the down slope, particularly on fragipan or shaley soils. The fence must direct animal traffic across the slope to the extent practical. The fence should not end in natural drains or where a potential exist for gully erosion as a result of animal trailing. Ideally, the fence is located within 2 feet of the HUA. See Figure 1 below.

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 is 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). The fence must be located within 2 feet of the HUA and no closer than 70 feet from the sensitive area. The area below the fence is maintained in permanent vegetation. The fence is 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.

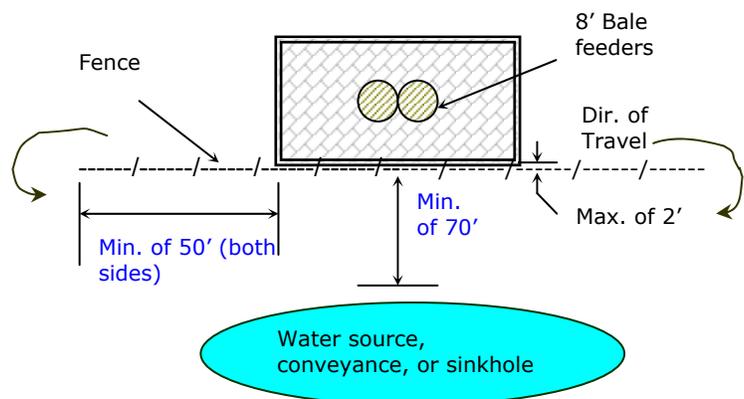


Figure 1 – Plan View of HUA Feeding Area

Guidelines for Watering Facility HUAs

For areas such as watering facilities or mineral boxes, the treatment area extends a minimum of 10 feet to a maximum of 16 feet outside the limits of the water facility and should be mounded. Freeze-proof or used tire watering facilities are 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) includes measures to maintain a vegetative buffer between the water facility and sensitive area. The width of the buffer adjacent to the sensitive area is at least 20 feet.

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



Guidelines for Animal Trail HUAs

Animal trails for the livestock meet the requirements of NRCS Conservation Practice Standard *Animal Trails and Walkways (Code 575)*. Trails that cross streams meet the requirements of *Stream Crossing (Code 578)*.

Trails are constructed wide enough to accommodate movement of animals and access by operator for management and maintenance of the livestock.

The cross slope of the trail should not vary more than 3 percent.

Fencing is used to keep animals confined to the trail until the desired destination is reached.

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

Provisions are made for surface and subsurface drainage and disposal of runoff water where necessary. The type of drainage structure used will depend on the intended use and runoff conditions. Culverts, bridges, fords, or grade dips for water management are provided at all natural drainage ways. When a culvert or bridge is installed in a drainage way, its minimum capacity conveys the 10 year, 24 hour design storm runoff without causing erosion or trail overtopping.

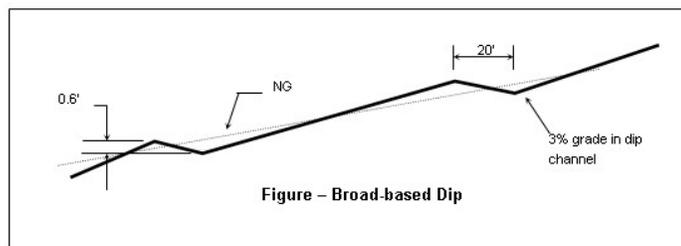
Trails are constructed in such a manner that accelerated erosion will not occur down or in side ditches along the lane. When necessary, broad based dips or other suitable structures made of rocks or logs are provided to control erosion. Broad based dips are shown in the Figure below. The channel slope of the dip for surface drainage is 3 percent. Dips are not used on trails that have a grade greater than 10%. Dips are constructed as follows:

1. The following formula or table is used as a guide for dip spacing:

$$\text{Spacing (in feet)} = 400/\% \text{slope} + 100$$

Trail Grade (percent)	Approximate Distance between Dips (ft)
1	500
2	300
5	180
10	140

2. The minimum front slope width is 20 feet with a 3 percent grade in the trail as shown in Figure.



3. The dip and channel section may require bedding with gravel for stability.
4. Install dips to outlet water on undisturbed or stable areas.



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 are vegetated by establishing Bermuda and/or tall fescue mixtures and managed according to the NRCS Conservation Practice Standard *Critical Area Planting (Code 342)*. Bermuda is established first between May 1 and July 1. Tall fescue is 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 are needed 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) Plan appropriate fencing or limited restricted use by cattle from all sensitive areas such as streams, water bodies, and sinkholes.
- 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)*.

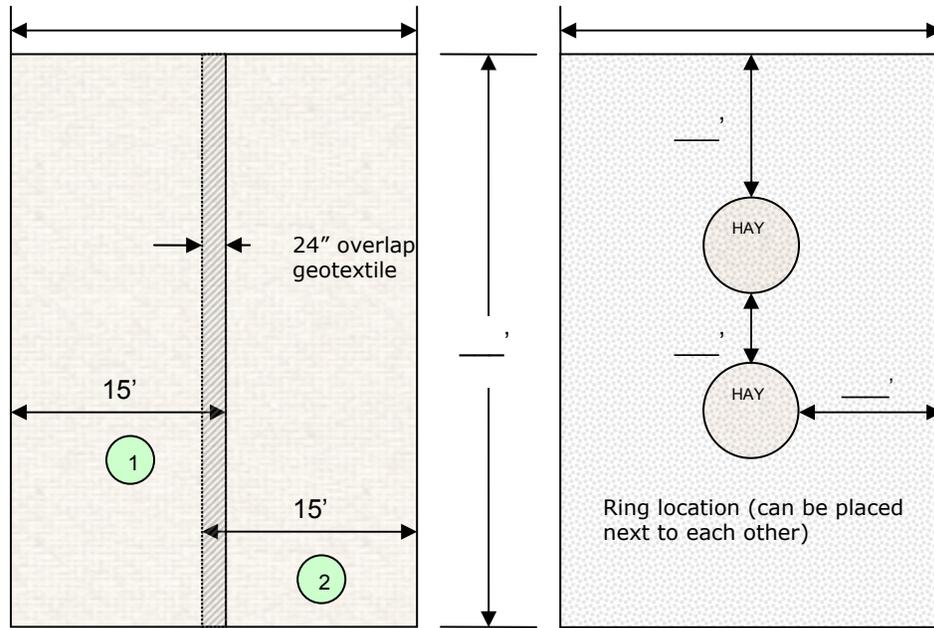


Operation & Maintenance of HUAs

- The HUA is 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 should 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.



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:

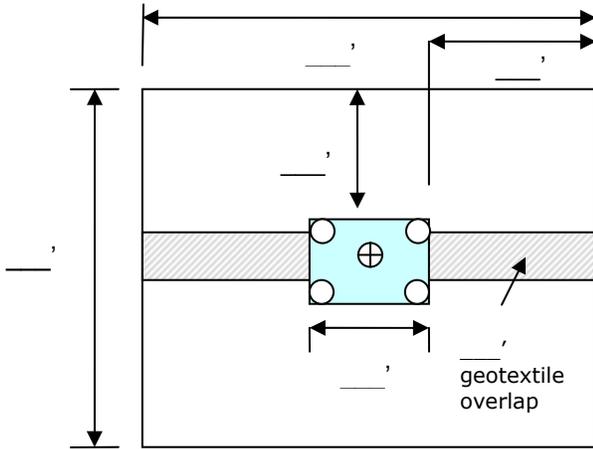
$$\frac{58 \text{ feet} \times 28 \text{ feet} \times (8 + 4) \text{ inches thick}}{324} \times 1.9 = 114 \text{ tons}$$

*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.

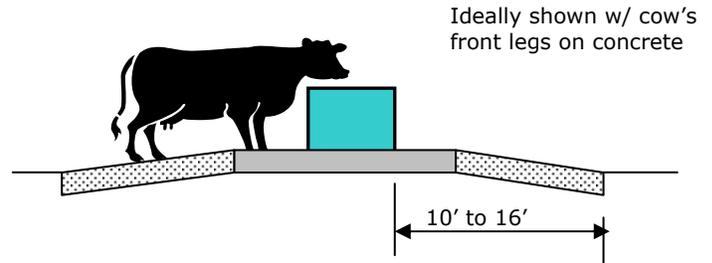
Geotextile Material

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.



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 is 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 is 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) should be present in the fine aggregate to promote bonding of the material when compacted. Aggregate (fine or coarse) is 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 is 6 inches and is 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 is provided around the HUA.

Guidelines for Concrete

1. Thickness is 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 is used in the slab. Fiber consists 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 should be reduced from a maximum of 30 feet to a maximum of 10 feet in any direction. Sawn joints are one-fourth of the slab's thickness in depth. Formed joints should be of a keyway type. Smooth vertical joints through the slab should not be used. 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.

Site Preparation

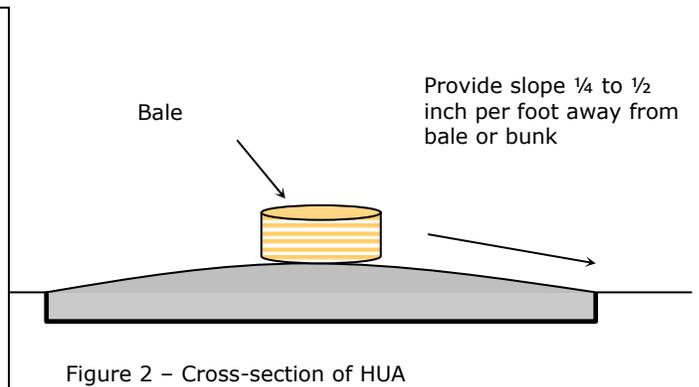
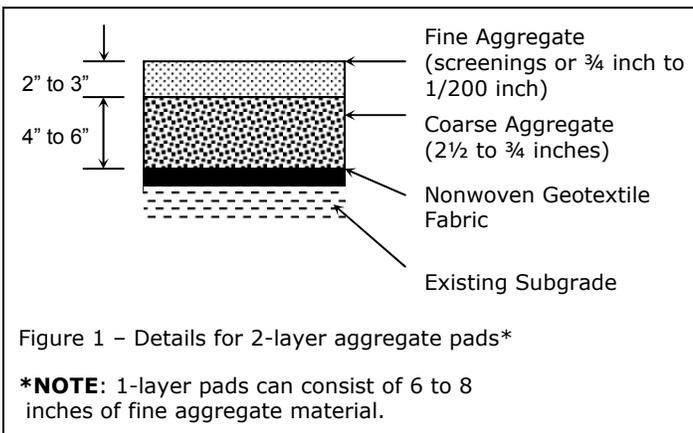
The area to be treated is graded and excavated to a depth of 6 to 8 inches. The excavated area must be free of large rocks or other material that might damage the fabric. All uncompacted, wet, organic or other undesired materials such as mud, hay, or debris is removed. The area is shaped in such a way as to allow for drainage of water away from the site. The finished project surface can 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) is loosely laid over the excavated area. Where the fabric is joined, a minimum of 1-foot overlap is needed. Pinning of the geotextile on 5-foot centers is preferred. The rock is 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 is then 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) is placed over the geotextile fabric. An additional 4 to 7 inches of crusher-run is 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.





Field Office: _____
 Phone Number: _____

Heavy Use Area Protection

561

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. = _____

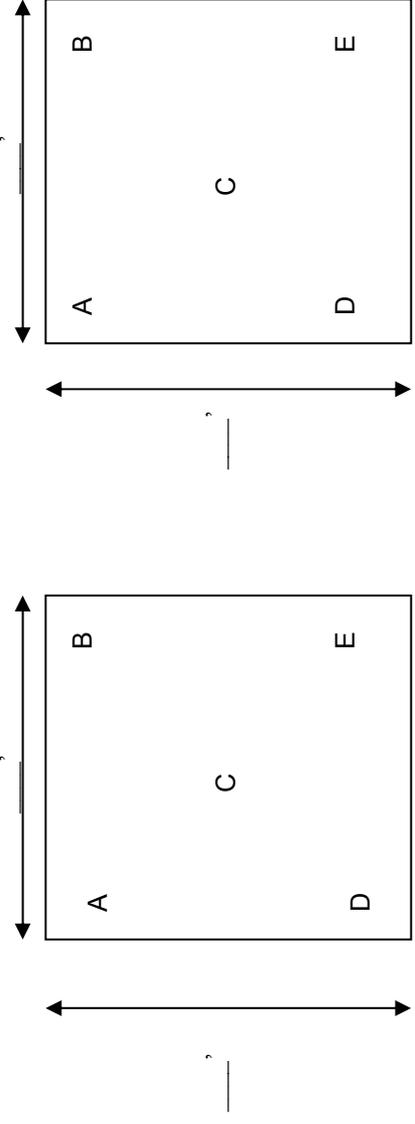
 Height of Instrument = _____

Field Layout Map



NOTES:

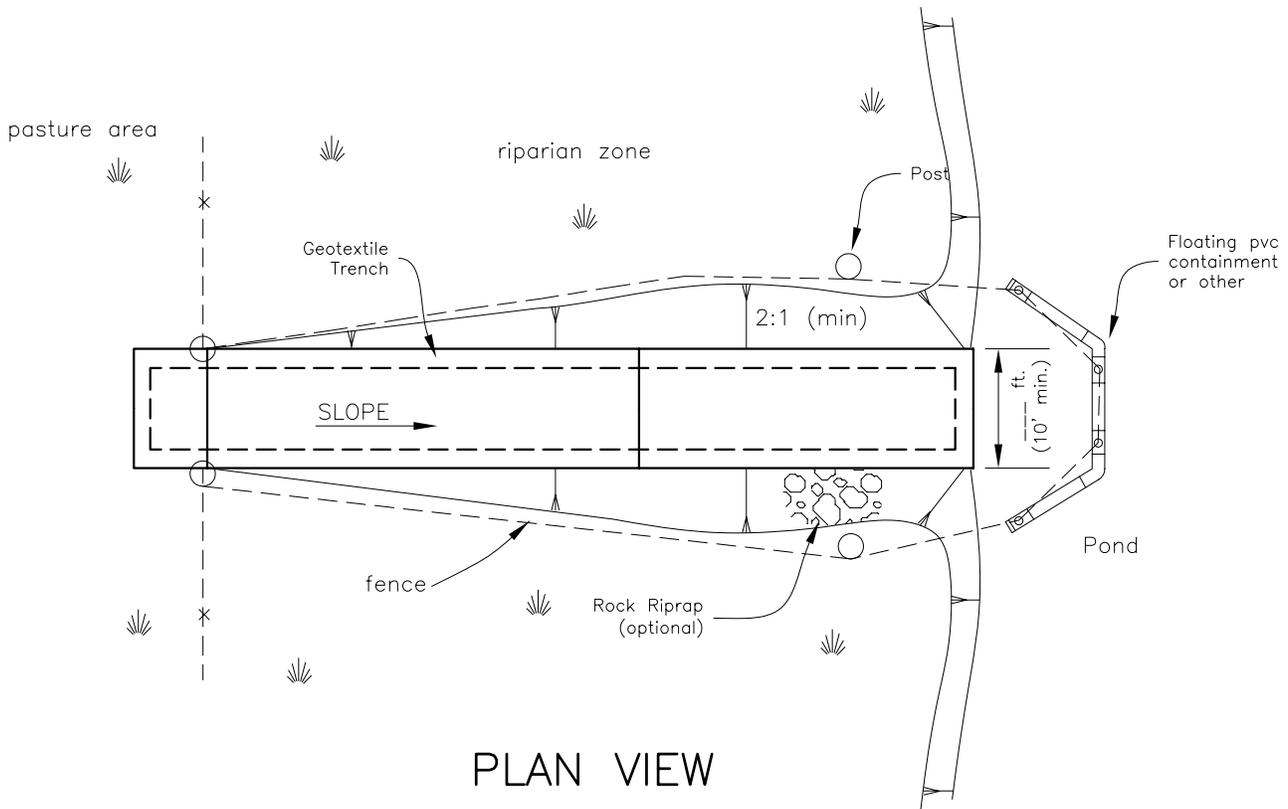
Checkout by: _____
 Date: _____
 Meets NRCS standards: YES NO



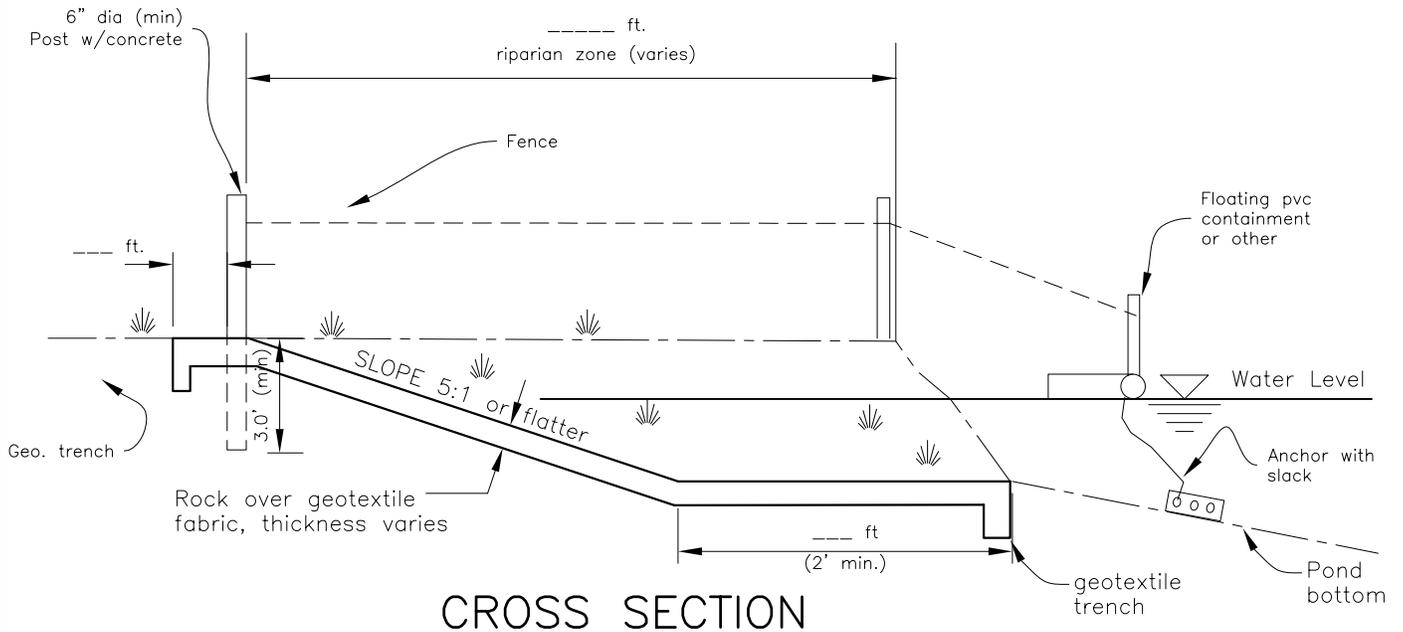
Before Construction

After Construction

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.