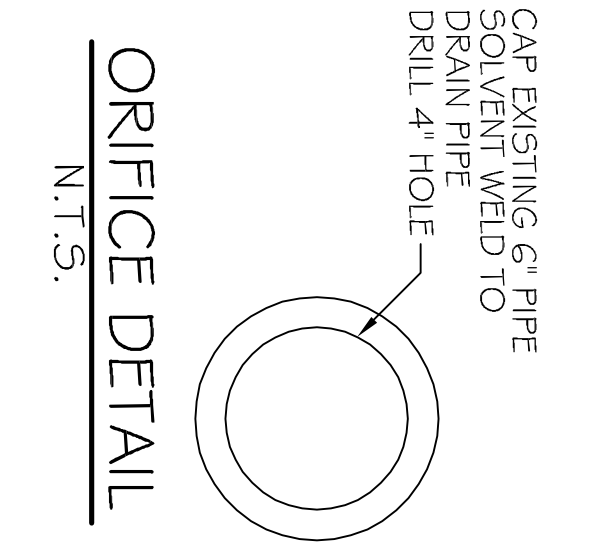


DRAINAGE PLAN  
SCALE: 1"=10'



- LEGEND:**
- PROPERTY LINE
  - EXISTING DRAIN LINE
  - EXISTING DRAIN INLET
  - SLOPE LINES
  - NEW ELEVATIONS
  - EXISTING SURVEY TOPO POINTS

<b>PROJECT:</b> SHOPPING CENTER	
STORMWATER RUNOFF CALCULATIONS	
Formulas used:	[1] RATIONAL METHOD: $Q=Aci$
where:	<ul style="list-style-type: none"> <li>Q= Peak discharge in cubic feet per second (cfs) due to maximum storm assumed.</li> <li>A= Area of watershed in acres.</li> <li>C= Coefficient of run-off [2]</li> <li>I= Intensity of rainfall in inches per hour based on concentration time [3]</li> </ul>
	<b>[4] TC=</b> $(2.48 \frac{1000 - 9.07}{(1.4)(60.3)})$
where:	TC= Time of concentration: time required for rain falling at most remote point to reach discharge point.
	c= Sitter run-off coefficient based on conditions shown.
	I= Percent slope of watershed flow.
<b>AREA OF WORK - PRIOR DEVELOPMENT</b>	
25 Year Frequency	
Watersight Surfaces	12875 sqft = 0.296 Acres
Gravel Surface (G1)	0 sqft = 0.000 Acres
Green Space (G2)	11970 sqft = 0.275 Acres
Summary	24845 sqft = 0.570 Acres
Duration (D) = Time of concentration (TC)	Elev. diff = 0.5
where:	<ul style="list-style-type: none"> <li>L= 152 run-off length ft</li> <li>c= 0.51 run-off coef</li> <li>S= 0.3289 percent slope</li> <li>TO = D = 5.59 minutes</li> <li>I= 3.90 in/hr</li> </ul>
Therefore Expected Rainfall Intensity	1.07 in/hr
<b>AREA OF WORK - POST DEVELOPMENT</b>	
25 Year Frequency	
Watersight Surfaces	16652 sqft = 0.383 Acres
Gravel Surface	0 sqft = 0.000 Acres
Green Space	8193 sqft = 0.189 Acres
Summary	24845 sqft = 0.570 Acres
D = Time of concentration (TC)	Elev. diff = 0.25
where:	<ul style="list-style-type: none"> <li>L= 189 Runoff length ft</li> <li>c= 0.64 Runoff coef</li> <li>S= 0.3899 Percent Slope</li> <li>TC = D = 6.29 minutes</li> <li>I= 3.50 in/hr</li> </ul>
Therefore Expected Rainfall Intensity	1.27 in/hr
Total Retention Required	0.316 cfs
<b>RESULTS</b>	
DETENTION REQUIRED	0.346 cfs
ONE HOUR DETENTION	1246.1 cfs
DETENTION DIMENSIONS	84 feet
WIDTH	147 feet
LENGTH	0.10 feet
DEPTH	
<b>DISCHARGE END AREA REQUIREMENTS</b>	
25 Year Frequency	
Area requirements for pipe sizerion, On-Site Retention Pond	
where:	<ul style="list-style-type: none"> <li>A= Discharge Area required</li> <li>g= Acceleration of gravity</li> <li>c= Discharge coefficient</li> <li>H= Hydraulic head</li> <li>Q= Flow volume from run-off</li> </ul>
Pipe Sizing Orifice Diameter	1.00 feet
O=	0.82 coefficient
c=	32.19 in/hr sec
g=	
<b>REQUIRED CONDUIT = 3.57 inch diameter</b>	
<b>Use 4 inch</b>	
<b>References:</b>	
1. Chen, W.F. The Civil Engineering Handbook, 1995, Eq.#31.1, pg. 1036	
2. Seelye, Elwyn E. Data Book for Civil Engineers, Vol.1, 1980, Tol. B, pg. 18-02	
3. Seelye, Elwyn E. Data Book for Civil Engineers, Vol.1, 1980, Fig. B, pg. 18-01	
4. Chen, W.F. The Civil Engineering Handbook, 1995, Tol. 31.2, Regan Equation (p=0.013)	
5. Chen, W.F. The Civil Engineering Handbook, 1995, Eq.#28.32, no. 989	

**DAMMON ENGINEERING, INC.**  
 CHIEF ENGINEER  
 EMMETT DAMMON, P.E.  
 CHIEF ARCHITECT  
 ROBERT WILTSE

1095 FLORIDA AVENUE  
 SLIDELL, LA, 70458  
 OFFICE: 985-643-5532  
 FAX: 985-641-5950

WWW.DAMMONENGINEERING.COM  
 EMAIL: DAMMONENG@BELL-SOUTH.NET

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CARL CHASTANT  
 LOT 53A  
 303 S. MILITARY RD  
 SLIDELL, LA 70461

DRAINAGE PLAN

REV: \_\_\_\_\_  
 SCALE: AS NOTED  
 JOB#: \_\_\_\_\_  
 DATE: 01-17-11  
 SHEET 1

C-1

OF 1