



ENGINEERING SUCCESS TOGETHER

August 31, 2015

Town of Sherborn
19 Washington Street
Sherborn, Massachusetts 01770

Attn: Mr. Alan Rubenstein, Chairman Mr. Steve Gaskin, Chairman
Board of Appeals Conservation Commission

Re: The Fields at Sherborn - Comprehensive Permit Application
Wetlands and Stormwater Management Review Update

Dear Mr. Rubenstein and Mr. Gaskin:

BETA reviewed the supplemental documents submitted for the Comprehensive Permit Application for The Fields at Sherborn relative to the Wetlands Protection Act, Sherborn Wetlands Protection Bylaw and Regulations and MassDEP Stormwater Management Standards. This letter is provided to outline BETA's findings, comments and recommendations.

BASIS OF REVIEW

The following documents have been provided and will form the basis of the review.

- Response to peer review comments letter with supporting documents to Mr. Steve Gaskin, Chairman of the Conservation Commission Inspections, dated August 26, 2015 from Creative Land and Water Engineering, LLC, Framingham, MA
- Response to peer review comments letter to Mr. Alan Rubenstein, Chairman of Zoning Board of Appeals and Mr. Steve Gaskin, Chairman of the Conservation Commission Inspections, dated August 28, 2015 from Bruce Saluk & Assoc. Inc., Marlborough, MA
- Plans (9 Sheets) entitled *The Fields at Sherborn Washington Street Sherborn* dated, December 8, 2014, revised through August 28, 2015 by Bruce Saluk & Assoc. Inc., Marlborough, MA
- *Storm Water Management Report (Addendum #1) The Fields at Sherborn Washington Street Sherborn, MA* dated, August 2015 by Bruce Saluk & Assoc. Inc., Marlborough, MA
- Property Plan entitled *Plan of Land Washington Street Sherborn* dated, December 8, 2014, revised through February 23, 2015 by Bruce Saluk & Assoc. Inc., Marlborough, MA

COMPILED REVIEW LETTER KEY

BETA reviewed this project previously and provided review comments in a letter to the Board dated July 29, 2015 (*original comments in italic text*). Creative Land & Water Engineering, LLC. (CLAWE) and Bruce Saluk & Associates, Inc. (BSAI) and provided responses (responses in standard text) and BETA has provided comments on the status of each (*in bold italics*).

Project Overview

The existing 17.55± acre wooded lot containing wetland resource areas is located on the south side of Washington Street opposite Knollcrest Farm Lane in Sherborn, Massachusetts. The project documents

indicate the proposed development includes 36 new residential units in 10 buildings with associated access drives, parking, private water wells, on-site septic, stormwater management systems and private utilities.

Massachusetts Department of Environmental Protections (MassDEP) Priority Resource Map indicates that the site contains wetland resource areas that may include one or more of the following: bordering and isolated wetlands, an intermittent stream, and a vernal pool buffer zone. A portion of the parcel is located within the limits of a wellhead protection area (Zone 2). Natural Heritage and Endangered Species Program (NHESP) maps indicate that the project parcel is located within an estimated habitat of rare wildlife and priority habitat of rare species.

WETLAND IMPACTS

Wetland Strategies, Inc. (WSI) reviewed the Notice of Intent, plans, and accompanying narrative for the subject project. On July 24, 2015, WSI conducted a site inspection and reviewed the flagged bordering vegetated wetland (BVW) boundaries. The following is a summary of WSI's findings, comments and recommendations.

Compliance with the MA Wetlands Protection Act and regulations at 310 CMR 10.00

MA DEP has issued file Number NE-283-0366 for the subject Notice of Intent.

The Notice of Intent (NOI) cover letter states that the work limits have been approved by the Natural Heritage and Endangered Species Program (NHESP). A letter dated June 24, 2014 from NHESP is included with the Notice of Intent filing. It is important to note however that the "approval" from NHESP is related to the earlier filing for this property (DEP file number NE 2830356).

W1. Since this is a new project, proposing different activities, the Commission must wait until NHESP issues a new letter (or until 30 days from the NOI filing date elapses) prior to issuing an Order of Conditions for this project. CLAWE: Letter from NHESP provided. WSI: New letter provided – conditions will need to be met.

During the course of the wetland delineation review, WSI observed an area where wetland vegetation and hydric soils were located up-gradient of the flagged wetland boundary. WSI placed a new pink/black wetland delineation flag, approximately 40 feet up-gradient of wetland flag A25. WSI notes that a previous NOI was filed for this site and on August 7, 2014 the Commission issued an Order of Conditions approving the work (See DEP file number NE 283-0356). A special condition of the Order was the confirmation of segments of the wetland boundary. Upon review of the former NOI plan an A25N flag was approved in a location similar to WSI flagging.

WSI agrees with the designation of intermittent for the stream located to the east of the site. In accordance with the MA regulations, WSI conducted a StreamStats analysis and has determined that the watershed to the stream is too small for perennial flows. As such the stream is intermittent and there is no Riverfront Area on the property.

The basic performance standard for wetlands protection is to avoid and/or minimize impacts to wetland resource areas and if that is not possible, provide mitigation to offset impacts. Although there are no direct proposed impacts to the bordering vegetated wetland (BVW) along the east and west sides of the development area, work including clearing, grubbing, grading and construction of buildings, driveways, access and utilities extends well within the 100 foot buffer zone of the BVW.

The project does not provide provisions to maintain the natural buffer zone nor mitigation for impacts to them and potential impacts to wetland resource areas. Note 310 CMR 10.53 (1) states the following as it relates to buffer zones:

.....For work in the Buffer Zone subject to review under 310 CMR 10.02(2)(b)3., the Issuing Authority shall impose conditions to protect the interests of the Act identified for the adjacent Resource Area. The potential for adverse impacts to Resource Areas from work in the Buffer Zone may increase with the extent of the work and the proximity to the Resource Area. The Issuing Authority may consider the characteristics of the Buffer Zone, such as the presence of steep slopes, that may increase the potential for adverse impacts on Resource Areas. Conditions may include limitations on the scope and location of work in the Buffer Zone as necessary to avoid alteration of Resource Areas. The Issuing Authority may require erosion and sedimentation controls during construction, a clear limit of work, and the preservation of natural vegetation adjacent to the Resource Area and/or other measures commensurate with the scope and location of the work within the Buffer Zone to protect the interests of M.G.L. c. 131, § 40. The purpose of preconstruction review of work in the Buffer Zone is to ensure that adjacent Resource Areas are not adversely affected during or after completion of the work.

W2. *Provide alternative(s) to maximize the maintenance of existing vegetation and reduction of impacts in buffer zones (i.e. cutting back grading, locating buildings further from wetlands, etc....) CLAWE:* We modified the project as a better alternative which including the following;

- Pull back all grading over spilled to 257 Washington Street
- Pull back the level spreader further away from wetland
- Provide wetland and buffer zone restoration and enhance planting beyond our limit of disturbance See revised plan, "Wetland and Buffer Zone Impact and Mitigation Plan", and landscape plan for details.

WSI2: The Commission should consider a condition requiring no further development beyond the work areas. A conservation restriction could also be put into place to make sure there is no further development or activity of any kind in that area. Since most of that area is located near the vernal pools, a permanent restriction is a good idea.

W3. *Clearly define limit of work and provide permanent visual barrier to prevent yards from expanding further into the buffers zones. Consider establishing setbacks from any steep slopes. CLAWE:* Yes. We provided a revised limit of work and pulled back as much as we can. The limit of work will be staked out first thing in the field. A permanent signage will also be provided as described in response to W1. *BETA2: An activity barrier is provided – provide details on plans.*

W4. *Mitigation should include providing supplemental plantings to enhance buffer zones to remain. CLAWE:* Yes. We provided supplemental plantings to enhance buffer zones as we described earlier. *WSI2: The buffer zone is altered, as a result of the agricultural use of the site. If the project goes forward, the agricultural use will cease and the field vegetation will shift and succeed to more of shrubby area and then more mature trees will take their place. This is typical succession of old farm fields.*

W5. *Provide the Commission any revisions to the plan as a result of Planning Board, Board of Health, Zoning Board of Appeals, Natural Heritage Endangered Species Program or other reviews. CLAWE:* Yes. We will provide revised plans to the Commission as a result of all review agencies. *BETA2: Applicant to conform – issue resolved.*

Private wells, nine of a total of ten, proposed for this project are located within the buffer zone. Although there is an on-site septic system that includes a soil absorption system, the water will be returned to the ground some 200 to 700 feet away and depending on groundwater flow directions it may not return to the same area.

W6. *Groundwater flow patterns should be analyzed to determine groundwater loss, if any, at the wetland and impacts to down gradient properties.* CLAWE: All drinking water wells will be bedrock wells with minimum depth of 400 ft with adequate casing sealed from the over burden aquifer to avoid and minimize interference and assure drinking water quality. We spoke with BOH staff, there were no water quality and quantity issues to the existing drinking water wells. Therefore, the drinking water wells will have little impact on the wetlands. Given the project is serviced by onsite septic system, 97% of the water will be returned to the groundwater and provide additional water resource to downgradient wetland. The total returned design flow in the leaching fields is about 10.04 ac-ft and as a real flow based on monitoring is about half of it, i.e. 5.02 ac-ft, which is about 30% and 22% of total available water resources on the 11.07 acres of land that we analyzed. See Table 4 for water budget analyses summary. We plotted ground water contours for high water season condition, which in general follows the surface topography. BETA2: *Stormwater and sanitary sewer water to be recharged on site. Further evaluation will be conducted for the Board of Health.*

Compliance with Sherborn Wetland Regulations

Section 3.4 of the local regulations requires a 50-foot no alteration zone. This indicates the Commission's regard for the importance of maintaining a natural buffer for the protection of wetland resource areas (see excerpt from 310 CMR above). The work including buildings, walkways, utilities proposed under this filing includes work within the 50 foot buffer zone and thus the project does not comply.

Provide a narrative explanation as to why proposed work is necessary within the 50 foot buffer. Explanation should document efforts to avoid, minimize and mitigate buffer zone impacts and how the project, with the reduced buffer zone, will continue to protect the BVW. CLWE: The project is a Chapter 40B project that require 25% homes be sold at or below construction cost to provide affordable homes for mid-low income families. As a tradeoff, the project is exempted from the local bylaws. Nevertheless, as we described above, the project design will provide adequate mitigation to protect all wetland interests. WSI2: *Recommend further discussion in this issue with the Commission.*

GROUNDWATER MOUNDING

GeoHydroCycle, Inc. (GHI) reviewed the infiltration testing and groundwater (stormwater) mounding calculations and offers the following comments.

GW1. Provide the following additional information or explanation for permeability testing:

- a. Method description
- b. Water temperature of 4.5° C
- c. Use of "Correction Factor"
- d. Tests done in Ap and Bw layers
- e. Reason for unsaturated testing

GW2. Provide the following additional information or explanation for groundwater mounding:

- a. Storm water volumes calculated by the mounding model
- b. The aquifer saturated thickness
- c. The hydraulic conductivity (134, 29 or 268 ft/day)

d. "Ker plunked" reference

GHC2: Recommend using the Dorney Method as was previously agreed upon. Provide calculations showing the basins meet the 3-day requirement that the mound is below the BMP bottom.

STORMWATER MANAGEMENT

BETA visited the site to confirm limits of watershed areas, characteristics, and existing surface conditions. The site is comprised of an open meadow, woodlands and wetlands. The topography of the site generally slopes down from the road to a knoll in the center of the lot sloping down to wetland areas on three sides. NRCS maps indicate upland soils are comprised of Haven silt loam and Hinckley loamy sand, with a Hydrologic Soil Group Rating (HSGR) A and low wetland areas are Freetown muck with a HSGR of A/D.

Development includes clearing portions of the wooded areas, grading the site and constructing buildings, pavements and lawns which will alter stormwater runoff from this site. The project proposes to mitigate these impacts by capturing and routing stormwater from roofs to subsurface infiltration systems. Runoff from pavement areas will be collected in deep sump catchbasins and routed through water quality units and then to a subsurface infiltration system.

The revised plan includes the addition of porous pavement for some access road and driveways.

The project is subject to the Wetlands Protection Act therefore the project was reviewed as it relates to DEP's ten Stormwater Management Standards with the following comments:

No new untreated stormwater conveyances (Standard No. 1): *No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.* The project does not propose any new stormwater conveyances and proposed uses are unlikely to generate pollutants - complies with standard.

SW1. *Provide sizing calculations and a level, non-erosive edge for the level spreaders (i.e. granite or concrete curb).* BSAI: A concrete curb has been added to the Level Spreader Detail shown on Sheet C6. The 10yr design flow to the East & West level spreaders are 0.3 cfs and 0.1 cfs; respectively. Since these flows are very small, we have changed the level spreader length to 10 ft. *BETA2: Revised detail provided – issue resolved.*

Post development peak discharge rates (Standard No.2): *Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.* Calculations included in the Stormwater Report indicate there will be no increase to the peak rates of stormwater runoff.

SW2. *The existing watershed map areas do not match the HydroCAD model. Watershed analysis areas should include areas from offsite upgradient areas that contribute runoff onto the site. The HydroCAD model analyzes a total of 11.07 acres where the maps show areas that includes the entire 17.55 acre parcel. Revise watershed maps and analysis accordingly.* BSAI: The attached Addendum includes the updated Watershed map that now includes up gradient tributary areas to the project site. The HydroCAD model does not analyze runoff from the Wetlands and other areas located down gradient of the development area, because those areas remain unchanged between Pre & Post Development conditions. *BETA2: Watershed maps revised – issue resolved.*

SW3. *Except for disturbance where test pits were dug, field observations indicate that existing woods and grass areas should be modeled in "good" not "fair" condition. Revise analysis to reflect "good"*

surface condition throughout. BSAI: The revised HydroCAD model now incorporates the ground coverage condition recommended above. *BETA2: Calculations revised – issue resolved.*

SW4. *Area PPR1 should be divided into two subareas to prevent the time of concentration for the septic fields from skewing the peak flow (time of concentration) calculations for the entire developed (impervious) area.* BSAI: Subarea PR1 has now been divided into 2 subareas shown as PR1 & PR4. *BETA2: Calculations revised – issue resolved.*

Recharge to groundwater (Standard No.3): *Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to maximum extent practicable.* The design plans show that project proposes the infiltration of roof runoff and an infiltration basin for pavement runoff - complies with standard.

SW5. *Provide explanation for PVC geomembrane liner on bottom of infiltration basin allowing utilization of only 21% of the basin for infiltration.* BSAI: The proposed 30m Mil PVC liner is was used to control the recharge volume with the previous hydrologic model. The current design also utilizes the PVC liner. *BETA2: BETA understands the concept, however, does not think this will work as intended. Water will fill the stone below the entire system and infiltrate evenly – at a high rate. However, the calculations indicate the system has the required capacity to accommodate volumes given the artificially reduced infiltration rates. BETA defers to the design engineer as to the need for the membrane.*

Total suspended solids (Standard No.4): *For new development, stormwater management systems must be designed to remove 80% of the annual load of Total Suspended Solids (TSS).* The project proposes deep sump catchbasins, water quality units and subsurface infiltration systems. Due to soils with high infiltration, 80% TSS removal is required prior to infiltration. The design meets this requirement - complies with standard.

SW6. *Recommend “clean” roof drains for buildings A, B and C be routed directly to infiltration system and not through water quality unit.* BSAI: Although DEP recognizes that the roof water does not require treatment before infiltration, there will be a small amount of suspended solids. Since the Water Quality Treatment devise has excess capacity, and is located in a convenient location, we feel that it is good practice to increase the treatment to 84 % TSS removal prior to infiltration where it does not add to the construction cost. *BETA2: The effectiveness of BMPs will be higher if roof water is separated. BETA defers to the Commission on this issue.*

Higher potential pollutant loads (Standard No.5): *Stormwater discharges from Land Uses with Higher Potential Pollutant Loads require the use of specific stormwater management BMPs.* The project does not propose any uses with higher potential pollutant loads – not applicable.

Critical areas (Standard No.6): *Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas.* The project discharges to critical areas. Design includes water quality inlets to treat runoff prior to infiltration and discharge to wetland - complies with standard.

Redevelopment (Standard No.7): *Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable.* The project does not qualify as a redevelopment project – not applicable.

Erosion and sediment controls (Standard No.8): *Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.* The project is proposing to disturb more than one acre of land and therefore a Stormwater Pollution Prevention Plan (SWPPP) and Notice of Intent with EPA are required. The Applicant will need coverage under the National Pollution Discharge Elimination System (NPDES) Construction General Permit. Erosion and Sedimentation Controls locations and details are provided on plan.

- SW7. *Provide dimension of straw wattle diameter. Recommend minimum of 12 inches.* BSAI: The 12 inch diameter dimension is now shown on the straw wattle detail on Sheet C6. *BETA2: Erosion control detail revised to haybales with silt fence– issue resolved.*
- SW8. *Provide locations and erosion controls for stockpile areas.* BSAI: The locations of the proposed stockpile areas and erosion control are now provided on the Grading Plan (SH C2). *BETA2: Stockpile areas provided – issue resolved.*
- SW9. *Provide specific methods to protect infiltration basin from sedimentation during constructions to maintain the design infiltration rate post construction.* BSAI: Language for protection of the Infiltration area has now been added to the Construction Sequencing of the Construction Pollution Prevention & Erosion /Sedimentation Control Plan in Appendix 'C'. The grading plan also addresses the protection of the infiltration area when it is being used as a temporary Sedimentation trap during construction. *BETA2: Notes provided – issue resolved.*
- SW10. *Recommend a condition to provide a copy of the stormwater pollution prevention plan (SWPPP) to Conservation Commission prior to commencing construction.* BSAI: The recommended Condition is as follows: Prior to the pre-construction conference, the applicant shall have obtained an EPA NPDES Construction General Permit. The Contractor shall follow the erosion control inspection and documentation specified in the storm water pollution Prevention Plan (SWPPP) that will be prepared, as required by the EPA regulations. The contractor shall document inspection using the inspection forms provided in the SWPPP. *BETA2: BETA concurs – issue resolved.*

Operations/maintenance plan (Standard No.9): *A Long-Term Operation and Maintenance Plan shall be developed and implemented to ensure that stormwater management systems function as designed.* An Operation and Maintenance Plan was not provided for review.

- SW11. *Provide a plan showing the locations of all stormwater BMPs along with discharge points.* BSAI: An 11x17 schematic BMP location plan has been included in the back of the Stormwater Management report. *BETA2: Plan provided.*
- SW12. *Recommend pavement areas be swept twice per year (spring and fall).* BSAI: This provision has been added to the Long Term Operation and Maintenance Plan in Appendix 'B'.
- SW13. *Provide snow storage areas on plan. These should be coordinated with landscape plan.* BSAI: The proposed snow storage areas have been added to the Layout plan (SH. C1). *BETA2: A few small snow storage areas are provided. Applicant should account for snow loads on infiltration system. It is also assumed that snow for individual driveways will be stored on areas adjacent to them.*
- SW14. *Recommend condition to provide copies of inspection reports to the Conservation Commission.* BSAI: The Inspection reports for the Construction Stage shall be submitted to the Conservation Commission on a Monthly basis. Refer to the inspection Forms provided in Appendix 'C' for the Construction pollution Prevention & Erosion/Sedimentation Control Plan. The inspection Reports for Post Development shall be submitted to the Conservation Commission on a bi-annual basis. Refer to the Inspection forms.
- BETA2: BSAI indicated that a revised O&M Plan will be submitted addressing the above comments and the Conservation Agent's comments. Special restrictions for installation, inspection and maintenance of the porous pavement should be included.*

Illicit discharges (Standard No.10): *All illicit discharges to the stormwater management system are prohibited.* The project documents include a statement noting the site does not include any illicit discharges - complies with standard.

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,
BETA Group, Inc.

GeoHydroCycle, Inc.

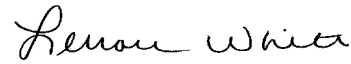
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