

Exercise 3 – Group Exercise

Given:

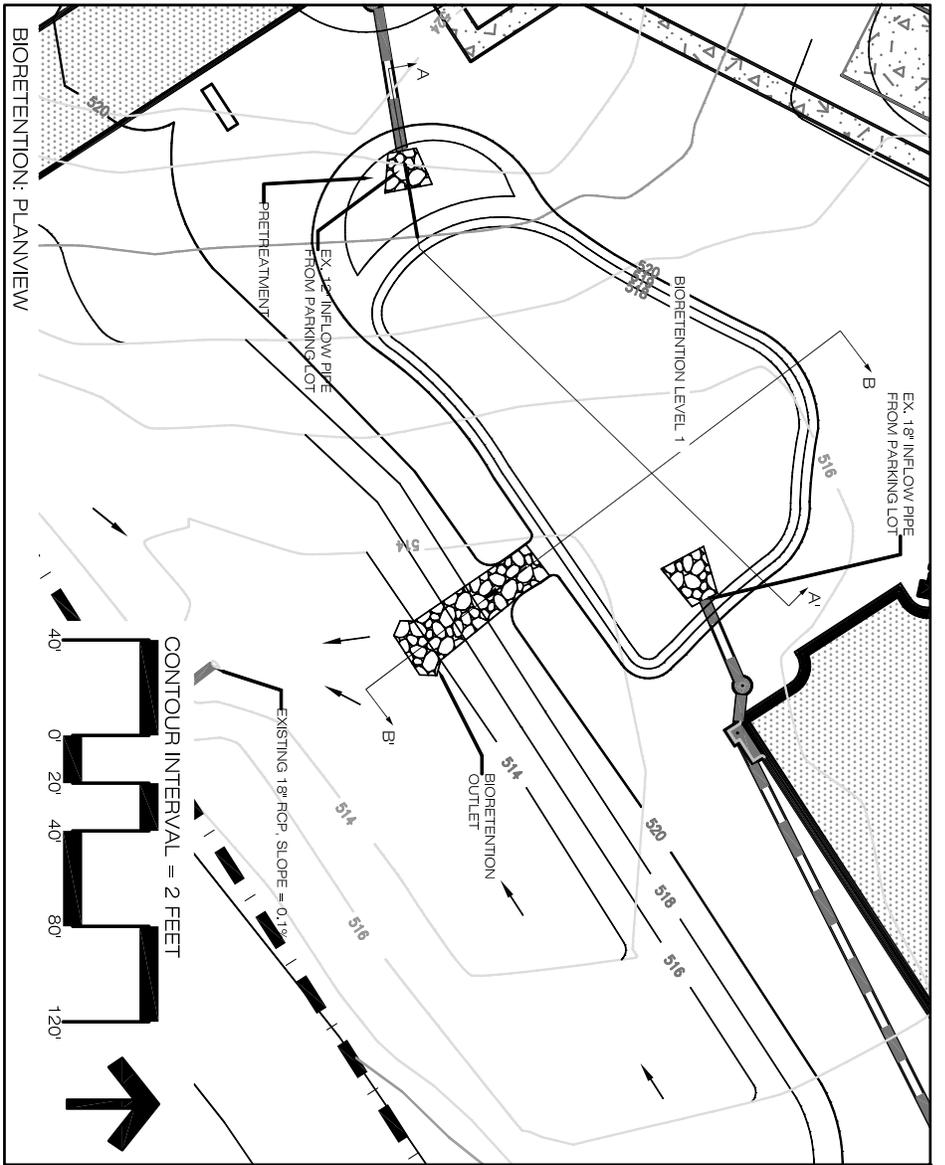
- ◆ Simplified Bioretention Level 1 Design (provided)
- ◆ Site Data and DA to Bioretention as follows:

	Impervious	Managed Turf	Open Space	Total
Site Data	1.95	1.25	3.50	6.70
Drainage Area Data (to BioL1)	1.9	1.10	1.67	4.67

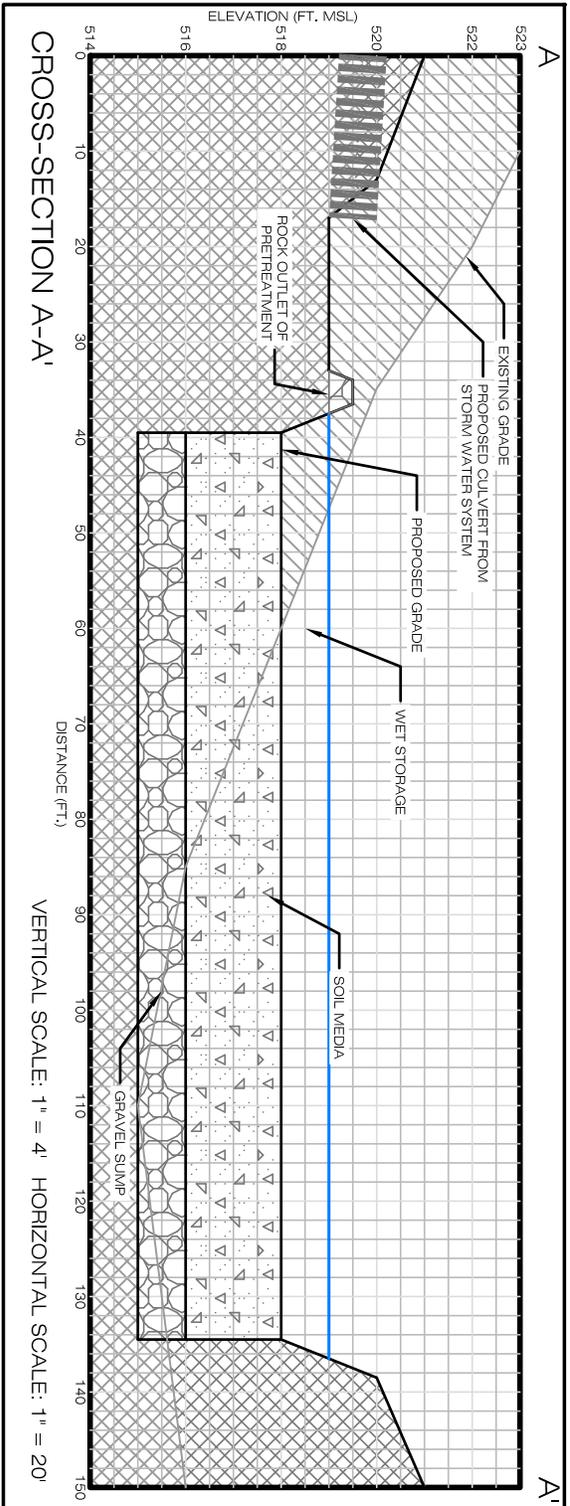
Conduct a quick review for the following (identify correct items and deficiencies):

Sizing and layout
Consistency with Clearinghouse Specification (#9)
Other general issues observed

Helpful Hint: *Use your time to try to identify those things that are important facets of a stormwater practice design*



BIORETENTION: PLANVIEW



CROSS-SECTION A-A'

VERTICAL SCALE: 1" = 4' HORIZONTAL SCALE: 1" = 20'

PHOSPHOROUS REDUCTION CALCULATIONS:
 POST DEVELOPMENT PHOSPHOROUS LOAD = 5.17 LB/YR
 TOTAL LOAD REDUCTION REQUIRED = 2.42 LB/YR
 RUNOFF REDUCTION BY PRACTICE = 2.972 C.F.
 TOTAL LOAD REDUCTION BY PRACTICE = 2.56 LB/YR

PROPOSED DRAINAGE AREA CHARACTERISTICS:
 AREA = 4.67 ACRES
 IMPERVIOUS ACREAGE = 1.90 ACRES
 OPEN SPACE/FOREST ACREAGE = 1.67 ACRES
 MANAGED TURF ACREAGE = 1.10 ACRES

CURVE NUMBER: 83
TIME OF CONCENTRATION: 5 MINUTES

SITE CONDITIONS:
 AREA = 6.7 ACRES
 IMPERVIOUS ACREAGE = 1.95 ACRES
 OPEN SPACE/FOREST ACREAGE = 3.5 ACRES
 MANAGED TURF ACREAGE = 1.25 ACRES

APRIL 2014

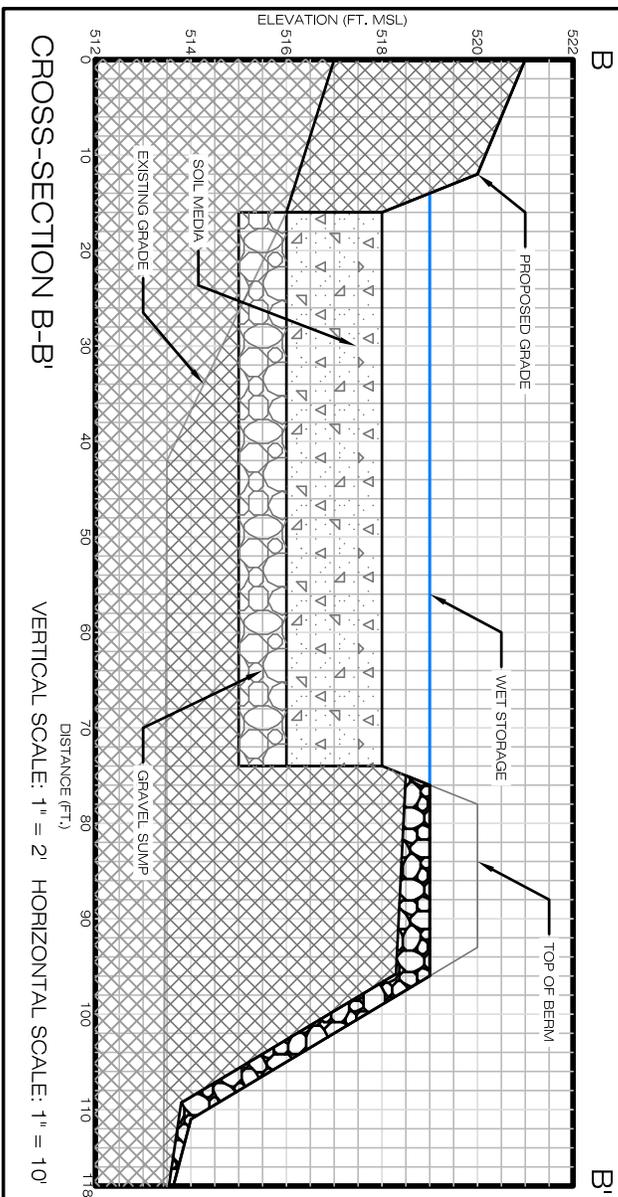
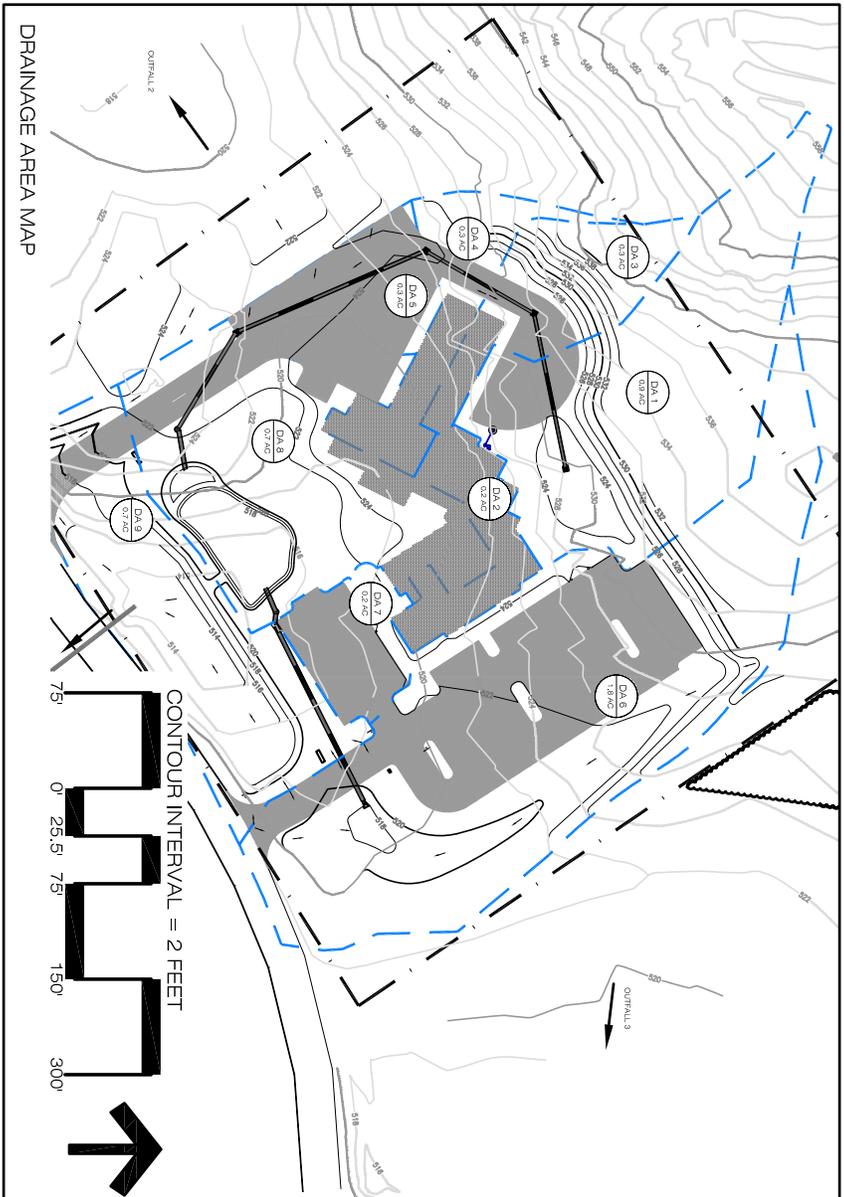
SMALLTOWN, VIRGINIA
 DEPARTMENT OF PUBLIC WORKS

SITE PLANNING DIVISION
EXERCISE 3
T&L COMMERCIAL DEVELOPMENT
DRAINAGE SCHEMATIC
DEQ TRAINING CASE STUDY

DESCRIPTION	BY	APPROVED	DATE
APPROVED BY PUBLIC WORKS			

SCALE 1"=40'
 DESIGNED BY: K PROPST
 DRAFTED BY: K PROPST
 CHECKED BY: J SMITH





SIZING CALCULATIONS, BIORETENTION LEVEL 1:
POST DEVELOPMENT BMP TREATMENT VOLUME REQUIRED
 BMP TV=8,231 C.F.
 SOIL MEDIA DEPTH = 24 IN
 GRAVEL SUMP = 12 IN
 WET STORAGE = 12 IN
 STORAGE DEPTH = DEPTH x VOID RATIO
 =(24x0.25)+(12x0.4)+(12x1) = 22.8 IN = 1.9 FT
 BIORETENTION SURFACE AREA
 =TV/STORAGE DEPTH = 8,231/1.9 = 4,332 S.F.
 SURFACE AREA PROVIDED = 4,345 S.F.
 TREATMENT VOLUME PROVIDED = 8,295 C.F.

SPILLWAY CALCULATIONS:
 Q2 = 5.8 CFS, Q10 = 12.2 CFS
 SLOPE = 33%
 DIMENSIONS: BOTTOM WIDTH = 8 FT
 SIDE SLOPES = 2:1

SHEAR STRESS = Rh X SLOPE X SW WATER
 =0.28 X 0.33 X 62.4 = 5.77 LBS/FT

CLASS II RIPRAP FOR CHANNEL LINING

APRIL 2014

SMALLTOWN, VIRGINIA
 DEPARTMENT OF PUBLIC WORKS

	SITE PLANNING DIVISION	
	EXERCISE 3	
	T&L COMMERCIAL DEVELOPMENT	
	DRAINAGE SCHEMATIC	
	DEQ TRAINING CASE STUDY	
DESCRIPTION	BY	APPROVED DATE
APPROVED BY PUBLIC WORKS	SCALE 1"=150'	DESIGNED BY: K PROPST DRAFTED BY: K PROPST CHECKED BY: J SMITH

