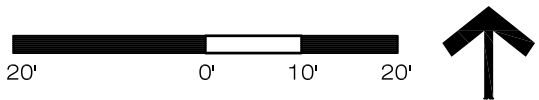
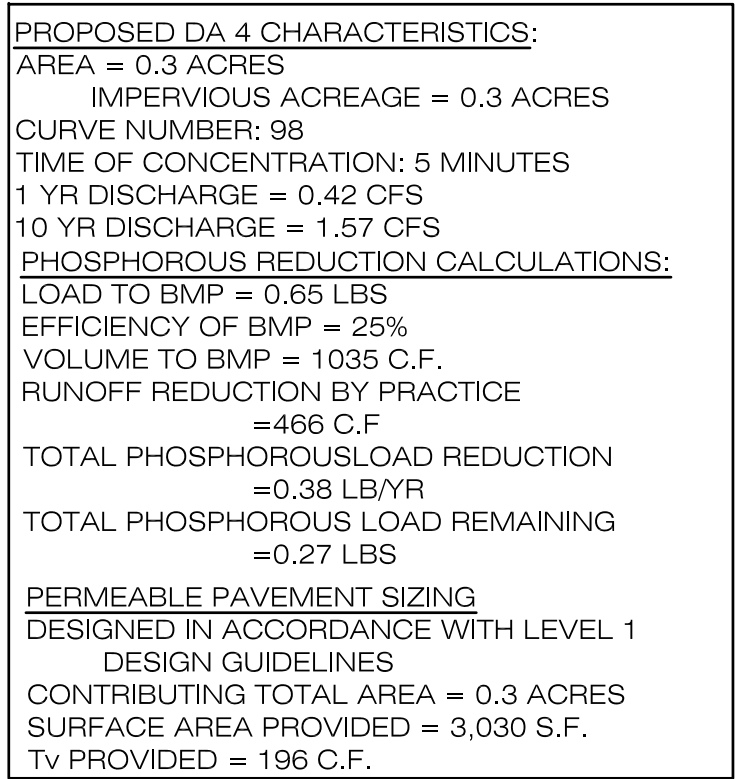
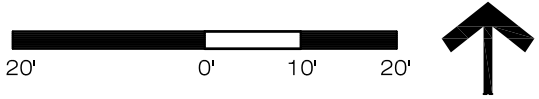
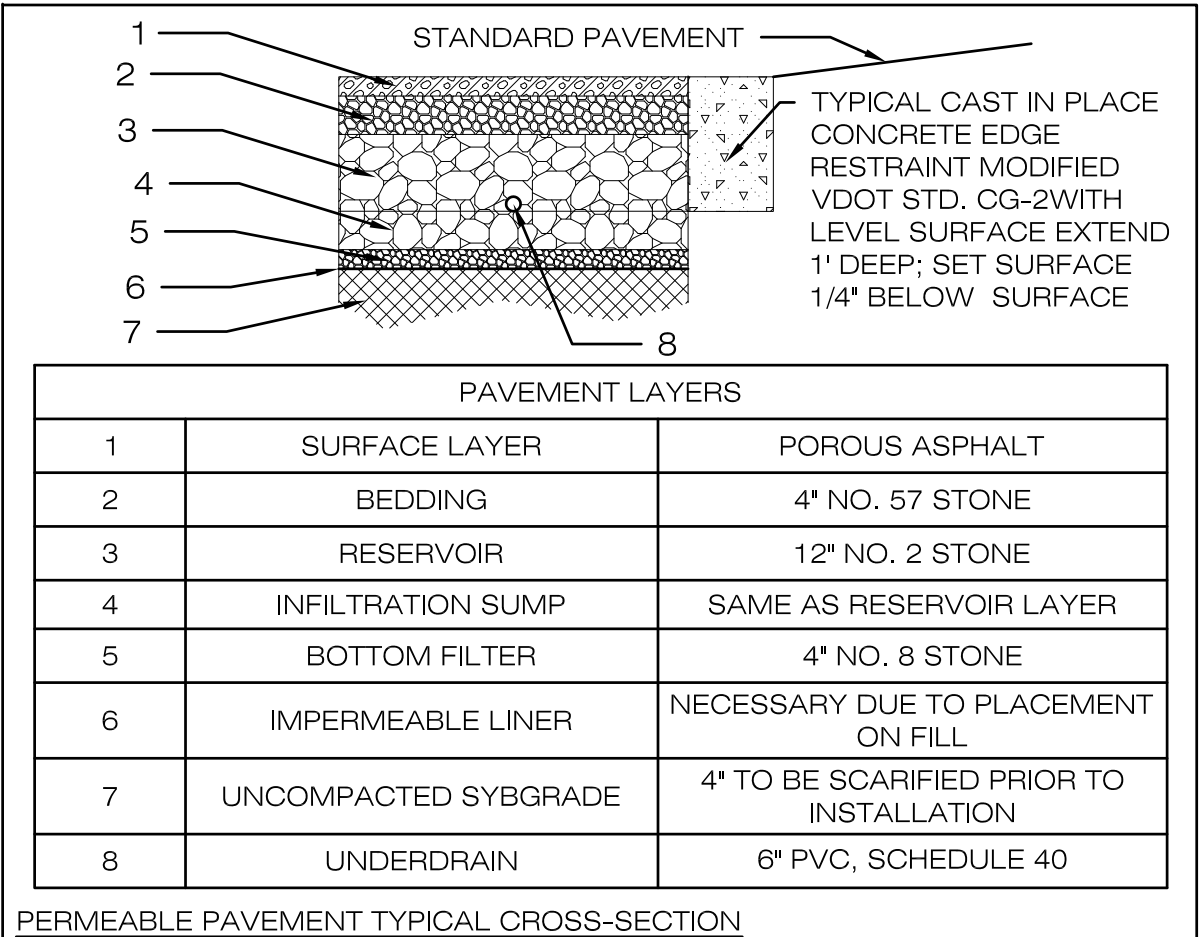


PROPOSED DA 7 CHARACTERISTICS:  
 AREA = 0.2 ACRES  
 IMPERVIOUS ACREAGE = 0.2 ACRES  
 CURVE NUMBER: 98  
 TIME OF CONCENTRATION: 5 MINUTES  
 1 YR DISCHARGE = 0.60 CFS  
 10 YR DISCHARGE = 1.41 CFS



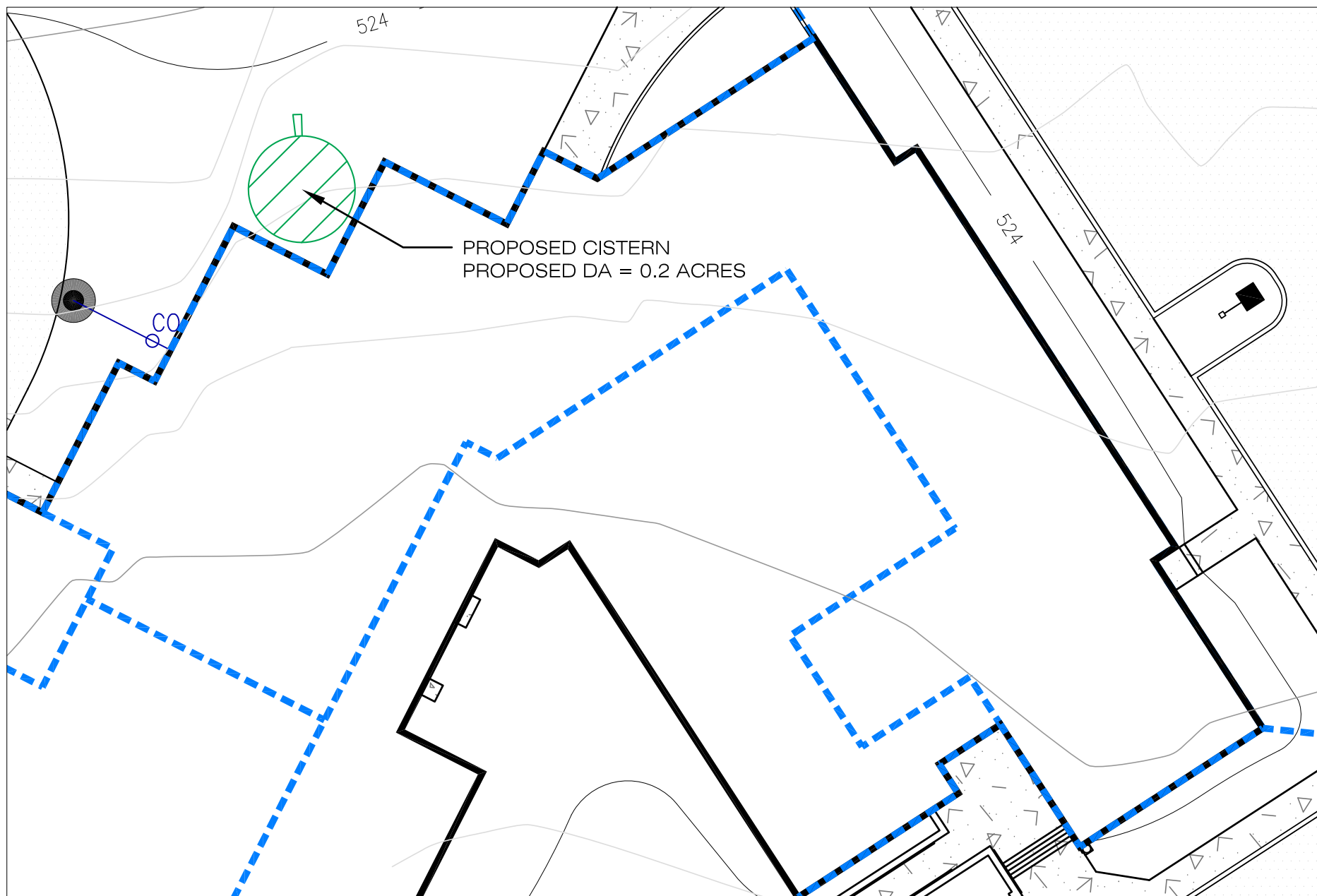
PHOSPHOROUS REDUCTION CALCULATIONS (DA7):  
LOAD TO BMP = 0.43  
MASS LOAD EFFICIENCY = 59%  
VOLUME TO BMP = 689 C.F.  
RUNOFF REDUCTION BY PRACTICE  
=310 C.F  
TOTAL PHOSPHOROUSLOAD REDUCTION  
=0.25 LB/YR  
TOTAL PHOSPHOROUS LOAD REMAINING  
=0.18 LBS

PERMEABLE PAVEMENT SIZING (DA7):  
DESIGNED IN ACCORDANCE WITH LEVEL 1  
DESIGN GUIDELINES  
CONTRIBUTING TOTAL AREA = 0.2 ACRES  
SURFACE AREA PROVIDED = 1,706 S.F.  
Tv PROVIDED = 111 C.F.



PAVEMENT LAYERS		
1	SURFACE LAYER	POROUS ASPHALT
2	BEDDING	4" NO. 57 STONE
3	RESERVOIR	12" NO. 2 STONE
4	INFILTRATION SUMP	SAME AS RESERVOIR LAYER
5	BOTTOM FILTER	4" NO. 8 STONE
6	IMPERMEABLE LINER	NECESSARY DUE TO PLACEMENT ON FILL
7	UNCOMPACTED SYBGRADE	4" TO BE SCARIFIED PRIOR TO INSTALLATION
8	UNDERDRAIN	6" PVC, SCHEDULE 40

APRIL 2014									
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<p align="center"><b>SITE PLANNING DIVISION</b></p>									
<p align="center">EXERCISE 5  <b>T&amp;I COMMERCIAL DEVELOPMENT</b>  <b>PERMEABLE PAVEMENT DESIGN</b></p>									
<p align="center"><b>DEQ TRAINING CASE STUDY</b></p>									
Δ	DESCRIPTION	BY	APPROVED	DATE	SCALE	DESIGNED BY: K PROBST DRAFTED BY: K PROBST CHECKED BY: J SMITH			
<p align="center"><b>APPROVED BY SITE PLANNING DIVISION</b></p>									
1" = 40'									



PROPOSED DRAINAGE AREA CHARACTERISTICS:

CISTERN:

Cistern Storage Associated with Design Volume (gallons)	Average Annual Overflow days for storms <= 1" (days/year)*	Average Annual Overflow Volume for storms <= 1" (1000's gal/year)*	Runoff Reduction Volume Credit
1,000	39	54	50%
2,000	28	35	67%
3,000	21	24	78%
5,000	12	14	87%
7,000	9	11	90%
10,000	7	8	92%
13,000	5	7	94%
18,000	4	5	95%

ACCORDING TO SPREADSHEET, THE TANK MUST BE 7,000 GALLONS IN ORDER TO BE 90% EFFICIENT

SEE FIGURE 1 ON THIS SHEET TO REVIEW SPREADSHEET  
TANK ASSUMPTIONS

PHOSPHOROUS REDUCTION CALCULATIONS:

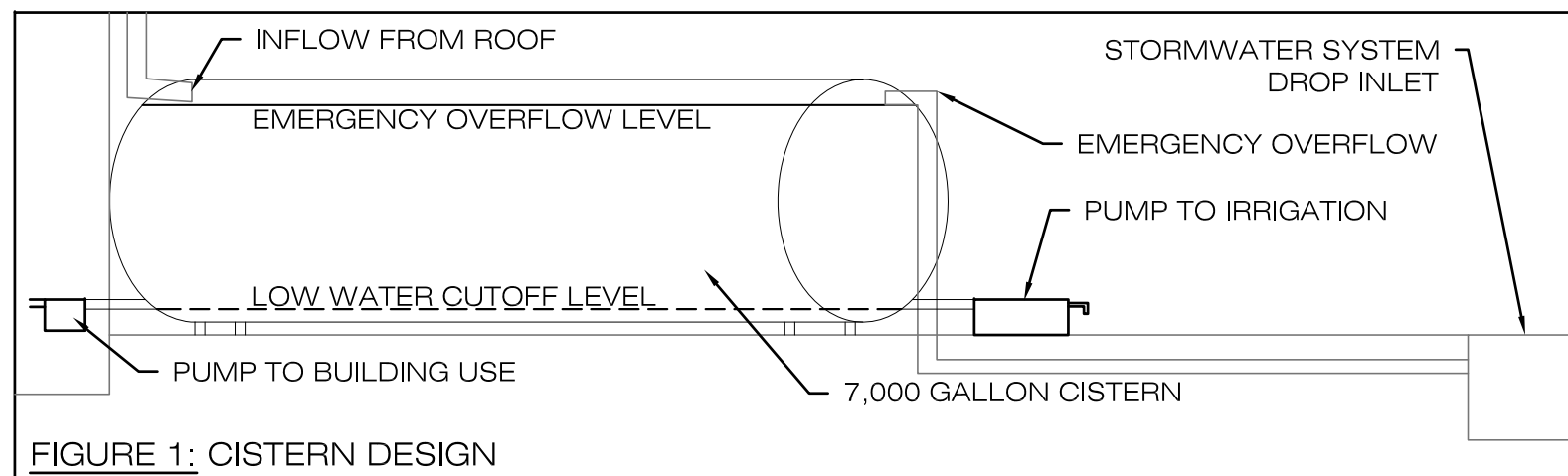
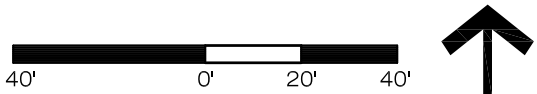
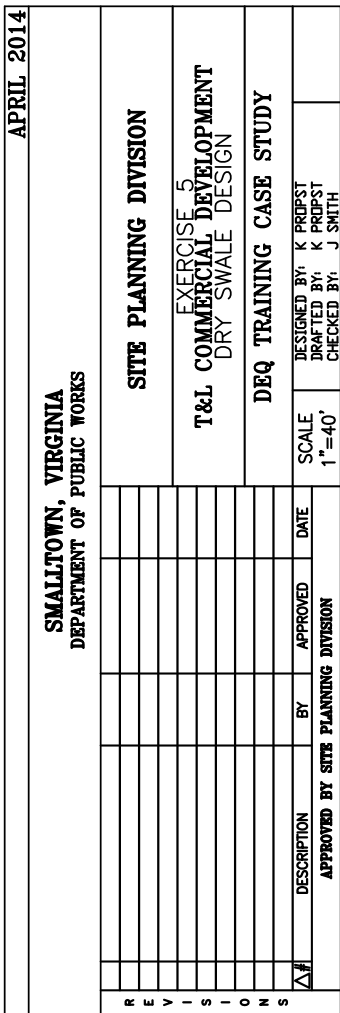


FIGURE 1: CISTERN DESIGN

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T&L COMMERCIAL DEVELOPMENT CISTERN DESIGN											
DEQ TRAINING CASE STUDY											
APPROVED BY SITE PLANNING DIVISION										SCALE	DESIGNED BY: K PROPST
										1"=40'	DRAFTED BY: K PROPST
											CHECKED BY: J SMITH

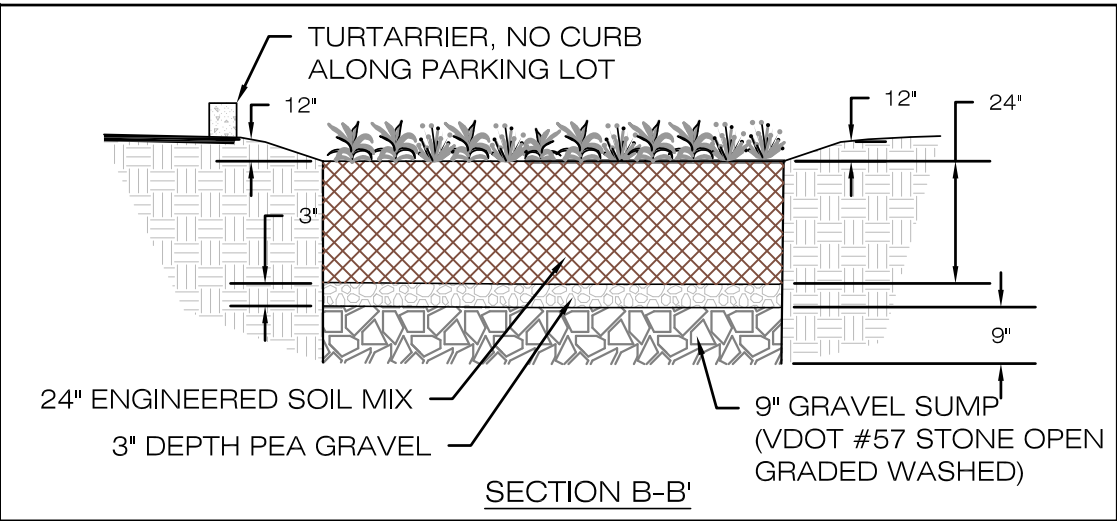


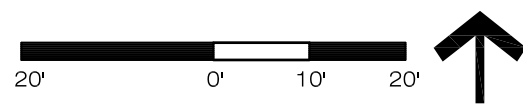


PHOSPHOROUS REDUCTION CALCULATIONS:  
LOAD TO BMP = 1.66 LBS  
MASS LOADING EFFICIENCY = 76%  
VOLUME TO BMP = 2642 C.F.  
RUNOFF REDUCTION BY PRACTICE  
=1,585 C.F  
TOTAL LOAD REDUCTION BY PRACTICE  
=1.26 LB/YR  
TOTAL PHOSPHOROUS LOAD REMAINING  
=0.40 LBS

VELOCITY COMPUTATIONS:  
CROSS-SECTION A-A' MODELED  
SLOPE = 1.5%  
DIMENSIONS:  
SIDE SLOPES = 3:1, BOTTOM WIDTH = 8  
DEPTH 10 YR = 0.42 FT  
RH 10 YR = 0.37  
SHEAR STRESS 10 YR = 0.35 LB/S.F.  
VELOCITY 10 YR = 2.33 FT/S

VELOCITY AND SHEAR STRESSES MEET  
TURF AND VEGETATION ALLOWABLE  
VALUES





BMP DESIGN DISCHARGES			
	IN	OUT	ELEVATION (FT)
Q1	5.99	3.17	518.7
Q2	9.57	7.08	519.2
Q10	11.93	12.02	519.8

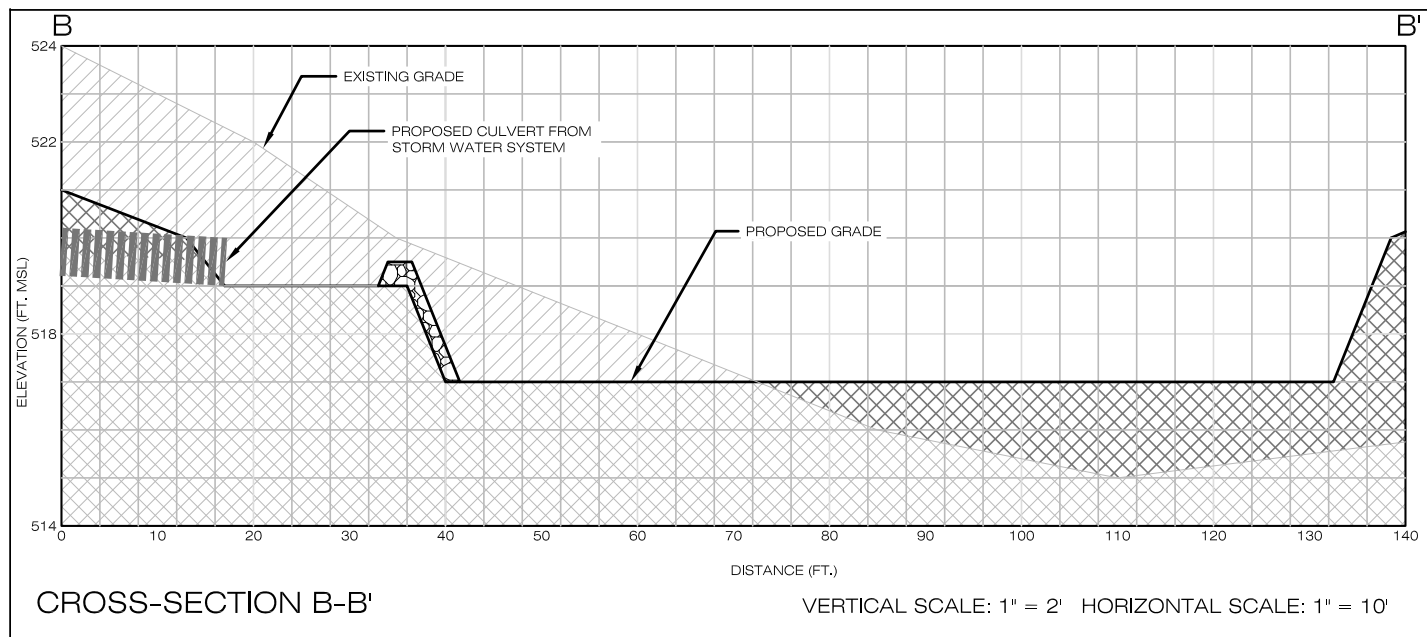
SIZING CALCULATIONS, EXTENDED DETENTION (L1):  
POST DEVELOPMENT TREATMENT VOLUME REQUIRED  

$$Tv = (Rv(A)/12)$$
+ REMAINING RUNOFF FROM US BMPS  

$$= [(0.32 \times (2.17 \times 43,560)) / 12] + 2074$$

$$= 4598 \text{ C.F.}$$

TOTAL TREATMENT VOLUME PROVIDED = 7,536 C.F.



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