PROJECT:	TABERNACLE CHURCH					
	STORMWATER RUN-OFF CALCULATIONS					

Formulas used:

[1] RATIONAL METHOD: Q=Aci

where:
- Q= Peak discharge of watershed in cubic feet per second (cfs) due to maximum storm assumed.
- A= Area of watershed in acres.
- c= Coefficient of run-of [2].
- i= Intensity of rainfall in inches per hour based on concentration time. [3]

[4] TC= $\frac{\left(L^{0.8}\left(\frac{1000}{c}-9\right)^{0.7}\right)}{(1140(s^{0.5}))}$

where:
- TC= Time of concentration= time required for rain falling at most remote point to reach discharge point.
- c= Site run-off coefficient based on conditions shown.
- s= Percent slope of overland flow.

PRIOR DEVELOPMENT

25 Year Frequency

Q_1 = Aci						
Watertight Surfaces			5824	sqft =	0.134	Acres
c(1) =	0.9					
Gravel Surface			0	sqft =	0.000	Acres
c(2) =	0.25					
Green Space			22963	sqft =	0.527	Acres
c(3) =	0.15					
Summary			28787	sqft =	0.661	Acres
c =	0.30					

Duration (D) = Time of concentration (TC)

where	L =	60	run-off length ft	Elev diff =	1
	c =	0.30	run-off coef		
	S =	1.6667	percent slope		
therefore	TC = D =	8.71	minutes		
Expected rainfall intensity	i =	2.33	in/hr		
Q_1 =	0.465	cfs			

POST DEVELOPMENT

25 Year Frequency

Q_2 = CIA						
Watertight Surfaces			14805	sqft =	0.340	Acres
c(1) =	0.9					
Gravel Surface				sqft =	0.000	Acres
c(2) =	0.14					
Green Space			13982	sqft =	0.321	
c(3) =	0.2					
Summary			28787	sqft =	0.661	Acres
c =	0.56					
Q_2 =	0.862	cfs				

RESULTS

DETENTION REQUI	Q_2-Q_1	0.398	cfs	
ONE HOUR DETENTION		1431.7	cuft	
DETENTION DIMENSIONS		WIDTH	62	feet
		LENGTH	100	feet
		DEPTH	0.23	feet

DISCHARGE END AREA REQUIREMENTS

10 Year Frequency

Area requirements for pipe servicing swale located in Zone #1 of the corresponding Key Plan

[5] A= $\frac{Q}{(c\sqrt{(2gh)})}$

where:
- A= Discharge Area required
- g= Acceleration of gravity
- c= Discharge coefficient
- h= Hydraulic head
- Q= Flow volume from run-off

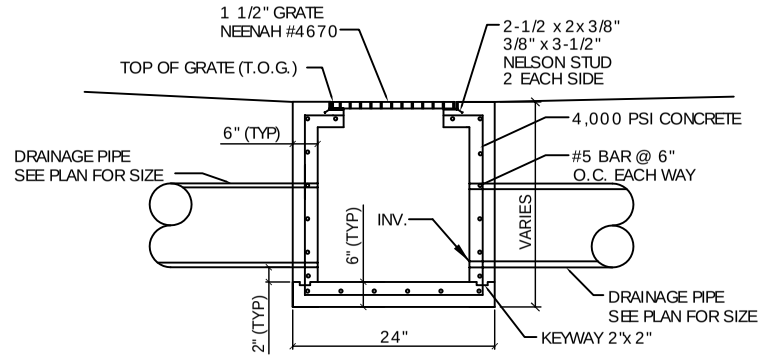
Pipe Servicing Site Drainage

Q =	0.862	cfs	H =	7.00	feet
c =	0.62	coefficient	A =	0.07	sqft
g =	32.16	ft/ft/sec			

REQUIRED CONDUIT =	3.47	inch diameter	Use 4" orifice

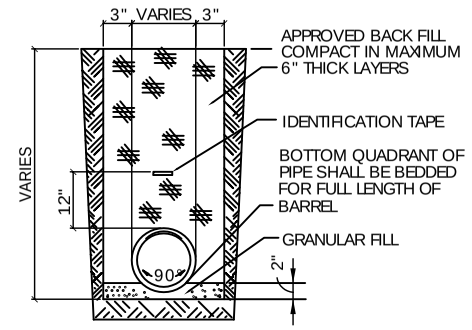
References:

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 1960. Tbl. B, pg. 18-02
3. Seelye, Elwyn E. Data Book for Civil Engineers. Vol.1 1960. Fig.B, pg. 18-01
4. Chen, W.F. The Civil Engineering Handbook. 1995. Tbl. 31.2 Regan Equation (n=0.013)
5. Chen, W.F. The Civil Engineering Handbook. 1995. Eq.# 28.32, pg. 969



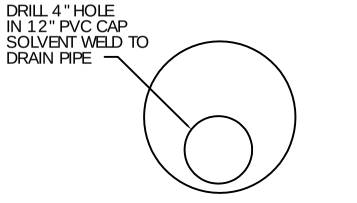
TYPICAL DROP INLET

N.T.S.



DRAIN PIPE BEDDING

N.T.S.



ORIFICE DETAIL

N.T.S.

GUTTERS AND DOWN SPOUTS TO BE SEAMLESS ALUMINUM 24 GAUGE, COLOR TO BE SELECTED BY OWNER. GUTTERS TO BE "OGEE" IN CROSS SECTION, MINIMUM 6" WIDTH.

NOTES:

1) DRAIN PIPE & FITTINGS WITHIN PROPERTY LINE SHALL BE POLYVINYL CHLORIDE PLASTIC PIPE, MEETING CLASS 100 C-900 PVC.
2) ELEVATIONS SHOWN ARE M.S.L.
3) FIELD VERIFY ALL ELEVATIONS AND DRAINAGE SYSTEM PLACEMENT PRIOR TO START OF WORK.
4) MUCK OUT 24" DEEP FOR FOUNDATION PAD MINIMUM, OR TO UNDISTURBED SOIL CAPABLE OF 1500 PSF BEARING.
5) DOWN SPOUTS SHALL FLOW INTO SUB-SUFRACE DRAINAGE.
6) THERE IS NO EVIDENCE OF EXISTING OFF-SITE FLOW CROSSING THE PROPERTY. NEW DRAINAGE CALCULATIONS ARE DETERMINED ACCORDINGLY.
6) THERE IS NO EVIDENCE OF EXISTING OFF-SITE FLOW CROSSING THE

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NEW CHURCH

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DRAINAGE DETAILS AND CALCULATIONS

REV:

SCALE: AS NOTED

JOB#: 2050

DATE: 2-8-10

SHEET 7

C-6

OF 25