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September 5, 2024

Andover Conservation Commission
Andover Planning Board
Andover Town Offices
36 Bartlet Street
Andover, MA 01810

RE: 140 Haverhill Street, Amended Plan
DEP File # 090-1387 Response to Peer Review Comments

Dear Conservation Commission Members,

Please accept this letter and the attached plans as a response to the review comments provided by Horsley Whitten Group in a letter dated August 19, 2024. Our responses to comments are located below. Comments that require a response have the comment inserted in regular text and our response immediately below in italicized text. Comments that did not require any response are not included.

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. Under existing conditions, the developed site manages the stormwater via a closed drainage network that is piped to one of the three onsite wetland resource areas. The small resource area on the east side of the site, delineated by wetland flags WF-1A through WF-4A, is piped to the central Bordering Vegetated Wetland (BVW), marked by flags WF-1B through WF-27B, via a 24-inch reinforced concrete pipe (RCP). The central BVW is piped to the larger BVW in the west and north corners of the site, delineated by wetland flags WF-1C through WF-34C, via an 18-inch RCP. There are six existing outfalls into one of the three resource areas.
No response required
 - b. The proposed development will modify the existing stormwater drainage network to include a subsurface detention chamber, new deep sump catch basins, and two jellyfish structures to improve water quality. Three of the existing outfalls will be eliminated and one new outfall is proposed. Under proposed conditions there will be four outfalls. *No response required.*

.The Applicant has revised the outlet configuration at the edge of the central BVW. Under existing conditions there is an 18-inch RCP that discharges near wetland flag WF-11B at elevation 82.15. There is a second 18-inch RCP that discharges near flag WF-128 at elevation 81.40. The Applicant has revised the design to remove both pipes and install a new 18-inch HOPE pipe with a head wall at elevation 82.15. This reconfiguration is identical to the approved 2021 design, creating a buffer zone disturbance of 660 square feet (sf) and a temporary BVW alteration of 340 sf.

No response required

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

- a. The narrative in the Drainage Report is not consistent with the proposed amended design. HW recommends that the Applicant revise the narrative to avoid confusion.

The introductory portions of the narrative have been revised to reflect the new project.

- b. It appears that the existing driveway on the north side of the parcel will be removed in accordance with the Demolition Plan. It is not obvious if this driveway will be repaved or replaced with loam and seed. HW recommends that the Applicant clarify the proposed plans for the northern driveway. If the driveway is removed credit for the reduction of impervious surfaces can be accounted for.

It has been noted that the area where the parking lot pavement is being removed is replaced with topsoil and seed on the landscape plan.

- c. HW recommends that the Applicant provide the closed drainage system sizing calculations to confirm the network is adequately sized.

Calculations for the drainage system pipes have been included as an attachment to this letter.

- d. The Applicant has revised the plans and eliminated one of the previously approved buildings and one of the previously approved subsurface detention systems. HW has the following comments regarding the amended plans.

- i. It appears that CB 7 and CB 8 are proposed to be replaced. HW recommends that the Applicant confirm that the associated pipes will remain. HW further recommends that the Applicant confirm that DMH 5 includes the connection of the existing pipes if they are to remain.

Additional notes have been added to CS1501 indicating what pipes remain.

- ii. HW recommends that the Applicant match the crowns of the pipes at a manhole instead of the inverts whenever feasible. For example, DMH 5 calls out an 18-inch inlet and an 18-inch outlet at elevation 82.60. The 12-inch inlet is also set at elevation 82.60. If feasible the 12-inch inlet should be raised 6 inches. DMH 3 and DMH 4 have similar configurations, if feasible the smaller inlet pipes should be raised at least 6 inches higher than the 18-inch outlet.

The pipes have been adjusted to comply with this comment with the exception of the 8" pipe that drains the north parking lot. The rim elevation at the inlet prevents raising this pipe.

- iii. Proposed catch basin 4 appears to be placed over the existing sewer main. HW recommends that the Applicant clarify that the proposed catch basin is to replace the existing catch basin in the same location.

The location of CB 4 has been revised and it no longer interferes with the sewer line.

- iv. There is an existing catch basin with a rim of 112.57 on High Street. The catch basin has an existing outfall onto the project site. HW recommends that the Applicant clarify the proposed grading at the outfall from this catch basin.

A swale has been added from the outlet to the swale that conveys water from the FES that drains water from the intersection.

- v. HW recommends that the Applicant clarify the limit of clearing around the site. The leader on the north side is not pointing to another specific.

The limit of clearing line has been adjusted.

- vi. There is an existing drainpipe around CB 9 that is noted to remain on the Demolition Plan but is not connected to anything on the Grading and Drainage Plan.

The pipe has been eliminated from the Grading and Drainage Plan.

- vii. There is a proposed retaining wall called out on the Grading and Drainage Plan that appears to have been removed. In the area of this call out are several spot grades that do not appear to be accurate. HW recommends that the Applicant review the proposed grading for the amended conditions.

These leftover labels from the previous plan have been eliminated from the current plan.

- viii. The callout for Pond 5P is still on the Grading and Drainage Plan.

This has been removed.

- ix. HW recommends that the Applicant confirm that DMH 5 can adequately accommodate the four pipes connected into it.

This manhole is now listed as being a 5' diameter manhole.

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

- a. The Applicant has conducted test pits and documented that the ground water elevation is shallow, and recharge is not feasible. It appears that the Applicant has reduced the impervious area from 93,800 sf to 89,556 sf. A reduction of 4,244 sf providing a slight increase in recharge.

No response required.

- b. The Applicant has designed the underground chambers as a detention system, so no groundwater recharge is provided. The bottom of the chambers is set at elevation 85.0, the top is set at elevation 88.0 and groundwater in the area based on TP2 and TP3 is approximately 87.2. The Applicant has added an impermeable liner to prevent groundwater from entering the chamber system. HW recommends that the Applicant also confirm that buoyance will not be an issue for this system.

Buoyancy calculations are attached to this letter.

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 stated that the project achieves 91% TSS removal via deep sump catch basins and the Jellyfish water quality device located just before the stormwater system discharges into the wetlands. HW recommends that the Applicant provide a

third-party review to demonstrate that the 89% TSS credit noted for the Jellyfish filter is appropriate.

The Jellyfish filter information is attached to this letter. The areas used to size the filter were from the last plan and are larger than presently proposed. The applicant would prefer to keep them as designed so there is room for future impervious area expansion.

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. Therefore Standard 5 is not applicable.

No response required.

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.

No response required

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 a/so 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 appears that the Applicant complies with Standard 7 and is improving existing water quality conditions.

No response required.

- b. HW notes that the Applicant has stated that Standard 7 is not applicable. However, HW considered this a misleading statement. The Applicant has reduced impervious cover by 4,244 sf. It will decrease the peak flows slightly while increasing the peak volumes slightly. The Applicant has not provided additional recharge measures but as a redevelopment it is required to provide recharge only to the maximum extent practicable.

No response required.

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

- a. The Applicant has provided a Soil Erosion & Sediment Control Plan. HW notes that the erosion controls measures shown are close to the wetland resource areas and it appears that they could be pulled back to the edge of the northern access drive in most areas. HW recommends that the Applicant review the location of the erosion control barrier and adjust to be as far from the resource areas as possible.

The erosion control locations have been adjusted.

- b. HW recommends that the Applicant list a size of 12 to 18-inches on the compost sediment sock detail.

The detail has been revised

- c. The Erosion and Sediment Control Plan includes a call out for a silt fence and an erosion control blanket that are not associated with specific line types. HW recommends that the Applicant clarify where these erosion control measures are proposed.

The EC line has been labeled with "silt fence barrier" to be consistent with the detail. Hatching has been added where the erosion control blanket should be used.

- d. The Applicant has previously provided a Stormwater Pollution Prevention Plan (SWPPP). The Planning Board and /or Conservation Commission may choose to require receipt of the final SWPPP signed by the contractor as a condition of approval.

The SWPPP can be submitted as a condition of approval.

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

- a. 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 log. HW has the following comments in relation to the O&M Plan provided by the Applicant:

- i. The Applicant has included a simple sketch with the O&M Plan. However, the subsurface detention system and the flared end sections have not been labeled.

The O and M plan has been revised.

- ii. HW recommends that the Applicant locate the inspection ports for the subsurface detention system on the Grading and Drainage Plan.

The inspection ports are located on the plan.

- iii. HW recommends that the Applicant include the manufacturer's O&M directives for the Jellyfish filters and confirm that the Owner is aware of its responsibilities.

The O and M requirements for the Jellyfish filters have been added to the O and M plan narrative

- iv. Per Andover Stormwater Regulations Section VI.C.1.b.5, HW recommends that the Applicant provide a copy of the O&M Plan signed by the property owner.

A signed copy of the O and M plan is attached to this letter.

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

- a. The Applicant has provided a signed Illicit Discharge Compliance Statement.

11. *Andover Stormwater Regulations Additional Comments*

- a. Section IX (Design Criteria)
 - i. 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.
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A copy of the Excell Spreadsheet used to calculate the depth of sediment in each catch basin is attached.

- ii. 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 evidence of the Jellyfish removal rate. Furthermore, the Applicant has not calculated phosphorus removal rates. HW recommends that the Applicant demonstrate that the proposed design will provide sufficient TP removal.

The plan two Jellyfish filters as manufactured by Contech. Independent testing information outlining the results is attached. On page 17 of that study the executive summary states the following.

“Median SSC and TSS removal efficiency results were 99% and 89%, respectively. Median removal efficiency was 59% for Total Phosphorus and 51% for Total Nitrogen. For Total Copper and Total Zinc, median removal efficiencies were 90% and 70%, respectively. The d50 for influent and effluent particle sizes were 82 and 3 μ m, respectively.”

I will be in attendance at the September 10, 2024 planning board meeting and the October 1, 2024 conservation commission meeting to discuss this matter. If you have questions prior to the meeting, please do not hesitate to contact this office.

Sincerely,



Benjamin C Osgood Jr. PE
President

**LONG TERM POLLUTION PREVENTION PLAN
140 HAVERHILL STREET, ANDOVER, MA**

As part of the development of 140 Haverhill Street, Andover, MA a stormwater system is being constructed as required by State and Local Stormwater Regulations. It is the responsibility of the property owner to properly maintain the drainage systems and structures, including drain pipes. The current property owner is Medico 140, LLC, and therefore will oversee long term maintenance of the stormwater system and will be responsible for compliance with the Long-Term Pollution Prevention Plan upon completion of the construction.

Regular maintenance is to include the following:

1. Pavement Sweeping

Pavement surfaces shall be swept a minimum of twice per year, preferably just after snow melt and late in the fall.

2. Catch Basin Sumps, Drain Manhole and Outlet Control Structures

Inspect quarterly for the evidence of structural damage, silt accumulation and improper function. Remove accumulated sediments and debris from catch basin sump when sump is more than 25% full, minimum annually just after snow melt.

3. Drain Pipes

Inspect annually for the evidence of structural damage, silt accumulation and improper function. Clean pipes when sediment occupies more than 20% of pipe diameter.

4. Buried Detention System - 2

Inspect inlet and outlet structures quarterly for damage and silt accumulation. Remove silt buildup and debris.

5. Jellyfish Treatment Systems - 2

Inspect quarterly per the attached Jellyfish System Owners Manual.

6. Graded Slopes and Rip Rap outlets

Inspect every spring for erosion. Repair any erosion by placing rip-rap or loam and seed. Nurtured freshly seeded areas to ensure proper germination and establishment of turf.

Each of the stormwater structures listed above is shown on a plan attached as Attachment A.

Inspections shall be performed by a qualified person with knowledge of stormwater structures and conveyance systems. A report of inspections shall be submitted to the Town of Andover on an annual basis within 30 days of the end of each calendar year.

The requirement and responsibility for the inspection and maintenance of the stormwater system will continue to any subsequent owners of the property.

140 HAVERHILL STREET
 CATCH BASIN SUMP SEDIMENT CALCULATIONS

CATCH BASIN	AREA (SF)	AREA(AC)	CUBIC FEET OF SEDIMENT/ YR	DEPTH OF SUMP(ft)
CATCH BASIN	AREA (SF)	AREA (AC)	CUBIC FEET OF SEDIMENT / YR	DEPTH OF SUMP (FT)
1	7431	0.171	14.215	1.132
2	15547	0.357	29.743	2.368
3A	6752	0.155	12.917	1.028
3	8127	0.187	15.548	1.238
4	21228	0.487	40.611	3.233
5	8160	0.187	15.611	1.243
6	8330	0.191	15.936	1.269
9	5319	0.122	10.176	0.810
10	5899	0.135	11.285	0.899

Project: 140 Haverhill Street
Location: Andover, MA
Prepared For: Ranger Engineering



Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 1 or 2. Figure 2 is in tabular form so is preferred. Using the t_c , read the unit peak discharge (q_u) from Figure 1 or Table in Figure 2. q_u is expressed in the following units: cfs/mi²/watershed inches (csm/in).

Compute Q Rate using the following equation:

$$Q = (q_u) (A) (WQV)$$

where:

Q = flow rate associated with first 1" of runoff

q_u = the unit peak discharge, in csm/in.

A = impervious surface drainage area (in square miles)

WQV = water quality volume in watershed inches (1" in this case)

Structure Name	Impv. (acres)	A (miles ²)	t_c (min)	t_c (hr)	WQV (in)	q_u (csm/in.)	Q (cfs)
Small Parking Lot	0.13	0.0002098	6.0	0.100	1.00	774.00	0.16
Parking Lot	1.66	0.0025862	6.0	0.100	1.00	774.00	2.00
Parking Lot + SW	1.88	0.0029342	6.0	0.100	1.00	774.00	2.27

The WQf sizing calculation selects the minimum size CDS/Cascade/StormCeptor model capable of operating at the computed WQf peak flowrate prior to bypassing. It assumes free discharge of the WQf through the unit and ignores the routing effect of any upstream storm drain piping. As with all hydrodynamic separators, there will be some impact to the Hydraulic Gradient of the corresponding drainage system, and evaluation of this impact should be considered in the design.



CONTECH Stormwater Solutions Inc. Engineer
Date Prepared:

DRA
9/22/2021

Site Information

Project Name **140 Haverhill Street**
Project State **MA**
Project City **Andover**

Total Drainage Area, Ad **1.88 ac**
Post Development Impervious Area, Ai **1.88 ac**
Pervious Area, Ap **0.00 ac**
% Impervious **100%**
Runoff Coefficient, Rc **0.95**

Mass Loading Calculations

Mean Annual Rainfall, P **48.0 in**
Agency Required % Removal **80%**
Percent Runoff Capture **90%**
Mean Annual Runoff, Vt **280,073 ft³**
Event Mean Concentration of Pollutant, EMC **75 mg/l**
Annual Mass Load, M total **1311 lbs**

Filter System

Filtration Brand **Jelly Fish**
Cartridge Length **54 in**

Jelly Fish Sizing

Mass to be Captured by System **1048 lbs**
Water Quality Flow **2.27 cfs**

Method to Use

FLOW BASED

Summary

Flow	Treatment Flow Rate	2.41 cfs
	Required Size	JFPD0808-12-3



CONTECH Stormwater Solutions Inc. Engineer
Date Prepared:

DRA
9/22/2021

Site Information

Project Name **140 Haverhill Street**
Project State **MA**
Project City **Andover**

Total Drainage Area, Ad **1.66 ac**
Post Development Impervious Area, Ai **1.66 ac**
Pervious Area, Ap **0.00 ac**
% Impervious **100%**
Runoff Coefficient, Rc **0.95**

Mass Loading Calculations

Mean Annual Rainfall, P **48.0 in**
Agency Required % Removal **80%**
Percent Runoff Capture **90%**
Mean Annual Runoff, Vt **247,299 ft³**
Event Mean Concentration of Pollutant, EMC **75 mg/l**
Annual Mass Load, M total **1157 lbs**

Filter System

Filtration Brand **Jelly Fish**
Cartridge Length **54 in**

Jelly Fish Sizing

Mass to be Captured by System **926 lbs**
Water Quality Flow **2.00 cfs**

Method to Use

FLOW BASED

Summary

Flow	Treatment Flow Rate	2.05 cfs
	Required Size	JFPD0808-10-3



CONTECH Stormwater Solutions Inc. Engineer
Date Prepared:

DRA
9/22/2021

Site Information

Project Name **140 Haverhill Street**
Project State **MA**
Project City **Andover**

Total Drainage Area, Ad **0.13 ac**
Post Development Impervious Area, Ai **0.13 ac**
Pervious Area, Ap **0.00 ac**
% Impervious **100%**
Runoff Coefficient, Rc **0.95**

Mass Loading Calculations

Mean Annual Rainfall, P **48.0 in**
Agency Required % Removal **80%**
Percent Runoff Capture **90%**
Mean Annual Runoff, Vt **19,367 ft³**
Event Mean Concentration of Pollutant, EMC **75 mg/l**
Annual Mass Load, M total **91 lbs**

Filter System

Filtration Brand **Jelly Fish**
Cartridge Length **54 in**

Jelly Fish Sizing

Mass to be Captured by System **72 lbs**

Method to Use

FLOW BASED

Summary		
Flow	Treatment Flow Rate	0.27 cfs
	Required Size	JF4-1-1