



Date: November 15, 2012  
To: Merrick Turner  
From: Matt Crowley/ Mark Gershman  
Philip Paradisi *PPR12* BETA Project #: 4410  
Subject: Stormwater Management Peer  
Review – Proposed Conditions

The purpose of the memorandum is to provide additional review comments regarding the *Preliminary Stormwater Management Report, University Station, University Avenue, Westwood MA*, submitted to Town of Westwood October 9<sup>th</sup>, 2012.

On October 29, 2012 BETA provided comments on the stormwater management calculations in regards to the existing conditions HydroCAD model. This memorandum provides our initial review comments on the proposed conditions model.

Of the comments provided below we anticipate the following key issues could have a significant effect on the analysis and should be addressed prior to the next submission of the stormwater management analysis. Pending resolution of the key issues and comments provided herein, we suggest that item IV be expedited to enable productive review to continue.

- I Satisfactorily address Dedham Westwood Water District concerns including:
  - a. Infiltration of non-roof runoff
  - b. Water balance
- II Separate systems for roof and non-roof runoff areas.
- III Sustainability of project and incorporation of low impact development (LID) techniques that may include:
  - a. Smaller collection, treatment and/or infiltration systems scattered throughout the project to manage stormwater runoff closer to the source.
  - b. Cisterns for reuse of water on site.
  - c. Porous pavements
  - d. Green roofs
- IV Provide revisions and supplemental data in response to previous comment on the existing conditions as soon as possible.



## **Stormwater Management Report and Grading and Drainage Plans**

### General Comments

1. Response to Existing Conditions model
2. Consider other Low Impact Development Techniques to be included
3. Comments from Dedham Westwood Water District (DWWD) and their consultant will need to be addressed prior to completing the design and review of the proposed stormwater management systems. Provide DWWD review comments.
4. To facilitate review of future submissions, BETA requests that the applicant submit print outs of full set of calculations for the 25 year storm event, summaries for the 2, 10 & 100 year storms and details of ponds for 100 year storm only and provide an electronic copy (pdf) of the full printout.
5. Separate roof drainage systems from roadway/parking lot drainage systems to maximize treatment effectiveness stormwater quality structures. Note DWWD to determine extent of infiltration in Zone I and Zone II areas.
6. The erosion potential in proposed swales should be evaluated, particularly those with steeper slopes. Appropriate erosion control measures should be implemented as necessary and detailed on the plans.
7. Provide hydraulic calculations for all pipes for 25 year storm event to determine pipe sizes are adequate (graphical profiles preferred).
8. Provide documentation of evaluation of existing capacity of offsite stormwater management systems for areas 3 & 4 to ensure no problematic downstream controls/restriction exist beyond the limits of the project.
9. Geotechnical data for site.
10. Soil test data (seasonal high groundwater elevations and soil permeability tests) for infiltration systems, detention ponds and wet ponds.
11. Water balance calculations.
12. Provide details of all special structures, swales, and ponds.
13. BMP sizing calculations
14. Double-grate catchbasins should be used on roadway slopes  $\geq 5\%$ .

## **Appendix B – HydroCAD Input/Output – Proposed Conditions**

### General Comments

1. Plans should be provided that label the location of ponds, reaches, and subwatersheds used in the HydroCAD model.
2. Provide description for all subcatchment CN input values including cover type and hydrologic soil group.
3. Provide detail for all subcatchment Time of Concentration (TC) values greater than 5 minutes (sheet flow, shallow concentrated flow, etc.).
4. Model all wetlands and wet ponds as impervious surfaces in HydroCAD. Revise associated subwatersheds as necessary.
5. Design all proposed wet ponds in conformance with the MassDEP Stormwater Management Regulations and include a draw-down device for maintenance and emergency purposes.
6. Care should be taken to ensure that subwatersheds, reaches, and ponds that are to remain unchanged in the Proposed Conditions are input and modeled the same as in the Existing Conditions. For example, confirm the minor changes in total and impervious areas associated with Subwatershed S32.
7. Model should evaluate flow out of proposed ponds routed through the outlet pipe exiting the outlet structure.

### Point of Analysis 1 (POA1)

1. As previously noted in comments dated October 29, 2012, the inlet/outlet values used for Reach L59 do not appear consistent with existing conditions. In consideration of flat or positive slopes towards the outlet it may be more appropriate to model this Reach as a Pond with outlet weir.
2. It is unclear which components of the existing drainage system will be retained or replaced in the vicinity of and including Reach L57. The HydroCAD model and Grading and Drainage Plan are in conflict in some cases and Subwatershed routing may be affected. Care should be taken to ensure that the HydroCAD model and Plans are in agreement and that Subwatersheds are routed correctly.
3. Outlet structure information indicates that the ponds 30P & 52P are detention basins with no infiltration but at the public presentation it was stated that these would be wet ponds.

4. Subwatershed S23 uses an input value of  $T_c = 19$  min. Given the high percentage of impervious surfaces (76.11%) this value is high. Provide detail of how this value was determined in the HydroCAD model and/or revise as necessary.
5. Subwatershed S30 uses an input value of  $T_c = 18.3$  min. Given the small watershed size this value is high. Provide detail of how this value was determined in the HydroCAD model and/or revise as necessary.

#### Point of Analysis 2 (POA2)

1. The pipe segment associated with Reach L123 appears to be substantially higher than both the upstream and downstream pipe segments. Revise inlet/outlet elevations to 42.06 and 40.74, respectively.
2. During the construction of the previous project, the outlet pipe connecting the drainage system in University Ave to the wetland west of the railroad tracks (1R) was observed composed of various size and material of pipe with some portions in poor condition. It should be replaced with a new pipe of appropriate material and size to carry the design stormwater flows.
3. The wetlands associated with Pond 47P have no outflow for any of the design storm events. Please confirm that the HydroCAD model reflects actual field conditions.

#### Point of Analysis 3 (POA3)

1. There are difference in how reaches and ponds upstream of Reach L108 have been modeled in the Existing and Proposed Conditions, resulting in a difference in modeled flows. Provided there are no changes to the stormwater system in these areas the HydroCAD models should be revised to match in the Existing and Proposed Conditions.
2. Subwatersheds/Reaches S1, S2, S3, 5R, and 6R are routed differently in the Existing and Proposed Conditions. If there are no changes in the drainage system upstream of Reach 4R the HydroCAD models should be revised to match in the Existing and Proposed Conditions.
3. Reaches P3, L179 and Link 110.1 have been modeled differently in the Existing and Proposed Conditions. If there are no changes to these portions of the drainage system the HydroCAD models should be revised to match in the Existing and Proposed Conditions.
4. Subwatersheds S53 and S54 are modeled as 100% pervious in the Proposed Conditions. Please confirm the lack of impervious surfaces in the Proposed Conditions.

5. Pond 52P has less than one foot of freeboard for the 100-yr design storm. Revise pond and/or outlet structure to provide at least one foot of freeboard.

Point of Analysis 4 (POA4)

1. The HydroCAD model uses a Rawls Rate of 8.270 in/hr for the infiltration system associated with Pond 59P. Provide soil test results confirming this exfiltration rate and groundwater depth test results.

Structural Comments for GeoStorage Units (Sheet C-509)

1. Provide design criteria to the Contractor for the design of the system (i.e. HS 25 live load, max. slab deflection, etc.)
  2. Increase the end panel overlap with the geo-grid wall below (currently 6")
  3. Consider requiring the application of a membrane waterproofing on the top and side surfaces of the concrete panels
  4. Consider requiring additional manholes (access points) for future inspection and maintenance operations
  5. Consider requiring the use of coated (epoxy, galvanized, etc.) for the welded wire baskets and steel
  6. Provide additional detail on cross section to show finish elevations and backfill over the structure (i.e. potential presence of gravel, pavement parking lot islands, etc.).
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