NRCS Natural Resources Conservation Service

February, 2010

Grassed Waterway

Washington: Conservation Practice Job Sheet ***WA-412***

Definition

A shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet.

Purposes

- To convey runoff from terraces, diversions, or other water concentrations without causing erosion or flooding.
- To reduce gully erosion.
- To protect/improve water quality.

Resource Management System

Grassed Waterway is most effective when designed as a feature of a Resource Management System. Grassed waterways and grade stabilization structures can fix gullies or washout areas in fields. Field Tillage, Crop Rotation, Buffers, and other conservation practices can be combined with a Grassed Waterway to also meet natural resource concerns and the landowner's objectives.

Vegetative cover is the single most effective and economical measure to protect soil from erosion. Erosion control measures for cropland involve an array of options to reduce water and wind erosion. Control measures that are less permanent include the type of crop or vegetation and residue/tillage management. Other practices such as strip and contour cropping, waterways, terraces and diversions are measures that further reduce erosion. These control measures can reduce the slope or length of hills and create buffers to catch sediments.

A grassed waterway is used in areas where added water conveyance capacity and vegetative protection are needed to control erosion resulting from concentrated runoff. Such areas commonly include draws and other low-lying areas or outlets for other conservation practices (e.g., diversions and terraces). The minimum capacity of a waterway conveys the peak runoff expected from a storm of 10-year frequency, 24-hour duration. In some areas, a combination of high peak runoff and steep slopes may cause water velocities that preclude the use of a grassed waterway.

A network of grassed waterways.

Contour terraces draining into a grassed waterway.

Plans and Specifications

Specifications for establishment and operation of this practice shall be prepared for each Field and the Criteria, Considerations and O&M described in the current Grassed Waterway: Conservation Practice Standard 412.

Complete a practice design and fill out the Job Sheet for each Grassed Waterway or defined Field where a Grassed Waterway is to be installed.

NRCS Natural Resources Conservation Service

Grassed Waterway – Specification and Standard Drawing

Landowner_____ Field number_____

Planning Assistance by: **Design Assistance by:**		**Date**	

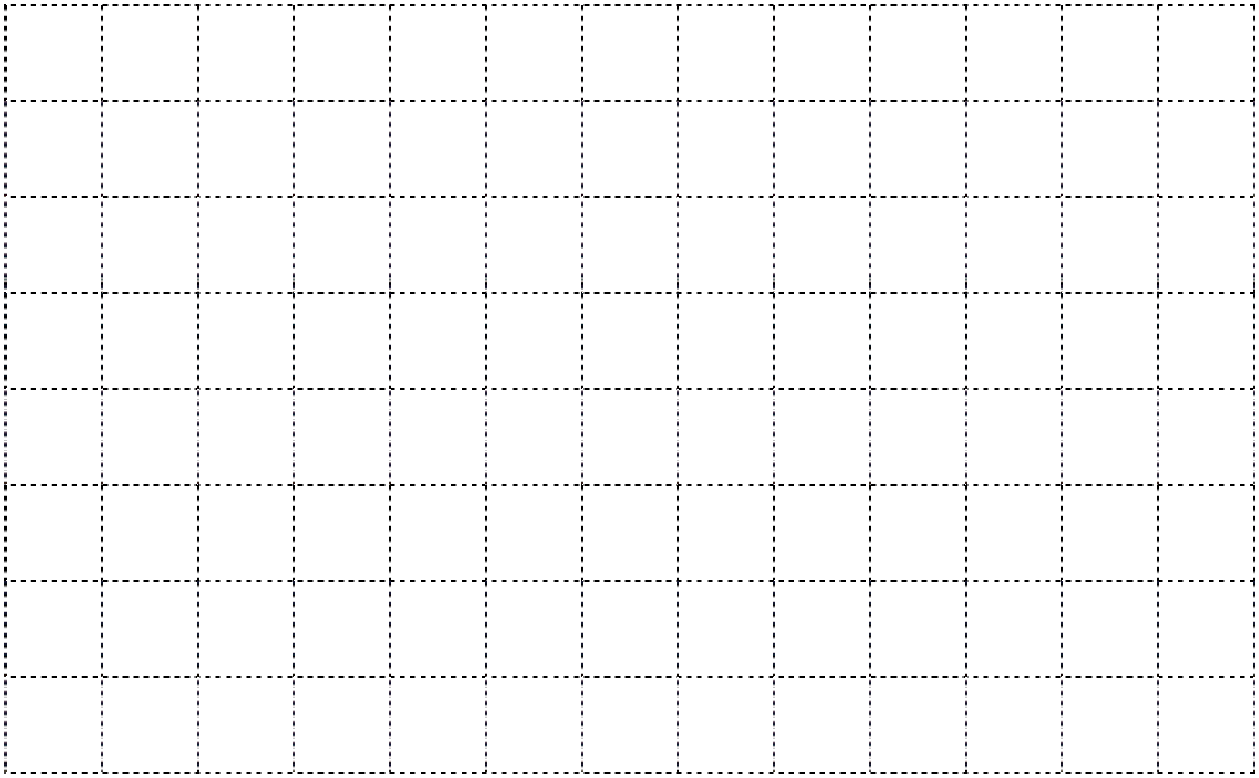
Purpose (check all that apply)	
Convey concentrated flow runoff:	**Protect/improve water quality:**
Reduce gully erosion:	**Other (specify):**

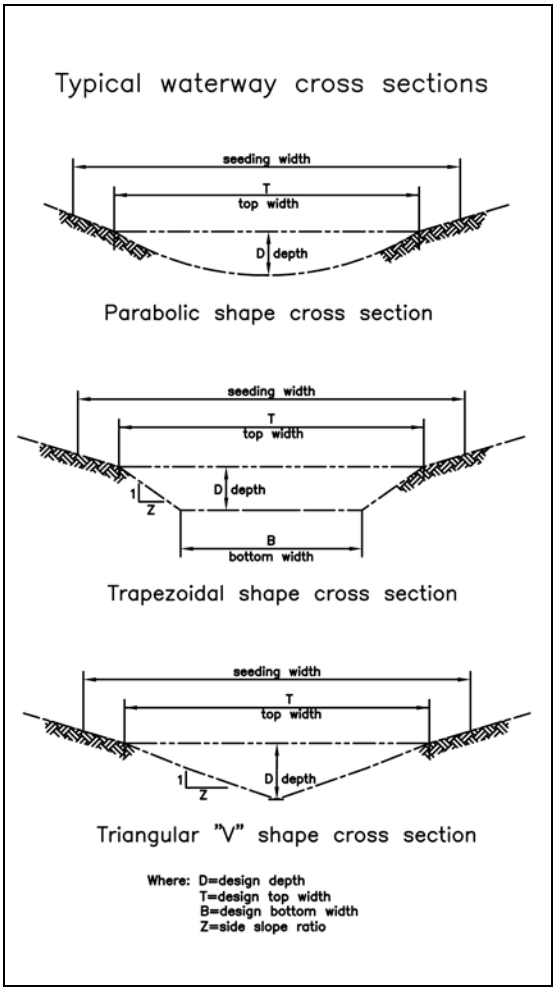
Channel Stability Determination:	
2-year 24-hour rainfall event: Inches	**Channel Slope: Ft/Ft**
Curve Number:	**Watershed Slope: Ft/Ft**
Drainage Area: Acres	**Annual Precipitation: Inches**

List additional Conservation Practices (with associated Job Class) that will be installed to reduce peak flow runoff in this waterway:

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

Scale 1" = _____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")





Attach: Engineering Field Tools
Waterway Design Report copies of

- Profile
- Selected cross sections
- Design reach simulation outputs

Also attach other engineering design and construction data and construction specifications as appropriate.

Complete the following tables based on the waterway engineering design output.

Materials Estimate (Re: lines in construction table below)			
Line	**Excavation (CY)**	**Fill (CY)**	**Seeding (ac)**

Layout (check applicable shape for design)			
Waterway shape:	**Parabolic:**	**Trapezoidal:**	**Triangular:**

Reach				**Channel Slope**	**Flow**	**Channel Dimensions**				
Line	**Start Station**	**End Station**	**Length (ft)**	**Ft/Ft**	**Rate (cfs)**	**Depth (ft)**	**Side Slope (z:1)**	**Bottom Width (ft)**	**Top Width (ft)**	**Seeding Width (ft)**

Vegetative Planting		Fertilizer		Mulch Rate	
Species	**Rate (lb/ac)**	**Nutrient**	**Rate (lb/ac)**	**Type**	**Amount (lb/ac)**

Site Preparation

Grade and shape the waterway site as designed and/or staked in the field by NRCS staff. Maintain the stability of the outlet during construction. After waterway grade and shape has been approved by NRCS, prepare a firm, weed-free seedbed during the crop year most likely to establish the grass vegetation for the waterway. Apply lime and fertilizer according to the design as listed above. Seed and anchor seed bed with mulch as recommended above.

Planting Methods(s)

Establish stand of vegetation according to specified seeding rate (Critical Area Planting (342) or as specified above.

- *Drill grass and legume seed ___ inches deep uniformly over area.*
- *Mulch newly seeded area with ___ tons per acre of mulch material. (Mulching 484).*
- *Drill and seed small grain as a companion crop, as necessary, at the rate of ___ pounds per acre, but clip or harvest before plants head out.*

*Additional requirements:*_____
_____
_____

Operation and Maintenance

Maintain original width and depth of the grass seeding area. Remove debris and sediment from waterway area needed. Harvest, mow, reseed, and fertilize to maintain vigorous vegetation.

- *Inspect periodically and, after major storms, repair eroding or bare areas.*
- *Do not use waterway as a field road.*
- *Avoid crossing waterway with heavy equipment when wet.*

*Additional requirements:*_____
_____
_____
_____

Client's Acknowledgement (To be signed after Grassed Waterway Job Sheet is completed and before practice installation.)

By signing below, I acknowledge that I:

- have reviewed and understand the site specific design, installation specifications and operation/maintenance requirements in this Job Sheet and have an understanding of the purposes and criteria for use of this conservation practice;
- will install, operate, and maintain this conservation practice in accordance with the site specific design and specifications.
- will make no changes to the planned design and installation without prior written approval of the Natural Resources Conservation Service.
- will obtain all necessary permits and/or rights, and comply with all ordinances and laws pertaining to the installation, operation, and maintenance of this conservation practice, prior to the start of installation; and
- will assume responsibility for notifying all utilities affected by the installation, operation and maintenance of this conservation practice.

Signature	Date

Required Job Approval Authority or TSP Certification Category: Grassed Waterway

NRCS Job Approval Authority:
(Job Class required for design and installation). (I, II, III, IV, or V).

Practice Units Description: Design Capacity	**CFS**	**This Specific Design Capacity:**	**CFS**
Required Certification Categories for Technical Service Providers		**Category for this Practice:**	**Engineering, Grade Stabilization**

Practice Design Certification: (To be completed after Job Sheet is complete and before practice installation.)

By signing below, I certify that:

- The conservation practice planning and design outlined in this Job Sheet meet the purposes, associated criteria, appropriate site conditions and client objectives; and
- I have the required Job Approval Authority or TSP certification required for this conservation practice design.

Signature	Date
Print Name	**Title**

Practice Installation Certification (To be completed after practice installation and check out)

By signing below, I certify that:

- the practice has been installed according to the site specific installation requirements and specifications,
- required operation and maintenance requirements are being met; and
- I have the required Job Approval Authority or TSP Certification for this conservation practice installation

Signature	Date
Print Name	**Title**