

**PROJECT: LIVING THE WORD INTERNATIONAL CHURCH**

STORMWATER RUNOFF CALCULATIONS

**Formulas used**

**[1] RATIONAL METHOD: C=ACI**

Where: Q = Peak discharge of watershed in cubic feet per second (cfs) due to maximum storm  
 A = Area of watershed in acres  
 C = Coefficient of run-off [2]  
 I = Intensity of rainfall in inches per hour based on concentration time [3]  
**[4] TC =  $(L/0.48 \times 0.7)^{0.7}$**   
 (1140(2.5))  
 where: TC = Time of concentration time required for rain falling at most remote point to reach discharge point  
 L = Site run-off coefficient based on conditions shown  
 S = Percent slope of watershed

**FROM DEVELOPMENT**

100 Year Frequency

Watershed Surfaces	C(1) = 0.9	sqft = 341971	sqft = 0.789	Acres
Gravel Surfaces	C(2) = 0.25	sqft = 999300	sqft = 2.280	Acres
Green Space	C(3) = 0.15	sqft = 830416	sqft = 0.191	Acres
Summary	C = 0.40	sqft = 1420056	sqft = 3.260	Acres

**POST DEVELOPMENT**

100 Year Frequency

Watershed Surfaces	C(1) = 0.8	sqft = 101851	sqft = 2.388	Acres
Gravel Surfaces	C(2) = 0.25	sqft = 69223	sqft = 0.158	Acres
Green Space	C(3) = 0.15	sqft = 34120.6	sqft = 0.784	Acres
Summary	C = 0.69	sqft = 142005.6	sqft = 3.260	Acres

**DETENTION REQUIREMENTS**

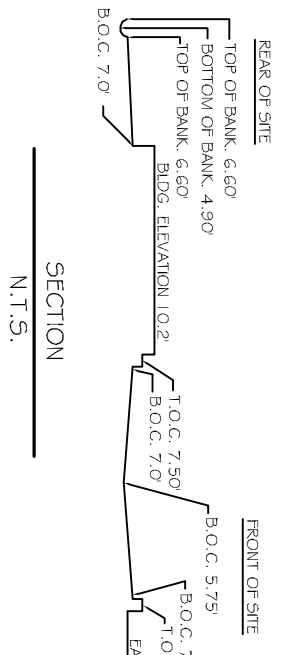
Detention required: 01-024-25(1) = 25.00 cu ft  
 Detention Dimensions: 60 feet width, 240 feet length, 1441 feet depth  
**DISCHARGE END AREA REQUIREMENTS**  
 100 Year Frequency

**REQUIRED CONDUIT = 10.50 inch inside diameter**

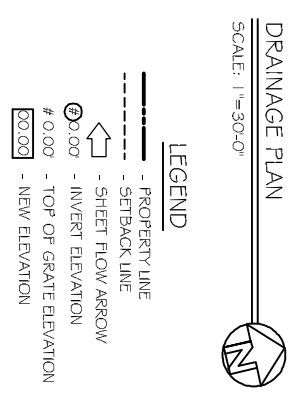
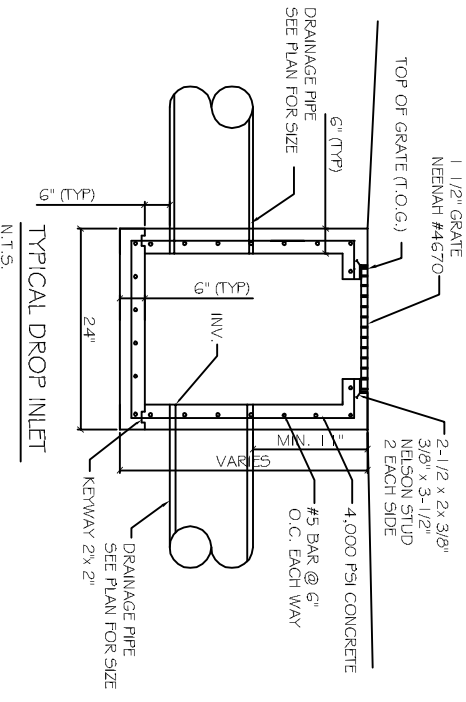
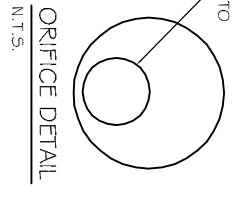
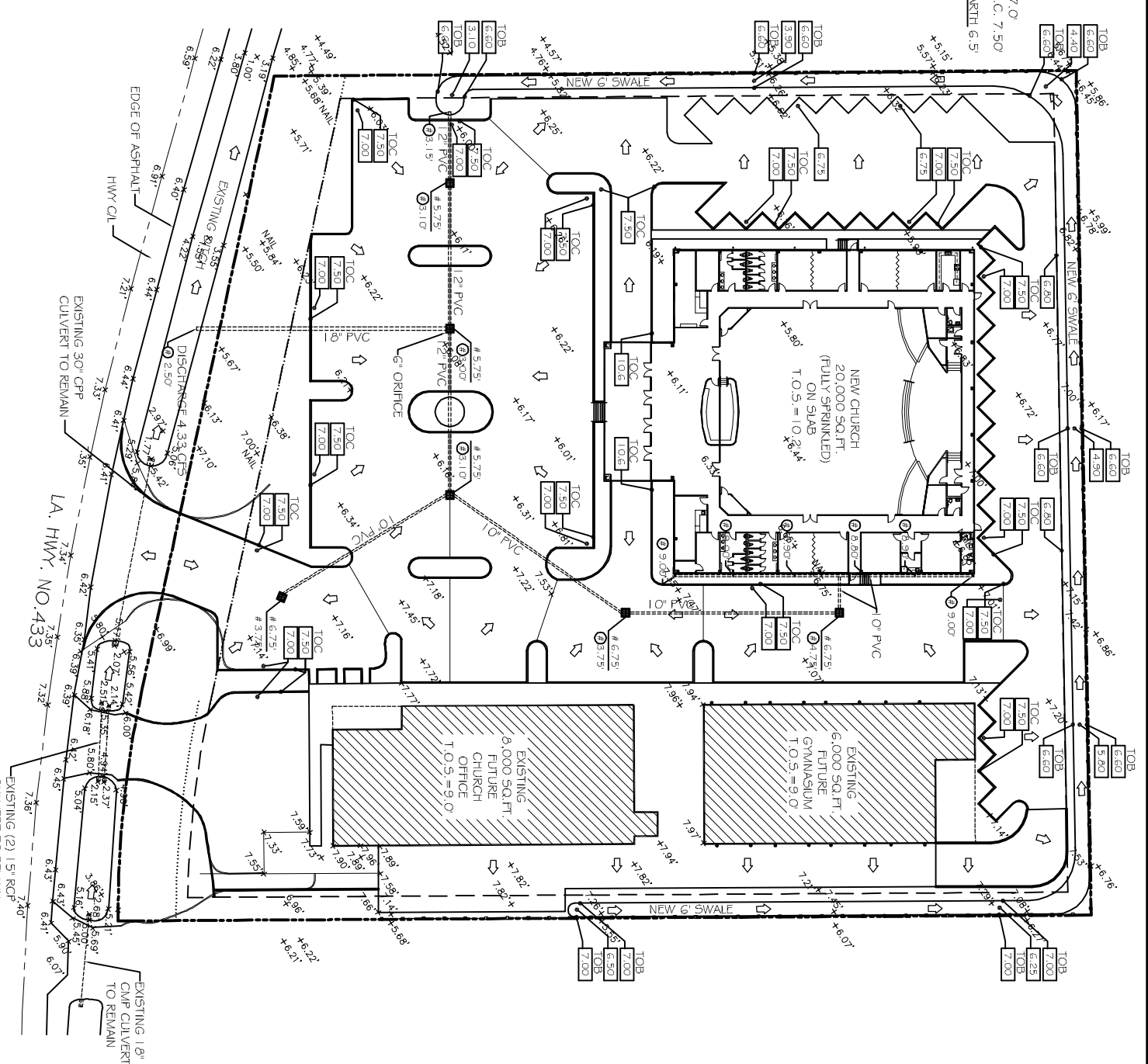
where: A = Draining Area required  
 D = Access diameter  
 C = Discharge coefficient  
 n = Hydraulic head  
 Q = Flow volume from runoff

Pipe Sizing	Q = 5.622 cfs	N = 3.30 feet
	C = 0.62 coefficient	A = 0.522 sqft
	g = 32.16 ft/sec <sup>2</sup>	D = 0.890 ft

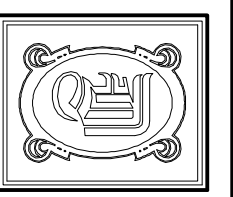
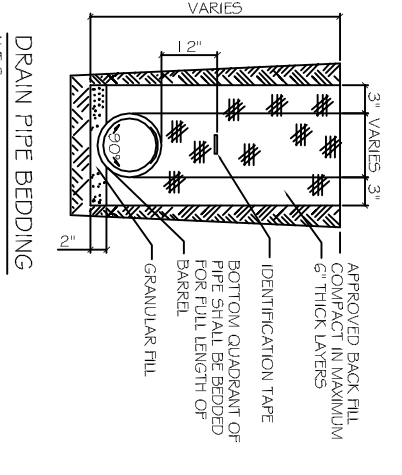
**References:**  
 1. Chen, W.F. The Civil Engineering Handbook, 1995, EN#311, pg. 1035  
 2. Savits, Elmer E. Data Book for Civil Engineers, Vol. 1, 1960, TD, B, pg. 16-02  
 3. Savits, Elmer E. Data Book for Civil Engineers, Vol. 1, 1960, TD, B, pg. 16-01  
 4. Chen, W.F. The Civil Engineering Handbook, 1995, TD, B, pg. 16-01  
 5. Chen, W.F. The Civil Engineering Handbook, 1995, EN# 28, 32, 33, 34, 35



- DRAINAGE PLAN NOTES:**
1. DRAIN PIPE & FITTINGS WITHIN PROPERTY LINE SHALL BE POLYVINYL CHLORIDE PLASTIC PIPE, MEDIUM 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. THERE IS NO EVIDENCE OF EXISTING OFF-SITE FLOW CROSSING THE PROPERTY.



- LEGEND**
- - - PROPERTY LINE
  - - - SETBACK LINE
  - SHEET FLOW ARROW
  - INVERT ELEVATION
  - TOP OF GRATE ELEVATION
  - NEW ELEVATION



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LIVING THE WORD INTERNATIONAL

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DRAINAGE PLAN

REV:	
SCALE:	AS NOTED
JOB#:	2128
DATE:	01-27-12
SHEET:	6