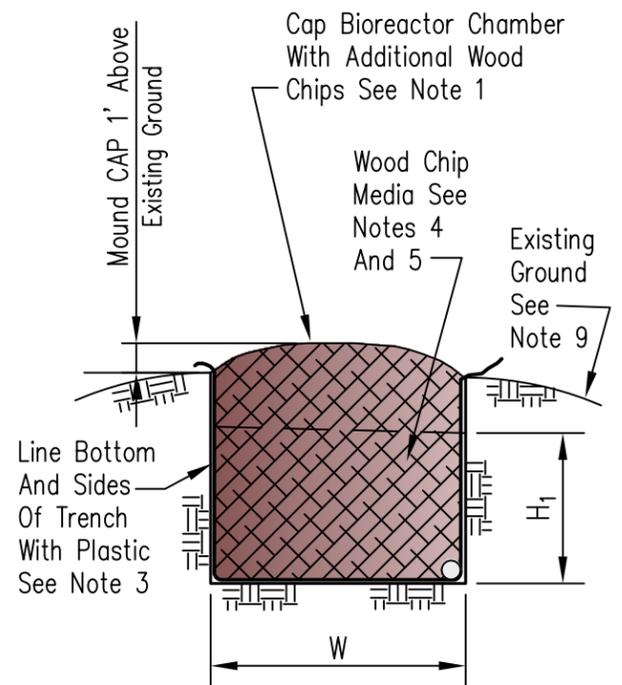
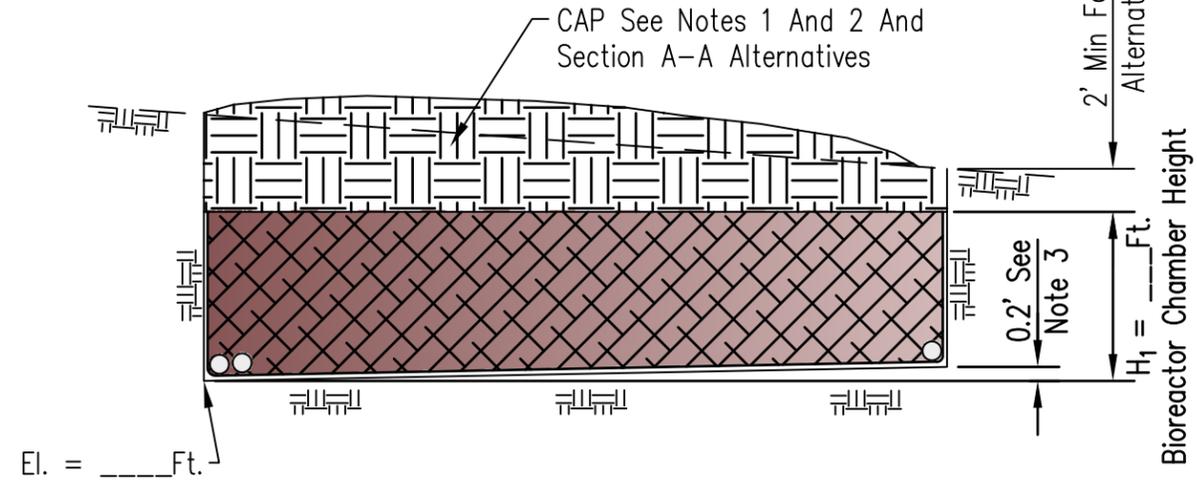


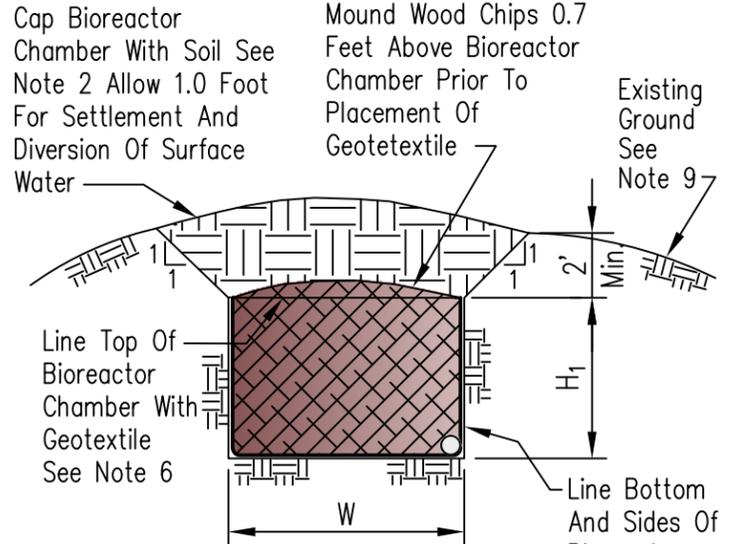
**PLAN**



**SECTION A-A**  
CAP ALTERNATIVE 1



**ELEVATION**



**SECTION A-A**  
CAP ALTERNATIVE 2

**NOTES:**

- Utilize CAP ALTERNATIVE 1 for the bioreactor chamber unless traffic over the top is anticipated.
- For CAP ALTERNATIVE 2, fill the area above the bioreactor chamber with soil, tamped for compaction. Use topsoil for at least the top 6" Vegetate according to Conservation Practice Standard 342 unless the area is to be cropped.
- Set bottom of bioreactor to drain towards entrance end.
- Line bottom and sides of bioreactor chamber with black plastic, minimum 4 mil thickness. Overlap any splices at least 6 inches. Wrap plastic carefully around tiles that enter/exit the chamber; no need to seal around tiles.
- Route supply line to centerline of entrance end of bioreactor chamber.
- Wood chip media must be reasonably free from dirt, fines, and other contaminants. Do not use oak, cedar or redwood chips because of their tannin content. Do not use treated wood chips.
- Obtain approval of engineer on the wood chips prior to installation.
- Geotextile (non-woven, needle punched)  
Minimum criteria:  
 Grab tensile strength (lb) ASTM D 4632 \_\_\_202  
 Elongation at failure (%) ASTM D 4632 \_\_\_≥ 50  
 Trapezoidal tear strength (lb) ASTM D 4533 \_\_\_79  
 Puncture strength (lb) ASTM D 6241 \_\_\_433  
 Ultraviolet light (% retained strength) ASTM D 4355 \_\_\_min 50  
 Apparent opening size (AOS) ASTM D 4751 \_\_\_max 0.22 mm (US sieve size 70)  
 Permittivity  $\text{sec}^{-1}$  ASTM D 4491 \_\_\_min 0.70  
 Overlap splices at least 6 inches.
- Grade site for positive drainage away from the bioreactor chamber. Spread soil in designated location away from bioreactor.

Bench Mark El. \_\_\_\_\_

Description \_\_\_\_\_

Date	9/15/16
Designed	
Drawn	M. QUINONES
Checked	
Approved	

**DENITRIFYING BIOREACTOR**  
**TYPE 3 - SINGLE STRUCTURE**  
**WITH DWM**

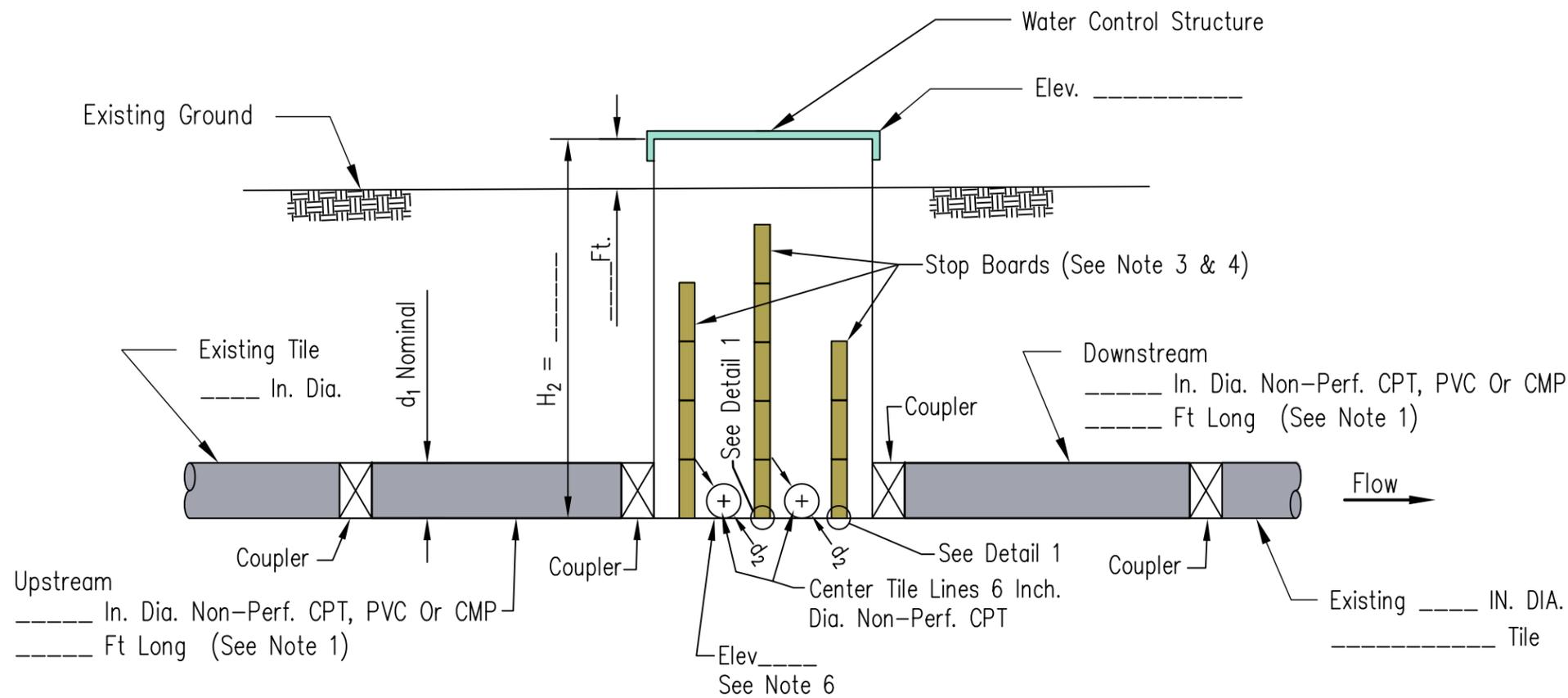


File No. IL-ENG-133

Drawing Set Page 1 of 2

Sheet of

Landowner		Location	
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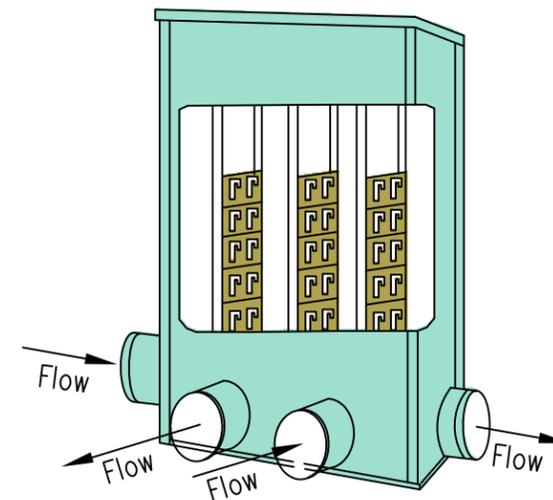
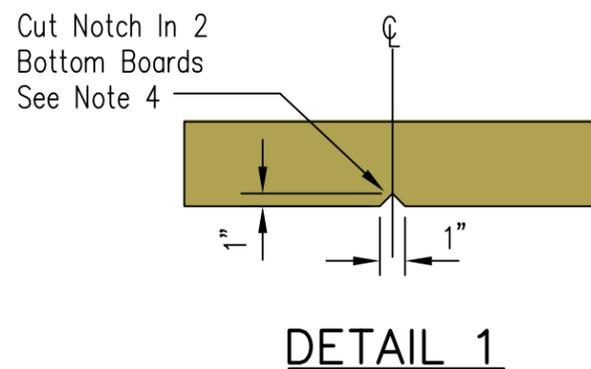
**TYPICAL SECTION**

**NOTES:**

1. Install a minimum of 20 feet of non-perforated tile adjacent to the water control structure, on all 4 lines: upstream, downstream and side ports.
2. Couplings between the water control section and the non-perforated tile must be water tight.
3. Stop boards must provide water tight seals under a minimum of 1 ft. pressure head (except notched boards).
4. Bottom boards in the middle and the downstream rows are to be notched as shown in Detail 1.
5. Mark location of structure using post or manufactured marker flag for safety in the field.
6. Set elevation of bioreactor chamber bottom at least 0.2 feet above structure/ tile flow line.

QUANTITIES*	
Water Control Structure 4 - Compartment H <sub>2</sub> = _____ft. d <sub>1</sub> = _____in. d <sub>2</sub> = _____in.	1
___" Non-perforated Pipe (ft)	
6" Non-perforated Pipe (ft)	
___" Perforated CPT (ft)	
Tee 6" x 6"	
Elbows 6"	
Wood Chips (cu. yd.)	
4 Mil Black Plastic (sq. yd.)	
Geotextile (sq. yd.)	
Excavation (cu. yd.)	

\* Quantities Do Not Include Tile/Pipe Couplers Or Extra Material For Geotextile/Plastic Overlap



**IN-LINE CONTROL STRUCTURE**

Designed	Drawn	Checked	Approved
	M. QUINONES		
Date	9/15/16		

**TYPE 3 BIOREACTOR IN-LINE  
WATER CONTROL STRUCTURE  
4 - COMPARTMENT**

United States  
Department of  
Agriculture  
**USDA**  
Natural Resources  
Conservation Service

Landowner		Location	
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