

## Appendix B – Sample Plan Notes

### 659, Soil Analysis Test (Each)

Soil Analysis Tests are used to field adjust the rate of Lime based on soil conditions.

C. Soil Analysis Test is not specified.

1. The standard rate for Lime will be used without adjustment.

D. Soil Analysis Test is specified. If specified, minimum of two tests.

1. If no Topsoil to be placed - One test per 10 Acres (one test per 48400 Sq. Yd.) of permanent sodded area.
2. If placing Topsoil - One test per 10000 Cu. Yds. of Topsoil.

### 659, Topsoil (Cu. Yd.)

111 Cu. Yds. per 1000 Sq. Yd. of permanent sodded area. Topsoil is optional. However, it is recommended, especially for projects involving A4 silty materials, granular embankment or granular materials due to severe erosion problems.

### 659, Commercial Fertilizer (Ton)

30 pounds per 1000 Sq. Ft. (one Ton per 7410 Sq. Yd.) of permanent sodded area. This rate includes 20 pounds per 1000 Sq. Ft. for the first application and 10 pounds per 1000 Sq. Ft. for the second application.

### 659, Lime (Acre)

Apply over permanent sodded area.

### 659, Water (M. Gal.)

1 application every 7 days for an additional 2 months beyond the requirements of 660.09. The rate shall be 300 gallons per 1000 Sq. Ft. (0.0027 M. Gallons per Sq. Yd.) of permanent sodded area.

### 660, Sodding (Sq. Yd.)

This is the actual number of Sq. Yds. of permanent sodded area.

## **W99 POST CONSTRUCTION STORM WATER TREATMENT**

THIS PLAN UTILIZES STRUCTURAL BEST MANAGEMENT PRACTICES (BMP'S) FOR POST CONSTRUCTION STORM WATER TREATMENT.

Designer Note: This plan note shall be used on all projects that have post construction storm water management BMP's. The note shall be followed by the below notes if applicable.

## **W101 BIORETENTION CELL(S)**

CONSTRUCT THE BIORETENTION CELL(S) AFTER ALL CONTRIBUTING DRAINAGE AREAS ARE STABILIZED AS SHOWN ON THE CONTRACT PLANS. DO NOT OPERATE HEAVY EQUIPMENT WITHIN THE PERIMETER OF A BIORETENTION CELL. USE ALL SUITABLE EXCAVATED MATERIAL IN THE WORK. ALTERNATIVELY, LEGALLY USE, RECYCLE, OR DISPOSE OF ALL EXCAVATED MATERIALS ACCORDING TO 105.16 AND 105.17.

EXCAVATE THE BIORETENTION CELL TO THE DIMENSIONS, WITH VERTICAL SIDES, TO THE ELEVATIONS SPECIFIED. MINIMIZE THE COMPACTION OF THE BOTTOM OF THE BIORETENTION CELL. EXCAVATION WILL BE MEASURED AND PAID AS ITEM 203, EXCAVATION AS PER PLAN..

THE BIORETENTION CELL CONSISTS OF FOUR DISCRETE LAYERS: BIORETENTION PLANTING SOIL LAYER, FINE AGGREGATE LAYER, COARSE AGGREGATE NO. 78 LAYER, AND COARSE AGGREGATE NO. 57 LAYER AND AN UNDERDRAIN SYSTEM. THE MATERIALS AND VOLUMES FOR EACH LAYER ARE AS SHOWN:

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BIORETENTION CELL		PROJECT QUANTITY (CY)
BIORETENTION PLANTING SOIL LAYER PLUS 3 INCH COVER		
	COMPOSITION BY VOLUME	
5	PARTS SAND – CMS FINE AGGREGATE AS PER 703.20	
1	PART TOPSOIL – CMS 659.05	
2	PARTS COMPOST – CMS 659.06	
FINE AGGREGATE AS PER CMS 703.20		
COARSE AGGREGATE SIZE NO. 78 PER 703.20		
COARSE AGGREGATE SIZE NO. 57 PER 703.20		
TOTAL CUBIC YARDS		

CONSTRUCT THE UNDERDRAIN SYSTEM AS SPECIFIED.

PLACE THE BIORETENTION PLANTING SOIL IN 12 INCH LIFTS. THE BIORETENTION PLANTING SOIL LAYER PLUS 3 INCH COVER IS 3 INCHES GREATER THAN THE DEPTH SPECIFIED TO ACCOUNT FOR EXPECTED SETTLING OF THE UNCOMPACTED SOIL.

THE BIORETENTION PLANTING SOIL SHALL BE A UNIFORM MIX THAT IS FREE OF STONES, STUMPS, ROOTS, OR ANY OTHER OBJECT LARGER THAN TWO INCHES. THE SOIL MAY CONSIST OF EXISTING SOIL, FURNISHED SOIL, OR A COMBINATION OF BOTH PROVIDED THAT THE PH IS BETWEEN 5.2 – 8.0 AND MEETS THE COMPOSITION REQUIREMENTS LISTED ABOVE. PHOSPHORUS CONCENTRATIONS OF THE PLANTING SOIL SHALL FALL BETWEEN 15 AND 60 MG/KG (PPM) AND DETERMINED BY THE MEHLICH III TEST.

THOROUGHLY MIX THE BIORETENTION PLANTING SOIL PRIOR TO PLACEMENT.

PLACE OBSERVATION WELL AND CLEANOUT WHERE SPECIFIED. CONNECT THE OBSERVATION WELL AND CLEANOUT TO THE PERFORATED UNDERDRAIN WITH THE APPROPRIATE MANUFACTURED CONNECTIONS. EXTEND THE OBSERVATION WELL AND CLEANOUT 4 INCHES ABOVE THE SURFACE ELEVATION. CAP THE OBSERVATION WELL AND CLEANOUT WITH A THREADED SCREW CAP. CAP THE ENDS OF PERFORATED UNDERDRAIN PIPES NOT TERMINATING IN AN OBSERVATION WELL AND CLEANOUT OR CONNECTED TO OTHER CONDUITS.

PLACE SEED, TURF, TREES, SHRUBS, OR OTHER PLANT MATERIALS FOR BIORETENTION FACILITIES AS SPECIFIED. PLANT MATERIALS WILL BE MEASURED AND PAID FOR PER CMS ITEM(S) 659, 660, OR 661 DEPENDING ON THE PLANT MATERIALS SPECIFIED. APPLY NO PESTICIDES, HERBICIDES, LIME, AND FERTILIZERS. INSTALL ITEM 611 AS SPECIFIED. INSTALL TEMPORARY EROSION CONTROL MAT TYPE A, B, C, OR E PER CMS 671 WITH EITHER STRAW MULCH OR COMPOST OR AS SPECIFIED IN THE PLANS.

BIORETENTION CELLS WILL BE PAID FOR AS ITEM 601, BIORETENTION CELL CU YD. AND ITEM 601, TIED CONCRETE MAT SQ YD. EXCAVATION FOR BIORETENTION CELLS SHALL BE FOR VERTICAL SIDES ONLY AS SPECIFIED AND PAID FOR AS ITEM 203, EXCAVATION AS PER PLAN CU YD. PERFORATED UNDERDRAINS, OBSERVATION WELLS, AND ASSOCIATED FITTINGS AND COUPLERS WILL BE PAID FOR AS ITEM 605, UNDERDRAIN AS PER PLAN. NON PERFORATED OUTLET PIPES FOR BIORETENTION CELLS SHALL BE PAID FOR AS ITEM 611. SEEDING AND MULCHING FOR THE BIORETENTION CELL SHALL BE PAID FOR AS ITEM 659 SEEDING AND MULCHING SQ YD. EROSION CONTROL MATS SHALL BE PAID FOR AS ITEM 671, EROSION CONTROL MATS SQ YD.

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Designer Note: This plan note shall be used on all projects that have bioretention cell(s) identified in the plan.

Add plan note that states: "ITEM 203, EXCAVATION, AS PER PLAN VERTICAL SIDES ONLY" on plan sheets showing bioretention cell cross section.

### **W102 INFILTRATION TRENCH (OR BASIN)**

THIS PLAN UTILIZES INFILTRATION FOR POST CONSTRUCTION STORM WATER TREATMENT. CONSTRUCT THE COMPLETED INFILTRATION TRENCH(ES) (AND OR BASIN(S)) AFTER ALL CONTRIBUTING DRAINAGE AREAS ARE STABILIZED AS SHOWN IN THE CONTRACT PLANS AND TO THE SATISFACTION OF THE ENGINEER. DO NOT USE INFILTRATION DEVICES AS TEMPORARY SEDIMENT CONTROL FACILITIES DURING CONSTRUCTION. DO NOT OPERATE HEAVY EQUIPMENT WITHIN THE PERIMETER OF AN INFILTRATION DEVICE DURING EXCAVATION OR BACKFILLING OF THE FACILITY.

Designer Note: This plan note shall be used on all projects that have infiltration trenches and or basins identified in the plan. Embankment work to create the impoundment will be constructed and paid for as Item 203 Embankment, using natural soils, 703.16.A.

### **W103 MANUFACTURED WATER QUALITY STRUCTURE**

THIS PLAN UTILIZES MANUFACTURED WATER QUALITY STRUCTURES FOR WATER QUALITY TREATMENT. AREAS HAVE BEEN SHOWN IN THE PLANS FOR PLACEMENT OF AN OFF-LINE SYSTEM. PAYMENT FOR THESE DEVICES SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR ITEM 895, MANUFACTURED WATER QUALITY STRUCTURE, TYPE \_\_\_\_.

Designer Note: This plan note shall be used on all projects that have manufactured water quality structures identified in the plan. If more than one manufactured water quality structure is provided in the plans, a table shall be provided to indicate the location and type of each structure used. Supplemental specification 895 outlines the different types of structures (1-4). **Manufactured systems may not be installed under the roadway or downstream of a connecting pipe more than ten feet deep without approval of the Office of Hydraulic Engineering.**

### **VEGETATED FILTER STRIP**

#### **W104**

THIS PLAN UTILIZES VEGETATED FILTER STRIP(S) FOR POST CONSTRUCTION STORM WATER TREATMENT. PLACE EITHER ITEM 660 SODDING OR ITEM 659 SEEDING AND MULCHING WITH A 4-INCH LIFT OF TOPSOIL AND ITEM 670, SLOPE EROSION PROTECTION TO ALL DISTURBED AREAS DESIGNATED AS VEGETATED FILTER STRIPS, THE EDGE OF SHOULDER, AND THE FORESLOPE AS SPECIFIED IN THE PLANS.

Designer Note: Use this plan note on all projects that have vegetated filter strips identified in the plan. Pay for grass planting and topsoil as Item 659 or Item 660 and include with quantities for the rest of the project. Pay for erosion control mat as Item 670, slope erosion protection and include with quantities for the rest of the project.

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### **W105 VEGETATED BIOFILTER**

THIS PLAN UTILIZES VEGETATED BIOFILTER(S) FOR POST CONSTRUCTION STORM WATER TREATMENT. PLACE EITHER ITEM 660 SODDING OR ITEM 659 SEEDING AND MULCHING WITH A 4-INCH LIFT OF TOPSOIL AS SHOWN IN THE PLANS TO ANY DISTURBED AREA ON THE SHOULDER AND FORESLOPE DRAINING TO A VEGETATED BIOFILTER. THE DITCH FOR EACH VEGETATED BIOFILTER SHALL BE TRAPEZOIDAL, AS SHOWN IN THE PLAN CROSS SECTIONS. PROVIDE ITEM 670 AS SPECIFIED IN THE PLANS.

Designer Note: Use this plan note on all projects that have vegetated biofilters identified in the plan. Pay for grass planting and topsoil as Item 659 or Item 660 and include with quantities for the rest of the project. Pay for erosion control mat as Item 670, ditch erosion protection and include with quantities for the rest of the project.

### **W106 EXTENDED DETENTION BASIN**

THIS PLAN UTILIZES EXTENDED DETENTION BASIN(S) FOR POST CONSTRUCTION STORM WATER TREATMENT. DETENTION BASINS MAY BE USED AS SEDIMENT CONTROL DEVICES DURING CONSTRUCTION. FOLLOWING STABILIZATION OF THE TRIBUTARY AREA, FINAL GRADING OF THE DETENTION BASIN MUST MATCH THE PLANS. THE DETENTION BASIN OUTLET STRUCTURE FOR CONSTRUCTION SEDIMENT CONTROL MUST BE REMOVED AND THE OUTLET STRUCTURE MUST BE MADE TO MATCH THE DESIGN SHOWN IN THE PLANS.

Designer Note: This plan note shall be used on all projects that have extended detention basins identified in the plan. This note may be modified for retention basins or constructed wetlands, if those are included in the plans.