

January 31, 2018

**Martha Morrison, Chair
Topsfield Planning Board**

Town of Topsfield
461 Boston Street, Unit E-6
Topsfield, MA 01983

**Reference: Perkins Row Open Space Development Definitive Subdivision
293 Boston Street, Topsfield, MA
Peer Review Report**

Via: Email

Dear Chair Morrison and Members of the Board:

Our office appreciates the opportunity to review the above referenced project and provide recommendations and commentary to the Town of Topsfield Planning Board. We have conducted this review based on the following documents supplied to our office by Town Staff:

- Perkins Row Open Space Development Plan Definitive Subdivision Plans, prepared by Marchionda & Associates, L.P., dated November 29, 2017, 12 Sheets.
- Stormwater Report, prepared by Marchionda & Associates, LP dated November 29, 2017 and revised January 17, 2018.

Our office has also utilized the following Town of Topsfield By-Laws and Regulations:

- Town of Topsfield Zoning Bylaws;
- Topsfield Planning Board Rules and Regulations Governing the Subdivision of Land in the Town of Topsfield;
- Stormwater and Erosion Control Regulations, Town of Topsfield Planning Board; and,
- Massachusetts DEP Stormwater Management Handbook

We have noted numerous locations where the project has not provided the required information per the regulations, or has provided information does not meet Topsfield criteria. We have noted the specific regulatory section that needs to be addressed.

Our specific comments are below.

Topsfield Planning Board Rules and Regulations Governing the Subdivision of Land in the Town of Topsfield

Comment 1 - Section 4.3.2.j – The applicant shall submit an Environmental Impact State which shall provide the information shown in Appendix to these Rules and Regulations and clearly show the relation of the proposed project to the total environment of the Town and its inhabitants. The applicant has requested a waiver to this requirement. Since the application is for the creation of a single buildable lot, our office has no objection to this waiver request.

Comment 2 - Section 5.1.2 – The cross-section standard on plate 2 includes 13 feet of pavement to the front face of the curbing and 14 feet of pavement total width on both sides of the centerline. The applicant has proposed 10 feet of pavement to the front face of the curbing, and has not shown the pavement to extend below the curbing. The cross-section should be revised to show the pavement extending one foot underneath the curb as shown on plate 2.

Comment 3 - Section 5.1.2 – The cross-section standard on plate 2 includes 1.5" surface course, 2.5" binder course, 12" crushed stone, and 12" gravel base course. The applicant has not shown any buildup depth layers. The buildup layer depths should be added to the plans. In addition, the applicant should add the following notes:

- Crushed stone shall contain no stones larger than 1.5" diameter
- Gravel base course shall:
 - Be reasonably free of fines.
 - Contain no stones over 4" diameter.
 - Be compacted to 95% optimum density
- Subbase to be acceptable to superintendent of highways.

Comment 4 - Section 5.1.2 – The applicant has not identified the treatment of the shoulder on the left side of the cross section.

Comment 5 - Section 5.1.2 – The cross-section standard on plate 2 includes a slope of ¼" per foot slope for the shoulder on both sides of the roadway. The applicant has not provided a slope for the two shoulders. This should be noted on the plans and details.

Comment 6 - Section 5.1.3 Table 1 – The required right of way width for a minor street is 50 feet. The applicant is proposing a 40 foot wide right of way. The applicant has requested a waiver. Since this the creation of a single buildable lot, our office supports this waiver request.

Comment 7 - Section 5.1.3 Table 1 – The required pavement width for a minor street is 26 feet. The applicant has requested a waiver to allow for a pavement width of 20 feet. The applicant should

justify their request of this waiver. As shown on the plans at approximately station 1+60, the right lane narrows from approximately 13.5 feet to approximately 10 feet as scaled from the plans. Dimensions should be added to the plans to confirm roadway widths along Martina Way.

Comment 8 - Section 5.1.3 Table 1 Grade a. – The maximum grade is 8.00 percent. The applicant has requested a waiver for the existing paved portion of Martina Way that according to the plans has a grade of 10.1 percent. This should be reviewed by the Highway and Fire Department, and comments should be provided to the Planning Board.

Comment 9 - Section 5.1.3 Table 1 Intersection a. - The minimum angle in degrees permitted is 90. The intersection between Martina Way and Perkins Row is not 90 degrees. A waiver should be requested for this requirement.

Comment 10 - Section 5.1.3 Table 1 Intersection c. - The minimum radius at roadway edge is 25 feet. The applicant should confirm what the existing radii are at the intersection of Perkins Row and Martina Way. If the radii are not 25 feet, a waiver should be requested.

Comment 11 - Section 5.1.3 Table 1 Intersection d. – The minimum sight distance required is 200 feet. No documentation has been provided verifying the sight distance at the intersection is in excess of 200 feet. Sight distances should be shown on the plans.

Comment 12 - Section 5.1.3 Table 1 Dead-End Streets e.1. - The minimum required pavement radius, outer edge is 110 feet. The applicant has proposed a minimum required pavement radius, outer edge of 45 feet. The applicant is requesting a waiver to reduce the outside diameter edge of the cul-de-sac from 110 feet to 90 feet. The applicant should provide a turning analysis that a fire truck will safely be able to navigate the reduced outside diameter edge. Our office has no objections to this waiver once this turning analysis has been performed and confirms the ability to navigate the reduced outside diameter edge.

Comment 13 - Section 5.1.3 Table 1 Dead-End Streets e.3. - The minimum height of island above surrounding pavement is 16 inches. The applicant is requesting a waiver of the minimum height of the island surrounded by pavement to allow the island to be depressed in order to provide for stormwater treatment. Our office has no objections to this waiver request.

Comment 14 - Section 5.1.3 Table 1 Dead-End Streets e.5. – The minimum right-of-way radius is 120 feet. The applicant has not provided a continuous radii along the entire cul-de-sac as the right-of-way terminates into the property line at 146 Perkins Row. In addition, the cul-de-sac has a radius of 65 feet and does not meet the requirement.

Comment 15 - Section 5.1.3 Table 1 – The actual cul-de-sac shall be centered on the right-of-way. The applicant has not provided any dimensions along the centerline of the proposed roadway, and it cannot be verified if the cul-de-sac has been centered on the right-of-way.

Comment 16 - Section 5.1.5.b – Natural features such as large trees, stone walls and other features to be preserved should be shown on the plans. It appears that large trees have been mapped on a portion of the site, and should be mapped on the remainder of the site subject to the development. The tree line shown on the plans should clearly depict the entire tree line and not terminate in lot 1.

Comment 17 - Section 5.1.5.d through 5.1.5.h – Please add notes relative to these items to the General Notes sheet or the appropriate details.

Comment 18 - Section 5.1.6.b through 5.1.6.e – Please add the material specifications noted in these sections to the typical roadway section detail in the plan set.

Comment 19 - Section 5.3 – The full arc length of curves at intersections shall consist of granite curbing. No granite curbing is proposed at the intersection of Perkins Row and Martina Way. Additionally, No transition details for the change from bituminous berm curbing to granite curbing are shown in the plan set, and should be added accordingly.

Comment 20 - Section 5.4 – Sidewalks may be constructed only on one side of the roadway at the property line on Minor Streets. The applicant has requested a waiver to this requirement. Our office has no objections to this waiver request.

Comment 21 - Section 5.7 – The location and details of the street name signs should be included on the plans.

Comment 22 - Section 5.9 – A proposed TEC line is shown on the plans, however it is not clear what this is being connected to. A label should be added to the plans to describe where the connection to existing utilities is being made. It appears the connection may be made to a utility pole, however this utility pole appears to be located outside the right of way and located on 146 Perkins Row. The applicant should confirm that they have permission to make this connection if this is the intention.

Comment 23 - Section 5.11 – The need for Fire Alarm and Police Call Boxes should be discussed between the applicant and the Board.

Comment 24 - Section 5.12.1.b – The applicant has proposed that the water service be installed 7 feet minimum to the right of the centerline of the roadway. Plate 1 requires that the water line be installed a minimum of 10 feet to the right of the centerline. Additionally, the applicant does not

provide a dimension from the edge of the roadway to the proposed telecomm, electric, and cable as shown on plate 1, and should be added accordingly. The horizontal location of the utility lines should match the location in Plate 1 of the Subdivision Regulations. If this is not practical, a waiver should be requested.

Comment 25 - Section 5.12.1.d – No trench detail has been provided. Trench details should be provided for each utility.

Comment 26 - Section 5.12.2.c. – The water pipe diameter shall not be less than 8 inches. The applicant has shown a water pipe that is a 1" type "k" copper water service. The applicant should request a waiver from this item.

Comment 27 - Section 5.12.3.b – The applicant has not provided documentation that the drainage system has been designed using a minimum of a 25-year design frequency storm event. Additionally, the drainage system has not been designed in accordance with the natural drainage boundaries of the total drainage area. According to the watershed maps, the boundaries of the total drainage area have terminated at various property lines. The watershed boundaries are discussed further in the Stormwater and Erosion Control Regulations of this report.

Comment 28 - Section 5.12.3.e – Drainage pipe beneath the roadway shall be reinforced concrete and have a minimum diameter of 12 inches. The applicant has requested a waiver to allow 8 inch HDPE under the roadway in lieu of 12inch RCP from CB 3 to DMH 2 and to allow all other drain pipe to be HDPE in lieu of RCP. It is not clear why the applicant is requesting a waiver to allow for 8 inch HDPE from CB 3 to DMH 2, when no calculations have been provided for the sizing of the pipes as required by section 5.12.3.b. Also, it is not clear why the applicant is proposing to use HDPE pipe instead of RCP. At this time our office does not support this waiver request.

Comment 29 - Section 5.12.3.k – No drainage pipe trench detail has been provided detailing that applicant will meet the requirements of the section. A drainage pipe trench detail should be provided detailing the requirements of this section.

Comment 30 - Section 5.12.3.f – Provide a detail per Plate 3 of the Subdivision Regulations. Provide a detail on transitioning from bituminous berm curb to the granite curb inlets.

Comment 31 - Section 5.12.3.f – Provide a profile and cross section of the swale shown between the proposed driveway and 142 Perkins Row to insure flooding does not incur onto the abutting property.

Comment 32 - Section 5.12.4 – The applicant has not proposed whether there will be a connection to a public sewerage system or whether there will be a private on-lot sewerage system. We anticipate

that there is a septic field in the southwest corner of lot 1, and if this is a septic field it should be labeled as such.

Comment 33 - Section 5.13.1 – No drainage easements have been shown for the drain lines and infiltration systems. Drainage easements should be shown on the plans.

Comment 34 - Section 5.13.1 – On sheet 2 of 12 Legend and Notes, General Note 13 states *“All required utilities exclusive of transformers shall be placed underground. The developer shall provide easements for transformers where necessary.”* The plans however do not show transformer locations or any easements pursuant to this section of the regulations.

Comment 35 - Section 5.14.3 – Iron pipe markers set in concrete shall be installed at the intersection of all lot lines with street lines. An iron pipe marker should be proposed along the lot 1 property line intersecting with the right of way. Details and notes for the iron pipe markers should be added to the plans.

Comment 36 - Section 5.19 – Notes regarding the preservation of trees and other features should be added to the plans.

Comment 37 - Section 5.20.1 – Shade trees of species approved by the Tree Warden shall be planted on each side of each street (at least two (2) per lot) in a subdivision, except where the Definitive plan show trees to be retained which are healthy and adequate. If the applicant is not proposing to provide shade trees, the applicant should submit a waiver request.

Stormwater and Erosion Control Regulations, Town of Topsfield Planning Board

Comment 38 - Section 5.0.C.1 – A note should be added to the Site Plan or General Notes sheet that reads “Any stormwater and erosion control permit issued in conjunction with a Definitive Plan for the Subdivision of Land shall apply to the alteration of the land approved in said plan, i.e. alteration associated with the construction of the infrastructure of the project and any grading or filling for the creation of lots indicated on the plan. Subsequent or additional alteration to individual lots in the subdivision will require stormwater and erosion control permits unless there are no changes from those approved in the Definitive Plan or the lots are exempt under the bylaw.”

Comment 39 - Section 6.0.L.2.e – On sheet 2 of 12 general note 13 indicates there will be transformer easements. The locations of all existing and proposed property lines and easements should be shown on the plans. Also, no easements have been shown for the stormwater management facilities.

Comment 40 - Section 6.0.L.2.g - There appears to be an 86 contour to the west of the flower bed, and the next contour to the north is a 90 contour. It appears an 88 contour is missing separating the 86 contour from the 90 contour. Additionally, existing contours should be provided extending beyond the watershed boundaries so that the watershed boundaries may be verified.

Comment 41 - Section 6.0.L.2.h - The watershed boundaries appear to follow the property lines along Martina Way, as well as the eastern and southern property lines. These boundaries should be reevaluated to determine the correct actual watershed boundary based on topography and natural features and not on boundaries established by deeds. In addition, existing subcatchment E-1 has been delineated with a study point within Perkins Row. It is not clear how stormwater in the southeastern corner of this subcatchment will flow to the analysis point. Additionally, there appears to have been watersheds delineated without surrounding contours. Contours surrounding the watersheds should be shown to verify that the watersheds have been correctly delineated.

Comment 42 - Section 6.0.L.2.k - Estimated high ground water elevation should be shown on the plans in areas to be used for stormwater retention, detention, or infiltration.

Comment 43 - Section 6.0.L.2.l - All existing vegetation, including trees over 12 inches in diameter at 4 feet above ground level should be shown on the plans. The plans appear to show only a certain portion of the site's existing vegetation, and should be shown throughout the development area of lot 1.

Comment 44 - Section 6.0.L.2.o.i - The location, cross sections and profiles of all drainage swales and their methods of stabilization should be shown. This includes but is not limited to the swale located between the proposed dwelling and the eastern property line and the swale created on the northern side of the cul-de-sac.

Comment 45 - Section 6.0.L.2.o.ii - No detail has been provided for the flared end structure. Additionally, no erosion control devices have been provided on the downstream side of what appears to be the unidentified leach field in the southwestern corner of lot 1.

Comment 46 - Section 6.0.L.2.o.iii - No construction sequence and installation timing as they relate to soil disturbance has been provided.

Comment 47 - Section 6.0.L.2.o.iv - Submit a plan showing areas of vegetation alteration, soil disturbance and areas of cut and fill.

Comment 48 - Section 6.0.L.2.o.v - Submit a phasing plan that indicates vegetation alteration, soil disturbance, cut and fill including designated soil stockpile locations with a tabulated sequence of construction and construction schedule, including earthworks.

Comment 49 - Section 6.0.L.2.o.vi - Submit a proposed schedule for the maintenance of erosion control measures in tabular form should be included for the project throughout the construction period.

Comment 50 - Section 6.0.L.3.d - Total runoff volumes have not been provided for each watershed area.

Comment 51 - Section 6.0.L.3.e - Provide information on construction measures used to maintain the infiltration capacity of soil where any kind of infiltration is proposed.

Comment 52 - Section 6.0.L.3.g - No documentation has been provided on culvert capacities.

Comment 53 - Section 6.0.L.3.h - No documentation has been provided on flow velocities.

Comment 54 - Section 6.0.L.6. – No landscaping plan has been provided describing the woody and herbaceous vegetative stabilization and management techniques to be used within and adjacent to the stormwater practice.

Comment 55 - Section 6.0.M.2 – Provide a map showing the location of the systems and facilities including catch basins, manholes/access lids, main and stormwater devices.

Comment 56 - Section 6.0.M.3 – Maintenance agreements should be included that specify the following:

- The names and addresses of the person(s) responsible for operation and maintenance;
- The person(s) responsible for financing inspection, maintenance and emergency repairs;
- An Inspection and Maintenance Schedule for all stormwater management facilities including routine and non-routine maintenance tasks to be performed;
- A list of easements with the purpose and locations of each;
- The signature(s) of the owner(s).

Comment 57 - Section 6.0.M.4 – Draft easement language should be included for the stormwater easements.

Comment 58 - Section 7.0.A - The applicant provides statements that the project meets or does not apply to the various DEP Stormwater Standards. In certain cases, the applicant has not provided calculations and documentation in accordance with the DEP Stormwater Handbook, Volume 3, Documenting Compliance.

Comment 59 - Section 7.0A – Massachusetts Stormwater Standard 3 requires a mounding analysis when the vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four feet and the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm. Mounding analyses should be provided for all infiltration systems within four feet of seasonal high groundwater.

Comment 60 - Section 7.0.A - Massachusetts Stormwater Standard 10 requires an Illicit Discharge Compliance Statement. The applicant has indicated that it shall be the project owner's responsibility to prepare an Illicit Discharge Statement in accordance with Standard 10 certifying that no discharges exist on the site. Since the Illicit Discharge Compliance Statement has not been filed, Mass DEP requires the Final Order of Conditions to require the submission of an Illicit Discharge Compliance Statement prior to the discharge of stormwater runoff to the post-construction best management practices.

Comment 61 - Section 7.0.A - Test pit 7-17 on the plans indicates the ground elevation to be 91.0, and the estimated water table to be 65 inches. By calculation, the estimated water table is at elevation 85.6. In accordance to Standard 3 of the Massachusetts Stormwater Handbook Volume 1 Chapter 1, there must be at least a two foot separation between the bottom of the infiltration structure and the seasonal high groundwater table. According to the plans, the sediment forebay located next to test pit 7-17, the bottom contour of the sediment forebay of 87 is within 1.4 feet of the estimated seasonal high groundwater table.

Comment 62 - Section 7.0.B.1 - The plans appear to indicate that the existing bituminous pavement ends approximately 170 feet from Perkins Row as scaled from the plans. The plans in the post-development condition appear to show 60 feet of proposed untreated pavement discharging to Perkins Row. Documentation should be providing detailing how this untreated pavement will achieve the required treatment prior to discharging to the municipal drainage system.

Comment 63 - Section 7.0.B.5 – Recharge calculations have been provided; however Massachusetts Stormwater Standard 3 requires an adjustment factor when recharge areas do not capture 100% of the impervious site area. This factor is known as the Capture Area Adjustment factor, and must be applied for the new proposed impervious area that are not being recharged. In appendix 2, on sheet one of two, the applicant states that there is 0.61 acres of proposed impervious cover, and on sheet

two of two, the applicant states 0.31 acres of impervious surfaces are draining to the BMPs. This indicates that the adjustment factor must be applied.

Comment 64 - Section 7.0.B.8.g – In preparing the hydrologic calculations, the standard for characterizing predevelopment land use for on-site areas shall be woods. The predevelopment calculations should be updated to accommodate this requirement.

Stormwater Management Report – Other Comments

Comment 65 - There appears to be a typo at the 12" HDPE pipe between FES-1 and DMH-2. FES-1 on the plans has an invert of 89.0 connected to a 12" HDPE pipe of 176 linear feet at a slope of 0.068 foot per foot. At this slope and length, the calculated invert at DMH-2 would be approximately 100.97. The invert on the plans at DMH-2 connected to FES-1 is 90.2.

Comment 66 - A discrepancy has been identified at the 8" HDPE pipe between DMH-2 and CB-3. DMH-2 on the plans has an invert of 90.3 connected to an 8" HDPE pipe of 44 linear feet at a slope of 0.03 foot per foot. At this slope and length, the calculated invert at CB-3 would be approximately 91.62. The invert on the plans at CB-3 is 91.5.

Comment 67 - The rim elevation of YD-1 is 93.5 and a 93 contour is shown around the yard drain. It is not clear if the intent is to make this an infiltration area, or if the rim elevation should be around elevation 92.5.

Comment 68 - The Time of Concentration calculation for subcatchment E-1 has been calculated to have a total travel time of 15.90 minutes. When all of the components of travel time are added individually, the sum is 15.95 minutes. While this may be a rounding error, we would like to confirm what the value should be.

Comment 69 - The Time of Concentration calculation for subcatchment E-2 has been calculated to have a total travel time of 10.90 minutes. When all of the components of travel time are added individually, the sum is 10.93 minutes. While this may be a rounding error, we would like to confirm what the value should be.

Comment 70 - According to Pond No. 1 – Cul-de-sac found in Appendix 1 Hydrographs section, the contour area for elevation 93.00 is 200 square feet, however scaled from the plans is approximately 175 feet. The contour area for elevation for 94.00 in the report is 400 square feet, however scaled from the plans is approximately 350 square feet. While we do not think this discrepancy will be problematic, the applicant should confirm the correct value.

Comment 71 - According to Pond No. 1 – Cul-de-sac found in Appendix 1 Hydrographs section the Manning's coefficient for the culvert structure is listed as 0.013 which is commonly used for concrete pipes. According to the plans, the pipes are shown as HDPE which are not found with a Manning's coefficient equal to this value.

Comment 72 - The cul-de-sac found in Appendix 1 Hydrographs section, Pond No. 1, which indicates the slope of the culvert is 1.00 percent. According to the plans, the slope is 3.00 percent.

Comment 73 - Pond No. 1 – cul-de-sac found in Appendix 1 Hydrographs section the span in inches of the culvert is 12.00, and on the plans the culvert is an eight (8) inch HDPE pipe.

Comment 74 - Pond No. 1 – Cul-de-sac found in Appendix 1 Hydrographs section indicates the length of culvert is 50 feet, however according to the plans, the pipe is 44 linear feet.

As the project moves through the various stages of permitting, we encourage the Board and the applicant to endeavor to submit one final set of plans at the conclusion of permitting with a final revision date and description labeled Control Documents. This final set should contain and any and all revisions requested by the Board, peer reviews and other regulatory authorities. The Control Documents will provide a basis for all Town Departments to understand exactly what was approved for construction without the confusion that can come from multiple sets of plans tied to the same project. We also encourage the applicant to develop a comprehensive stormwater management plan for the entire project as required by the Town of Topsfield Stormwater Management regulations.

Our office looks forward to answering any questions you may have on this review and we look forward to discussing our findings with the Board on the evening of February 6, 2018 at the Planning Board's regular meeting. If you have any questions prior to that meeting, please do not hesitate to contact me directly.

Sincerely,
Beals Associates, Inc.



Devin P. Howe, EIT
Project Engineer
C: C-979.01 File