Design Example:
Allegany County Burbridge Building

Stormwater Design Workshop
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Burbridge Building

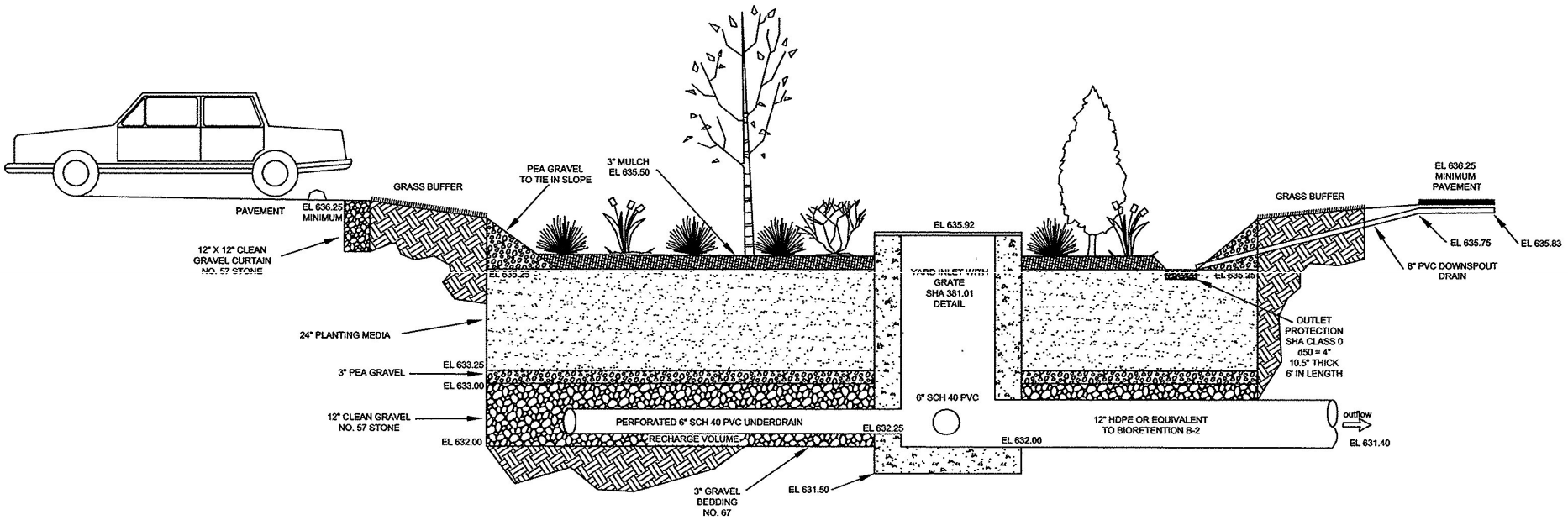
- 15,000 sf Industrial Building
- 2 acre site in North Branch Industrial Park
- 2 Loading Docks w/ truck turnaround
- Employee parking

Key Issues: Concept Plan Phase

- Soils Investigation by Allegany SCD
  - HSG D
  - Fragipan @ 3 ft. depth – impermeable layer
  - Perc Test below fragipan: 0.1 in/hr
  - Hydric Soils
  - Result: underdrain required
- Wetland Determination by MDE
  - Hydric soils present
  - Wetland vegetation present
  - Could not establish hydrology
- http://maps.google.com/maps

Refer to Handout

Micro-Bioretention B-1 Cross Section



BIORETENTION B-1

SECTION VIEW A - A'

NTS

Lessons learned from this Design Example

- Approach A and Approach B basically result in same size facility

- $P_E = 15" A_f / DA$ (Equation 5.2) is very conservative
  - Use as a "planning tool" in Concept Phase only
  - Do not use A_f derived from Equation 5.2 as a controlling function when sizing micro-bioretention facilities
  - Use ESDv as controlling function

Other Points

- Suppose P_E = 1.8" could not be met:
  - Say only P_E = 1.0" was met ⟶ Use Table 5.3 to get Reduced CN=85

Hydrologic Soil Group D										
%I	RCN*	P_E = 1"	1.2"	1.4"	1.6"	1.8"	2.0"	2.2"	2.4"	2.6"
0%	80									
5%	81									
10%	82									
15%	83									
20%	84	77								
25%	85	78								
30%	85	78	77	77						
35%	86	79	78	78						
40%	87	82	81	79	77					
45%	88	82	81	79	78					
50%	89	83	82	80	78					
55%	90	84	82	80	78					
60%	91	85	83	81	78					
65%	92	85	83	81	78					
70%	93	86	84	81	78					
75%	94	86	84	81	78					
80%	94	86	84	82	79					
85%	95	86	84	82	79					
90%	96	87	84	82	79	77				
95%	97	88	85	82	80	78				
100%	98	89	86	83	80	78	77			

Cp_v Addressed (RCN = Woods in Good Condition)

RCN Applied to Cp_v Calculations

Use CN=85 to address CP_v in a BMP

Other Points

- How to handle larger storm events
  - Demonstrate safe passage of 10-year storm (yard inlet/barrel)
    - Used TR-55 and Hydraflow
  - Suppose management of 10-year storm is required
    - Use "true" post-development CN to determine 10-year volume to be stored in Best Management Practice (BMP)
    - Then subtract ESD_V from volume stored in BMP
- How to size culverts downstream of ESD practices
  - Use "true" post-development CN

Other Points

- Should provide Recharge volume (Re_v) below invert of underdrain pipe.
  - Sub-area B-1:
    - $Re_v = (S)(R_v)(A)/12 = (0.07)(0.662)(31{,}220\ sf)/12 = 121\ cf$
      where S = 0.07 (HSG D)
    - Volume below underdrain pipe (3 inches):
      = (1,280 sf) (0.25 ft) (0.4)
      = 128 cf > Re_v of 121 cf √

Questions?

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