Drew Manual

40081 Carrol St

Slidell, La

Drainage Calculations - Modified Rational Method, LDOTD Hydraulics Manual

Predevelopment Condition

25 Year Frequency

Q= CiA			Factor	Area, sf	Total
	Undeveloped Area		0.25	86,497	21624.25
	Gravel Area		0.25	0	0
	Building/ Parking		0.95	553	525.35
				87,050	22149.6
	Weighted C Factor		0.25		
L	Hydraulic Length, L	262	feet		
	Slope, in %, S	0.5725			0.005725
C	Runoff Coefficient, C	0.25			
Tc	Time of Concentration	Tc	32.7	minutes	
		8.856224	4.701216	1.117066	
i	intensity from Region 1		5.05		
	D	0.545629			
	a	4.611			
	b	0.346			
	c	-0.798			
A	Area, Acres	1.998			
	Q25 Flow, cfs	C*i*A	2.57	cfs	

Q25 Predev Flow	**2.57 cfs**	

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Postdevelopment Condition
25 Year Frequency

Q= CiA			Factor	Area, sf	Total
	Undeveloped Area		0.25	54,148	13537.00
	Gravel Area		0.25	23,688	5922.00
	Building/ Parking		0.95	9,214	8753.30
				87,050	28212.30
	Weighted C Factor		0.324		
L	Hydraulic Length, L	345	feet		
	Slope, in %, S	0.4899			0.004899
C	Runoff Coefficient, C	0.324			
Tc	Time of Concentration	Tc	28.6	minutes	
		9.864242	3.575886	1.152183	
i	intensity from Region 1		5.39		
	D	0.476792			
	a	4.611			
	b	0.346			
	c	-0.798			
A	Area, Acres	1.998			
	Q25 Flow, cfs	C*i*A	3.49	cfs	

Q25 Postdev Flow	**3.49**	**cfs**

Q25 Allowable Flow- 90% Undeveloped Flow =	**2.31** cfs

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Storage Requirements for a 25 Year Frequency Storm Event

i = a(D + b) ^c

q = CiA

Max Storage Volume= [(D x q) - (.5 x Q25 Allowable Flow x (D + Tc)]

Storm Duration (D)	Time	i	q, cfs	Max. Storage Volume, cf	Max. Storage Volume, ac-ft
10	min	7.86	5.09	376	0.009
20	min	6.28	4.07	1,507	0.035
30	min	5.27	3.41	2,077	0.048
40	min	4.56	2.96	2,336	0.054
50	min	4.04	2.62	2,401	0.055
60	min	3.64	2.36	2,334	0.054
70	min	3.31	2.15	2,174	0.050
80	min	3.05	1.97	1,944	0.045
90	min	2.83	1.83	1,659	0.038
100	min	2.64	1.71	1,332	0.031

Discharge End Area Calculations : q=cA(2gh)^1/2

Allowable Run Off, q	2.31	cfs - direct dischage	1.23
=	1.08	cfs	
Friction Factor, c	0.62		
Acceleration, g	32.2	ft/ft/sec	
Height above Invert, H ft	0.5	ft	
End Area, Sq ft	0.31	s.f.	5.674504

Square Inches	44.30	s.i.
Diameter, Inches	7.51	inches

Use 7.5" Diameter Orifice Plate in Discharge Pipe