CE 5338

Pierson **HYDROLOGIC ENGINEERING**

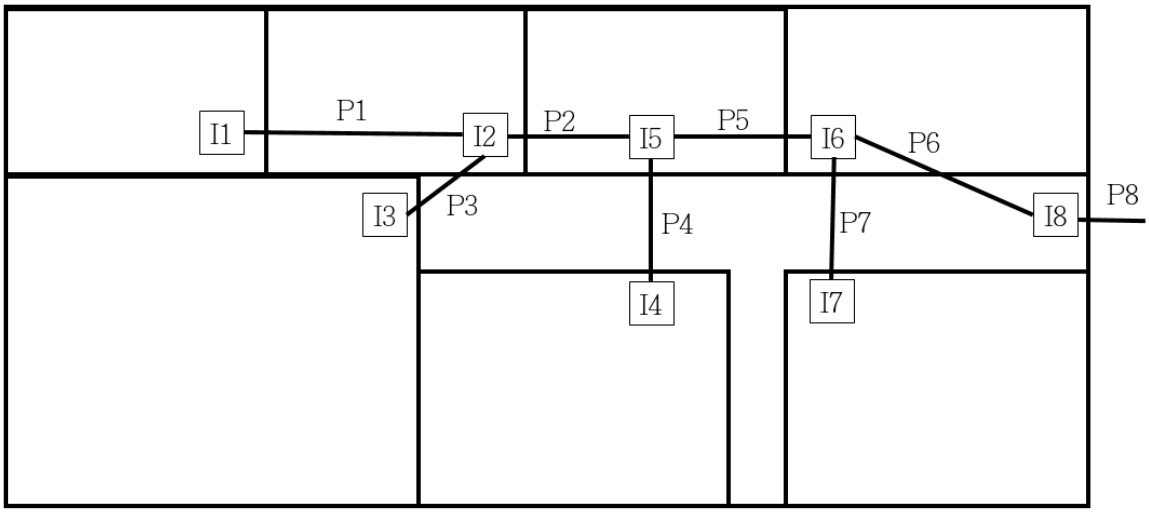
Assignment #3

Pipe Sizing for Storm Drainage by the Rational Method

Due Sept. 14th (10 points)

The sketch below shows a proposed layout for a storm drainage system for a subdivision in Springfield. The table below shows the land use, drainage area, length of overland flow, length of each pipe, and percentage of impervious area for each sub-basin. Use the City of Springfield Design guide; rational method to compute the **design discharge** for each inlet and each pipe. Submit a table that summarizes your calculations.

The city requires that the system be designed for a 10 year recurrence interval. Determine the **size of pipes** needed.



ID #	Land Use	Average Lot Size, acre	Drainage area, acres	Impervious area, %	Land Average Slope, %	Length of Overland Flow, (ft)
I1	Residential	1/4	3	-	8.3	200
I2	1/2 ImPervious 1/2 Lawn		3	-	7.7	170
I3	Residential	1/2	5	-	5	300
I4	Residential	1	3	-	5	300
I5	Woods	n/a	3.5	15	2.2	450
I6	Residential	1/4	2.5	-	2.2	250
I7	Residential	1/2	2.5	-	1.5	200
I8	Road Way	n/a	2.5		1.5	300

PipeID #	Average Slope of Pipe, %	Length of Pipe, (ft)
P1	1.4	170
P2	0.5	160
P3	0.5	125
P4	0.5	140
P5	0.3	160
P6	0.3	300
P7	0.2	125
P8	0.1	200