



*Understanding Road Maintenance
Concerns in Managing Water
Quality Improvements*



Sometimes a ditch is just a ditch



Mowed

Erosion Free



Sometimes a ditch is a front yard



We “know” how to maintain a ditch



Maryland Department of Transportation
State Highway Administration
Highway Maintenance Division

ACTIVITY GUIDELINES

Ditching with Excavator/Grader

23 --- Maintenance
27 --- Reimbursable
28 --- Non-Reimbursable
435

Description and Purpose: Cleaning and reshaping roadside inlet and outlet ditches with mechanized equipment, including removing, hauling, and disposing of excess material, reshaping front and back slopes, and cleaning and maintain adequate drainage.

Scheduling: Ditch with an excavator or grader on ditches where large amounts of silt have accumulated, have lost their cross section, or where the blocked culverts. A letter of authorization from the Maryland Department of Transportation may be necessary.



Maryland Department of Transportation
State Highway Administration
Highway Maintenance Division

ACTIVITY GUIDELINES

Hand Cleaning Ditches

23 --- Maintenance
436

The following should be interpreted as a statewide guide only. Actual practice at the local level may vary, while maintaining a similar degree of efficiency.

Description and Purpose: Cleaning roadside inlet and outlet ditches, by hand, within the right-of-way, including removing, hauling, and disposing of excess material and debris to restore and maintain adequate drainage.

Scheduling: Hand clean ditches where large amounts of silt have accumulated in areas where motorized equipment can not be used. If possible, hand clean ditches during the dry season.

The following should be interpreted as a statewide guide only. Actual practice at the local level may vary, while maintaining a similar degree of efficiency.

Team:

Facility Maintenance Technician IV	1
Facility Maintenance Technician	6

- Work Method:**
1. Follow guidelines for protective equipment
 2. Place signs and other safety devices in accordance with MUTCD and WZTC.
 3. Remove roadway signs and other safety devices if necessary.
 4. Remove dirt and debris from ditches with hand tools and load into dump truck.
 5. Re-establish uniform cross-section of ditch which will accumulate debris.
 6. Dress and shape front and back slopes for creating steep slopes.
 7. Haul excess material to designated disposal area.
 8. Apply grass seed, fertilizer, and erosion control material as required.
 9. Replace roadway signs and other safety devices.
 10. Remove signs and other safety devices.

Team:

Facility Maintenance Technician IV	1
Facility Maintenance Technician	4

Equipment:

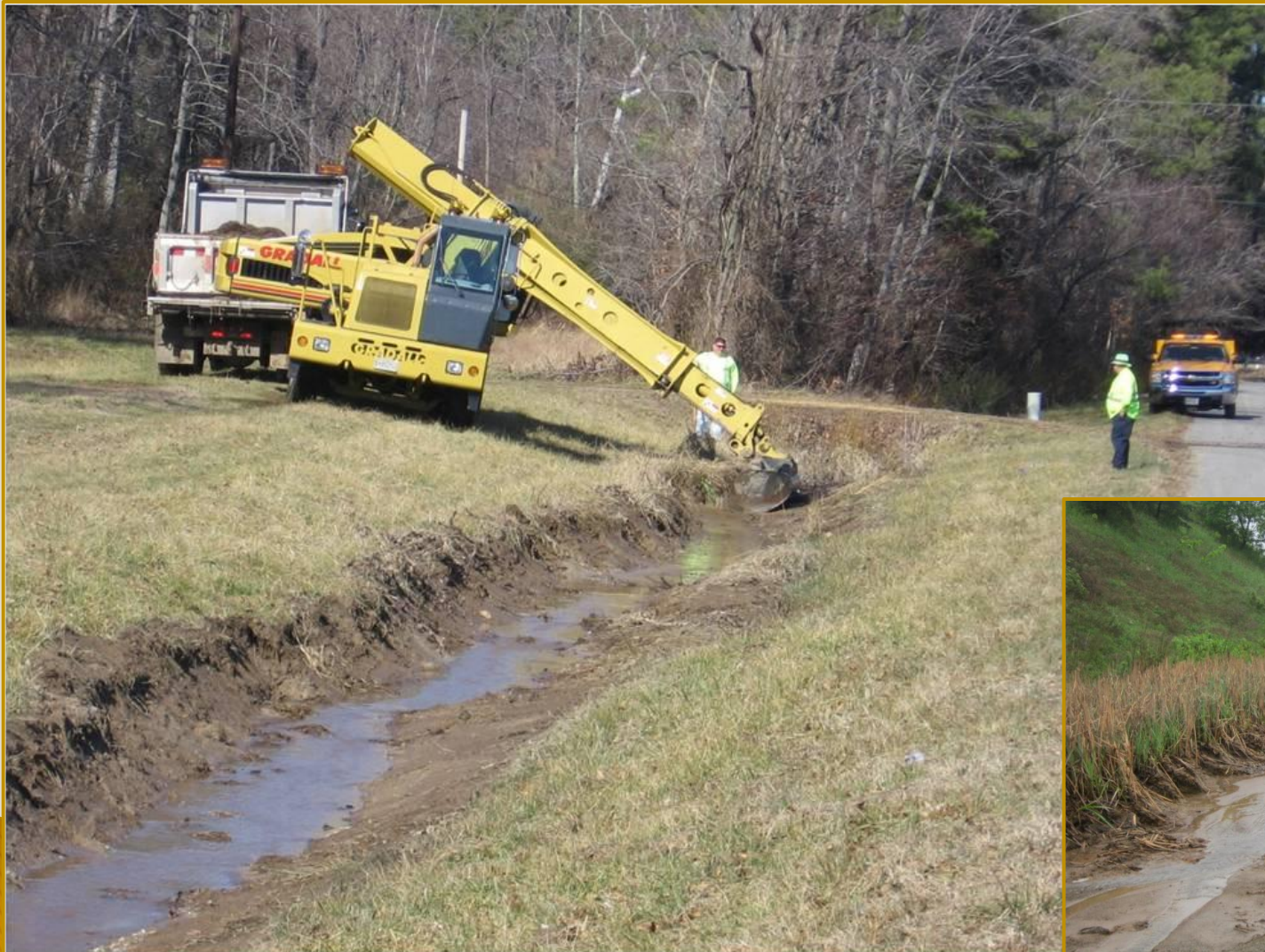
Dump Truck	2
Loader	1
MOT/Safety Equipment	1

Equipment:

Dump Truck	3
Excavator/Grader	1
Loader/Belt Loader	1
A-Boom Tractor with Spin Ditch Attachment	1
Pick-Up/1 Ton Dump Truck	1
Hydroseeder	1
Tractor Sweeper	1
MOT/Safety Equipment	1

- Work Method:**
1. Follow guidelines for recommended personal protective equipment.
 2. Place signs and other safety devices in accordance with MUTCD and WZTC.
 3. Remove dirt and debris from ditches.
 4. Make ditch sufficiently wide to accommodate water.
 5. Be certain that ditch is cleaned for sufficient distance from outlet end of pipe to ensure continuous flow.
 6. Haul excess material to designated disposal area.
 7. Remove signs and other safety devices.

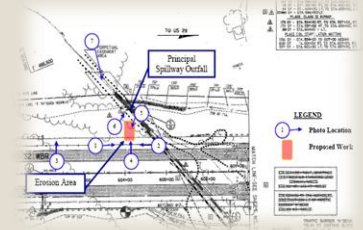
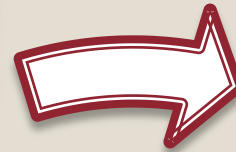
Keep them flowing



Keep them flowing



Identification of Existing Water Quality Grass Swales



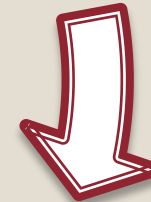
Asset Management
administering the growing number of stormwater facilities drainage structures, drainage conveyances

Planning

Design

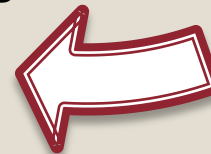


Stormwater and Drainage Asset Management Program



Operations

Construction



Ditch or Water Quality Treatment Facility?



Identification of Existing Water Quality Grass Swales

- ▶ Provide conveyance,
- ▶ Water quality treatment
- ▶ Flow attenuation of stormwater runoff
- ▶ Provide pollutant removal through vegetative filtering
- ▶ Sedimentation
- ▶ Biological uptake
- ▶ Infiltration into the underlying soil media.




**No comprehensive inventory exists
for roadside ditches**

SHA Progress – Projects Underway



Maintenance concerns

- ▶ **Complicated landscaping**
 - ▶ Many layers of media
 - ▶ “Soft” biosoil media
 - ▶ Construction techniques
 - ▶ Tight spaces
 - ▶ Traffic
- 

Converting a concrete swale ...



... into Biotrench...




12/30/2008

... the neighbors like grass



01/08/2009

Maintenance concerns

- ▶ Complicated landscaping
 - ▶ Many layers of media
 - ▶ “Soft” biosoil media
 - ▶ Construction techniques
 - ▶ Tight spaces
 - ▶ Traffic
- 

Complicated Construction ...



...Looks Pretty...



...Really Pretty...



Switchgrass maintenance tools



Hand trimmers

