



September 25, 2014

Town of South Hadley
Office of the Planning Board
116 Main Street, Room 204
South Hadley, MA 01075-2896

RE: Proposed Rivercrest Condominium Project
Stormwater Peer Review Response

On behalf of the applicant, Ferry Street Nominee Trust, R. Levesque Associates, Inc. (RLA) has completed this letter in response to the peer review comments made by GZA GeoEnvironmental, Inc. ("GZA"). R. Levesque Associates, Inc. has reviewed the comments and is herein providing this memorandum to summarize and provide a response as to how the comment(s) have been addressed. The following document was reviewed as part of this evaluation:

Letter from GZA to Town of South Hadley, Office of the Planning Board regarding "Peer Review Services, Rivercrest Condominium Project, Ferry Street, South Hadley, MA" dated September 2, 2014.

Based on the comments provided in the review letter above, R. Levesque Associates, Inc. has updated and revised the site plans as necessary. The following sections provide the original comment as stated in the GZA letter followed by the RLA response in bold. The comment numbering is consistent with the original letter for ease of reference.

Stormwater Management Report & Associated Site Plans

1. The Applicant should provide calculations demonstrating that the rip rap outlet protection at FES-1 and FES-2 has been designed to prevent erosion.

RLA Response: RLA has analyzed the rip rap such that the stone sizing will resist scouring. The Stormwater Drainage Report has been revised to include the calculations. A summary of the calculations is as follows:

FES #1:	Riprap $d_{50}=4''$	FES #2:	Riprap $d_{50}=4''$
	Apron Length=8'		Apron Length=8'
	Apron Thickness=1'		Apron Thickness=1'.

Due to discharge rates below the minimum threshold of 3 cfs for both FES-1 and FES-2, the dimensions stated above reflect the minimum sizing of outlet protection as recommended by the USDA Soil Conservation Service.

2. The Applicant should provide calculations demonstrating that the proposed grass swale behind Units 6-11 (Grass Swale #1) and the proposed grass swale behind Units 13-18 (Grass Swale #2) are capable

of conveying the modeled stormwater runoff to the surface infiltration system for each design storm as claimed. GZA suggests that the Applicant divide subcatchment PS-6 into four (4) separate subcatchments:

- a. one describing the area draining to Grass Swale #1 upstream of YD-1,
- b. one describing the area draining to Grass Swale #1 upstream of PYD-2,
- c. one describing the area draining Grass Swale #2,
- d. and one describing the area draining directly to the proposed surface infiltration system

GZA additionally suggests that the Applicant model the grass swales as Hydro-CAD® Reaches conveying runoff to YD-1, PYD-2, and the surface infiltration system. Modeling the swales will demonstrate whether the swales overtop during the more intense, less frequent storm events (i.e., 10-yr, 25-yr, 100-yr events).

RLA Response: RLA has revised the HydroCAD model as suggested in order to analyze the proposed grassed swales. The following discusses each swale as the model was revised.

- **Grass Swale #1 upstream of YD-1:** The catchment area of YD-1 includes the up-gradient grassed areas as well as roof runoff from the rear of units 6 through 10;
- **Grass Swale #1 upstream of YD-2:** The catchment area of YD-2 includes the up-gradient grassed areas beside and behind units 10 and 11 as well as roof runoff from a portion of unit 11;
- **Grass Swale #2:** The catchment area of Grass Swale #2 includes the up-gradient grassed areas as well as roof runoff from the rear of units 13 through 18;
- **Area draining directly to surface infiltration system:** The catchment area draining directly to the surface infiltration system includes the remaining grassed areas up-gradient of the basin which are not directly tributary to the swales.

In conclusion, the swales were found to have adequate capacity to convey storm events up to and including the 100-year storm event without overtopping.

3. GZA suggests the Applicant provide calculations demonstrating that the proposed roof runoff collection system is capable of conveying the modeled stormwater runoff to the proposed street drainage system for each design storm.

RLA Response: RLA has conducted a hydraulic analysis of the proposed roof runoff collection systems. The roof leader piping includes the lines of the drainage system which convey runoff from the roof leaders to the stormwater management system. In summary, the most roof area any one roof leader pipe will convey is the roof leader collecting the runoff from units 11 through 18. The maximum discharge for the 100-year storm event from those roof areas is 1.72 cfs. An 8" PVC pipe sloped at 1% is able to convey 1.9 cfs. Calculations have been provided demonstrating that the proposed roof leader systems have the capacity to convey up to and including the 100-year storm event, refer to Appendix G of the Stormwater Drainage Report. Therefore, the roof leader piping is sufficient as designed.

4. GZA suggests that the Applicant provide a hydraulic analysis demonstrating that the piped portions of the proposed stormwater management system are capable of conveying the design storms to the proposed BMPs.

RLA Response: RLA has conducted a hydraulic analysis of the proposed stormwater infrastructure. Calculations have been provided demonstrating that the proposed stormwater infrastructure has the capacity to convey up to and including the 100-year storm event, refer to Appendix G of the Stormwater Drainage Report.

5. The three infiltration systems (2 subsurface, 1 surface) are proposed to attenuate post-development peak rates of runoff to pre-development levels. The SMS states that a "Mounding analysis is required when the vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four (4) feet *and* the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm (e.g., 10-year, 25-year, 50-year, or 100-year 24-hour storm). In such cases, the mounding analysis must demonstrate that the Required Recharge Volume (e.g., infiltration basin storage) is fully dewatered within 72 hours (so the next storm can be stored for infiltration). The mounding analysis must also show that the groundwater mound that forms under the recharge system will not break out above the land or water surface of a wetland (e.g., it doesn't increase the water sheet elevation in a Bordering Vegetative Wetland, Salt Marsh, or Land Under Water within the 72-hour evaluation period)." Reference SMS Volume 3, Chapter 1, pp 28 & 29.

RLA Response: RLA has revised the site grading such that the two subsurface infiltration basins and the one surface basin now have a 4-foot separation to the estimated seasonal high groundwater. As such, the requirement for a mounding analysis as stated in the MassDEP Stormwater Management Standards no longer applies.

6. The overflow spillway for the surface infiltration system is proposed to be constructed out of rip rap. Placed rip rap has voids between individual stones that could allow water passage below the designed spillway crest elevation. GZA suggests the Applicant revise the spillway design such that water would be retained within the surface infiltration system up to the spillway crest elevation.

RLA Response: The proposed riprap overflow spillway has been replaced with a geogrid reinforcement material that will stabilize the overflow spillway. The use of the geogrid stabilization will eliminate the need for riprap and provide storage capacity within the basin up to the emergency overflow spillway crest elevation.

7. The Applicant should provide a TSS Removal Form for the proposed surface infiltration basin.

RLA Response: A TSS Removal form has been provided for the surface infiltration basin. It should be noted that the proposed surface basin will be collecting roof runoff, lawn areas, and the overflow from the subsurface infiltration systems. The roof runoff and lawn areas are not required to be treated for TSS removal and the overflow from the subsurface infiltration basins will be pre-treated by the up-gradient pre-treatment structures.

8. The invert elevation of the 12-inch diameter outlet pipe for proposed drain manhole PDMH-9 has multiple values assigned to it:
 - a. the profile on plan sheet C-5 lists an invert elevation of 192.60,
 - b. the detail on plan sheet D-6 lists an invert elevation of 192.85, and
 - c. the HydroCAD® analysis lists an invert elevation of 193.10

The Applicant should remedy or otherwise explain this discrepancy.

RLA Response: The discrepancy has been reviewed and the plans have been revised accordingly such that the invert elevation is consistent across the planset as well as the Stormwater Drainage Report.

9. The Applicant should provide a detail of the inlet debris protection grate proposed for the surface infiltration basin outlet control structure and incorporate the protection grate into the HydroCAD® model. GZA is requesting calculations verifying that the protection grate is less restrictive than the proposed 7-inch orifice the grate is protecting.

RLA Response: RLA has analyzed the inlet debris grate. A detail has been added to the planset and calculations demonstrating that the debris grate is less restrictive than the 7" orifice have been provided, see Appendix G of the Stormwater Drainage Report.

10. On plan sheet C-7, the orifice for the surface infiltration basin outlet control structure is incorrectly labeled in the plan view as being 6-inches in diameter.

RLA Response: The discrepancy has been reviewed and the plans have been updated to reflect a 7" orifice.

Compliance with MassDEP Stormwater Management Standards (SMS)

The following comments address the project's compliance with the ten MassDEP Stormwater Management Standards.

11. *Standard #1 – Untreated Stormwater:* GZA Comment No. 1 above, describes additional information required for compliance with this Standard.

RLA Response: RLA has provided the additional required information to demonstrate compliance with this standard.

12. *Standard #2 – Post-development Peak Discharge Rates:* GZA Comment Nos. 2 through 5 above, describe additional information required to demonstrate compliance with this Standard.

RLA Response: RLA has provided the additional required information to demonstrate compliance with this standard.

13. *Standard #3 – Recharge to Groundwater:* The Applicant should provide additional information demonstrating that the required recharge volume for the impervious areas draining to each infiltration BMP is provided within the respective BMP.

RLA Response: RLA has revised the Required Recharge Volume calculations in the Stormwater Drainage Report to reflect the impervious area tributary to each subsurface infiltration basin. A summary of the calculations is as follows:

- Subsurface Infiltration Basin #1: Required Recharge Volume=2,752 cf
Volume Provided=5,677 cf
- Subsurface Infiltration Basin #2: Required Recharge Volume=1,224 cf
Volume Provided=2,644 cf
- Surface Infiltration Basin: Required Recharge Volume=449 cf
Volume Provided=2,269 cf

14. *Standard #4 – 80% Total Suspended Solids (TSS) Removal:* The project appears to be in compliance with this standard, although GZA cautions that the 80% TSS removal rate claimed by the Applicant for

the two proposed Proprietary BMPs is not sufficiently verified by the supplemental manufacturer's information provided in the report. A more conservative approach would be to assign the BMPs a removal rate of 25%, similar to the MassDEP approved rate for an oil/grit separator.

RLA Response: In order to provide TSS removal efficiency beyond the requirements of the MassDEP Stormwater Management Standards, RLA has incorporated a treatment train of deep sump hooded catch basins with proprietary sedimentation devices (Stormceptors) prior to runoff discharge into the subsurface infiltration basins. The proposed treatment train is anticipated to provide a removal efficiency greater than 44% which is the standard set by the MassDEP. However, in an effort to remain conservative, and still provide the 44% TSS pre-treatment efficiency, RLA has revised the TSS Removal worksheets such that the proprietary sedimentation devices are given a 25% TSS removal efficiency.

It should also be noted that in addition to the deep-sump hooded catch basin and proprietary sedimentation device treatment train process, "isolator rows" which are also a proprietary form of pre-treatment have also been incorporated into the design of the subsurface systems. An "isolator row" consists of diverting the water quality rain event into the first row of the subsurface infiltration system. The first row is completely wrapped in a filter fabric and essentially acts as a filter for the first flush of runoff. Any storms greater than the water quality rain event are directed towards the remainder of the subsurface system. This feature was incorporated into the design to further enhance the water quality prior to discharge to the subsurface systems.

15. *Standard #5 – Land Uses With Higher Potential Pollutant Loads (LUWHPPLs):* This standard does not apply.

RLA Response: No response necessary.

16. *Standard #6 – Protection of Critical Areas:* This standard does not apply.

RLA Response: No response necessary.

17. *Standard #7 – Redevelopment Projects:* This standard does not apply.

RLA Response: No response necessary.

18. *Standard #8 – Erosion/Sediment Controls:* The project appears to be in compliance with this standard.

RLA Response: No response necessary.

19. *Standard #9 – Operation/Maintenance Plan:* The project appears to be in compliance with this standard.

RLA Response: No response necessary.

20. *Standard #10 – Illicit Discharges:* The Applicant has indicated in the Stormwater Report Checklist that an Illicit Discharge Compliance Statement will be submitted prior to the discharge of any stormwater to post-construction BMPs; as such, the project appears to be in compliance with this standard.

RLA Response: No response necessary.

Additional Comments Relative to the "Essential Steps for Review of Stormwater Reports by Conservation Commissions"

21. The Stormwater Report Checklist has been stamped, signed, and dated by the registered professional engineer.

RLA Response: No response necessary.

22. The project Stormwater Report appears to include plans depicting the catchment areas of all contributing drainages areas for existing and proposed conditions.

RLA Response: No response necessary.

23. A soil evaluation has been conducted and submitted.

RLA Response: No response necessary.

24. There is a clear and basic summary for selection of the method for hydrologic calculations, and summaries provided for individual subcatchment calculations under both existing and proposed conditions for the 2, 10, & 100 year storms.

RLA Response: No response necessary.

25. There is not a detailed alternatives analysis for consideration of Environmentally Sensitive Site Design & Low Impact Development. The Applicant should provide this information for review.

RLA Response: A detailed alternatives analysis was prepared as part of the Notice of Intent submission. The alternatives analysis has been incorporated into the Stormwater Drainage Report.

26. The project as proposed will not discharge stormwater from a LUWHPPL as defined by the SMS.

RLA Response: No response necessary.

27. The project is not proposed to discharge near or to a Critical Area as defined by the SMS.

RLA Response: No response necessary.

Additional Comments Relative to the Town of South Hadley Stormwater Bylaw

28. The Applicant should provide a description of provisions for project phasing.

RLA Response: The phasing of the project will be such that the roadway and stormwater management system shall be constructed first, prior to any units being built. Thereafter, the units will be built as they are sold. Upon completion of site clearing activities, any exposed soil areas shall be stabilized with temporary seeding until the units are built and final grading completed. A construction sequence outline has been included on sheet C-4.

29. The Applicant should provide a description of construction waste materials expected to be stored on site.

RLA Response: Construction materials will be collected in dumpster containers as the units are constructed. Containers will be removed and materials properly disposed of by a professional waste collection company.

Conclusion

R. Levesque Associates has provided detailed responses to the comments provided by the peer review consultant, GZA GeoEnvironmental, Inc. in the letter above. Each response correlates to the associated comment and describes how the comment was addressed. Accordingly, the planset and Stormwater Drainage Report have been revised to incorporate the suggestions and modifications made by GZA.

R. Levesque Associates would like to thank the Town of South Hadley Planning Board, Conservation Commission, and GZA GeoEnvironmental, Inc. for the opportunity to provide a response to the peer review comments. RLA found that the comments were logical and provided for a more complete project through the peer review process.

Sincerely,

R. LEVESQUE ASSOCIATES, INC.



Robert Levesque, RLA, ASLA
President



Filipe Cravo, P.E.
Project Engineer

cc: Ferry Street Nominee Trust