Classroom Examples

Classroom Example #1 (page 24)

- Flooding has occurred in Woodhull, NY in the south Branch of Tuscarora Creek and repair work is needed on a small stretch of stream. There is a bridge ¼ mile downstream of the affected area with a drainage area of 19.6 square miles.

- Find the following:
  - Bankfull width
  - Bankfull depth
  - Bankfull area
  - Floodplain width

1. Find the Drainage Area (D.A.)

- Drainage area at the bridge is 19.6 square miles
  - Use the appropriate Regional Bank-full Hydraulic Geometry Table from Appendix C
  - Use 20.0 square miles

2. Select the Proper Table (Appendix C)

- There is a table for each of the Hydrologic Regions in New York State

- Woodhull is located in the Southern Tier Region

Figure 3.7 Hydrologic Regions in New York State

3. Find the Construction Dimensions

- Enter the table at the correct D.A. in the left hand column
- Read across & note the construction dimensions

Southern Tier Region

Bank Full Hydraulic Geometry vs. Drainage Area for Selected Hydrologic Regions

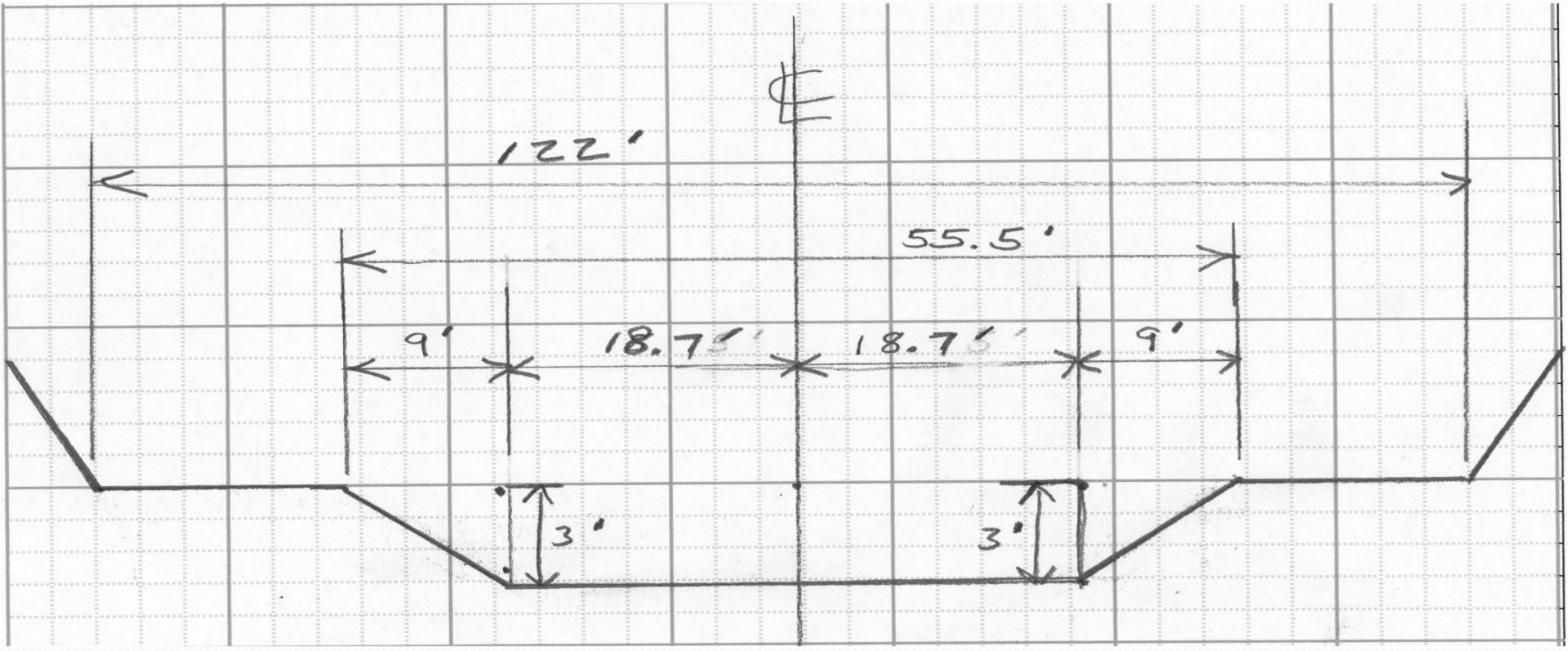
				Construction Dimensions					
DA (sq. mile)	Bank-Full Area (sq. ft)	Bank-Full Width (ft)	Bank-Full Depth (ft)	channel side slope	D (ft)	3D (ft)	X (ft)	TW (ft)	Min. FP (ft)
1.0	17.60	16.90	1.04	3:1	1.38	4.13	4.32	16.90	37.18
2.5	32.28	24.81	1.30	3:1	1.62	4.85	7.56	24.81	54.58
5.0	51.08	33.17	1.54	3:1	1.85	5.55	11.04	33.17	72.98
7.5	66.80	39.31	1.70	3:1	2.01	6.02	13.63	39.31	86.49
10.0	80.82	44.35	1.82	3:1	2.13	6.39	15.78	44.35	97.57
12.5	93.68	48.70	1.93	3:1	2.23	6.70	17.65	48.70	107.13
15.0	105.70	52.56	2.01	3:1	2.32	6.96	19.32	52.56	115.64
17.5	117.06	56.07	2.09	3:1	2.40	7.20	20.84	56.07	123.35
20.0	127.88	59.30	2.16	3:1	2.47	7.41	22.24	59.30	130.45

Answer to Example #1

- Bankfull width = 59.30 ft.
- Bankfull depth = 2.16 ft.
- Bankfull area = 127.88 ft.^{2}
- Floodplain width (FP) = 130.45 ft.

Classroom Example #1

- It is highly recommended that you prepare a sketch of the proposed cross section to use during stake out & construction

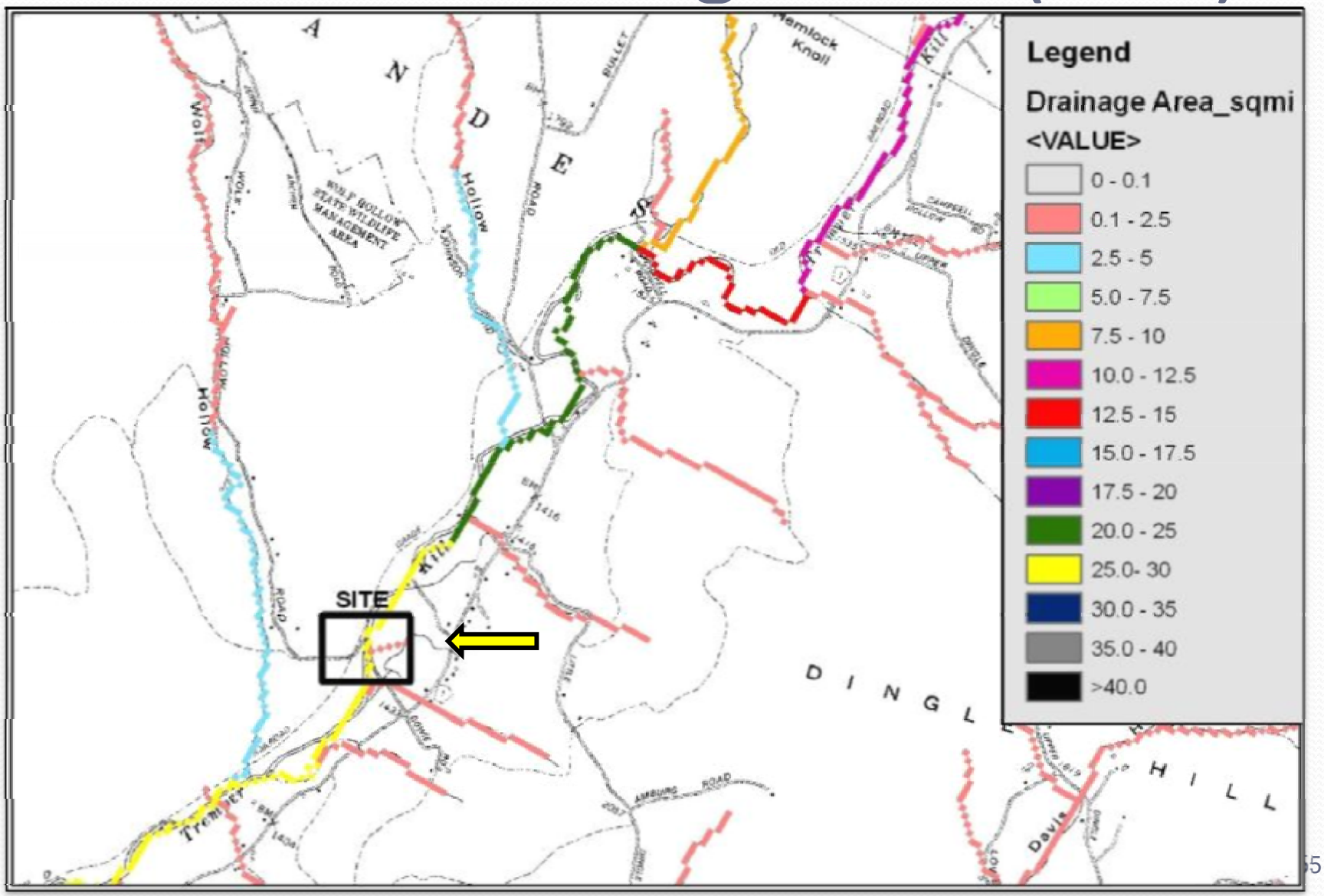


Classroom Example #2 (page 25)

- Flooding has occurred in Andes, NY on a portion of the Tremper Kill stream near Wolf Hollow Road.

- Find the following:
  - Drainage Area
  - Construction Dimensions

1. Find the Drainage Area (D.A.)



1. Find the Drainage Area (D.A.) Cont.

- On the map, the reach is coded **YELLOW**
- The key tells us that this is between 25-30 square miles
- Wolf Hollow road intersection is near the upper end of the reach – use 25 square miles

2. Select the Proper Table (Appendix C)

- There is a table for each of the Hydrologic Regions in New York State

- Andes is located in the Catskill West Region

Figure 3.7 Hydrologic Regions in New York State

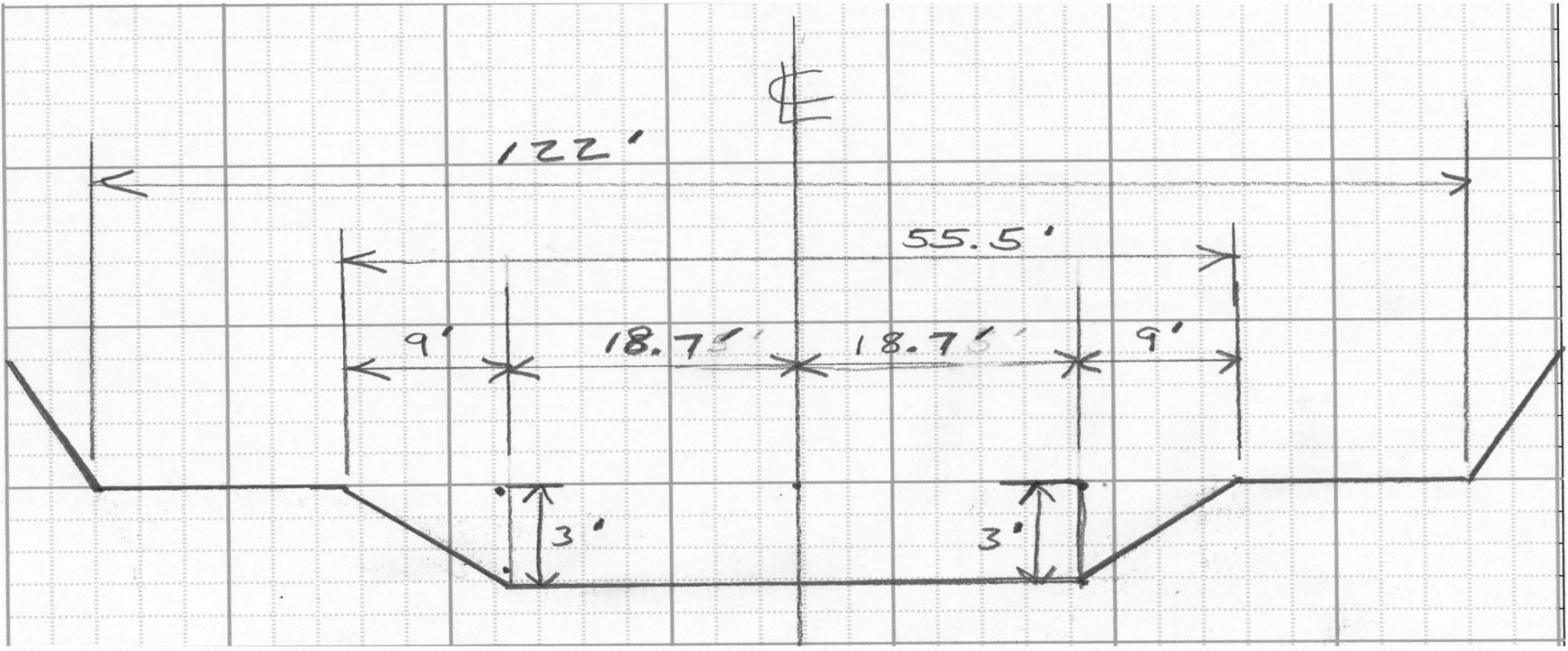
3. Find the Construction Dimensions

- Enter the table at the correct D.A. in the left hand column
- Read across & note the construction dimensions

DA (sq. mile)	Bankfull Area (sq. ft)	Bankfull Width (ft)	Bankfull Depth (ft)	Construction Dimensions					
				channel bank side slope	D (ft)	3D (ft)	X (ft)	TW (ft)	Min. FP (ft)
1	7.2	9.1	0.8	2:1	1.0	2.1	2.5	9.1	20.0
2.5	16.3	15.0	1.1	3:1	1.6	4.8	2.7	15.0	33.0
5	30.4	21.9	1.4	3:1	1.9	5.6	5.3	21.9	48.1
7.5	43.6	27.3	1.6	3:1	2.1	6.2	7.4	27.3	60.0
10	56.4	31.9	1.8	3:1	2.2	6.7	9.2	31.9	70.2
12.5	68.9	36.0	1.9	3:1	2.4	7.2	10.9	36.0	79.3
15	81.1	39.8	2.0	3:1	2.5	7.5	12.4	39.8	87.6
17.5	93.0	43.3	2.2	3:1	2.6	7.9	13.8	43.3	95.3
e20	104.8	46.6	2.3	3:1	2.7	8.2	15.1	46.6	102.5
22.5	116.5	49.7	2.3	3:1	2.8	8.5	16.3	49.7	109.2
25	128.0	52.6	2.4	3:1	2.9	8.8	17.5	52.6	115.7
27.5	139.3	55.4	2.5	3:1	3.0	9.0	18.7	55.4	121.9
30	150.6	58.1	2.6	3:1	3.1	9.3	19.8	58.1	127.8

Classroom Example #2

- It is highly recommended that you prepare a sketch of the proposed cross section to use during stake out & construction



Work Methods

Limiting Gravel Removal

- Do **NOT** remove gravel to such a depth that the channel is disconnected from the floodplain
- Do **NOT** remove point bars
  - Removing them may increase deposition & destabilize the system
  - If you think a point bar has grown too large ask for advice from local SWCD or NYSDEC

Limiting Gravel Removal

- Generally, center bars & side bars can be safely removed
- Do **NOT** over excavate or over-widen
- If the center bars & side bars are **NOT** a product of the flood leave them alone. You have more important things to do

Reconnecting to the Floodplain

- The provided tables give you the dimension for the floodplain
- The elevation of the floodplain is at the bankfull elevation
- The channel is automatically reconnected to the floodplain
- If there is not enough room available for the recommended width, make the floodplain as wide as you can

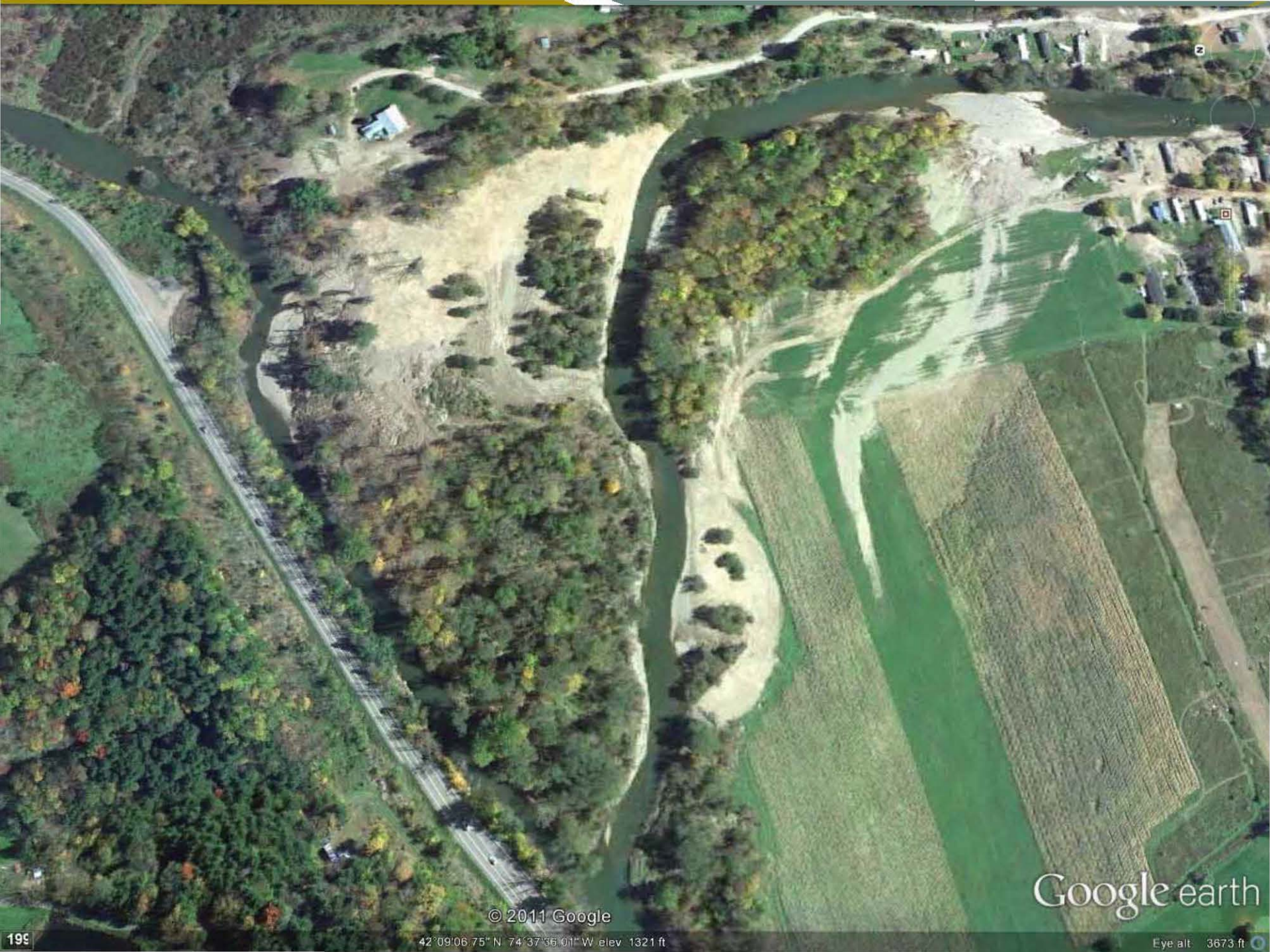

07/19/2006


3-30-09


07-29-09

2011 Hurricane

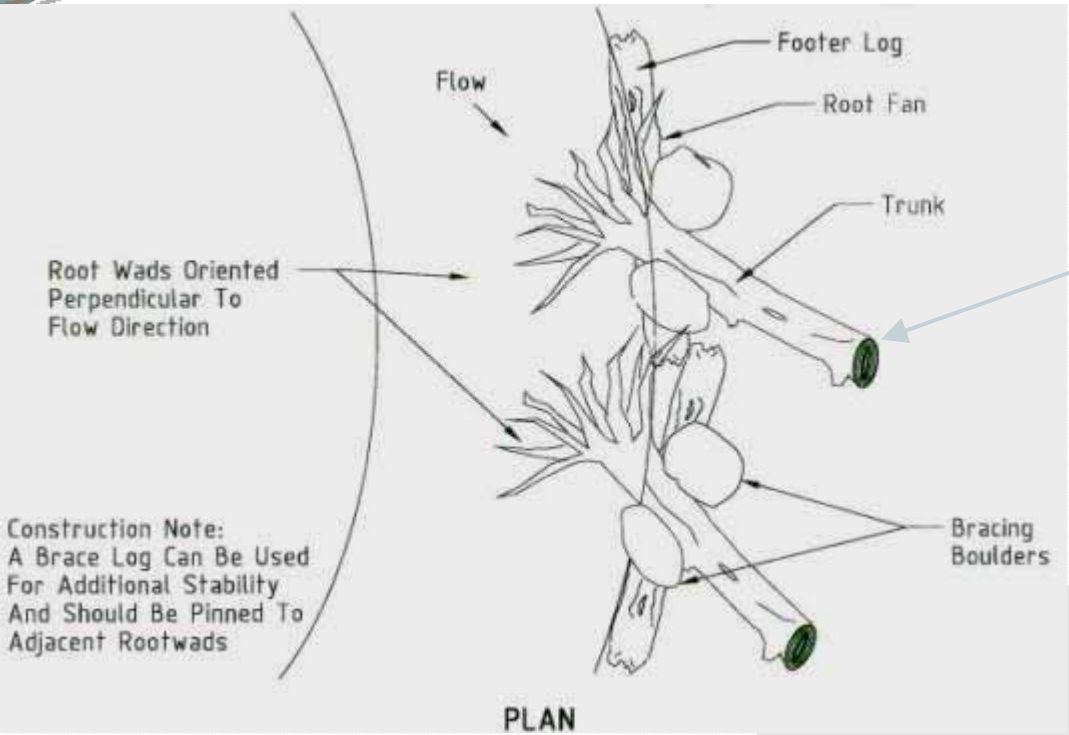
Impact on Dry Brook Stream in Arkville, NY


© 2011 Google
42°09'06.75" N 74°37'36.01" W elev 1321 ft
Eye alt 3673 ft
Google earth

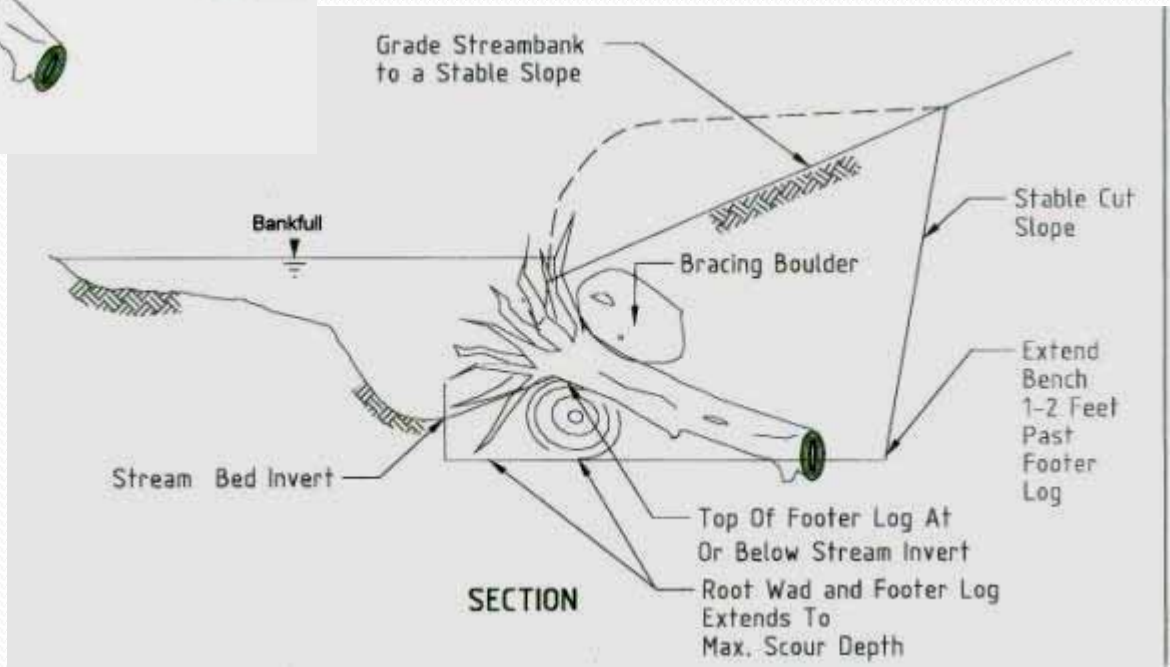
Root Wads

- Root wads can be used to stabilize the streambank
- Use debris trees that are conveniently located nearby
- The bottom of the root ball should be below the channel grade
- Brace with boulders or other large logs

Root Wads



Leave trunk as long as possible



Root wads were placed in two layers with large rocks to hold them in place


9-22-2011

Vegetation

- Vegetation holds the streambanks together
- For emergency work, there is no time to plant trees and shrubs
- Grass will provide short term stability and prevent fine sediment runoff
- Seed and mulch or hydroseed (this will be a NYSDEC permit condition)

Vegetation

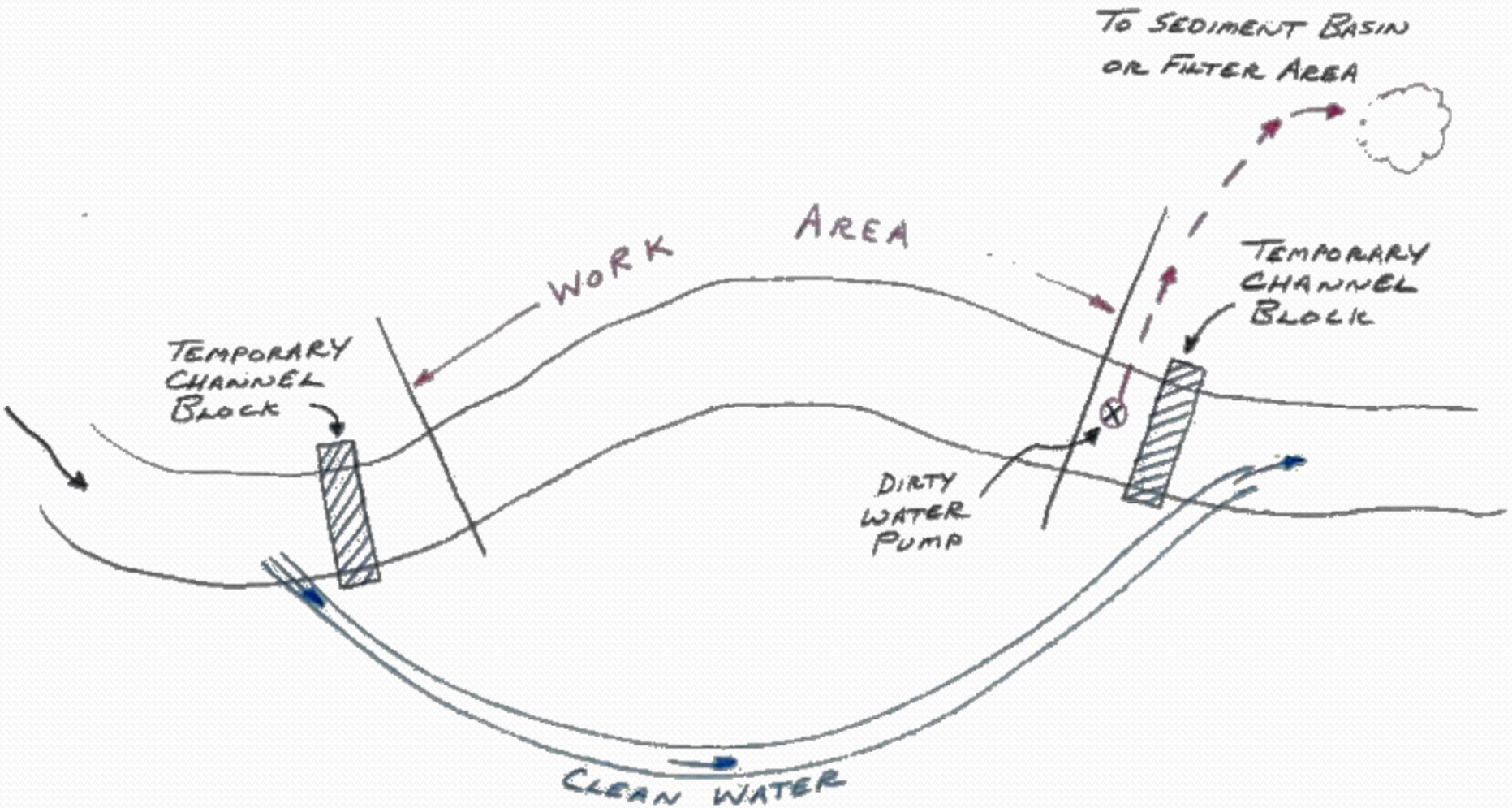
- After repair if there is an absence of woody vegetation on the banks inform local SWCD, NYSDEC, and the local municipality

- A proper vegetation plan can be designed & implemented later

De-watering

Must Isolate the Work Area

General Work Area Schematic



De-watering – Avulsion

De-watering – Avulsion

De-watering – Point Bar

Diversion – General Rules

- Place the barrier as close to the work area as possible without interfering with the operations
  - This maximizes area open to flow
- Plan the staging of your barrier – minimize the number of times the barrier will have to be moved
- The ends of the barrier will have to tied in to the bank or placed high enough so that they cannot be outflanked by the water

Diversion – Barrier


Blocks wrapped in plastic
8-03-07

Pumping Around

Pumping Around

- Generally only done on small streams
  - Dave Post farm (DA = 3 mi^2)
    - Planned on pumping 5 cfs
    - Actually pumped 15 cfs
- May be done on short term projects during known periods of low flow
  - Combination of bypass and pumping

Pump Capacities

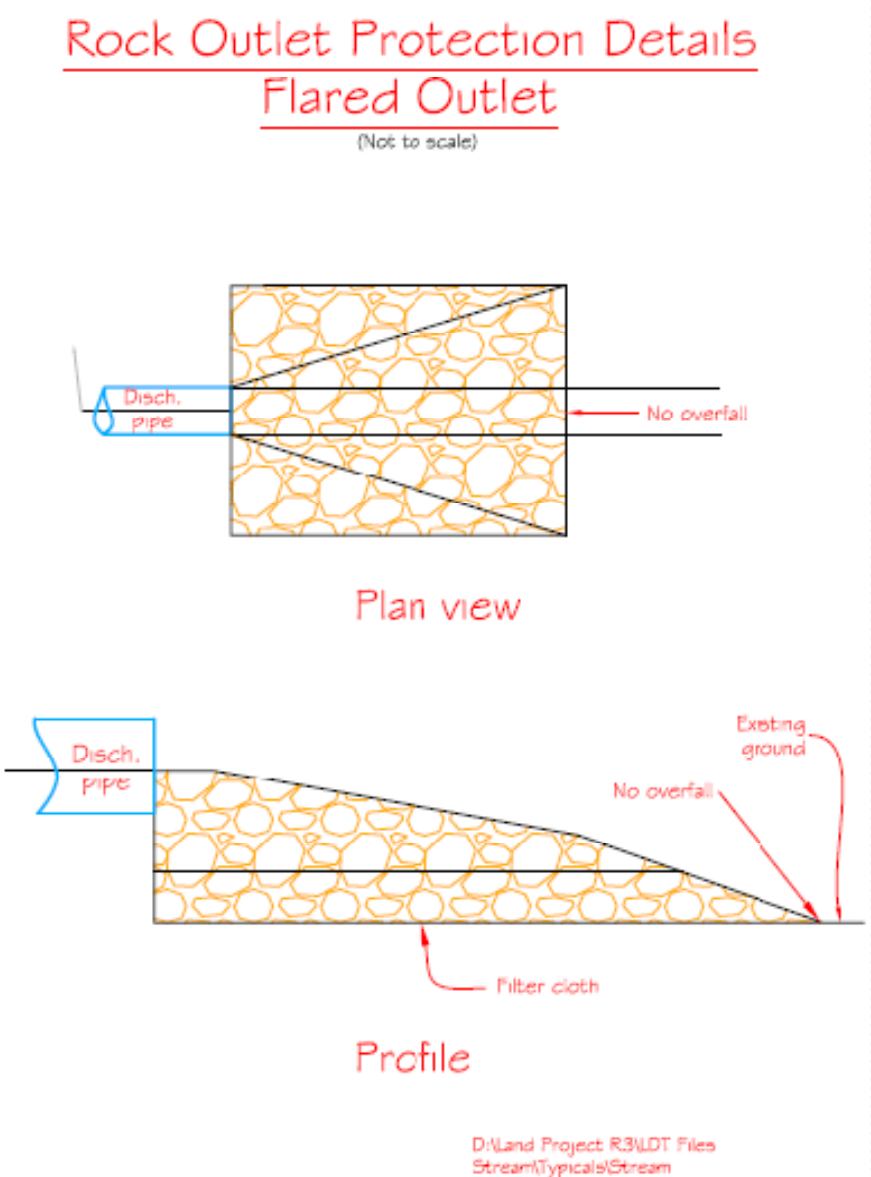
Pump Size	Max Capacity CFS	Max Capacity GPM
2"	0.5	216
3"	0.7	300
4"	1.6	700
6"	4.5	2000
8"	7	3200
10"	7.8	3500
12"	10	4500

Source: Godwin Pump, CD Series Dri-Prime

Pumping Around

- Place the pipe outlet at a well vegetated area
- Construct the energy dissipater
- Check frequently to be sure that the device is working and that no erosion is occurring
- Clean water in sheet flow enters the stream – *only!*

Pump Outlet Protection



- Leave rock loose and "jumbled"
- Adjust elevation of pipe if necessary
- Add rock and cloth if necessary
- *Intent is to induce sheet flow and avoid erosion*


08-12-10

Diversion or Pumping Around

- No turbid water may leave the site
- Cause no erosion
- Check your operation often!
- If have any problems, **stop and repair at once!**