



ENGINEERING SUCCESS TOGETHER

MEMORANDUM

Date: December 17, 2012
To: Merrick Turner
From: Matt Crowley/Philip Paradisi *PPR* BETA Project #: 4410
Subject: University Station
Stormwater Management Peer Review

The purpose of the memorandum is to provide review comments regarding the *Stormwater Management Report, University Station, University Avenue, Westwood MA*, submitted to Town of Westwood November 30, 2012.

On October 29, 2012 and November 15, 2012 BETA provided comments on the stormwater management calculations in regards to the October 9, 2012 preliminary submission. This memorandum provides our initial review comments on the big picture issues of the latest submission.

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 Provide comments from Dedham Westwood Water District and satisfactorily address concerns including:
 - a. Infiltration of non-roof runoff
 - b. Water balance
- II Separate systems for roof and non-roof runoff areas.
- III Provide documentation on discussions of the 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 comments on the existing conditions as soon as possible.
- V Provide written responses as to the disposition of all previous comments.

Stormwater Management Report and Grading and Drainage Plans

General

- G1. Provide revised watershed plans to make all watershed labels and links readable.
- G2. Provide labels on watershed plans for all nodes (e.g. 1R and 48R are missing from the proposed watershed model).
- G3. Provide revised grading and drainage plans to make all structure and pipe data readable. Suggest showing only 5 foot contours and no stockpiles with limits of proposed work.
- G4. Provide notations on plans to clearly identify the disposition of all existing drainage structures and pipe segments within the project limits.
- G5. Show proposed Stormceptor locations drawn to scale on plans.
- G6. Direct all roof areas to infiltration systems.
- G7. Provide drainage system modification to University Ave. to accommodate changes in roadway layout.
- G8. Provide structure and pipe data for east portion of the project.
- G9. Provide backup for groundwater recharge assumption for the water balance report.
- G10. Provide documentation for how 84.3 ac. of impervious was determined for recharge calculations. It is not clear from the tables or appendix.
- G11. Clarify method used for recharge volume calculations. There are inconsistencies between text, tables, footnotes, and calculations throughout document.
- G12. The stormwater report references the former Westwood Station project SWMM model for detailed information regarding ground covers, soil groups, and time of concentrations – this is not acceptable. The current stormwater report should be a comprehensive, stand-alone document that includes all relevant input data for both the existing and proposed conditions.
- G13. Provide mitigation to reduce post construction peak runoff rates to at or below those from the previously approved existing conditions in POA3 for the 25 and 100 year storm events.
- G14. Provide documentation for how exfiltration rates used in calculations were determined from hydraulic conductivity values provided in geotechnical stormwater report.

- G15. Show all structures including below grade drain to scale that to verify that there are no conflicts with drainage components.
- G16. Show snow storage areas or document snow removal operation and maintenance plans.
- G17. Verify that landscape plantings will not conflict with drainage systems or snow storage.

Existing Conditions

To point of Analysis 2

- E2.1. Include Link 19L in HydroCAD output.
- E2.2. 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 and proposed conditions. Refer to routing of subwatersheds S1 to S3.
- E2.3. Provide verification that the outlet pipe L69 is in fact a 60 inch RCP in good condition. During construction of the previous project this was discovered to be comprised of various sizes and materials and in poor condition and alignment. It was about to be replaced with a new 54 inch RCP.

To point of Analysis 3

- E3.1. Reaches and ponds upgradient of Reach L108 do not appear to reflect the existing drainage configuration at Pear Tree Drive and Endicott Street. Revise the HydroCAD model to reflect the existing configuration and appropriately route flow offsite.

Proposed Conditions

To Point of Analysis 1

- P1.1. Provide grading and drainage system for residential units off Canton Street.
- P1.2. Provide outlet structure for pond 30P on grading and drainage plan.
- P1.3. Provide erosion control measures for outlets and swales.
- P1.4. Provide outlet to swale along Harvard Street near DMH 619.
- P1.5. Provide soil test data to show seasonal high groundwater elevations.
- P1.6. Recommend providing some infiltration making basin 30P an extended basin. The bottom of the basin is shown at elevation 49 and the pond empties through the outlet structure (in calculations and detail) at elevation 49. The peak elevation for the 100 year storm is

calculated at elevation 51.47 while the overflow is at elevation 52.5 indicating that there is at least 1 foot of storage for infiltration.

- P1.7. Show on plan the replacement of existing 24 inch RCP (L57) with new 48 in RCP to match calculations. Recommend daylighting this pipe, combining flows with and expanding detention/infiltration basin, and/or installing a constructed wetland in this area.

To Point of Analysis 2

- P2.1. Provide verification that the outlet pipe L69 is in fact a 60 inch RCP in good condition. During construction of the previous project this was discovered to be comprised of various sizes and materials and in poor condition and alignment. It was about to be replaced with a new 54 inch RCP.
- P2.2. Provide soil test and seasonal high groundwater elevation data for proposed infiltration system. Note that recharge calculations utilizing the dynamic field method require a field derived saturated hydraulic conductivity value to be determined.

To Point of Analysis 3

- P3.1. Representations at public hearings were that the two ponds at the intersection of University Ave and Blue Hill Drive (52.1P & 52.2P) were to be wet ponds. Calculations indicate that the outlets of these ponds are at elevation 47, the same elevation of the bottom of the ponds. Recommend that the applicant provide a design by a botanist and or wetland scientist to certify that the pond will sustain aquatic plants and species.
- P3.2. Provide outlet structure for ponds 52.1P & 52.2P on plan.
- P3.3. Provide erosion control measures for outlets and swales.
- P3.4. Provide soil test data to show seasonal high groundwater elevations.
- P3.5. Verify that down-gradient, off-site drainage infrastructure is in good condition and can accommodate peak flows and volume of runoff from this project.
- P3.6. Reaches and ponds upgradient of Reach L108 do not appear to reflect the existing drainage configuration at Pear Tree Drive and Endicott Street. Revise the HydroCAD model to reflect the existing configuration and appropriately route flow offsite.
- P3.7. Replace the existing 12" steel pipe associated with Reach L176 with a new pipe.
- P3.8. Ponds 52.1P and 52.2P have less than one foot of freeboard for the 100-yr design storm. Revise ponds and/or outlet structures to provide at least one foot of freeboard.

To Point of Analysis 4

- P4.1. Work is shown on MBTA property. Provide documentation from MBTA indicating approval of proposed work and connection to their drainage system.
- P4.2. Provide soil test and seasonal high groundwater elevation data for proposed infiltration system.
- P4.3. Verify that down-gradient, off-site drainage infrastructure is in good condition and can accommodate peak flows and volume of runoff from this project.
- P4.4. This area may be more amenable to various low impact development techniques.