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February 12, 2016

Mr. Nathaniel Strosberg, Town Planner
101 Main Street
Town of Ashland
Ashland, MA 01721

RE: "Whittemore Estates, Ashland, MA
Definitive Subdivision Review

Dear Mr. Strosberg:

GCG Associates, Inc. has reviewed the following information for the proposed Definitive Subdivision Plan for Whittemore Estates, Map 12 parcel 207, Whittemore Drive in Ashland, MA.

Plan References: "Definitive Subdivision Plan of Whittemore Estates — Ashland, MA ", dated November 13, 2015, revised February 3, 2016, prepared by: Connorstone Engineering, Inc.

Documents: Cover Letter to the Town of Ashland Planning Board, dated February 3, 2016, prepared by: Connorstone Engineering, Inc.

"Stormwater Report & Documentation" for "Whittemore Estates" – Off Whittemore Drive – Ashland, MA ", revised February 3, 2016, prepared by: Connorstone Engineering, Inc.

Based upon our review of the above information, we offer the following general comments and comments with respect to compliance with Town Bylaws: Chapter 282 - Zoning, Chapter 344 Subdivision of Land, Chapters 274 & 343 - Stormwater Management, Chapter 348 - Wetlands Protection Regulations. The numerical section of the regulations is referenced at the beginning of each comment unless it is a general comment. GCG's latest comments show in **bold** text.

GENERAL PLAN COMMENTS

The following are general comments with respect to the plans.

Definitive Subdivision Plan, Sheet 1 of 2 - Locus Plan / Index Sheet:

1. General Note, item number 3 referred to the Flood Insurance Rate Map (FIRM) dated June 4, 2010. The latest FIRM was updated on July 7, 2014. The plan and

note should be update to the latest floodplain boundary data. A new FIRM map number had also been issued. **(Resolved)**.

Definitive Subdivision Plan, Sheet 2 of 2 - Definitive Subdivision:

1. Section 334-8 – requires plan to be shown at a scale of one (1) inch equals (40) forty feet or such other scale that the Board may accept. This plan sheet is shown in a scale of one (1) inch equals (60) sixty feet. **(GCG concurs that the plan is legible with the 1 inch equals 60 feet scale)**.
2. Section 344-8.B.(5) - requires lot numbers be enclosed in an one-half-inch diameter circle. The plan shows the lot number underlined. **(Resolved)**.
3. Section 344-25,A - requires six inches square monument to be installed at front lot corners. The plan proposed iron rod. Proposed monument size should be specified on the plan. **(The type of the proposed monument should be included on the Plan Legend or shown on the detail.)**
4. Zoning Bylaws Section 10.0 Definitions – “Lot Area” – requires at least ninety percent of the Lot Area shall be other than land within utility transmission easement, and Chapter 344, Section 344-4 defines Utilities includes drains. Calculations should provide demonstrate that Lots 7, 8 & 9 have the required minimum lot area (90% of 30,000 square feet required). **The use of “utility transmission easement” area in the lot area should be evaluated by appropriate town official.**

Definitive Subdivision Plan, Sheet 1 of 8, (1 of 10) - Existing Conditions Plan:

1. General Notes number three (3) should be updated to reference to the latest FIRM date and map number. **(Resolved)**.
2. FEMA Flood Zone line and Floodplain Overlay District (FPOD) boundary should be updated according to the latest FIRM dated July 7, 2017. **(Resolved)**.
5. This plan sheet is shown in a scale of one (1) inch equals (60) sixty feet. **(GCG concurs that the plan is legible with the 1 inch equals 60 feet scale)**.
3. Section 344-8.B(11)(k) – require trees to be located on the plan. Applicant has requested a waiver. **(Requires Planning Board approval)**.
4. **The proposed water mains and hydrants were shown on the existing conditions plan.**

Definitive Subdivision Plan, Sheet 2 of 8, (2 of 10) - Topographic Plan:

1. Two soil test logs for stormwater basins are shown on the plan, the number of test pits required should meet MassDEP Massachusetts Stormwater Handbook requirements. Additional test pits are required. (Also see Drainage Report review comments.) **(Resolved)**.
2. This plan sheet is shown in a scale of one (1) inch equals (60) sixty feet. **(GCG concurs that the plan is legible with the 1 inch equals 60 feet scale)**.

Definitive Subdivision Plan, Sheet 3 of 8, (3 of 10) – Construction Drawing:

1. Section 344-12.A(8) – requires intersection curb radius of not less than thirty (30) feet, the proposed radius appears to meet the 30 feet requirements, the radius should be called out on the plan. **(Resolved)**.
2. Section 344-12.F(4) – requires center island to accommodate the turning radius movement of a WB-40 vehicle, a plan showing turning movements should provide

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demonstrate that the WB-40 vehicle can move around the island. Center Island should include curbing on its outside radius. **The type of curbing in the turnaround should be identified on the plans.**

3. Section 344-26 – require Street name signs (Temporary and Permanent) for new subdivision roadway. Sign location should be shown on the plan. **(Resolved).**
4. The proposed drop inlet rim on Lot 3 is approximately 2.4' below the existing grade, additional contour is required around the drop inlet. **(Resolved).**
5. Section 344-23.(4) – requires a hydrant be placed at intervals not exceeding five hundred (500) feet, starting at the street intersection. The proposed subdivision utilizing individual drinking well and on-site septic system. Therefore, water main and sewer main are not proposed. A cistern system may be required to satisfy the fire safety concerns. **The revised plan shows approximately six hundred (600'+/-) linear feet of eight-inch (8") diameter water main along the south side of Whittemore Drive and dead ended with a hydrant at the intersection of the proposed roadway. Approximately four hundred and fifty five feet (455'+/-) of six-inch diameter water main is proposed alongside the proposed sidewalk and dead ended with a hydrant in the subdivision. However, Section 334-38.J. – “No dead ends shall be permitted. On dead-end streets, the full size water main shall be extended through easements to connect with existing water mains. On approved dead-end water mains, a valve shall be located with a hydrant within fifteen (15) feet of the dead end.” GCG recommends the proposed water main should be full size (Eight - inch (8") diameter minimum) and loop back to the existing water main on Whittemore Drive through easements. An additional hydrant should be added within fifteen 15 feet of the dead end. No domestic water services are proposed off the water main. Section 334-15 requires water supply system to be approved by the Department of Public Works – Water and Sewer Division. A hydrant flow test should be performed on the existing water main to verify adequate pressure and fire flow will be available once the proposed development is constructed.**
6. Ponds 1 and 2 do not provide the “access around the entire basin perimeter” requirement, MassDEP Stormwater Handbook. **(Resolved).**
7. Section 344-23.D(1) – requires street level type lamppost lighting in the front yard area per each lot. **(Resolved).**

Definitive Subdivision Plan, Sheet 4 of 8, **(4 of 10)** – Roadway Plan & Profile:

1. Section 344-20.E – requires one-inch (after compaction) of leveling course, if required. The plans should include the 1" Leveling Course in the Typical Roadway Section and state “if required, as determined by the Planning Board.” GCG recommends the 1" leveling course be required. **(Resolved).**
2. Section 344-22.B– requires sidewalk with a slope of one-fourth (1/4) inch per foot. Typical Roadway Section labelled a ¼" per foot pitch for the grass strip. The label should be for the sidewalk area. GCG recommends to label the sidewalk cross pitch at 1.5% with tolerance for construction $\pm 0.5\%$. Since (1/4) inch per foot/ (2%) cross slope is the maximum allowable for handicap accessible limit. **(Resolved).**
3. Stone Swale with subdrain cross-section should be shown on the roadway cross section. **(Resolved).**
4. Section 344-23.B(4)- requires reinforced concrete pipe (RCP) for drainage pipe and requires RCP Class 'V' for less than three (3) feet of cover. Drainage System Notes number 1 specified high density polyethylene (HDPE) dual wall pipe. **(The drop inlet pipe invert elevation should match the drain pipe sizing calculations, the plan**

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shows 8.31% pipe slope and the calculations use 6.60% slope, the proposed 18" diameter HDPE pipe has a flow full velocity of 15.3 feet per second. GCG recommends reduce the pipe slope to 4% or less and keeping the flow full velocity below 12 feet per second and use Class V RCP).

5. The proposed Drainage Manhole (DMH) at Station 5+90 60 feet right is over 12.5 feet deep, the dead load over the pipe is at the limit of the standard Class IV reinforced concrete pipe. Drainage profile should be provided for the 24-inch diameter and 30-inch diameter pipes, (between DMH Station 5+90 to Flared End-1). Pipe material should be designed based on the earth loads and live loads over the drain pipe accordingly, use Class V RCP as necessary. **(Resolved)**.
6. Section 344-8,B(11)(e) – requires all drainage facilities to be shown on profiles, showing invert elevations, slopes, capacity and velocity. **(The 18" diameter pipe from the Lot 3 drop inlet to DMH at Station 0+50 capacity and velocity should be listed)**.
7. **Pipe length and slope should be labelled for the 30-inch diameter outlet pipe between the basin outlet structure and the Flared End #2.**

Definitive Subdivision Plan, Sheet 5 of 8, (5 of 10) – Sediment and Erosion Control Plan:

1. The plans show a staked haybale ring at drop inlet. The label should match with the detail drawing which titled Drop Inlet Sediment Barrier. **(Resolved)**.

Definitive Subdivision Plan, Sheet 6 of 8, (6 of 10) – Roadway Cross Sections:

1. Section 344-8,B(10) – requires twenty five (25) feet intervals cross Section, fifty feet intervals cross sections provided. **(Resolved)**.

Definitive Subdivision Plan, Sheet 7 of 10 – Roadway Cross Sections:

1. **(Check proposed roadway cross-section between Stations 5+75 to 6+70, the proposed cross-section should include the center landscape island and roadway(s) with cross pitch within the cul-de-sac. The proposed pavement ended at Station 6+60 and it is still showing at the Station 6+70 section).**

Definitive Subdivision Plan, Sheet 7 of 8, (8 of 10) – Construction Details:

1. Section 344-23,B(6) – requires Type A-1 catch basin grate, (MassDOT has renamed the Type A-1 grate to Hooklock bar grate, as shown on the MassDOT Standard Detail Drawing Number E201.10.0). The proposed Precast Concrete Catch Basin Detail specifies Cascade style grate, which is an acceptable alternative. The Cascade style grate provides higher inflow capacity and is bicycle safe for use in roadway. **(No response required, subjects to Board approval)**.
2. The sub-drain detail should modified to specify the thickness of crushed stone to be placed over the filter fabric in the roadside swale with sub-drain. **(Resolved)**.
3. **(The Rip-Rap Apron Detail pipe end stone length FE-6 should be FE-2)**

Definitive Subdivision Plan, Sheet 8 of 8, (9 of 10) – Construction Details:

1. Section 344-8,B(10) – requires twenty five (25) feet intervals cross Section, fifty feet intervals cross sections provided. **(Resolved)**.
2. Drop Inlet detail should be included. **(Resolved)**.

3. (Typical Outlet Structure Detail Elevation View should be updated with two inlet orifices, 6-inch and 2-inch diameter openings)
4. (The length of the basin 2 emergency spillway rip-rap should be specified on the detail or on the Topographic Plan - sheet 2 of 10)

Definitive Subdivision Plan, Sheet 10 of 10 – Construction Details:

1. (No comment).

STORMWATER REPORT & DOCUMENTATION COMMENTS

Checklist for Stormwater Reoport:

1. The checklist uses a “country drainage” for LID Measures, however, the proposed system is using curb and gutter for roadway stormwater runoff collection, which does not qualify for LID Measures. **(Resolved)**.

Soil Test Logs:

1. Additional soil tests should be performed per MassDEP Stormwater Handbook requirements for infiltration Basin. **(Additional test logs have been provided within the proposed basin 2. However, the estimated seasonal high water table from the January 26, 2016 test pit DTH-B is approximately 5.5 higher than the test pit DTH-314-7 performed in March 19, 2016, both tests were performed at elevation 230+/- and 100 feet apart. Since this stormwater report includes the watershed area of the 6 frontage lots, GCG hereby requests a copy of the previously approved drainage study for basin one (1) for record.)**

MA D.E.P. Stormwater Standard:

1. Standard 1 - Item 2, Riprap sizing for the basins overflow spillway should be included in the calculations. The emergency spillways should be sized based on the brimful conditions. **(Basin 2 emergency spillway length should be specified on the plan).**
2. Standard 3 – Mounding Analysis, WQV calculations should be based on the HSG rating. (See Standard 4 – Water Quality Volume (WQV) comments). **(Resolved)**.
3. Standard 4 – Water Quality:
 - a) The proposed infiltration basin calculations are based on 2.40 inch per hour infiltration rate for Loamy Sand soil. DEP Stormwater Handbook Table 2.3.3. specified Loamy Sand, HSG ‘A’, should use 2.41 inches per hour infiltration rate, which also considered as Rapid Infiltration Rate and requires 1 inch Water Quality Volume. **(Resolved)**.
 - b) The proposed infiltration basins are located in the “416B” soil (Narragansett Silt Loam) area. It appears that the NRCS soil survey data has been updated recently, the soil report in the drainage report which indicates the 416B soil was rated HSG ‘B’. However, the latest Web Soil Survey has re-rated the 416B soil at the site location with a HSG rating of ‘A’ group soil. GCG believes that both ratings are acceptable. But the calculations should be consistent with the HSG chosen. Group ‘B’ soil should be associated with the Rawls infiltration rate for group ‘B’ soil (1.02 inch per hour) and the WQV would be based on the 0.5-inch rule. Group ‘A’ soil should use 2.41 inch per hour infiltration rate with the WQV based on the 1- inch rule. **(Resolved)**.

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- c) Treatment chain number 2, (Lots 4 and 5) does not meet the pre-treatment requirements for Infiltration Basin with 80% TSS removal. If the design intent is to use a Vegetated Filter Strip treatment, sizing calculations should be provided. **(GCG requests a copy of the previously approved study to be submitted for the record).**
4. Standard 9 – Operation and maintenance (O&M) Plan, see comments for the O&M plan. **(Resolved).**
5. **(Check 25-year storm event peak rate of runoff for the existing conditions, which should be 36.9 cfs.)**

Drain Pipe Sizing Calculations:

1. Drop inlets should be sized to handle the inflow of the 7.95 cfs and 6.86 cfs. Drop inlet grate or opening inlet capacity calculations should be submitted. **(Resolved).**
2. Pipes from Drop Inlet to DMH 0+50; from DMH 0+50 to DMH 2+55; from DMH 2+55 to DMH 5+05; from DMH 5+55 to DMH 5+90; DMH 5+90 to DMH 5+90RT; from DMH 5+90RT to DMH 1; and from DMH 1 to FE-1 have flow velocity exceeded the standard engineering practice of 10 feet per second. Maximum flow velocity for the design storm should be limited to 10 feet per second. **(Resolved).**
3. Section 344-23.B(4) requires reinforced concrete pipe (RCP) for drainage system, drainage pipe capacity and flow velocity calculations should be based on RCP sidewall roughness coefficient. **(Resolved).**
4. Emergency spillways sizing calculations should be provided with brimful conditions. **(The opening of the spillway should be sized to divert the storm associated with brimful conditions for the design (100-year) storm event per MassDEP Stormwater handbook Volume 2 Chapter 2 Infiltration Basin, page 91, rip-rap sizing should be based on the same storm flow).**

HydroCAD Calculations:

1. Subcatchment E1 (Existing Conditions), Project Engineer please verify the CN value for the 89,000 square feet of Pasture/Grassland /Range area, it appears the large pasture area is located in Map 12 Parcel 201 (the south side of Lot 1), this area has a HSG rating of 'C'. CN value should be 74. **(Resolved).**
2. The sum of (Post-Development Conditions) Subcatchments 23S, 25S and 27S total area exceeded Subcatchment E1 by 23,280 square feet. The post-development watershed area should equal to the pre-development watershed area. **(Resolved).**
3. Subcatchment 25S has a 99,000 square feet of HSG 'B' Pasture/Grassland /Range area, which should be HSG 'C' soil, same situation as item 1. Since this subcatchment drains through the roadside swale and pipe system to Infiltration basin #2. This CN value changes would affect the pre-development and post-development peak flows, the pipe capacity and velocity for the proposed network, and the available freeboard in Basins 1 & 2. **(Resolved).**
4. The post-development total HSG 'B' soil area should match the pre-development conditions. Project engineer should clarify the different of the total watershed area between the pre-development and post-development conditions. **(Resolved).**
5. Pond 1 is using 2.40 in/hr exfiltration rate in the infiltration calculations. MassDEP Stormwater Handbook specified 2.41 in/hr infiltration rate should be used for Loamy Sand soil (HSG 'A') (Rawls 1982). However, the watershed runoff calculation is based on HSG 'B' soil. Project engineer should not mix use the HSG type in the calculations. Loamy sand is rated HSG 'A', if 'A' soil is used for the infiltration, than it

- is considered exfiltration in Rapid Exfiltration Rate and the Water Quality Volume requirements should be based on 1 inch rule. **(Resolved)**.
6. Pond 2 shows a 12 feet long overflow weir routing should be considered a primary discharge, not secondary. **(Resolved)**.
 7. Pond 1 does not meet the 1-foot freeboard for the 100-year storm event as required by MassDEP Stormwater Handbook. **(Resolved)**.
 8. Drainage calculations should be revised accordingly. **(Resolved)**.

Operation and maintenance (O&M) Plan:

1. The General Site Restrictions calls for slow-release, low-nitrogen fertilizers. The applicant should explain how this requirement can be enforced. **(Resolved)**.
2. Catch Basins sump should be cleaned at least four times per year per MassDEP Stormwater handbook. **(Resolved)**.
3. Infiltration basin buffer, side slopes & basin bottom requires mowing at least twice a year. **(Resolved)**.
4. Forebay inspection and maintenance should be included in the plan. **(Resolved)**.

Additional Waive Requested:

1. Section 344-8.D Traffic Impact – the applicant is requesting a waiver for the Traffic Impact Assessment. GCG concurs with the ITE's trip generation, the proposed roadway will serve 7 single-family lots, the estimated average daily vehicle trips of 67 is within the ITE guild line. **(No response required)**.

If you have any questions regarding this matter, please contact our office.

Respectfully Submitted,
GCG Associates

Michael J. Carter

Michael J. Carter, P.E.
Project Manager