

EROSION CONTROL PLAN DESIGN 201

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OBJECTIVES

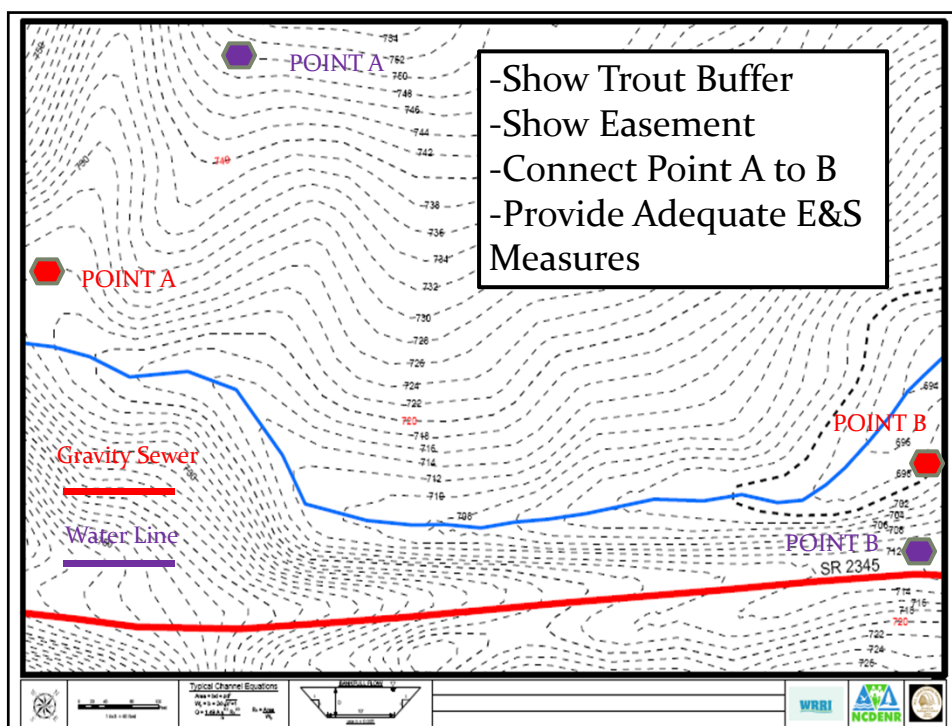
- **Properly Show a Trout Buffer**
- **Grade/Show Construction Easements**
- **Draw in Utilities**
- **Provide Adequate Erosion and Sediment Control Measures**
- **Adequately Design Stream Crossings (Temporary Crossing)**

Gravity Sewer/Water Line

- Show Trout Buffer
- Show Easement
- Connect Point A to B
- Provide Adequate E&S Measures

Design Considerations

- Width of Easement
- Minimizing Impacts
- E&S Measures for Linear Projects
- How many structures are needed?



Trout Buffer

- 15A NCAC 04B .0125 BUFFER ZONE REQUIREMENTS

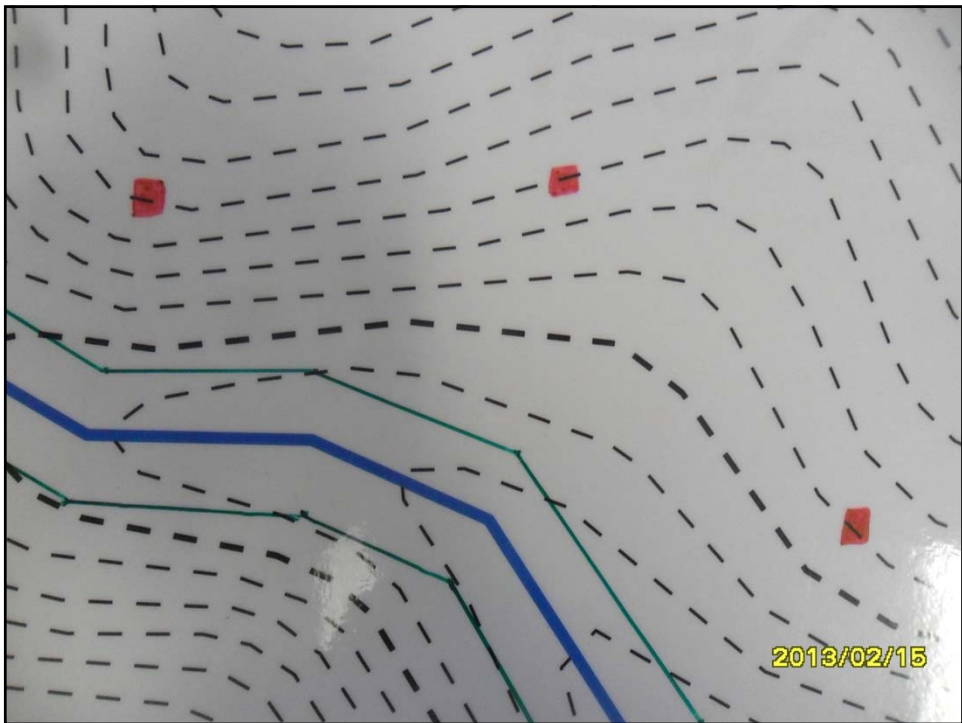
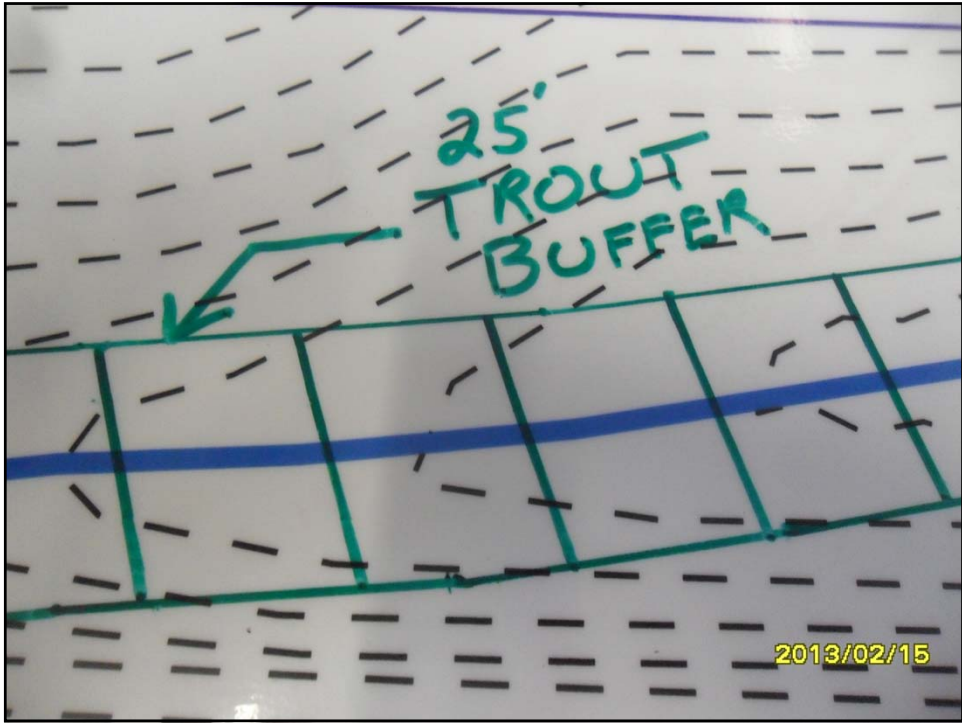
- Unless otherwise provided, the width of a buffer zone is measured from the edge of the water to the nearest edge of the disturbed area, with the 25 percent of the strip nearer the land-disturbing activity containing natural or artificial means of confining visible siltation.
- The 25 foot minimum width for an undisturbed buffer zone adjacent to designated trout waters shall be measured horizontally from the top of the bank.
- Where a temporary and minimal disturbance is permitted as an exception by G.S. 113A-57(1), land-disturbing activities in the buffer zone adjacent to designated trout waters shall be limited to a maximum of ten percent of the total length of the buffer zone within the tract to be distributed such that there is not more than 100 linear feet of disturbance in each 1000 linear feet of buffer zone. Larger areas may be disturbed with the written approval of the Director.
- No land-disturbing activity shall be undertaken within a buffer zone adjacent to designated trout waters that will cause adverse temperature fluctuations, as set forth in 15A NCAC 2B .0211 "Fresh Surface Water Classification and Standards", in these waters. 15A NCAC 04B .0112

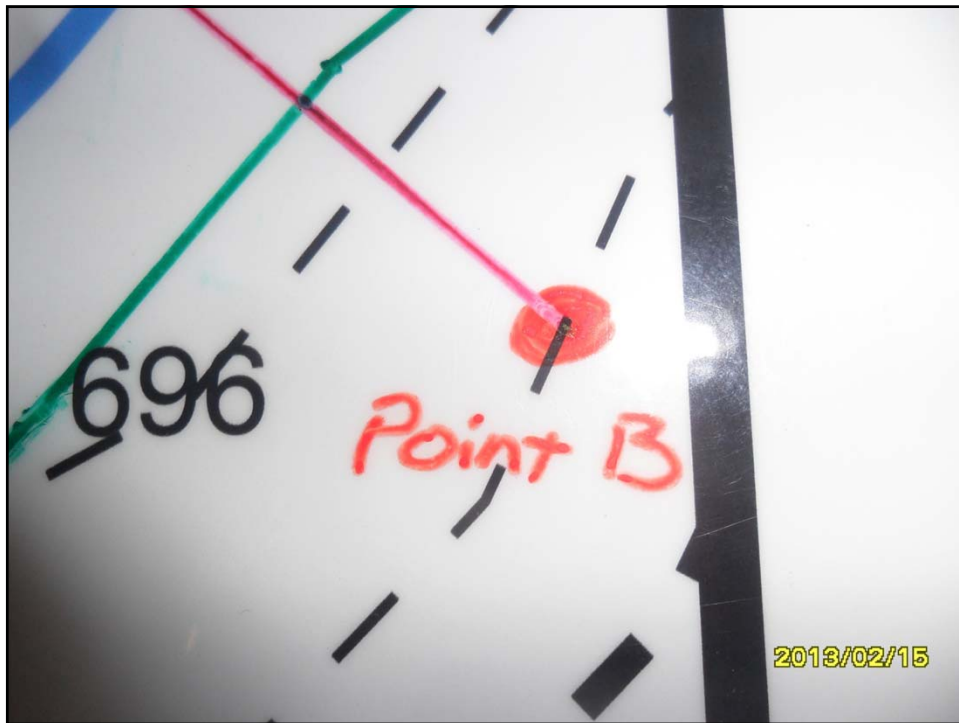
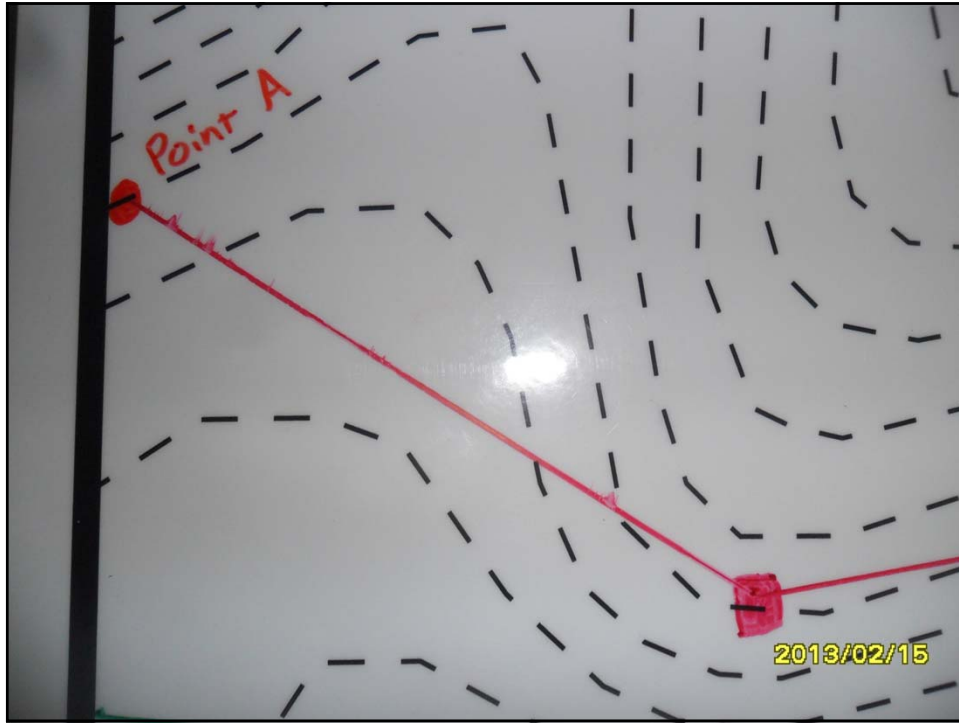
Trout Buffer

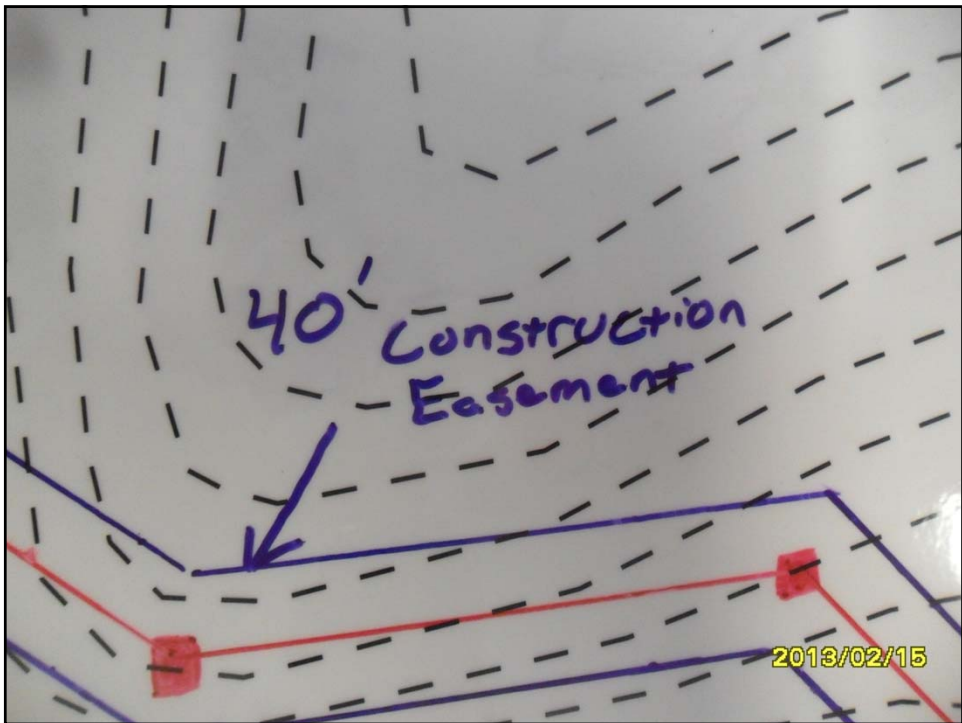
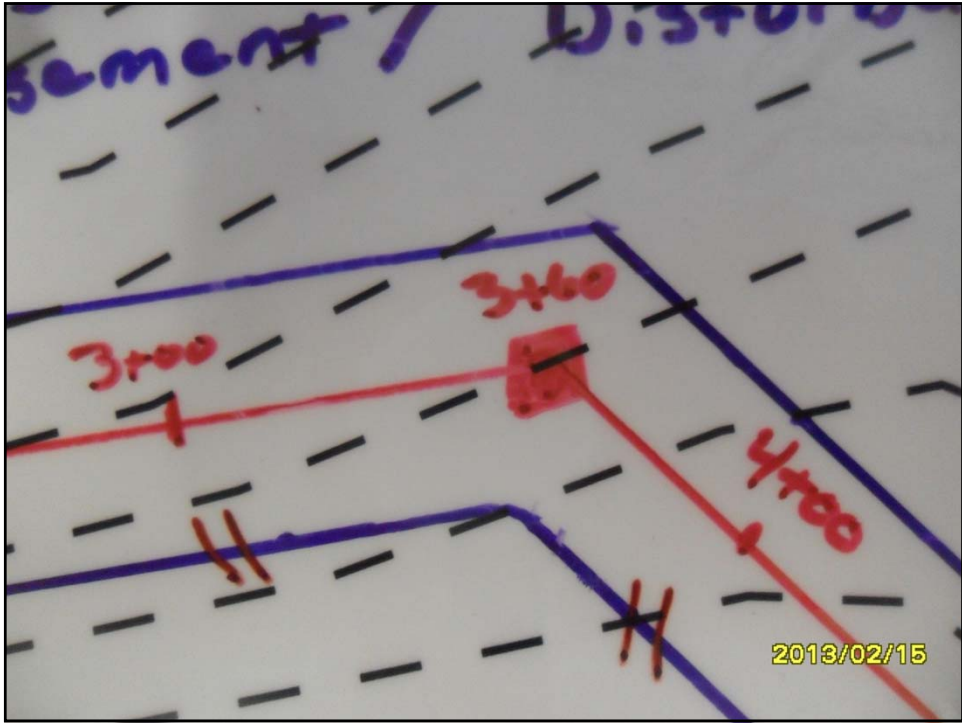
- 15A NCAC 04B .0112 OPERATIONS IN LAKES OR NATURAL WATERCOURSES

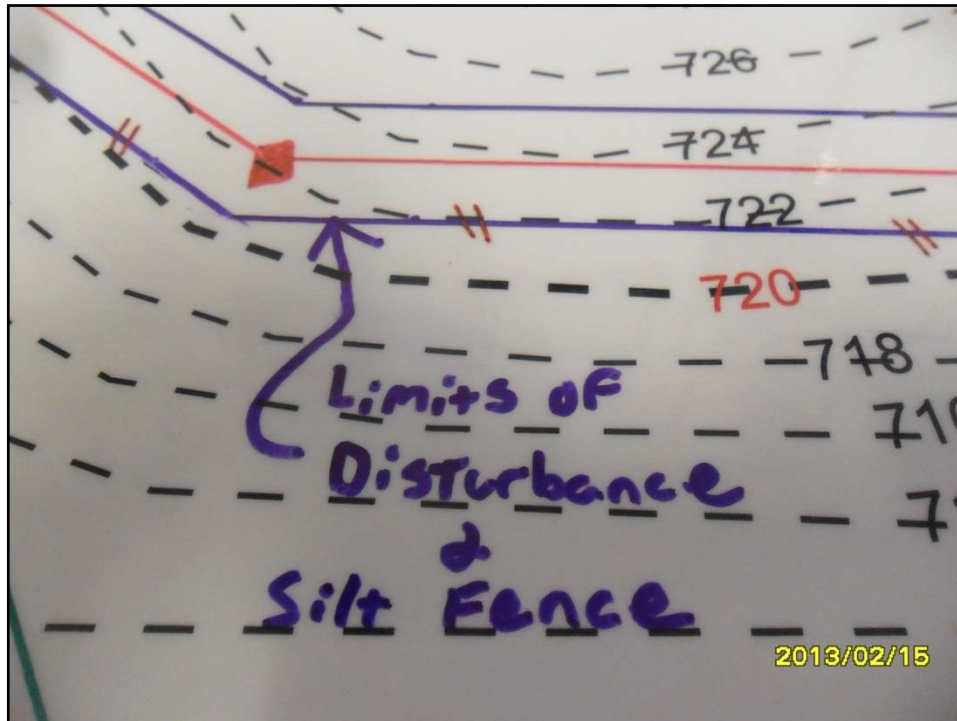
Land disturbing activity in connection with construction in, on, over, or under a lake or natural watercourse shall minimize the extent and duration of disruption of the stream channel. Where relocation of a stream forms an essential part of the proposed activity, the relocation shall minimize unnecessary changes in the stream flow characteristics.











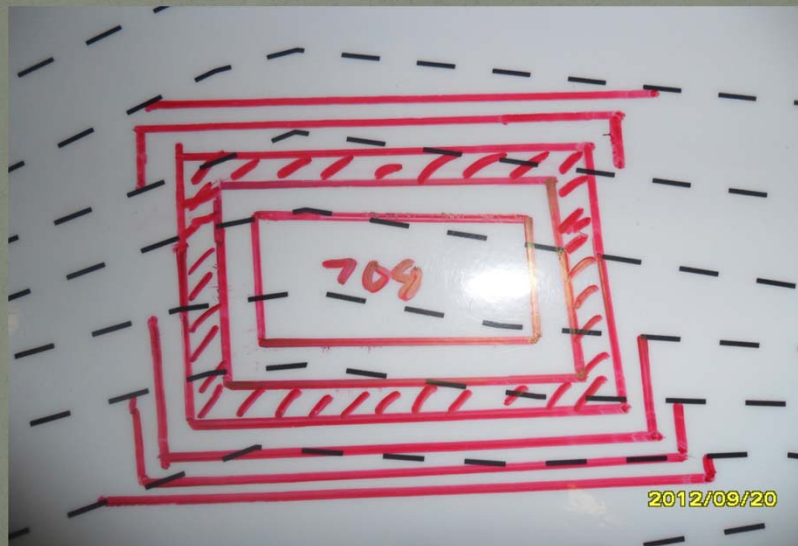
Skimmer Sediment Basin Design

- Disturbed Area (DA) of 2 acres
 - Solve for basin Volume; $V = 1800 \times DA$
- $Q_{10} = 6$ cfs;
 - Solve for Surface Area (SA); $SA = 325 \times Q_{10}$
- Solve for basin depth (d)
 - $d = V \div SA$
- Solve Length (l) and Width (w); 2:1 ratio
 - $SA = l \times w$
 - $2w = l$ (per ratio)
 - $SA = 2w^2$ (Solve for w)

Skimmer Basin Dimensions

- Answers
 - $V = 3600$ cf; $SA = 1950$ sf; $d = 1.8'$ (min. is $2'$) Use $2.0'$
 - $w = 31'$; $l = 62'$
- **USE THESE DIMENSIONS FOR ALL BASINS PLACED ON MAP!**
- **SET BOTTOM EL. FOR A BASIN**
- **DRAW LENGTH AND WIDE; THEN GRADE (USE 3:1 SLOPES FOR ALL)**
- **NEXT STEP: DRAW/GRADE IN ALL DESIRED BASINS!**

Skimmer Basin Dimensions



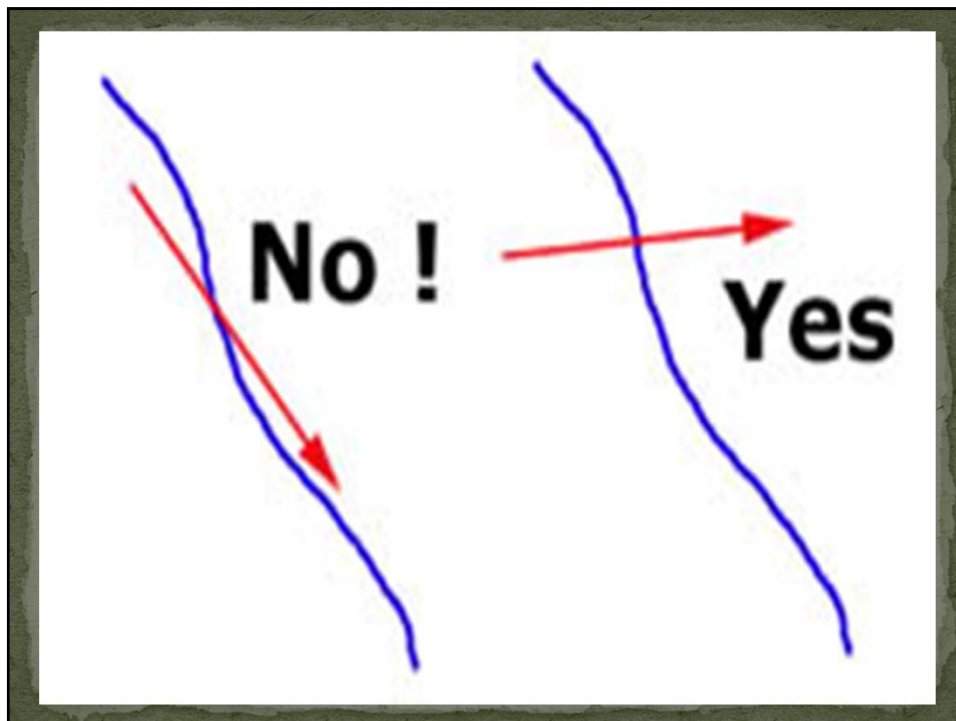
Temporary Stream Crossing

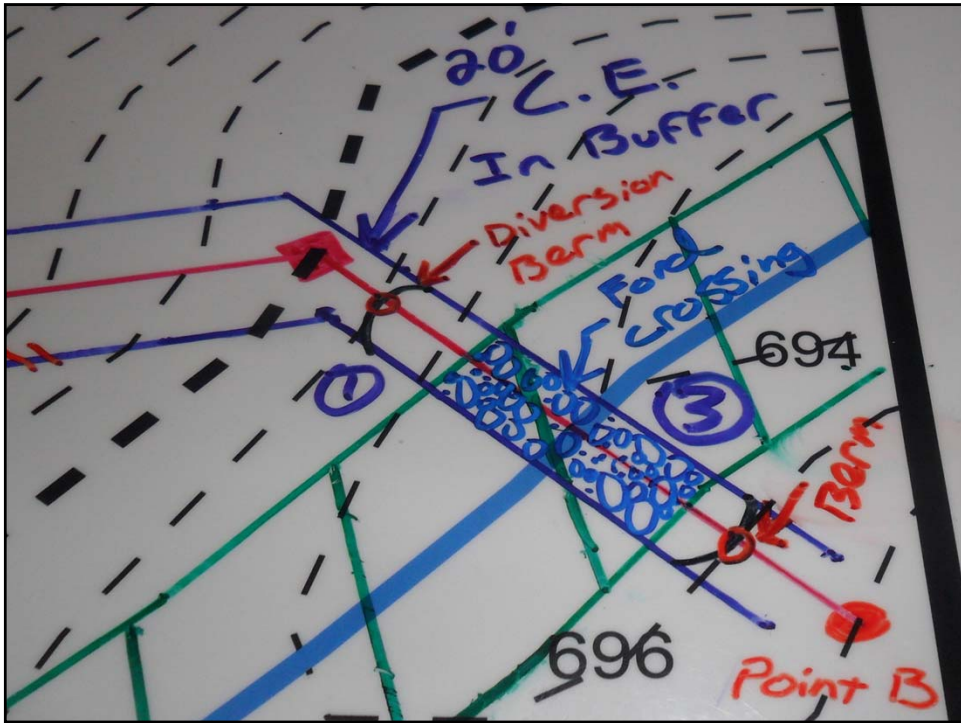
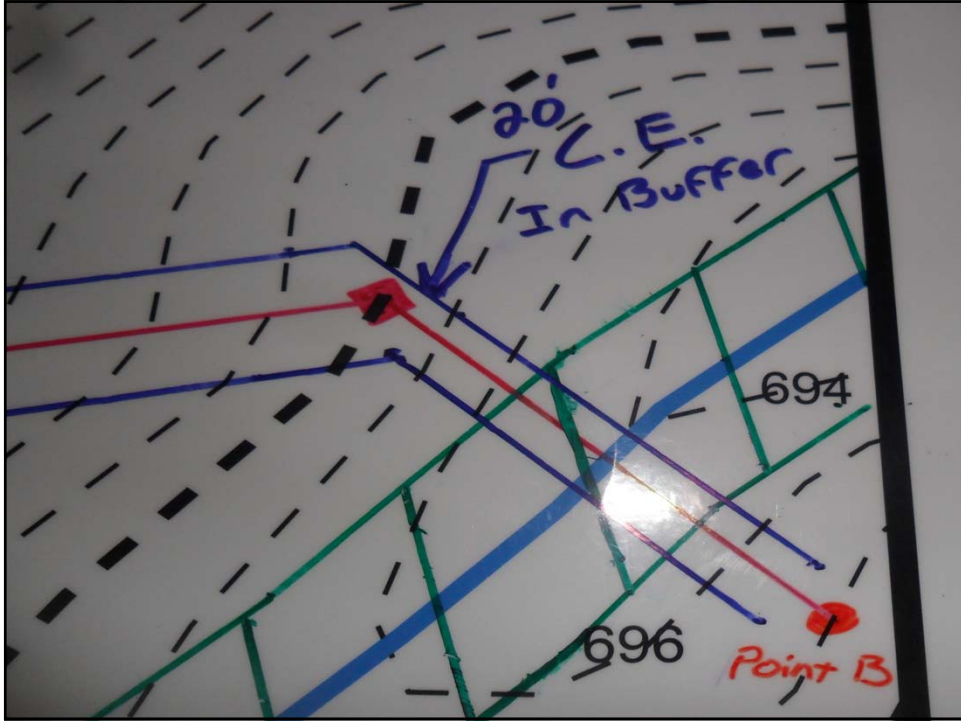
- Temporary Crossings, Solve for Bank-Full Flow
- Solve for $Q = ?$
- $A = 24 \text{ sf}$; $W_p = 15.7 \text{ lf}$; $S = 0.025$; $n = 0.035$

Reminder: $Q = 1.486 * Rh^{2/3} * S^{1/2} / n$;

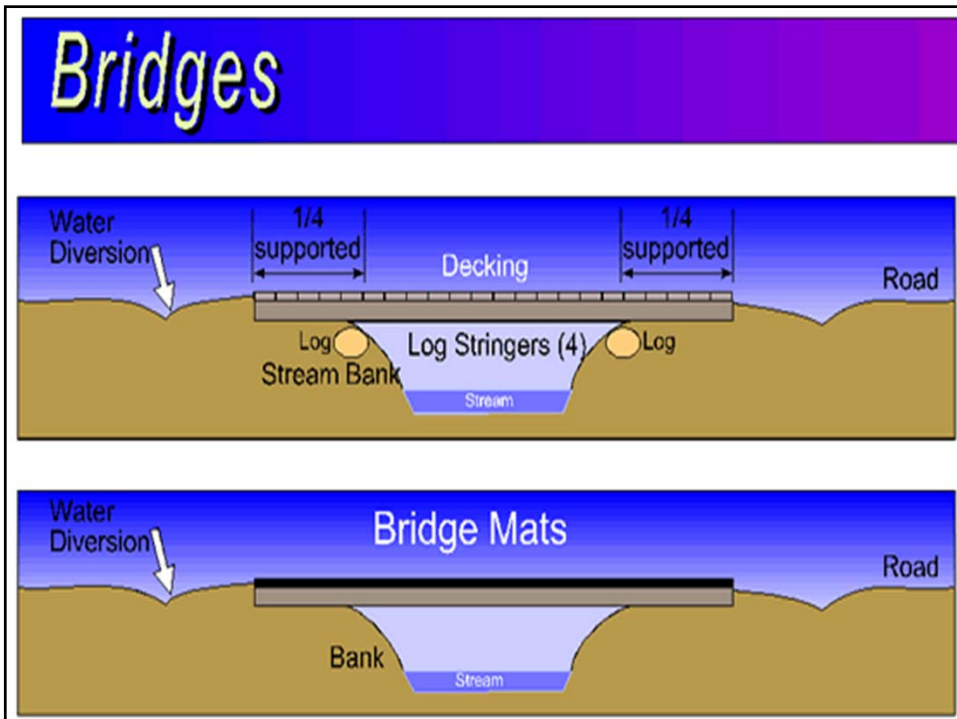
$$Rh = A/W_p$$

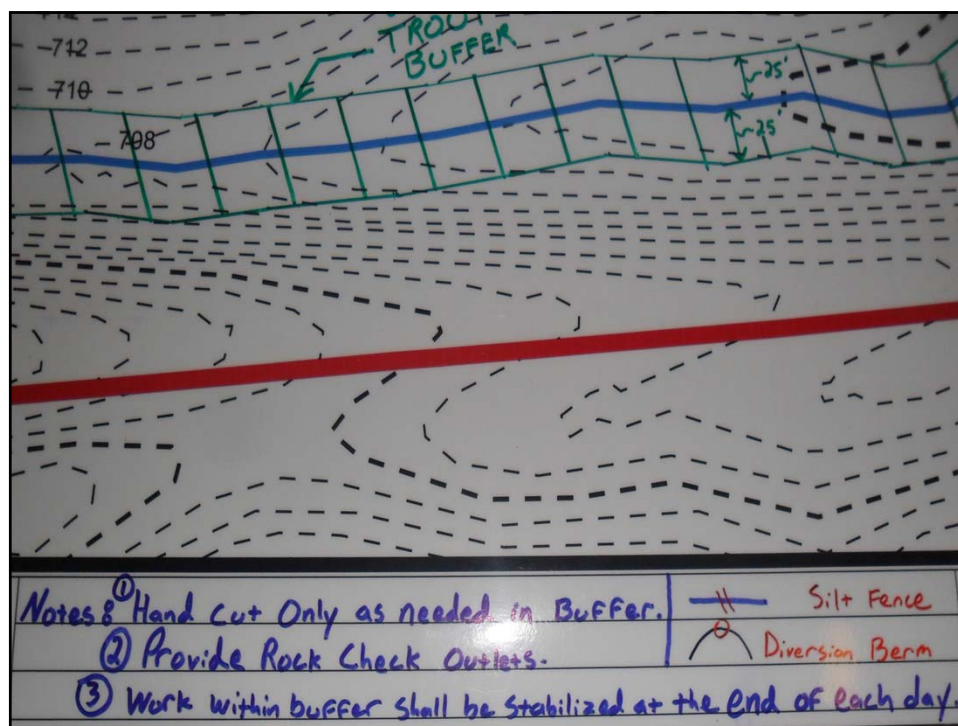
- $Q = 214 \text{ cfs}$











Riparian Area Seeding

- Approved by the Sediment Control Commission February 28th 2013
- Help promote seeding of native grasses within riparian areas.
- Need to select 4 different types of grasses when planning.

Riparian Area Seeding

Table 6.24a Temporary Seeding Recommendations

Common Name	Scientific Name	Rate per Acre	Optimal Planting Dates		
			Mountains	Piedmont	Coastal Plain
Rye grain	Secale cereale	30 lbs	Aug. 15 - May 15	Aug. 15 - May 1	Aug. 15 - Apr. 15
Wheat	Triticum aestivum	30 lbs	Aug. 15 - May 15	Aug. 15 - May 1	Aug. 15 - Apr. 15
German millet	Setaria italica	10 lbs	May 15 - Aug. 15	May 1 - Aug. 15	Apr. 15 - Aug. 15
Browntop millet	Urochloa ramosa	10 lbs	May 15 - Aug. 15	May 1 - Aug. 15	Apr. 15 - Aug. 15

Riparian Area Seeding

Table 6.24b Permanent Seeding Recommendations -- Mountain Region

Common Name	Scientific Name	Cultivars	Type*	Percentage of Mix	Optimal Planting Dates	Soil Drainage Adaptation	Shade Tolerance	Height
Switchgrass	Panicum virgatum	Cave-in-rock -- well drained Blackwell -- well drained Shelter -- well drained Kanlow -- poorly drained Carthage -- well drained	Warm Season	10-15%	Dec. 1 - Apr. 15	Cultivar Dependent	Poor	6
Indiangrass	Sorghastrum nutans	Rumsey, Osage, Cheyenne	Warm Season	10-30%	Dec. 1 - Apr. 15	Well-drained to Droughty	Poor	6
Deerfongue	Dichanthelium clandestinum	Tioga	Warm Season	5-25%	Dec. 1 - Apr. 15	Poorly-drained to Droughty	Moderate	6
Big Bluestem	Andropogon gerardii	Roundtree, Kaw, Earl	Warm Season	10-30%	Dec. 1 - Apr. 15	Well-drained to Droughty	Poor	6
Little Bluestem	Schizachyrium scoparium	Aldous, Cimaron	Warm Season	10-30%	Dec. 1 - Apr. 15	Well-drained to Droughty	Poor	4
Sweet Woodreed	Cinna arundinacea		Warm Season	1-10%	Dec. 1 - Apr. 15	Poorly-drained to Well-drained	Moderate	5
Rice Cutgrass	Leersia oryzoides		Warm Season	5-25%	Dec. 1 - Apr. 15	Poorly-drained	Poor	5
Redtop Panicgrass	Panicum rigidulum		Warm Season	10-20%	Dec. 1 - Apr. 15	Well-drained	Poor	3.5
Eastern Gammagrass	Tripsacum dactyloides		Warm Season	10-20%	Dec. 1 - Apr. 15	Well-drained to Poorly-drained	Poor	4.5
Purple top	Tridens flavus		Warm Season	5-10%	Dec. 1 - Apr. 15	Well-drained to Droughty	Poor	2.5

Riparian Area Seeding

Indian Woodoats	<i>Chasmanthium latifolium</i>		Cold Season	1-10%	Mar. 1 - May 15, July 15 - Aug. 15	Well-drained to Droughty	Moderate	4
Virginia Wildrye	<i>Elymus virginicus</i>		Cold Season	5-25%	Mar. 1 - May 15, July 15 - Aug. 15	Well-drained to Droughty	Moderate	3
Eastern Bottle-brush Grass	<i>Elymus hystrix</i>		Cold Season	5-10%	Mar. 1 - May 15, July 15 - Aug. 15	Well-drained to Droughty	Moderate	3
Winter Bentgrass	<i>Agrostis hyemalis</i>		Cold Season	10-20%	Mar. 1 - May 15, July 15 - Aug. 15	Well-drained	Moderate	3.5
Rough Bentgrass	<i>Agrostis scabra</i>		Cold Season	10-20%	Mar. 1 - May 15, July 15 - Aug. 15	Poorly-drained	Poor	2.5
Soft Rush	<i>Juncus effusus</i>		Wetland	1-10%	Dec. 1 - May 15, Aug. 15 - Oct. 15	Poorly-drained	Poor	4
Shallow Sedge	<i>Carex lurida</i>		Wetland	1-10%	Dec. 1 - May 15, Aug. 15 - Oct. 15	Poorly-drained	Poor	3
Fox Sedge	<i>Carex vulpinoidea</i>		Wetland	1-10%	Dec. 1 - May 15, Aug. 15 - Oct. 15	Poorly-drained	Poor	3
Leathery Rush	<i>Juncus conaceus</i>		Wetland	2-5%	Dec. 1 - May 15, Aug. 15 - Oct. 15	Poorly-drained	Poor	2

*Pick at least four species, including one from each type.

Final Products

● Discussions?