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March 22, 2022

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

Re: Initial Stormwater Peer Review
Special Permit Application Major Non-Residential Project
1 and 4 Corporate Drive
Andover, MA

Dear Ms. Byerley and Board Members:

The Horsley Witten Group, Inc. (HW) is pleased to provide the Andover Planning Board with this letter report summarizing our initial peer review of the stormwater management for the proposed renovation and expansion project at One and Four Corporate Drive in Andover, Massachusetts.

The plans were prepared for IQHQ-1 Corporate, LLC and IQHQ-4 Corporate, LLC (Applicant) by Linden Engineering Partners, LLC. The Applicant proposes to renovate and expand the existing two story 67,900 square foot (sf) building at One Corporate Drive with a 95,640 sf addition, reconfigure the parking lot, and improve the stormwater infrastructure. The proposed project does not include any structural changes to the existing two-story building at Four Corporate Drive. The proposed stormwater management includes a closed drainage network, water quality units, and subsurface infiltration galley systems which discharge to the existing stormwater basin located behind Four Corporate Drive.

HW has reviewed the stormwater management design for compliance with Andover's Stormwater Management and Erosion Control Bylaw and Regulations and the MassDEP Stormwater Standards. The proposed work is not within the buffer zone of a wetland resource area and therefore it does not appear the project will be under the jurisdiction of the Andover Conservation Commission.

HW received the following documents and plans:

- Cover Letter, prepared by Linden Engineering Partners, LLC, dated February 10, 2022, (2 pages).
- Application for Special Permit for Major Non-Residential Project at 1 Corporate Drive, Andover Massachusetts, prepared by Linden Engineering Partners, LLC, dated January 26, 2022 (11 pages).
- Application for Special Permit to Reduce Number of Parking Spaces at 1 Corporate Drive, Andover Massachusetts, prepared by Linden Engineering Partners, LLC, dated January 26, 2022 (11 pages).

- Response to Comments, prepared by IQHQ, dated March 18, 2022 (4 pages).
- Entering and Exiting Truck Turning Exhibits, prepared by Linden Engineering Partners, LLC, dated March 18, 2022 (2 pages).
- Report on Subsurface Investigations and Geotechnical Design Recommendations,1 Corporate Drive, Andover, Massachusetts, prepared by Haley & Aldrich, Inc., Boston, Massachusetts dated January 2022 (82 pages).
- Stormwater Report, Proposed Redevelopment, Building 1, 1 Corporate Drive, Andover, MA, prepared by Linden Engineering Partners, LLC, dated January 26, 2022 (181 pages);
- Sanitary Sewer System Investigation, Minuteman and Shattuck Road Area, Andover, MA, prepared by Linden Engineering Partners, LLC, dated December 2021 and January 2022 (174 pages).
- Sanitary Sewer System Investigation Supplemental Report, Minuteman and Shattuck Road Area, Andover, MA, prepared by Linden Engineering Partners, LLC, dated March 17, 2022 (24 pages).
- Sanitary Sewer Profile, Exhibit – Profiles 1 thru 6, dated March 17, 2022 (6 pages).
- Plan Set for Proposed Renovation and Addition, One and Four Corporate Drive Andover MA, prepared by Linden Engineering Partners, LLC, dated January 26, 2022, which includes:

o Cover Sheet	Cover
o Existing Site Survey Plan	SV-1
o Existing Site Survey Plan	SV-2
o Existing Site Survey Plan	SV-3
o Existing Site Survey Plan	SV-4
o Site Layout And Materials Plan (revised 3/18/22)	C-1
o Site Grading And Erosion Control Plan	C-2
o Site Utility Plan (revised 3/18/22)	C-3
o Sewer Connection Plan, Notes & Zoning Table (revised 3/18/22)	C-4
o Construction Details	C-5
o Construction Details	C-6
o Construction Details (revised 3/18/22)	C-7
o Construction Details	C-8
o Construction Details	C-9
o Future Parking Plan	FP-1
o Future Parking Plan	FP-2
o Future Parking Plan	FP-3
o Site Lighting Plan	SL-1
o Lighting Schedules, Details And Notes	SL-2
o Photometric Plan	SL-3

o	Site Lighting Fixtures	SL-4
o	Landscape Material Plan	L-100
o	Landscape Material Plan	L-101
o	Landscape Layout Plan	L-200
o	Landscape Layout Plan	L-201
o	Landscape Planting Plan	L-400
o	Landscape Planting Plan	L-401
o	Landscape Details	L-500
o	Landscape Details	L-501
o	Landscape Details	L-502
o	First Floor Plan	A1.00
o	Second Floor Plan	A1.01
o	Roof Plan	A1.02
o	Exterior Elevations	A2.01

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 Bylaw and Regulations amended May 11, 2021 (Stormwater Bylaw).

In accordance with Section VI. B. of the Andover Stormwater Bylaw the Stormwater Management Permit and Narrative provided by an 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 proposed site improvements are considered redevelopment and therefore are required to comply with MassDEP Stormwater Management Standards 2, 3, and 4 only to the maximum extent practicable and the pretreatment requirements of Standards 4, 5, and 6 only to the maximum extent practicable. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

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 existing site discharges stormwater via overland flow to two separate design points of analysis (DP):

        a. DP-1: Existing overland flow to Shattuck Road from the western portion of the site.

        b. DP-2: Existing flow onsite that travels overland to the existing system in Corporate Drive, collected and routed through the existing onsite drainage

system within the property. These ultimately discharge to an existing stormwater basin located behind Four Corporate Drive.

Under proposed conditions the Applicant has provided stormwater practices to collect, manage, treat, and recharge the stormwater within the developed areas of the site. The watershed areas and flow rates that continue to discharge towards the DPs have been reduced under proposed conditions. The Applicant has demonstrated that there are no new untreated discharges to the wetlands as a result of the project.

The Applicant appears to comply with Standard 1.

2. *Standard 2 requires that post-development runoff does not exceed pre-development runoff off-site.*

   a. The Applicant has provided the HydroCAD results for the existing and proposed conditions for the 25-year event storm. HW recommends that the Applicant provide the summaries for the existing and proposed HydroCAD models for the 2-year, 10-year, and 100-year storm events.

   b. The Applicant has provided the HydroCAD results for the 25-year storm event with a rainfall depth of 6.02 inches. It appears that the Applicant has used the most recent Atlas-14 Rainfall data from NOAA's online database as noted in its Stormwater Report. HW recommends that the Applicant provide a printout of the rainfall data to confirm the precipitation depths used.

   c. It appears that in the provided HydroCAD model, the Total Area modeled for the Existing Conditions (7.865 acres) does not match the Total Area modeled for the Proposed Conditions (8.134 acres). HW recommends that the Applicant review and revise the HydroCAD model such that the total area analyzed is consistent in both models. As designed the size of the stormwater system is considered conservative.

   d. The Applicant has provided soil maps and test pits for the Site. The Soil Map provided lists the site as having soils from Hydrologic Soil Groups (HSG) "C/D" and "A". The HydroCAD model lists the onsite soil as HSG "C". HW recommends that the Applicant revise the existing and proposed area/cover to include the area to the east of the existing driveway where HSG "A" soil has been mapped.

   e. The Applicant has provided Drainage Area Maps as part of the Stormwater Report. HW recommends the following:

      i. Incorporate the existing and proposed grading on the Drainage Area Maps.

      ii. Incorporate proposed stormwater management on the Drainage Area Maps (catch basin, pipes, and subsurface features).

      iii. Incorporate the HSG designation on the Drainage Area Maps.

   f. The Applicant has modeled each of the subsurface systems in the proposed model without any exfiltration. The Geotechnical Report prepared by Haley and Aldrich recommended using a HSG "B" for infiltration and included the results of the in-situ hydraulic conductivity testing performed on site. HW recommends that the Applicant include exfiltration in accordance with Volume 3, Chapter 1, Page 23 of the MSH. As designed the size of the stormwater system is considered conservative.

g. It appears that there are a few inconsistencies between the HydroCAD model and the subsurface system information on the plans. HW has noted the following:

   i. Subsurface system #4 notes 20 chambers where the plan notes 18; and

   ii. Subsurface system #4 notes a different size outlet on the plans compared to the model.

   HW recommends that the Applicant adjust the HydroCAD model and/or the plans for consistency.

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

   a. The Applicant has conducted multiple test pits onsite. A geotechnical report that includes soil borings has been provided as part of the Stormwater Report by Haley and Aldrich. Based on the geotechnical report and test pit data, the depth to groundwater onsite ranges from eight feet to greater than 10 feet. Based on the soil type identified it appears that the site adequately meets the recharge requirement. The Applicant has not included the exfiltration rate of the subsurface galley systems in the HydroCAD model. The proposed site design has an overall reduction in impervious area, therefore, complies with Standard 3.

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 provided water quality volume calculations for ½ inch of runoff over the impervious area. In accordance with Section IX. G of the Andover Stormwater Regulations the required water quality volume shall be a minimum of 1.0 inches times the total impervious area. As the project is a redevelopment the Applicant shall comply with Section IX.D.1.a.(2) (b) and retain 0.8 inches of runoff times the total post-construction impervious area. HW recommends that the Applicant review the total water quality volume provided and confirm it has met the local regulations.

   b. The Applicant has stated that the project achieves at least 80% TSS removal from hydrodynamic separators located just after the subsurface galley systems prior to leaving the site. HW has the following comments:

      i. The Applicant has provided TSS treatment with water quality units (WQU). The units have been placed after the subsurface galley systems in the treatment train. It appears that the sediment laden water would run through the subsurface system depositing sediment in clean stone. Therefore, reducing the effectiveness of the infiltration rate to the soil. HW recommends that where feasible the Applicant relocate the water quality units before the subsurface systems to allow for pre-treatment and reduce maintenance on the leaching galleys. HW recommends installing a water quality unit for the largest catchment areas prior to each of the four subsurface systems.

      ii. The Applicant has provided water quality calculations for each WQU. However, it does not appear that the Applicant has provided the manufacturer information confirming the credit listed for the TSS removal. HW recommends that the

Applicant provide the manufacturer information to confirm the TSS removal rate of the WQU.

iii. The Applicant has stated that the water quality units provide 80% TSS Removal. However, it does not appear that all treatment trains have been included. In the stormwater report narrative for stormwater standard 4, it states treatment for the runoff areas is done through new deep sump catch basins, subsurface systems, and water quality treatment units. HW recommends that the Applicant provide the TSS removal calculations for each treatment trains proposed.

c. The Applicant has provided water quality volume calculations showing the water quality volume retained onsite. It is unclear how the captured volume was calculated for each subsurface system. HW recommends providing a stage storage table from the HydroCAD model for each galley system that highlights the storage up to the outlet to confirm the volume that each galley system holds.

d. The Applicant has listed the time to empty for each infiltration structure as a calculation that has a 1.2-foot depth for each subsurface basin. It is not clear where this depth is taken from. HW recommends that the Applicant review and clarify the calculation. The volume contained in the galleys shall be the volume below the outlet elevation.

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

   a. The Applicant has noted that the proposed project is not considered a LUHPPL. However, the project would be considered a LUHPPL if it exceeds 1,000 vehicle trips per day. HW recommends that the Applicant clarify the vehicle trips per day anticipated at the project site.

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 site does not discharge to a critical area, therefore Standard 6 is not applicable.

7. *Standard 7 is related to projects considered Redevelopment. A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

   a. The proposed project is considered a redevelopment, therefore Standard 7 is applicable. It is HW's opinion that once the Applicant adequately addresses the comments in this letter and raised by the Town, the proposed stormwater management design is improving existing conditions and complies with the MSH to the maximum extent practicable.

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

   a. The Applicant has provided a Landscape Plan. It appears there are portions of the site

that will be disturbed due to grading or drainage that do not include grass seed or stabilization. HW recommends revising the Landscape Plan to include limits of general grass seeding and stabilization within the limit of work.

b. HW recommends that the Applicant confirm that native species will be used for revegetation.

c. The Applicant has proposed straw wattles and sediment sacks at catch basins throughout each phase. HW recommends that the Applicant include installation of sediment sacks or catch basin inserts in all the existing onsite and all proposed catch basins as they are constructed within the limit of work during the construction phase. Furthermore, HW recommends that inlet protection be provided for any catch basins within 100 feet of the construction entrance on both sides of the road.

d. The Applicant has proposed several Sediment and Erosion Control statements for different types of erosion control being used as part of the Stormwater Drainage Report. HW recommends confirming these directions are included as Erosion Control Notes on the Plans.

e. The Applicant has stated in the Drainage Report in a section titled Stabilization Activities requirements for slope stabilization and stabilized construction entrances. HW recommends labeling on the Erosion Control Plans where slope stabilization is anticipated to be needed and where a stabilized construction entrance will be installed.

f. There are several drainage structures proposed as part of the development around the existing building. These drainage structures are tying into an existing system downstream. HW recommends that the Applicant include a note stating that it is the responsibility of the contractor to maintain drainage onsite during all phases of construction.

g. HW recommends that the Applicant include dust control measures and a note stating that paved surfaces will be swept weekly during construction.

h. The proposed development requires disturbance of greater than one acre of land and therefore is required to obtain coverage under the NPDES Construction General Permit issued by EPA and prepare a Stormwater Pollution Prevention Plan (SWPPP). The Applicant has provided a draft SWPPP. HW recommends that a copy of the final SWPPP be provided to the Town at least 14 days prior to commencing land disturbance activities.

i. It is noted in the Stormwater Narrative under the Stabilization Activities section that disturbed areas will be stabilized with appropriate ground cover as soon as possible and will receive a layer of topsoil for stabilization. HW recommends that the Applicant include temporary seeding, mulch, or other stabilization methods over the topsoil.

j. The Typical Crushed Stone Tracking Pad detail is provided on Sheet C-5. The length of tracking pads has a 50 foot minimum requirement for developments of this size. If the slope towards the access road exceeds 2%, it is recommended to construct a ridge across the foundation approximately 15 feet from the entrance to divert runoff away from the public road. Also, a filter fabric fence may need to be installed down-gradient from the construction entrance to contain any sediment-laden runoff.

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

The Applicant has provided a Stormwater Operation and Maintenance (O&M) Plan, which includes instructions for maintenance of stormwater control measures, an O&M budget, and an O&M checklist. HW has the following comments regarding the O&M Plan:

a. A sample Operation and Maintenance Log is provided and describes acceptable practices and frequency of procedures for long term maintenance of the stormwater practices. HW recommends adding space for
    i. Descriptions of the condition of the stormwater practices,
    ii. Descriptions of maintenance performed,
    iii. Signature of the responsible party,
    iv. Signature of the Professional Engineer, where applicable and,
    v. Receipts showing payment for maintenance performed.

b. The Applicant has listed 5 infiltration systems and a wet basin along with numerous Catch Basins in the O&M Plan. HW recommends providing an exhibit that highlights each of these stormwater practices and where to inspect them. HW also recommends providing a structure table to the catch basins locations to help with inspection.

c. Furthermore, per Andover Stormwater Regulations Section VI.C.1.b.7, HW recommends that the Applicant include a simple sketch as part of the O&M Plan that clearly labels the various stormwater practices to be inspected. The Applicant has provided a plan that illustrates the catch basins for the overall complex and for the proposed improvements. HW recommends adding the other stormwater practices to this plan.

d. HW recommends a more robust maintenance log for the O&M Plan. The quantity and types of stormwater practices may need more space for notes or logging. For example, the inspection of 50 catch basins and trench drains does not have enough room for notations of findings or notes for the inspection in the current format.

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

a. The Applicant has stated a signed illicit discharge statement has been provided as part of the Stormwater Report. However, it does not appear to be located in the Report. HW recommends that the Applicant provide a signed Illicit Discharge Compliance Statement.

Additional Comments per Andover Stormwater Regulations:

11. Section IX (Andover Stormwater Regulations - Design Criteria)

a. C - Pretreatment: The Applicant must size all pretreatment practices (deep sump catch basins) to accommodate one-years' worth of sediment and debris using the calculation provided in Andover's regulations. HW recommends that the Applicant provide the required calculation.

b. D – Pollutant Removal: As a redevelopment project, the design is required to remove 80% of TSS and 50% of Total Phosphorus (TP). The Applicant has not provided phosphorus loading and removal calculations. HW recommends that the Applicant provide the required phosphorus load calculations and subsequent removal calculations

for the project site.

12. Other Comments:

a. Pipe calculations – The Applicant has provided the pipe routing for the site. It is unclear if the routing is sizing for the 25-year storm event. HW recommends that the Applicant provide the pipe calculations to confirm that the proposed closed pipe system is adequately sized.

b. HW recommends that the Applicant address any additional comments provided by the Planning Board or Department of Public works in relation to the project in addition to this letter.

Conclusions

HW recommends that the Planning Board require the Applicant to provide a written response to address these comments as part of the permitting review process. The Applicant is advised that 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 857-263-8193 or at jbernardo@horsleywitten.com if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.

Janet Carter Bernardo, P.E.
Associate Principal

Steve Stanish, P.E.
Senior Engineer

CC: Andover Conservation Commission