

Stream Smart Field Training: Hydrology & Hydraulics

StreamStats Report

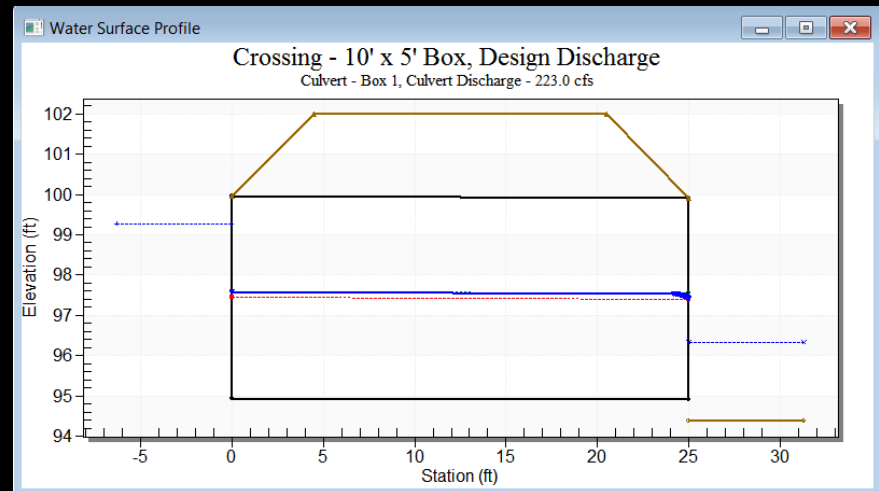
Region ID: ME
 Workspace ID: ME20181003100529229000
 Clicked Point (Latitude, Longitude): 44.82323, -68.59974
 Time: 2018-10-03 06:05:44 -0400



PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SEp
1.01 Year Peak Flood	20.5	ft ³ /s	38
2 Year Peak Flood	66.2	ft ³ /s	34
5 Year Peak Flood	103	ft ³ /s	35
10 Year Peak Flood	127	ft ³ /s	37
25 Year Peak Flood	166	ft ³ /s	39
50 Year Peak Flood	190	ft ³ /s	41
100 Year Peak Flood	223	ft ³ /s	42
250 Year Peak Flood	248	ft ³ /s	44
500 Year Peak Flood	295	ft ³ /s	47

Discharge Names	Total Discharge	headwater Elevation (ft)	Inlet Control Denth(ft)	Outlet Control Denth(ft)	Flow Type	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
1.1	20.50	95.73	0.00	1.78	7-A2c	0.51	0.48	4.04	3.54
2	66.20	96.71	0.00	2.76	7-A2c	1.11	1.01	5.97	5.49
5	103.00	97.33	0.00	3.38	7-A2c	1.49	1.33	6.92	6.43
10	127.00	97.70	0.00	3.75	7-A2c	1.71	1.53	7.42	6.92
25	166.00	98.25	0.00	4.30	7-A2c	2.05	1.82	8.12	7.59
50	190.00	98.57	0.00	4.62	7-A2c	2.24	1.99	8.49	7.94
100	223.00	98.99	0.00	5.04	7-A2c	2.49	2.22	8.95	8.37
500	295.00	99.76	0.00	5.81	7-A2c	3.00	2.68	9.83	9.16



Stream Smart Design

Structures that match natural channels – shape, slope, materials & elevations.

Crossings should mimic reference channels.

Flows and depths in new structures present no more of a challenge to movement of organisms than natural channels.

Keys to Successful Stream Smart Design

- **Thorough site assessment** w/good reference reach(es)
- **Set slope and elevations** of structure & channel correctly
- Size structure to **match stream cross-section** dimensions and **with excess capacity** to pass large storm events
- **Match natural substrate** in bed and banks

Hydrology

What volume of flow are we allowing for?

25, 50 or 100-year storm event?

What are the dominant land uses in the drainage?

Forest/Undeveloped, Agriculture, Developed?

What model to use?

- **StreamStats** - drainage area regression
- **TR-20 / TR-55** - watershed runoff & storage
- **HydroCAD** - application extension of above
- **Rational Method** – discharge w/runoff coefficients

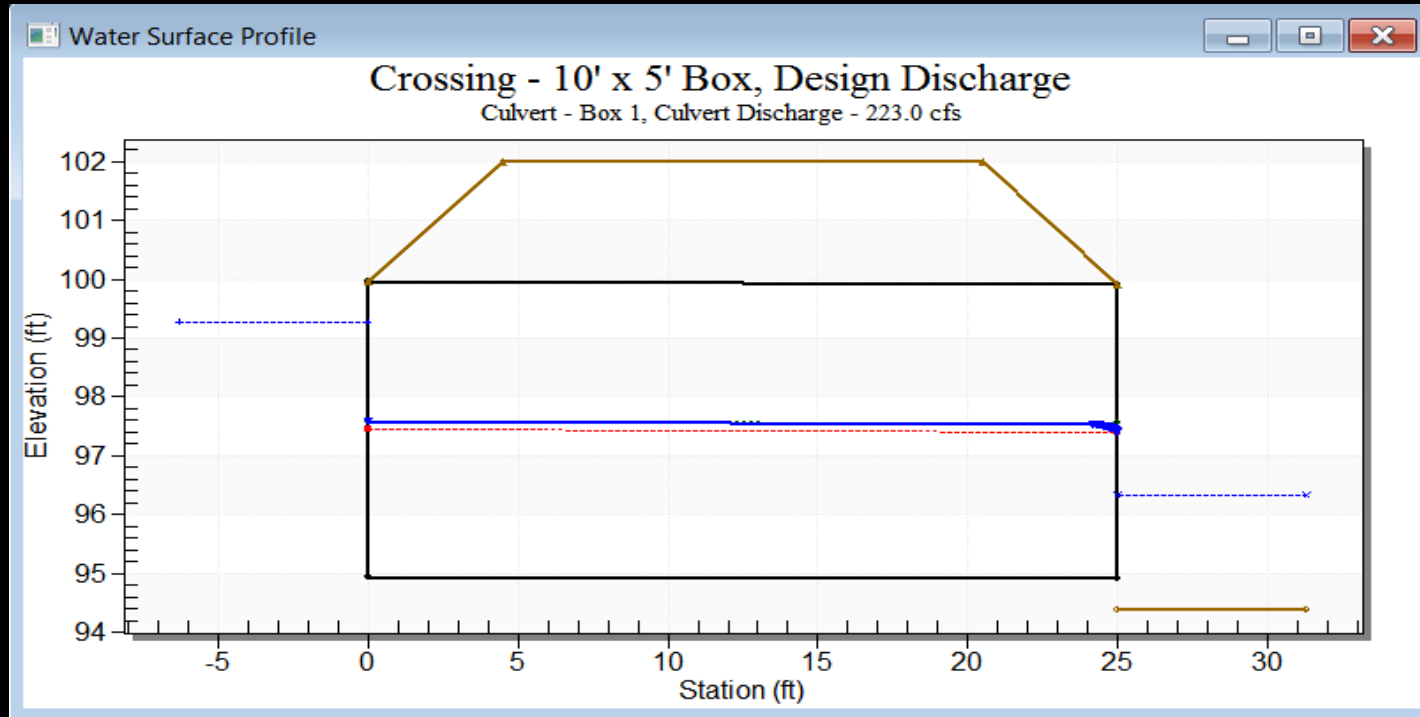
Hydraulics

How complex is the project/site?

What model to use?

- **HY-8** – Free Federal Highways application for simple crossings
- **HEC-RAS** – Free Army Corps of Engineers application for complex modeling

HY-8 Output



Discharge	Total Discharge	headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
Names									
1.1	20.50	95.73	0.00	1.78	7-A2c	0.51	0.48	4.04	3.54
2	66.20	96.71	0.00	2.76	7-A2c	1.11	1.01	5.97	5.49
5	103.00	97.33	0.00	3.38	7-A2c	1.49	1.33	6.92	6.43
10	127.00	97.70	0.00	3.75	7-A2c	1.71	1.53	7.42	6.92
25	166.00	98.25	0.00	4.30	7-A2c	2.05	1.82	8.12	7.59
50	190.00	98.57	0.00	4.62	7-A2c	2.24	1.99	8.49	7.94
100	223.00	98.99	0.00	5.04	7-A2c	2.49	2.22	8.95	8.37
500	295.00	99.76	0.00	5.81	7-A2c	3.00	2.68	9.83	9.16