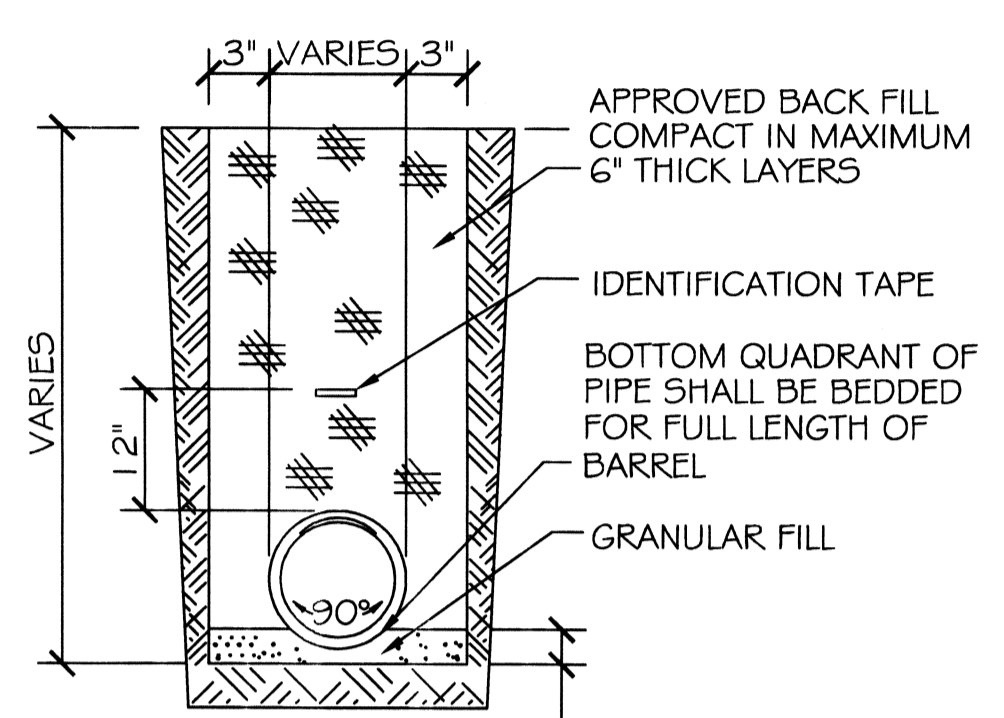


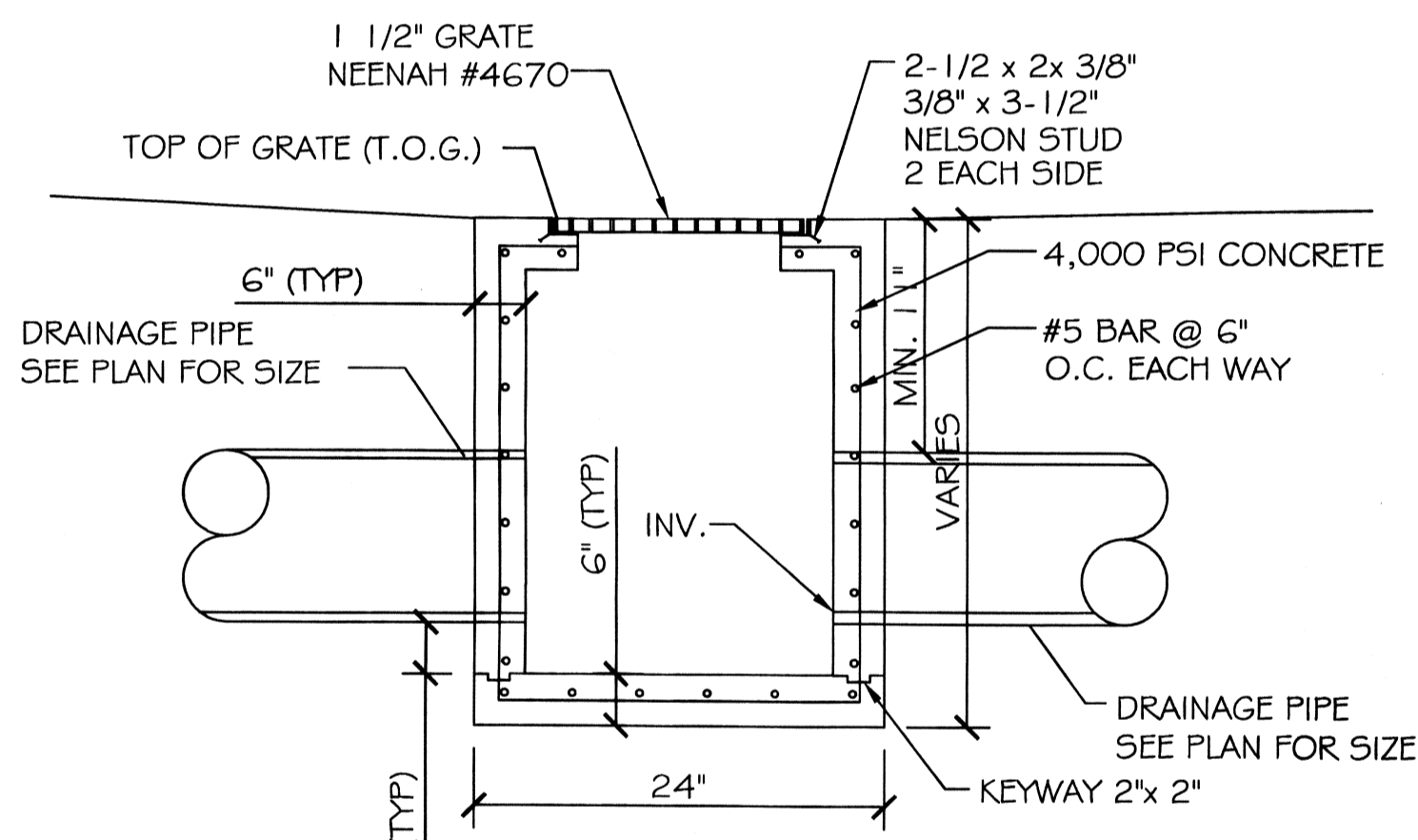
**DRAINAGE PLAN**  
SCALE: 1/8" = 1'-0"

DRILL 6" HOLE IN 10" PVC CAP SOLVENT WELD TO DRAIN PIPE

**ORIFICE DETAIL**  
N.T.S.



**DRAIN PIPE BEDDING**  
N.T.S.



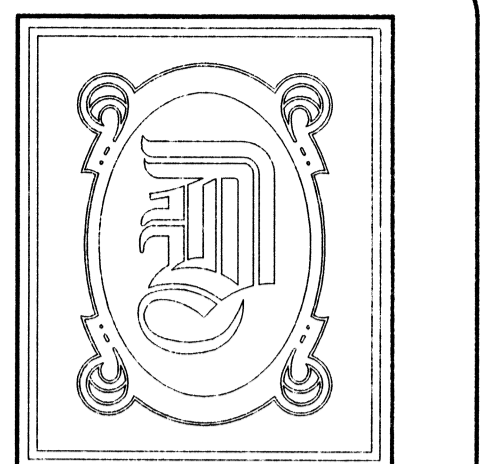
**TYPICAL DROP INLET**  
N.T.S.

- DRAINAGE 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) DOWN SPOUTS SHALL FLOW INTO SUB-SURFACE DRAINAGE SYSTEM.
  - 5) THERE IS NO EVIDENCE OF EXISTING OFF-SITE FLOW CROSSING THE PROPERTY. NEW DRAINAGE CALCULATIONS ARE DETERMINED ACCORDINGLY.

**LEGEND**

- - - - - PROPERTY LINE
- - - - - SETBACK
- - NEW DROP INLET w/TEMP. SILT FENCE
- # 0.00' - NEW ELEVATION
- # 0.00' - INVERT ELEVATION
- # 0.00' - TOP OF GRATE ELEVATION
- - - - - NEW DRAINAGE PIPE
- - - - - EXISTING DRAINAGE PIPE
- - SHEET FLOW DIRECTION

PROJECT: PAUL REES OFFICE BUILDING	
STORMWATER RUN-OFF CALCULATIONS	
Formulas used	
<b>[1] RATIONAL METHOD: Q=AcI</b>	
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-off [2]
	i = Intensity of rainfall in inches per hour based on concentration time [3]
<b>[4] TC = <math>\frac{(L^{0.8}(\frac{1000}{c} - 9)^{0.7})}{(1140(c^{0.5}))}</math></b>	
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
<b>PRIOR DEVELOPMENT</b>	
25 Year Frequency	
<b>Q<sub>1</sub> = AcI</b>	
Watertight Surfaces	0 sqft = 0.000 Acres
c(1) = 0.9	
Gravel Surface	0 sqft = 0.000 Acres
c(2) = 0.25	
Green Space	10808 sqft = 0.248 Acres
c(3) = 0.15	
Summary	10808 sqft = 0.248 Acres
c = 0.15	
Duration (D) = Time of concentration (TC)	
where	L = 140 run-off length ft Elev. diff = 1.4
	c = 0.15 run-off coef
	S = 1.0000 percent slope
therefore	TC = D = 21.69 minutes
Expected rainfall intensity	i = 3.64 in/hr
<b>Q<sub>1</sub> = 0.135 cfs</b>	10% reduction 0.014 cfs
<b>POST DEVELOPMENT</b>	
25 Year Frequency	
<b>Q<sub>2</sub> = AcI</b>	
Watertight Surfaces	6028 sqft = 0.138 Acres
c(1) = 0.9	
Gravel Surface	0 sqft = 0.000 Acres
c(2) = 0.25	
Green Space	4780 sqft = 0.110 Acres
c(3) = 0.15	
Summary	10808 sqft = 0.248 Acres
c = 0.57	
Duration (D) = Time of concentration (TC)	
where	L = 122 run-off length ft Elev. diff = 3.1
	c = 0.57 run-off coef
	S = 2.5410 percent slope
therefore	TC = D = 12.16 minutes
Expected rainfall intensity	i = 3.64 in/hr
<b>Q<sub>2</sub> = 0.513 cfs</b>	
<b>DETENTION REQUIREMENTS</b>	
Detention required Q <sub>2</sub> -Q <sub>1</sub>	0.38 cfs
ONE HOUR DETENTION	1360.0 cuft
DETENTION DIMENSIONS	WIDTH 72 feet
	LENGTH 40 feet
	DEPTH 0.47 feet
<b>DISCHARGE END AREA REQUIREMENTS</b>	
10 Year Frequency	
<b>Q = <math>\frac{Q}{(c\sqrt{2gh})}</math></b>	
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 = 0.014 cfs h = 3.00 feet
	c = 0.62 coefficient A = 0.002 sqft
	g = 32.16 ft/sec/sec
<b>REQUIRED CONDUIT = 0.54 inch inside diameter</b>	
<b>References:</b>	
1. Chen, W.F. <i>The Civil Engineering Handbook</i> , 1995 Eq # 31.1 pg 1036	
2. Seelye, Elwyn E. <i>Data Book for Civil Engineers</i> , Vol 1 1960 Tbl B pg 18-02	
3. Seelye, Elwyn E. <i>Data Book for Civil Engineers</i> , Vol 1 1960 Fig B pg 18-01	
4. Chen, W.F. <i>The Civil Engineering Handbook</i> , 1995 Tbl 31.2 Regan Equation (n=0.013)	
5. Chen, W.F. <i>The Civil Engineering Handbook</i> , 1995 Eq # 28.32 pg 969	



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**DRAINAGE PLAN**

REV: *Robert Wiltse*

SCALE: AS NOTED

JOB#: 2104

DATE: 05-20-11

SHEET 4

C-3

OF 20

USE 6" ORIFICE  
*Emmett Dammon*