Horsley Witten Group
Sustainable Environmental Solutions
112 Water Street • 6th Floor • Boston, MA 02109
857-263-8193 • horsleywitten.com

July 10, 2025

Ms. Jacki Byerley, Planner
Andover Planning Board
Town Office
36 Bartlett Street
Andover, MA 01810

Re: Third Peer Review of the Stormwater Design
Ministers Estates Subdivision
39 Sunset Rock Road, Andover, MA

Dear Ms. Byerley and Members of the Board:

The Horsley Witten Group, Inc. (HW) is pleased to provide the Andover Planning Board with this letter summarizing our third peer review of the stormwater management for the proposed Ministers Estates definitive subdivision located at 39 Sunset Rock Road in Andover, Massachusetts. We understand that Ministers Lane LLC (Applicant) has applied for the Approval of Definitive Plan for a five-lot subdivision on a 4.90-acre parcel. The Applicant is proposing to construct a 480-foot-long cul-de-sac, with sewer, water, and stormwater management to access the five proposed house lots. The stormwater management includes deep sump catch basins, a grassed swale, and a detention basin with a forebay. The roof runoff from the individual houses will be managed by subsurface infiltration chambers. No wetlands are indicated on the Existing Conditions Plan.

HW conducted a site visit with the Planning Board on June 3, 2025.

The following additional documents and plans were received by HW in response to our June 20, 2025 second review letter:

- Letter to Andover Planning Board, regarding the Response to 2nd Peer Review of the Stormwater Design, Ministers Estates, prepared by DK Engineering LLC, dated July 7, 2025 (4 pages);
- Project Report on Drainage & Sedimentation Control & Stormwater Report, Ministers Estates, prepared by DK Engineering LLC, dated April 14, 2025, revised July 7, 2025 (183 pages);
- Operation & Maintenance Plan, Ministers Estates, Sunset Rock Road, Andover, MA (5 pages); and
- Definitive Subdivision Plan - Ministers Estates, prepared by DK Engineering LLC, dated April 14, 2025, revised through June 25, 2025 (9 pages) which includes:
    - Title Sheet 1 of 9
    - Definitive Subdivision Plan 2 of 9
    - Existing Conditions Plan 3 of 9

- o Grading Plan 4 of 9
- o Erosion Control Plan 5 of 9
- o Plan & Profile Sheet 6 of 9
- o Drainage Detail Sheet 7 of 9
- o Detail Sheet – Miscellaneous 8 of 9
- o Landscape Plan 9 of 9

Stormwater Review

HW has reviewed the documents listed above and has the following comments concerning the stormwater management design in accordance with the Massachusetts Stormwater Handbook (MSH) dated February 2008, and the Town of Andover Stormwater Management and Erosion Control Regulations amended May 11, 2021 (Stormwater Regulations).

In accordance with Section VI. B. of the Andover Stormwater Regulations the Stormwater Management Permit and Narrative provided by the Applicant shall contain sufficient information to verify compliance with the local Stormwater Bylaw and the MassDEP Stormwater Management Handbook (MSH). Below are comments relating to the standards as presented in the MSH. Where the more stringent requirements of the Andover Stormwater Regulations are applicable, those comments are included.

The following comments correlate to our second review letter dated June 20, 2025. Follow up comments are provided in **bold underlined font** where applicable.

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

   a. The Applicant has analyzed the pre- and post-development stormwater runoff for the site. Under existing conditions, the site sheet flows to five different study points along the edges of the property. Under proposed conditions, the roof tops, driveways, and roadways will increase the area of impervious cover. Runoff from most of the proposed impervious cover is directed to either subsurface infiltration systems or to grassed swales that lead to an infiltration trench onsite or to an extended detention basin located on the west side of the development. The outfall from the detention basin will be discharged via an outlet control structure through a level spreader and offsite. HW recommends that the Applicant provides the sizing calculations for the level spreader to confirm that no erosion will occur at the outfall.

      June 20, 2025: The Applicant has removed the level spreader from the outlet control structure for the infiltration basin and replaced it with a rip-rap outfall for the flared end section. The proposed discharge is less than 1 cubic foot per second (cfs) for all storm events modeled, therefore erosion should not be an issue. HW recommends that the Applicant includes the flared end section on the Infiltration Basin Overflow Outlet Detail provided on Sheet 7.

      July 10, 2025: The Applicant has added the flared end section as suggested to the detail on Sheet 7. No further action is requested.

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

   a. HW has reviewed the Pre-Development and Post-Development Drainage Maps and the HydroCAD model. The total area for pre-development does not match the post-development area. HW recommends that the Applicant revisit the subcatchment areas and revise as necessary. Furthermore, HW notes that separating the pre-development and post-development HydroCAD models simplifies the review.

June 20, 2025: **The Applicant has resubmitted the Pre-Development and Post-Development Drainage Maps and HydroCAD model. The Pre-Development Area now matches the Post-Development Area. No further action is requested.**

b. The Applicant has provided NOAA Atlas 14 rainfall data. HW concurs with the precipitation rates utilized in the HydroCAD model.

June 20, 2025: HW has no further comment.

c. The Applicant has provided a Post-Development Drainage Map. It appears a portion of subcatchment area "E" cuts through a proposed grassed swale that routes to subcatchment area "A-1". HW recommends that the Applicant revisit the catchment area divide and confirm it reflects the proposed topography.

June 20, 2025: The Applicant has updated the Post-Development Drainage Area Map to reflect the proposed topography. No further action is requested.

d. The Applicant has provided summary tables for each study point and design storm. Some of the values listed are not consistent with the HydroCAD output provided in the Project Report. HW recommends that the Applicant review the HydroCAD models and revise the summary tables as needed. Furthermore, HW recommends that the Applicant provide the pre- and post-development peak runoff volumes to confirm that the Applicant is controlling the volume per the Stormwater Regulations.

June 20, 2025: The Applicant has updated the HydroCAD model and the summary tables as suggested. No further action is requested.

e. The Applicant has provided exfiltration rates for the various infiltration systems in the Post-Development HydroCAD. HW recommends that the Applicant use the Rawls Rates as provided in Volume 3, Chapter 1, page 1 of the MSH for the respective hydrologic soil groups or justify the values listed with on-site permeability testing.

June 20, 2025: The Applicant has updated the HydroCAD model with the corresponding Rawls Rates. The soil test pits conducted throughout the property indicate loamy sand and gravel which corresponds to a Rawls Rate of 2.41 iph. No further action is requested.

f. The Applicant has provided a Post-Development HydroCAD model. There are multiple nodes regarding infiltration trenches. (Nodes 24, 34, 44) It is unclear where these trenches are on the plans. HW recommends that the Applicant clearly label these stormwater practices on the Grading & Erosion Control Plan. HW further recommends that the Applicant consider providing a separate plan for the stormwater management and utilities layout.

June 20, 2025: The Applicant has labeled the infiltration trenches on the Grading and Drainage plan. It is unclear how these trenches are connected or receive stormwater. HW recommends that the Applicant clarify the design intent and use in the stormwater narrative and on the grading plans. Furthermore, HW recommends that the Applicant review the setback requirements from slopes as listed in Volume 2, Chapter 2, page 97 of the MSH and confirm the placement of the trenches complies with the requirements.

July 10, 2025: The Applicant has proposed area drains to capture runoff upgradient of the infiltration trenches and has added 6-inch outlets that are

directed towards the southern property line. The HydroCAD model and the plan set are not consistent. For example, the HydroCAD indicates that the top of Infiltration Trench #1 is set at elevation 210.8 elevation, with primary 6-inch outlets at elevation 208.75, and the secondary 10-inch outlets at elevation 210.0. Sheet 4 indicates that the southern edge of the trench (top of level spreader) is set at elevation 210, with 6-inch outlets at elevation 208.50 and 10-inch outlets at elevation 208.00. As drawn, it is not obvious where the 6-inch outlets will be installed. It is HW's opinion that the 6-inch outlets should be set at the top of the infiltration trenches as overflow devices. However, it is not clear if that is the intention of the proposed design.

The Applicant has included a level spreader on the southern side of Infiltration Trench #1. HW recommends that the Applicant includes a detail that clearly illustrates the material and dimensions proposed for the level spreader to confirm it will be constructed and remain level at elevation 208.0 as designed.

g. The Applicant has proposed a Stormwater Pond (node 23) in the Post-Development HydroCAD model. It is unclear where this is on the plan. There is a proposed depression area on the southeast corner of the lot, but it does not match in size or elevation. Furthermore, there is no information regarding the overflow spillway or structure information on the plans. HW recommends that the Applicant review the design and revise the HydroCAD model as needed.

June 20, 2025: The Applicant has provided an updated HydroCAD model. The Grading Plan indicates that Reach 23 flows towards a circular structure at the southeast corner of the lot surrounded by stone. This structure appears to discharge into Infiltration Trench 1. However, it is not labeled, the pipes and inverts are not listed, and the structure is not included in the HydroCAD model. During a 25-year storm event, the ditch (B23) flows at 6.6 cfs (having a maximum velocity of 4.51 fps). This is a high rate of flow that may cause erosion. The slope of the ditch is modeled in HydroCAD at 4.0% with a surface of dense weeds. The plans appear to have a steeper slope. HW recommends that the Applicant adjust the HydroCAD model to reflect the slope on the plans, changing the manning coefficient to 'clean and straight' for this ditch and all other swales, and adding a pond node for the circular structure prior to Infiltration Trench 1 (B24) to confirm that the stormwater from the ditch is fully captured and not flowing off property.

July 10, 2025: The Applicant has adjusted the slope of Reach 23 to have a 1% slope and has modeled it accurately in HydroCAD. The reduced slope has reduced the velocity. The circular structure is a Nyloplast basin surrounded by stone. HW recommends that the Applicant add the rim of the dome grate to the plan set. Furthermore, HW recommends that the Applicant include a detail of the structure with the depth and size of stone proposed.

h. The Applicant has proposed a Stormwater Basin (node 14) in the Post-Development HydroCAD model. The elevation of the bottom of the basin is not listed on the plan and the size of the basin and the outlets in the HydroCAD model do not match the information provided on the plans. HW recommends that the Applicant review the design and revise the HydroCAD model or the plans for consistency.

June 20, 2025: The Applicant has listed the Infiltration Basin elevations on the Drainage Detail Sheet. HW suggests that the Applicant includes the peak elevations of the various storm events modeled. HW further recommends that the

Applicant label the inverts and pipe sizes on the Grading Plan (Sheet 4).

July 10, 2025: The Applicant has included the elevations of the storm events as suggested and has labeled the inverts and pipe sizes on the Grading Plan. No further action is requested.

i. The Applicant has proposed a Stormwater Basin (node 14) in the Post-Development HydroCAD model with an outlet control structure. HW recommends that the Applicant add a primary routing out of the structure that represents the outlet pipe and include devices #2 and #3 (the orifices) as shown on the outlet control structure detail.

June 20, 2025: The Applicant has updated the HydroCAD model to reflect the routing on the plans. No further action is requested.

j. It appears that the Applicant is proposing an infiltration basin and trench on the south side of the lot. However, there are no dimensions or details for either of these practices on the plans. HW recommends that the Applicant clarify the design of these proposed stormwater practices and provide details for each.

June 20, 2025: **The Applicant has included three infiltration trenches along the south side of the parcel. Some design information has been provided under the Infiltration System Typical Detail on the Drainage Detail Sheet. It is unclear how Infiltration Trench #2 or #3 is connected to Trench #1. As noted above, there is a circular structure at the end of a grassed swale along Sunset Rock Road that appears to be piped to Infiltration Trench #1 that is not labeled. HW recommends clarifying this on the plans. HW further recommends labeling all drainage structures and inverts on the Grading Plan for continuity. The outlet devices included in the HydroCAD model are not shown on the design plans.**

July 10, 2025: The Applicant has added the pipe information as requested and has clarified the connection between the various stormwater practices. No further action is requested.

k. The Applicant has provided a standard roof infiltration system detailed on the plans and in the Post-Development HydroCAD model. However, the dimensions of the systems in the HydroCAD model do not match the plans. Furthermore, it appears that the routing of the buildings in the HydroCAD model to the infiltration systems does not match the plans. HW recommends that the Applicant review the design and revise as needed.

June 20, 2025: The Applicant has updated the HydroCAD model to match the plans. HW notes that the information for Building #2 and Building #4 is not consistent between Sheet 7 and the HydroCAD model. HW recommends that the Applicant review the Table provided on Sheet 7. It also appears that some of the downspout's routing and invert elevations of the pipes may be exposed based on the surrounding grades. HW recommends that the Applicant confirm there is adequate cover over the drainage pipes leading to the infiltration systems specifically for Lots 1 and 2 and adjust the grading if necessary.

July 10, 2025: It appears that the information provided on Sheet 7 for Building #2 does not match the HydroCAD model. The top elevation should be 223.9 and the finish grade should be higher than 224.2. HW recommends that the Applicant adjust the table on Sheet 7 as applicable.

HW further notes that the garage elevations (GF) on several of the houses does not appear accurate. For example, on Lot 5 the GF is listed as 221.8, the Basement

Floor Elevation (BFE) is 224.8 and the elevation 224 contour crosses the driveway in front of the garage. HW recommends that the Applicant review the GF elevations listed and revise as necessary.

HW also recommends that the Applicant include all proposed contours including those that may be similar to the existing grades within the limit of disturbance. For example, between Lot 4 and Lot 5, HW recommends that the Applicant include the 226, 228, and 230 proposed contours. It is not clear if these grades are proposed to cross the Lot 4 driveway.

l. The Applicant has detailed the plans for a grassed channel. The detail calls for 1:1 side slope within the grass channel. HW recommends using a 3:1 side slope to reduce erosion along the side slopes of the channel.

   June 20, 2025: The Applicant has revised the detail to show a 2:1 slope. No further action is requested.

m. The Applicant has provided a detail shown on the plans for a grassed channel. This channel is also listed in the Post-Development HydroCAD model. The dimensions of the channel in HydroCAD do not appear to match the plans. Furthermore, the coefficient used for the bottom of the channel is listed as cobblestones. There does not appear to be any indication of cobblestones within the channel on the plans. HW recommends that the Applicant review and revise the HydroCAD model to reflect the detail shown on the plans.

   June 20, 2025: The Applicant has updated the HydroCAD model. HW recommends that the Applicant adjust the HydroCAD model to reflect clean and straight channel bed instead of 'dense weeds.' See comment 2g.

   July 10, 2025: The Applicant has revised the HydroCAD model as suggested. No further action is requested.

n. The Applicant has provided a detail shown on the plans for a grassed channel in the Post-Development HydroCAD model. The elevation of the flared end section (HW#2) does not match the start elevation of the grassed channel in the HydroCAD model. HW recommends that the Applicant review and revise the HydroCAD model or the plans as needed.

   June 20, 2025: The Applicant has revised the plans and the HydroCAD model. No further action is requested.

o. The Applicant has modeled several rooftop infiltration trenches as drywells in the HydroCAD model. HW recommends that the Applicant confirm the elevation of each trench that corresponds with the design elevations on the plans.

   June 20, 2025: **The Applicant has updated the HydroCAD model to be consistent with the plans. No further action is requested.**

p. The Applicant has conducted several test pits over the entire site. It appears that the estimated seasonal high groundwater (ESHGW) ranges onsite from 48 inches to 68 inches below existing grade. The proposed grade is about the same elevation as the existing grade in several areas. Several proposed infiltration trenches and basins do not have adequate separation from ESHGW. A minimum of two feet of separation from the ESHGW is required for infiltration practices, and four feet of separation is required for infiltration without a mounding analysis. HW recommends that the Applicant review the infiltration practices as they relate to the elevation of ESHGW and revise accordingly.

June 20, 2025: **The Applicant has provided test pit elevations on the Existing Conditions Plans. HW recommends providing these test pit locations on the Grading and Drainage plans. The Applicant has provided a mounding analysis for each infiltration system. No further action is requested.**

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

   a. It does not appear that the Applicant has provided recharge calculations as part of the Stormwater Report. HW recommends that the Applicant provide a summary of the required recharge calculations for the site in accordance with the MSH Volume 3, Chapter 1, page 15.

   June 20, 2025: The Applicant has provided recharge calculations in Section V of the Project Stormwater Report. The Applicant used a total impervious area of 5,037 sf for Treatment Train #1 in the Required Recharge Volume calculations. HW believes this value is closer to 9,228 sf. It does not appear that the Applicant has included the storage provided in Trench #2 or #3 in the Provided Recharge Volume calculations. In HW's opinion the Applicant has provided adequate recharge, however we were not able to confirm the values provided. HW recommends that the Applicant revisit the calculations and for documentation purposes clearly outline the proposed impervious areas and the provided recharge volumes.

   <u>July 10, 2025: The Applicant has revised the recharge calculations. However, it appears to have left out the impervious areas of the houses. HW recommends that the Applicant include the stage storage area print out from the HydroCAD model to confirm the storage provided below the lowest outlet elevation. HW agrees that the Applicant has provided adequate recharge, however we were not able to confirm the values provided.</u>

4. *Standard 4 requires that the stormwater system be designed to remove 80% Total Suspended Solids (TSS) and to treat 1-inch of volume from the impervious area for water quality. The Town of Andover requires stormwater management systems to remove TSS at a rate of 90% and total Phosphorus at a rate of 60% for new projects and 80% and 50%, respectively for redevelopment projects.*

   a. Per the Town Stormwater Regulations Section IX.D.1, stormwater systems shall be designed to remove a percentage of total suspended solids and total phosphorus. The Applicant has not provided TSS or TP removal calculations for this project. HW recommends that the Applicant submit documentation to confirm removal at the new development specified rate.

   June 20, 2025 The Applicant has provided water quality treatment train diagrams showing the percentage of TSS removal. However, it does not appear that the Applicant has submitted documentation showing the total phosphorus load and removal calculations for the site. HW's previous comment stands.

   <u>July 10, 2025: The Applicant has met the total phosphorus load removal by retaining the volume of 1-inch of stormwater over the total impervious area. No further action is requested.</u>

5. *Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).*

    a. HW notes that a residential development is not considered a land use of higher potential pollutant load. Therefore, Standard 5 is not applicable.

    June 20, 2025: No further action is requested.

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.*

    a. The proposed development is not discharging near or into a critical area, Zone II, or an IWPA area; therefore Standard 6 is not applicable. No further action is requested.

    June 20, 2025: No further action is requested.

7. *Standard 7 is related to projects considered Redevelopment.*

    a. The project at 39 Sunset Rock Road is considered a new development, and therefore, Standard 7 is not applicable. No further action is requested.

    June 20, 2025: No further action is requested.

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

    a. The proposed project will be disturbing greater than one acre of land. A SWPPP is required by EPA for land disturbance of greater than 1 acre. The Applicant has provided recommended erosion controls to be included in a SWPPP in Section V. of the Stormwater Report. The SWPPP should include source control and pollution prevention measures, stormwater practices to address erosion and sedimentation, stabilization measures, and procedures for operating and maintaining the proposed stormwater practices. The plan should also identify the parties responsible for implementing the plan. HW recommends that the Planning Board requires receipt of a final signed SWPPP a minimum of 14 days prior to land disturbance.

    June 20, 2025: Suggested Condition of Approval.

    b. The Applicant has provided a Grading and Erosion Control Plan, Sheet 4 of 7, that includes an erosion control barrier. HW recommends that the Applicant provide a separate Erosion Control Plan and illustrates where the construction entrance will be located, any stockpiles, and the proposed silt sacks.

    June 20, 2025: The Applicant has provided an updated Erosion Control Plan that includes a construction entrance, stockpiles, and proposed silt sacks. No further action is requested.

9. *Standard 9 requires a Long-Term Operation and Maintenance (O & M) Plan to be provided.*

    a. In the Stormwater Management Report, the Applicant has provided some descriptions as part of a Long-Term O&M Plan. HW recommends that the Applicant provides a standalone O&M Plan to the Planning Board that includes the entire subdivision. The O&M Plan should include the parties responsible, descriptions of the various stormwater practices, clear descriptions of how they should be maintained and the frequency of inspections. A simple inspection log with a schedule, a simple sketch to illustrate where the practices are located on the site, and a budget, so that the property owner understands what to expect.

June 20, 2025: The Applicant has included an Operation & Maintenance (O&M) Plan in Appendix XI of the Stormwater Management Report. HW recommends that the O&M Plan for the long-term maintenance of the stormwater practices is provided as a standalone document that is provided to the party responsible for long-term maintenance. The document should include the name of the parties responsible, whether the Town of Andover or a Homeowners Association (HOA). Furthermore, a simple sketch to illustrate where the practices are located on the site should be attached to the O&M Plan.

July 10, 2025: The Applicant has provided a standalone O&M Plan. The party responsible for the long-term maintenance will be the HOA. A simple sketch has been attached as suggested. No further action is requested.

10. *Standard 10 requires an Illicit Discharge Compliance Statement be provided.*

    a. The Applicant has provided a signed Illicit Discharge Compliance Statement. No further action is requested.

    June 20, 2025: No further action is requested.

11. **During the site visit, the proposed water line loop was discussed. It appears that the trees behind proposed Lots 4 and 5 will need to be removed to install and maintain the water line per the Town's requirements. HW recommends that the Applicant clearly illustrate the proposed tree line on the site plans taking into consideration the location of the new water line.**

    July 10, 2025: The Applicant has added the water line loop and has updated the tree line behind Lots 4 and 5 as suggested. No further action is requested.

Conclusions

HW recommends that the Applicant provide a written response to address the few outstanding comments as part of the permitting process. The Applicant is advised that the provision of these comments does not relieve him/her of the responsibility to comply with all Town of Andover Codes and By-Laws, Commonwealth of Massachusetts laws, and federal regulations as applicable to this project. Please contact Janet Bernardo at 508-833-6600 or at jbernardo@horsleywitten.com if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.

Janet Carter Bernardo, P.E.
Principal