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August 29, 2022

Andover Planning Board
C/o Jacki Byerley, Planner
36 Bartlet Street
Andover, MA 01810

RE: **Stormwater Peer Review Response**
William Wood Way Subdivision (fka Hidden Pines)
22 William Street
Map 52 Lot 106

Applicant: **Steven Leed**
22 William Street
Andover, MA 01810

Dear Ms. Byerley and Board Members:

We are in receipt of review comments from Horsley Witten Group via a letter to the Board c/o of Jacki Byerley, dated June 21, 2022. We have reproduced their comments in *italics* and our response noted below in **bold**.

1. Standard 1 states that no new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.
a. *The Applicant has proposed to utilize the existing outlet in the retaining wall located along the south property boundary. The existing 15-inch corrugated metal pipe (CMP) most likely feeds the wetland flagged to the south of the property. The existing and the proposed 15-inch outlet pipe discharge to the southern BVW with no rip rap apron. HW recommends that the Applicant determine whether erosion within this wetland is likely with the proposed stormwater design. HW notes that the stormwater to this existing stormwater conveyance will be treated prior to discharging.*
Response: The outlet flow velocity for the 15" CMP (n=0.022, s=0.0083 and the calculated 10-year outflow = 0.6cfs) has an exit velocity of 2.3 ft/sec, maximum and shear stress = 0.173 lbs/sf. Both of these are considered low and not erosive. The outlet is not on the property, and currently does not appear to be eroding after decades of flow from the existing pipe.

b. The proposed grading and stormwater management do not include any pipe discharges towards the wetlands off the west property boundary. Under existing and proposed conditions there is an area of vegetation that flows towards the west. This area has been reduced from pre-development conditions by approximately 10,000 square feet (sf). No further action required.
Response: Noted. For clarification, the revised reduction of tributary area to the western boundary is approximately 13,530 square feet.

2. Standard 2 requires that post-development runoff does not exceed pre-development runoff off-site.
a. *The Applicant has included two drainage areas (EX1 & EX2) under existing conditions. It appears that the watershed boundary between the two areas should extend to a high point noted with a 78-foot contour and a 30-inch tree. HW recommends that the Applicant redraw the border between EX1 and EX2 to pass through this high point or clarify the delineated area. HW also notes that the existing house at 24 William Street is completely within the catchment area noted as EX2. HW suggests that the Applicant clarify how this was determined.*
Response: The watershed boundary noted above has been revised as recommend. Additional topographic survey was conducted at the site including the property at 24 William Street and the catchment areas within the HydroCAD model were adjusted to suit.

b. The Applicant has divided the project site into three (3) proposed sub-catchments (DEV1, DEV2, DEV3). As noted above the catchment divide around the existing house at 24 William Street should be clarified.

Response: Additional topographic survey was conducted at the 24 William Street lot and the catchment areas adjusted to suit as noted above.

c. The peak discharge rate at the southern property boundary increases by 0.2 cubic feet per second (cfs) during the 2-year 24-hour storm event. Per the Andover Stormwater Regulations, the post-development peak discharge rate shall be equal to or less than the pre-development peak discharge rate. HW understands that the increased flow is attributed to DEV3 which consists primarily of vegetation that sheet flows towards the southern property boundary. HW recommends that the Applicant consider measures to eliminate the minimal increased flow.
Response: The revised project, with changes to the tributary watersheds based upon additional topography survey, results in no increase in peak rates to the southern property boundary. The HydroCAD model and Stormwater Report have both been revised to reflect this change.

d. The Applicant has used a curve number (CN) of 39 with a description of >75% grass cover area for EX1 and EX2. During the site visit conducted on May 25, 2022, HW observed several large pine trees throughout the property. HW recommends that the Applicant revise the existing curve number value considering the site partially wooded.
Response: The wooded areas are underlain by maintained grass and the overstore is primarily evergreens which do not shed much leafy detritus, so the model of grass was retained. The Tc calculation was modified to a dense grass (this was previously modeled as short grass) cover for the sheet flow component where applicable.

e. The Applicant has utilized a woods/grass combination within DEV1 and DEV3, HW recommends that the Applicant clarify the extent of the wooded area under proposed conditions.
Response: The woods/grass combination was used to model the areas to be allowed to re-naturalize (hatched areas on plans) with additional pollinator seeding. These areas include the drainage easement on lots 3 and 4 and Parcel A.

f. The Applicant has used a time of concentration (Tc) value of 4.5 minutes for DEV1.
Standard engineering practice is to use a minimum Tc value of 6 minutes. The 4.5 value may be considered conservative.
Response: The value for Tc was changed to 6 minutes when calculated Tc was less than 6.

g. HW recommends that the Applicant confirm that the underground stormwater chamber systems can be installed as proposed. HW recommends that the Applicant consider placing the chambers on 6 inches of crushed stone.
Response: The underground system can be installed by a contractor with experience installing similar underground systems and using typical equipment and methods for constructing below grade facilities. The underground system is required to comply with the Andover Stormwater Regulations, but avoids an unsightly surface basin, in a heavily developed area. Additionally, a subsurface system eliminates, or will minimize, safety and vector concerns associated with an open basin.

h. HW recommends that the Applicant include a detail illustrating the installation of the 4- foot diameter manholes to be installed beneath the chambers, including a means to inspect the manholes from above the chambers.
Response: A detail of the siphon manhole cover was added to the plans, see sheet 5 of 8.

i. HW recommends that the Applicant provide a detail for the proposed drainage swale. Furthermore, documentation will be necessary to alert the new homeowners that the swale must be maintained and cannot be altered in the future.
Response: A detail cross section of the proposed swale is depicted on sheet 4 of 8, as recommended. The homeowners associated, which will be required as part of any approval, will outline the requirements to maintain the swale and also restrictions regarding altering the swale.

j. As required per Section IX.E.6 of the Andover Stormwater Regulations the Applicant has utilized the current precipitation data provided in NOAA Atlas 14. No further action required.
Response: No response needed.

3. Standard 3 requires that the annual recharge from post-development shall approximate annual recharge from pre-development conditions.

A. Test Pit 2 (TP-2) data indicates fill to 6 feet below the surface. HW recommends that the Applicant conduct an additional test pit within the footprint of the proposed chamber system to demonstrate adequate separation to the estimated seasonal high groundwater (ESHGW) per MSH Volume 2 Chapter 2 Page 88 as well as the depth to natural material.
Response: Due to the highly developed nature of the property testing locations were limited. Test pit 1 was successfully completed and representative of undisturbed soils in the area. Test pit 2 was conducted in another area of the system, on the other side of the utility easement, however during the excavation for the test pit, the contractor hit a buried water line that serviced the carriage house in the rear of the lot. The area was in fill because this water line had previously been installed there when the carriage house was built (±20 years ago). The Web Soil Survey indicates that the entire lot and abutting properties is within a Hinckley loamy sand deposit in an area where the topography is relatively flat so additional testing is not needed, in our opinion.

b. HW recommends that the Applicant note that all fill below the chambers will be removed and replaced with clean material with an infiltration rate of at least 2.41 inches per hour.
Response: Note 8 was added to the detail depicted on sheet 7 of 8.

c. It appears that the Applicant has provided adequate recharge by using the subsurface infiltration systems to capture runoff from the post-developed area, specifically DEV2.
Response: No response needed.

4. Standard 4 requires that the stormwater system be designed to remove 80% Total Suspended Solids (TSS) and to treat 1.0-inch of volume from the impervious area for water quality.
a. The Applicant has proposed catch basins, a Stormceptor (STC 900), and subsurface infiltration structures to provide TSS removal. HW recommends that the Applicant provide documentation for the TSS removal rate used for the STC 900.
Response: The MADEP Standard "Method to Convert Wqv to Discharge Rate for Sizing Flow" was used to determine the Wqv flow rate. The STC 900 unit water quality flow rate, per manufacturer is 0.64 cfs; and according to New Jersey TARP, the unit achieves 75% TSS removal at the Wqv, but was approved for 50% which was used in the TSS removal calculation.

b. HW recommends that the Applicant provide supporting calculations for the 60% total phosphorus removal per the Andover Stormwater Regulations.
Response: The removal rate was determined from a study "Stormwater Best Management Practices (BMP) Performance Analysis" document, dated March 2010, and prepared for EPA-Region 1. According to this study, a subsurface infiltration structure removes 98% of TP.

5. Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).
A residential site is not considered a LUHPPL, therefore Standard 5 is not applicable.
Response: No response needed.

6. Standard 6 is related to projects with stormwater discharging into a critical area, a Zone II or an Interim Wellhead Protection Area of a public water supply.

The site is not within a critical area, therefore Standard 6 is not applicable.
Response: No response needed.

7. Standard 7 is related to projects considered Redevelopment.

While parts of this property have been previously developed, this proposed project will increase impervious area and is not considered redevelopment. Therefore, Standard 7 does not apply.
Response: No response needed.

8. Standard 8 requires a plan to control construction related impacts including erosion, sedimentation or other pollutant sources.

a. The Applicant has included "Recommended Construction Period Pollution Prevention and Control" in the Stormwater Report and details for various erosion control measures on Sheet 7 of the plan set. It appears that the erosion control measures shown in the plans are proposed hay bales on Sheets 4, 5, & 6 placed along the west and south property boundaries. HW recommends that the Applicant provide an additional sheet for the Erosion and Sediment Control Plan in the plan set to clearly delineate all proposed erosion control practices.
Response: An additional sheet has been prepared to depict erosion and sediment control.

b. Projects that disturb one acre of land or more are required to obtain coverage under the NPDES Construction General Permit (CGP) issued by EPA and prepare a Stormwater Pollution Prevention Plan (SWPPP). HW recommends that a copy of the SWPPP be provided to the Town a minimum of 14 days prior to land disturbance.
Response: Noted, the site contractor will need to apply for coverage and develop a SWPPP. A copy of the SWPPP will be provided to the Town by the contractor responsible for its preparation as required.

c. HW recommends that the Applicant clarify how the wetland to the west of the tennis courts will be protected. HW recommends that the Applicant provide a more robust erosion control barrier along the western property boundary.
Response: A "double barrier" erosion and sedimentation control is proposed consisting of staked haybales and staked silt fence for this area. Notes to this effect were added to sheet 8 of 8 including a detail of the "double barrier".

d. HW recommends that the Applicant include temporary inlet protection for existing and proposed catch basins within the project site as well as within 100 feet of the construction entrance.
Response: Haybale barriers around the proposed catch basins are depicted, along with a detail, on sheet 8 of 8.

e. The Applicant has provided a stabilized construction entrance detail with a minimum length of 30 feet which is acceptable for a small residential development. HW recommends that the Applicant clarify where the construction entrance will be installed.
Response: The proposed location is depicted on sheet 8 of 8.

f. HW recommends that the Applicant clarify where the staked haybales demarcated on the plans will be supplemented with siltation fence.
Response: Notations on sheet 8 of 8 have been added to address this comment.

g. The Applicant includes a detail for a temporary sediment trap. HW recommends that the Applicant show where on the site this practice may be placed.
Response: This detail may or may not be required depending upon conditions at the site during construction. This detail is to be used by the Contractor, as needed. The necessary locations will be determined by the Contractor. Depicting them now would be speculative and, more likely than not, in locations not necessarily where the contractor will need them.

h. HW recommends that the Applicant include proposed stockpile locations with appropriate erosion controls on the site plan.
Response: Potential soil stockpile locations have been added to the plan, sheet 8 of 8, but may not coincide with that used by the Contractor. For roadway construction, there is ample area on any one of the lots to accommodate a stockpile(s). The exact locations of stockpiles will be determined by the Contractor when necessary, and documents within the onsite SWPPP document required for the NPDES CGP. .

9. Standard 9 requires a Long-Term Operation and Maintenance (O & M) Plan be provided.
a. The Applicant has provided a Long-Term O&M Plan in the Stormwater Report as required. HW recommends that the document become a standalone document to be provided to and signed by the property owners prior to occupancy.
Response: The long-term O&M portion has been extracted from the report to serve as a standalone document, as recommended.

b. HW recommends that the Applicant include maintenance tasks for the grassed swale.
Response: Routine maintenance will consist of mowing the swale, removal of trash, leaves and debris and added to tasks.

c. HW recommends that the Applicant include a schedule for implementing routine and non-routine maintenance tasks to be undertaken after construction is complete.
Response: The long-term maintenance document includes a delineated maintenance schedule as recommended.

d. HW recommends that the Applicant provide a simple plan that is drawn to scale and shows the location of all stormwater practices requiring inspections.
Response: A sketch has been added to the maintenance document, as recommended.

10. Standard 10 requires an Illicit Discharge Compliance Statement to be provided.
HW recommends that a signed Illicit Discharge Compliance Statement be provided to the Town prior to the discharge of any stormwater to post-construction best management practices.
Response: Noted. A signed Illicit Discharge Compliance Statement will be provided to the Town by the Owner prior to the discharge of any stormwater to post construction best management practice. There are no known existing illicit discharges at the property and none are proposed.

11. Additional Comments.
a. HW recommends that the Applicant clarify which walls along the property line are to remain. Specifically, the extent of the wall adjacent to the pool house.
Response: The walls at the southern end of the property, adjacent to the pool house, will remain in place. An internal wall, east of the tennis court, on lots 3 & 4, will be removed.

b. HW recommends that the Applicant revisit the connect of the proposed contour for elevation 74 near the eastern property line.
Response: An additional contour line, elevation 74, was added here.

12. Concerns raised by abutters in 11-page document:
1) Location of wetlands: Ann Marton from LEC and Janet Bernardo form HW conducted a joint site visit on May 25, 2022. Ann Marton has provided a memorandum dated June 21, 2022 discussing her findings of the wetland delineation.
Response: The wetland delineation was reviewed, as noted, and deemed accurate for this filing.

2) Water line easement:
a) The existing property at 24 William Street includes a 20-foot-wide utility easement that the Applicant is using to loop the proposed water line. There are several large pine trees within this easement that may be impacted by the six-foot-deep trench needed to install a water line. HW recommends that the Applicant revisit the proposed location of the water service and discuss alternative locations with the Andover Water Department or document what will happen to these trees.
Response: Looping the water main is a requirement within the Town's Subdivision Regulations. An alternative location for a looped water main, within the proposed Right of Way, is shown on the revised plans. Existing trees within the limit of the proposed work will be saved, if possible, or removed as needed due to large differences in grade or close proximity to dwellings. The revised location of the water loop will require final approval by the Water Department, Engineering, among other Town Departments.

b) Existing trees and vegetation: As noted above, HW recommends that the Applicant revisit the curve number and description of the surface conditions under pre-development and post-development conditions.
Response: The wooded areas are underlain by maintained grass and the overstore is primarily evergreens which do not shed much leafy detritus, so the model of grass was retained. The Tc calculation was modified to a dense (short previously) grass cover to for the sheet flow component where applicable.

c) HW believes that the proposed water line within the utility easement is proposed to loop the water line that is proposed within the roadway. Waterlines are frequently looped as a requirement of the water department to provide adequate water pressure throughout the main. HW recommends that the Applicant review the need for the water line within the easement with the water department.
Response: As noted above, an alternative water line loop location has been shown on the revised plans for review and approval by required Town Departments and Boards.

3) Watershed flowing towards the west:
a) The Applicant has proposed installation of an erosion control barrier along the western property boundary. HW recommends that a more robust barrier be installed, such as a siltation fence and a strawbale combination. The Applicant has proposed a vegetated swale in the vicinity of the existing tennis court. This swale will capture and direct the stormwater runoff from Lot 3 and Lot 4 towards catch basin CB-5 and the subsurface infiltration chamber system. In accordance with the Massachusetts Stormwater Standards the Applicant is required to document that post-development runoff does not exceed pre-development runoff off-site. HW has reviewed the Applicant's stormwater report and provided comments above under Standard 2.
Response: A staked haybale and silt fence combination is proposed along the west side of the property, as recommended, and is depicted on Sheet 8 of 8.

b) Nature Belt: The LEC memorandum dated June 21, 2022 includes recommendations regarding the proposed vegetation to be planted within the area to be naturalized.
Response: LEC recommendation regarding extent and type of vegetation to be planted has been incorporated in the revision, see notes on revised sheet 4 of 8.

4) Site Conditions: There is a concern that the existing site within 50 feet of the abutting property to the west has not been depicted properly. The Applicant is not increasing runoff to the west and the grades within 10 feet of the property line do not appear to be altered. The existing tennis court that is proposed to be removed is located approximately 10 feet from the west property boundary. HW recommends that the Applicant describe the construction measures to remove the tennis court without altering the adjacent grades.
Response: A "double barrier" staked haybale and staked silt fence combination, see sheet 8 of 8, is proposed in the vicinity of the tennis court. The tennis court will be removed from the east side of the court and sediment barrier. The area will be regraded to restore existing grade of the tennis court surface (elevation 73±) prior to final grading of proposed swale in the same area.

5) Recent activities: HW notes that any tennis court surface would have been considered to have a curve number of 98 which is considered impermeable like a roadway or roof top. Under Standard 2 above, HW recommended that the Applicant adjust the curve numbers used for the existing surface condition listed as grass in the HydroCAD model.
Response: The tennis court was modeled as impervious. The "wooded areas" of the property are underlain by maintained grass and the overstore is primarily evergreens which do not shed much leafy detritus, so the model of grass was retained. The Tc calculation was modified to a dense (short previously) grass cover to for the sheet flow component where applicable.

6) Erosion and Stormwater Runoff: HW has provided comments above regarding the Applicant's stormwater design and suggested improvements to the erosion control measures to comply with the Andover Stormwater Regulations as well as the Massachusetts Stormwater Standards.
Response: Noted, see related comments and responses above.

7) Existing structures within 50 feet:
a) The abutter at 28 William Street would like to see its house located on the plan set. HW suggests that the house at 28 William be shown in a similar manner on the plan set as the houses on the east side of the project site.
Response: The house has been added as scaled from the Town GIS web site.

b) Trees within existing utility easement. During the site visit, HW observed several trees within the utility easement. If a water line is required by the Andover Water Department HW recommends that the Applicant document what will happen to these trees.
Response: Any trees within the limit of the proposed work will be saved, if possible, or removed as needed due to differences in proposed and existing grades or close proximity to dwellings.

8) Buffer Zone and House Layout: In Massachusetts a building is allowed to be constructed within the buffer zone of a wetland resource area by obtaining an Order of Conditions from the local Conservation Commission. The Andover Conservation Commission prohibits buildings to be constructed within 50 feet of a bordering vegetated wetland.
Response: A Notice of Intent has been file with the Andover Conservation Commission for the roadway and appurtenant drainage infrastructure. Work on lots will require separate, individual Notice of Intent filings.

9) Soil Erosion and Sedimentation Control Plan: HW has made recommendations under Standard 9 above regarding the proposed erosion controls.
Response: Noted, see related comments and responses above.

10) Locus: HW has reviewed the areas utilized in the stormwater calculations. The total site area modeled is contained to the subject property. The area highlighted on the locus map does not appear to directly impact the HydroCAD model.
Response: No response needed.

11) Utilizing easement as driveway: The plan indicates a 20-foot utility easement. It is HW's understand that a utility easement cannot be used as a vehicle easement without prior approval by the Planning Board. Any changes from the proposed subdivision plans would require the Applicant to return to the Planning Board.
Response: The water main has been re-looped to fall within the Right of Way of the proposed street. Further, a note was added to the existing easement along the westerly side of the property at 24 William Street, per abutter to the west request, that the easement shall not be used as access to lots 3 and 4. See sheets 4 and 5 of 8, for note stating that the existing easement shall not to be used for access.

12) Stormwater: HW has conducted a peer review of the stormwater management design as described above.
Response: No response needed.

If you have any questions concerning this revision, or require anything further, please feel free to contact me at your convenience.

Sincerely,

Andover Consultants Inc.

Dennis A. Griecci, P.E., LEED AP
Enclosures