CE 5338

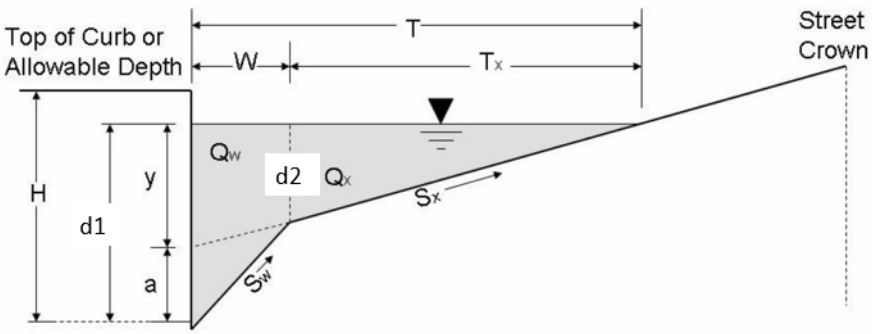
Pierson **HYDROLOGIC ENGINEERING**

Assignment #4

Street Drainage (10 points)

1. Use the provided screen shot and the equations from the presentation in class (6 2 Street Drainage.pdf) as a guide, create your own spread sheet that solves the gutter flow equations. (note: the "Pass" is an option to check the depth d1 is less than H)

Inundation Calculations			
SLOPES			
Long Street Slope	SL	0.03	ft/ft
Transverse Street Slope	SX	0.021	ft/ft
Transverse Gutter Slope	SW	0.0833	ft/ft
Manning n	n	0.016	
GEOMETRY			
Spread	T	9.37	ft
Curb Width	W	2	ft
Tx	Tx	7.367	ft
a	a	0.1246	1.495
d2	d2	0.154707	ft
d1 or y+a	d1	0.321307	
Max Depth Criteria	H	0.5	ft
d1 < H		PASS	
FLOW			
Street Flow	Qs	1.978796	cfs
Gutter Flow	Qw	3.012384	cfs
Total Flow	Q	**4.99**	cfs



2. Using your spreadsheet, determine the depth of flow (d1) and the street spread (T) using the following inputs: Q = 7.5cfs, SL = 0.025 ft/ft, Sx = 0.021 ft/ft, Sw = 0.0833 ft/ft, n = 0.015, and W = 3 ft. Use a screen shot to record your solution.

3. Determine the intercepted flow and bypass flow for a street inlet that is 7' wide (L), with Q = 7.5cfs, SL = 0.025 ft/ft, Sx = 0.021 ft/ft, Sw = 0.0833 ft/ft, n = 0.015, and W = 3 ft and a clog reduction of 10%.

4. Determine the inlet flow rate (Qi) for an inlet of type SS-3 with L = 7', h = 10" with the following depths: 4", 1', and 2'.

5. A long rectangular property that drains to the street will be developed as a park with an average C of 0.5. The width of the park is 200 feet and the street is 30 feet wide. Determine where to place the first inlet such that the flow for the two year storm is 5cfs at the inlet.

6. Let's combine problem 5 and 2 to determine the location of the second inlet from problem 5. Using the inlet and street properties from 3 determine the location of the second inlet from problem 5.