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September 29, 2021

Karen Sherman, Town Planner
Holliston Planning Board
703 Washington St
Holliston, MA 01746

RE: Stormwater Design Engineering Peer Review #2 "Eagle Path Definitive Subdivision"

Dear Ms. Sherman:

The following are Guerriere & Halnon, Inc's (G&H) responses to comments from CMG, comment letter dated September 22, 2012. Each CMG comment is reiterated below along with G&H #2's responses in **bold** & *italics*.

General Engineering & Drainage Design Comments:

1. The property area according to the design plans, project narrative, and assessor's card appears to be 6.29 Acres. The area analyzed in the submitted stormwater report appears to be 6.18 Acres. The total lot area should be included in the HydroCAD model.

G & H: There was a discrepancy in the areas between the submitted plans and the stormwater report. Both are now consistent.

CMG Comment #2: Comment Addressed

2. Pre and Post Development Condition plans should provide a legend and clearly depict time of concentration flow paths, lengths, slopes and NRCS soil type limits.

G & H: Pre & Post Development Plans now show flow paths, lengths, slopes and NRCS soil types.

CMG Comment #2: Topographic contours must be clearly labeled on the Pre and Post Development Conditions plans.

G & H #2: Plans have been corrected.

3. Pond 5P is not labelled and Sub catchment P-4 appears to be split into two areas as shown on Sheet 2 of 2, Post Development Conditions.

G & H: Pond 5P is labeled and sub catchment P-4 shows one (1) sub catchments.

CMG Comment #2: Comment partially addressed. Lot 2 post development drainage area should be split between Subcatchment P-3 & P-4B and not included in roadway Subcatchment area P-4.

G & H #2: Drainage area has been revised.

4. The proposed stormwater basin's outlet control pipe appears to have incorrect inlet invert and outlet invert elevations labelled on Sheets 4 & 5. (Plans show 345.00 and 344.50, assume inverts should be 245.00 and 244.50 respectively)

G & H: Basin outlet control pipe call out had incorrect elevations (345.00 & 344.50).These have been corrected.

CMG Comment #2: Plans and HydroCAD calculations still contain inconsistencies. Outlet control structure detail must be provided to verify construction detail, orifice openings, frame and grate, and outlet pipe size, type, and inverts.

HydroCAD model incorrectly models the outlet structure. Two (2) 6" orifices should be routed through "Device #1" in order to take into account the 0.47' pending within the basin and not listed as primary outlets.

HydroCAD model lists 18" round culvert primary outlet and plans show a 12" RCP. Basin 5P emergency spillway is not included in the HydroCAD model.
Proposed Basin 5P does not currently provide 1ft. of freeboard during the 100-year storm event.
G & H #2: Basin Berm is set at 248.50 which is above the 247.42 /100 Yr. Elevation.

5. Water line is not shown on the roadway profile on Sheet 5 of 8. Ortho imagery of the site also shows a Fire Hydrant alongside Utility Pole 16. This hydrant should be shown in the plan set. Additionally, CMG recommends coordination with Holliston Water Department to verify if proposed water line connection to hydrant is possible instead of saw cutting and tapping in the Prospect Street right-of-way.

G & H: Water line has been added to the roadway profile on Sheet 5 of 8. The hydrant has been added to the plan. We have contacted the Holliston Water Department regarding the actual water connection and they recommend a separate connection with a 3- 8" gate valves tee set up that reduces to 6" to tie into the existing 6" AC water main. The plan has been corrected.
CMG Comment #2: Comment Addressed

6. Proposed 6" underdrains should be shown connecting into each catch basin and inverts listed for each. Underdrains must also be shown on the roadway profile Sheet 5 of 8.

G & H: Proposed 6" underdrains is now shown connected to the catch basins. Invert elevations have been added on the roadway profile Sheet 4 of 8.
CMG Comment #2: Comment Addressed

7. Drainage easement bearings and distances along with the width of the easement between Lot 3 & 4 are not shown on the plans.

G & H: Drainage easement bearings distances and width have been added to the plans.
CMG Comment #2: Drainage easement should also be clearly labelled on Lot 4 and include area of easement on Lot 4. Easement line and bearings and distances are missing for the portion of the 20 ft. wide easement between Lot 3 and 4.
G & H #2: Plans have been corrected.

8. Drain pipe type, length, and slopes should also be labelled on the plan view.

G & H: Drain pipe type, length and slope information has been labeled on the plan view.
CMG Comment #2: Comment remains. Labels are shown on the profile only and should be added to the plan view & grading and utility plan.
G & H #2: Plans have been corrected.

9. Holliston Subdivision Regulations Section 5.3.3 require all drain pipes to be reinforced concrete pipe. Infiltration basin detail, on Sheet 8 of 8, references HDPE piping.

G & H: HDPE reference on Sheet 8 of 8 has been revised to (infiltration basin detail) reinforced concrete pipe.
CMG Comment #2: Comment Addressed

10. Drain Manhole and Catch Basin structure frames and grates should match those specified in Holliston Subdivision Regulations Section 5.3.4.

G & H: Note added to details regarding DMH and catch basin to meet Subdivision Regulations 5.3.4,
CMG Comment #2: Catch Basin frame and grate reference is still incorrect on Sheet 7 of 8.
G & H #2: Plans have been corrected.

11. Plans should reference the specific FIRM flood plain map for this location to verify the Site is not in a flood plain.

G & H: FIRM flood plain map information added to the Existing Conditions Plan.
CMG Comment #2: Comment Addressed

12. The drain pipe inverts shown in the "Street Drainage Calculations" located in Appendix 8 of the Stormwater Report do not match the design plans.

G & H: Drain pipe inverts have been corrected to be consistent.
CMG Comment #2: Comment Remains. Inverts and rim grades shown are inconsistent with design plans.
G & H #2: Plans have been corrected.

Stormwater Standard 1: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or water of the Commonwealth.

13. The first 100 ft. of proposed roadway will be untreated as shown on the design plans. The plan depicts two (2) stone aprons on either side of the roadway. This section of roadway must be collected and routed through the appropriate stormwater management practices. It appears there is adequate elevation difference across the Site to install catch basins at Sta. 0+0 and pipe to the proposed stormwater basin at the rear of the Site.

G & H: Catch basins and DMH has been added on the beginning of the proposed roadway that ties into the drainage piping that goes to the basin.

CMG Comment #2: Comment Addressed

14. Location of the proposed stormwater basin's 15" RCP outlet pipe may cause potential erosion issues to the abutting N/F Themeli property located northeast of the Site. Applicant's Engineer should provide additional information to verify the basin's outlet will not cause flooding or erosion on abutting property and/or relocate this discharge point in a manner to direct runoff towards the nearby wetlands.

G & H: Discharge from the basin goes onto a rip-rap apron that is sized to midigate the 100 Yr. peak flow. Calculations are in the Storm water report.

CMG Comment #2: Comment Remains. Stormwater basin outlet pipe discharge location should be moved further to the south to direct storm water closer to the off-site wetlands as discussed on the 9/15/21 Site walk with the Applicant's Engineer. A construction detail for the "outlet control structure" must be provided to clarify orifice openings, grate construction, and outlet pipe configuration.

G & H #2: Outlet pipe discharge location revised. Outlet control structure removed.

15. Rip-rap aprons are not shown for proposed flared end sections for basin inlet and outlet control structures as necessary to dissipate flow and deter scouring of vegetated slopes. Applicant's engineer should also provide design calculations for proposed riprap aprons to verify the apron size will be able to handle 100-year flow events.

G & H: Rip-rap aprons have been added to both the inlet and outlet points. Calculations are provided in the Storm Water report to show that the proposed apron size will handle a 100 year flood.

CMG Comment #2: A rip-rap apron is not shown for the 12" RCP pipe FES inlet to the forebay; sizing calculations should also be provided. Rip-rap apron locations and dimensions should be called out on the Grading and Drainage Plan Sheet 4 of 8.

G & H #2: Rip Rap added to plans and calculations provided.

Stormwater Standard 2: Stormwater management systems shall be designed so that post development peak discharge rates do not exceed pre-development peak discharge rates.

16. Applicant's engineer should show approximate limits of paved driveways for each lot and include these areas in the HydroCAD calculations to verify all proposed impervious areas will not cause post-development peak discharges to exceed pre-development conditions.

G & H: The initial Hydro CAD report included the paved driveway areas.

CMG Comment #2: Comment remains. Driveways are not shown on the "Post Development Conditions" drainage area plan Sheet 2 of 2 and do not match those shown on Subdivision Sheet 6 of 8, revise date 9/10/21. This information is needed to verify the impervious areas provided in the hydrology calculations.

G & H #2: Driveway added to Sheet 2 of 2.

17. HydroCAD calculations use a time of concentration (Tc) = 26.4 minutes based on woods and woodland for the combination of roadway and residential lots for Sub catchment P-4. CMG recommends a minimum Tc =5 min. be used for pavement surfaces and the roadway be broken out as a separate sub catchment.

G & H: Plans have been revised with new subcatchment for P-4 due to the new CB & DMH located at the beginning of the proposed roadway. New time of concentration rates is included in the revised Hydro CAD Report.

CMG Comment #2: Comment remains. Time of Concentrations are incorrect. Additionally, Lot 2 post development drainage area should be split between Subcatchment P-3 & P-4B and not included in roadway Subcatchment area P-4.

G & H #2: Time of Concentrations has been revised, per comment #3.

Stormwater Standard 3: Loss of annual recharge of groundwater shall be eliminated or minimized.

18. NRCS Soil mapping provided in Appendix 2 of the Stormwater Report identifies Site soils as Hydrologic Group C/D and D. The curve numbers used in the HydroCAD calculations all reference Type D soils. This conflicts with the Rawls Rate listed in the Stormwater Report for Sandy Loam, Hydrologic Soil Group B. CMG recommends additional supporting information be provided to justify the 1.02 in/hr. infiltration rate or consider in-situ permeability testing options.

G & H:, A majority of the site is located within the soil group which is 341B Fine Sandy Loam. There have been 8 witnessed percolation test done on the property with all but one having a percolation rate of less than 30 min/in. Understanding that BOH percolation tests results are not acceptable for stormwater design, we believe that this proves that the soils will allow the use of the Rawls rate for Sandy Loam.(1.02 In/hr.)for design purposes.

CMG Comment #2: CMG respectfully disagrees with G&H's response and believes a maximum Rawls Rate of 0.27 in/ hr "silt loam" may be used for stormwater design purposes based on the identified NRCS Hydrologic soil groups C/D and listed permeability (ksaf) range. CMG recommends the Applicant's Engineer provide a soil textural analysis for a subsurface soil sample from within the proposed basin area to verify the soil texture class assumption or perform in-situ permeability testing in accordance with accepted engineering practice.

G & H #2: The stormwater handbook (Volume 3, Chapter One) states that "When the lower soil horizons or layer are proposed for stormwater infiltration, the soils must be assigned to a hydrologic soil group by a competent soil professional". Six (6) test pits were excavated in the proposed basin area. They were evaluated by a MA approved Soil Evaluator and witnessed by the Holliston Board of Health Agent (Mr. Scott Moles). All six test pits were identified as Sandy Loam in the "C" Horizon. Based on this information, we designed using the Rawls Rate as 1.02 in/hr.

19. HydroCAD model lists an infiltration rate = 5.00 cfs for stormwater Basin SP which differs from the Rawls Rate listed in the report. The HydroCAD model should use the appropriate Rawls infiltration rate based on site soil conditions.

G & H: Hydro CAD infiltration rate has been adjusted to 1.02 in/hr. (Rawls Rate for Sandy Loam).

CMG Comment #2: Comment remains, See Comment 18.

G & H #2: See above response.

20. Required recharge volume calculation uses 0.25 in for Hydrologic Type C soils instead of 0.10 in. for Type D soils.

G & H: Required recharge volume calculation revised.

CMG Comment #2: Comment Addressed

21. Infiltration basin berm must have an impervious clay core specified on the detail sheet.

G & H: Impervious clay core for the berm has been added to the infiltration basin detail.

CMG Comment #2: Comment Addressed

22. Rip-rap stone sizes and materials should be specified for the forebay berm.

G & H: Rip-rap stone size and material now specified (6" Rip-Rap)

CMG Comment #2: Design plan shows a 6 in. high forebay berm with a 6" "slow drain" underdrain pipe. 6" rip-rap is too large and irregular in shape to be used to construct a uniform berm. CMG recommends 1.5 - 3" washed stone be considered for construction of the forebay berm and the 6" "slow drain" be eliminated and the detail revised.

G & H #2: Detail has been corrected.

23. 15" outlet pipe is not shown on the Infiltration Basin detail on Sheet 8 of 8. Pipe appears to only have 0.25 ft. of cover (Holliston Subdivision Regulation Section 5.3.3 requires 36" minimum cover). CMG recommends Applicant's Engineer consider a different outlet structure design. (Also see Comment 14.)

G & H: Plan revised so outlet pipe has sufficient cover.

CMG Comment #2: A construction detail for the "outlet control structure" must be provided to clarify orifice openings, grate construction, and outlet pipe configuration.

G & H #2: Outlet control structures removed.

24. Impervious areas for both proposed houses and proposed driveways should be accounted for to calculate the required recharge volume.

G & H: See #16 response above.

CMG Comment #2: Comment remains, See Comment #16.

G & H #2: HydroCad report revised to include both house and driveway impervious areas.

25. Portions of the proposed stormwater basin and associated sediment forebay do not meet the required 2' of vertical separation to estimated seasonal high groundwater (ESHGW). ESHGW in the vicinity of the proposed stormwater basin is identified at 30" below the ground surface in an area with sloping topography. Therefore the ESHGW elevation ranges between 243.5 241.5 within the limits of the proposed stormwater basin. ESHGW in the vicinity of the sediment forebay is between 242.5 ~ 245.5.

G & H: Basin elevations adjusted to provide a minimum of 2' separation between the bottom of the basin and ESHGW.

CMG Comment #2: Comment Addressed

26. CMG recommends preliminary sizing and location of the proposed septic leach fields for each lot be shown on the Site Plans to verify conformance with required Title V setbacks from the proposed stormwater management structures.

G & H: Plan revised to show preliminary sizing and location of septic absorption systems.

CMG Comment #2: Comment Addressed

27. A mounding analysis is not provided. The proposed stormwater infiltration basin bottom is within 4 ft. of estimated seasonal high groundwater.

G & H: Ground water mounding analysis provided in the stormwater report.

CMG Comment #2: Mounding analysis will need to be revised based on results of soil textural analysis.

G & H #2: Per comment #18, Ground water mounding is the same.

Stormwater Standard 4: Stormwater management systems shall be designed to remove 80% of the average annual post construction load of Total Suspended Solids (DSS).

28. Holliston Subdivision Regulations Section 5.3.1 required treatment for first 1 in. of rainfall. Stormwater Report calculations reference the State standard WQV = 0.5 in.

G & H: Stormwater report revised to use 1" for WQV calculations.

CMG Comment #2: Comment Addressed

29. The first 100 ft. of roadway is currently untreated. All roadway areas must be collected and treated in accordance with Standard 4 as the project is new development. (See Comment 13 above).

G & H: See Comment #13 above.

CMG Comment #2: Comment Addressed

30. Stage-storage volume table for the proposed stormwater basin should be included to verify the basin's proposed storage volume below the lowest outlet invert elevation.

G & H: Stowmwater stage storage table included in HydroCAD report.

CMG Comment #2: Comment Addressed

Stormwater Standard 5: Land uses with higher potential loads (LUHPPL), source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.

31. Not applicable — Site is not a LUHPPL.

G & H: No Comment

CMG Comment #2: Comment Addressed

Stormwater Standard 6: Stormwater discharges within a Zone II or Interim Wellhead Protection Area of public water supply, and stormwater discharges near or to any other critical area.

32. Not applicable — Site does not appear to discharge to a Zone II, Interim Wellhead Protection Area, or any other critical area.

G & H: No Comment
CMG Comment #2: Comment Addressed

Stormwater Standard 7: Redevelopment Projects

33. Not applicable — Site is considered "New" development

G & H: No Comment
CMG Comment #2: Comment Addressed

Stormwater Standard 8: Construction period erosion and sedimentation control

34. Proposed erosion control barrier should be extended along the entire rear property line of Lot 4 and along the Jewett & Hovsepian property lines and clearly labelled.

G & H: The Erosion Control barrier has been extended per report.
CMG Comment #2: CMG recommends erosion control barriers also be provided along the limit of clearing for proposed Lot 1 and Lot 2 to prevent sediment runoff towards Marked Tree Road residents based on 9/15/21 Site observations.
G & H #2: Erosion control barriers have been extended behind Lot 1 & 2.

35. Limits of tree clearing (or proposed tree line) should be shown on the Demolition Plan.

G & H: Limit of tree clearing shown on Layout Plan. It has been marked out in the field.
CMG Comment #2: Comment remains. Existing Conditions & Demolition Plan should also be stamped by a licensed State of Massachusetts Land Surveyor.
G & H #2: Plans stamped by a PLS.

36. The "Construction Phase Inspection Form", includes a Stormceptor as an inspection item. The site does not appear to utilize water quality units. Applicant's engineer should revise as needed.

G & H: Stormceptor reference removed from construction phase inspection form.
CMG Comment #2: Comment Addressed

37. Site is > 1 Acre therefore an EPA NPDES Construction General Permit (CGP) registration and SWPPP is required to be submitted prior to construction. CMG recommends the Planning Board make this a condition of approval.

G & H: Acknowledged.
CMG Comment #2: CMG recommends this as a Condition of Approval.

Stormwater Standard 9: Long term operation and maintenance (O&M) plan

38. The proposed stormwater basin is not included in the Long-Term O&M Plan as a Best Management Practice (BMP).

G & H: Stormwater basin added to long term O&M Plan as a best management practice.
CMG Comment #2: Comment Addressed

39. Applicant's Engineer should include the written maintenance requirements for the stormwater basin, forebay, and riprap aprons in the O&M Plan.

G & H: The maintenance requirements for the stormwater basin, forebay, and rep-rap aprons added to the O & M Plan.
CMG Comment #2: Comment Addressed

40. The Long-Term O&M Plan states the site is to be serviced by municipal sewer, which does not appear to be correct.

G & H: Site to have on-site septic system and the Long Term O&M Plan has been corrected.

CMG Comment #2: Comment Addressed

41. Long Term O&M Plan does not include a description of public safety features or estimated operation and maintenance budget.

G & H: Estimate operation and maintenance budget included in Long Term O&M Plan.

CMG Comment #2: Comment Addressed

42. Operation and Maintenance Log form is not provided in the O&M plan. CMG recommends a corresponding Stormwater BMP figure also be included depicting the locations of all on-site stormwater piping and structures.

G & H: O & M log form added to the O & M Plan.

Comment Addressed

43. As the Responsible party will not be the final Owner of the parcel (Lot 3) where the Stormwater Basin BMP is located, a copy of the DRAFT — "plan and easement deed" that allows site access for the legal entity to operate and maintain BMP functions must be provided.

G & H: This is typically done at the end of the project with Road Acceptance. We request that this be made a condition of approval.

CMG Comment #2: CMG recommends this as a Condition of Approval

Stormwater Standard 10: All illicit discharges to the stormwater management system are prohibited.

44. A signed illicit discharge statement is not provided. CMG recommends the statement be included in the Site's Long-Term O & M Plan.

G & H: A signed illicit discharge statement is now provided.

CMG Comment #2: Comment Addressed

If you have any questions, please do not hesitate to contact me.

Sincerely,

Robert J. Duff, PE
Senior Project Manager

Enclosures

CC: CMG, David Faust
John Hovsepian