

Bay Colony Group, Inc.
Professional Civil Engineers & Land Surveyors

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December 2, 2020

Mr. Anthony Padula, Chairman
Franklin Planning Board
355 East Central Street
Franklin, MA 02038

RE: "Maple Hill" Definitive Plan

Dear Mr. Padula:

We have completed our filing with the Franklin Conservation Commission which closed the public hearing on November 19th and voted to issue an Order of Conditions. We have also received a letter from BETA Group which indicates that all outstanding engineering issues are addressed. After our last meeting we discussed the issue of paving Bridle Path as a condition of approval and the Applicant has agreed to that condition. In order to be sure that we are all on the same page I have prepared an off-site improvement summary which outlines the work to be done and the timeline for completion. The document is attached and we can discuss it at the next meeting on December 7th.

Thank you for your consideration.

Very truly yours,

BAY COLONY GROUP, INC.



William R. Buckley, Jr., P.E.
Project Manager

Encl.

Off-site Improvement Summary

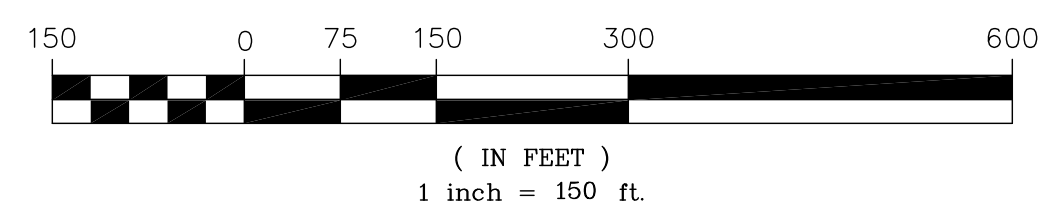
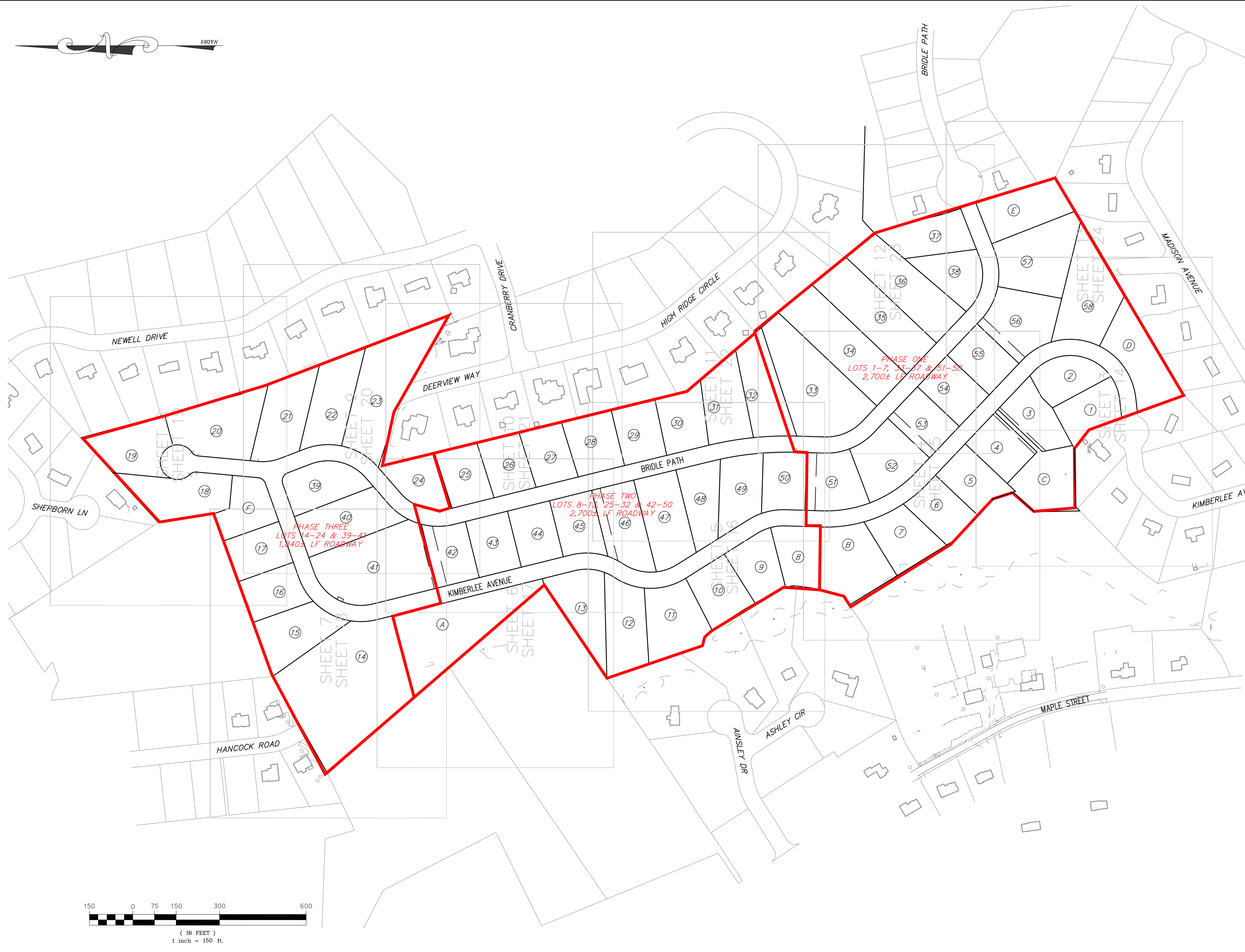
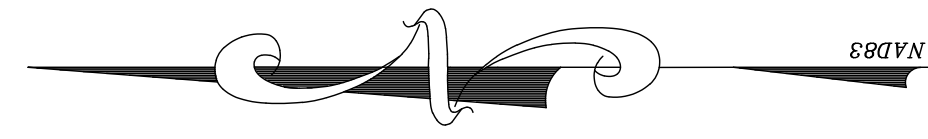
As part of the approval of the Maple Hill subdivision with the requested waivers, Applicant will perform the below described off-site improvements. These off-site improvements will be designed and constructed by the Applicant subject to receipt of all necessary rights, easements, permits and approvals, including the Town negotiating and obtaining the necessary easements and rights-of-entry to allow for the construction of the following off-site improvements.

1. **Maple Street Sight Distance Improvements** – Work that is shown on the plan entitled “Maple Street Stopping Sight Distance Study Plan” by Vanasse & Associates, Inc. dated 9/16/2020. The work will be completed prior to the issuance of any building permits for Phase 2 of the Project. Said phasing is as shown on Sheet 2 of the Maple Hill definitive plan.
2. **Kimberlee Avenue/Bridal Path Traffic Calming** – Work that is shown on Figures 1-4 as attachments to the letter to the Franklin Planning Board from Vanasse & Associates, Inc. dated September 21, 2020. The work includes traffic calming measures along both Kimberlee Avenue and Bridal Path that will include the installation of mountable mini roundabouts at the three (3) intersections along Bridal Path (Surrey Way, Phaeton Lane and Steeplechase Lane) and within the cul-de-sac at the current terminus of Kimberlee Avenue. The work will be commenced no later than the issuance of the first building permit for Phase 3 and will be completed prior to the issuance of the 57th building permit for the permit. The intent is to retain 1 lot under the subdivision covenant until all of the work is completed.
3. **Bridal Path Overlay** – Mill and overlay Bridle Path to a depth of 1-1/2” in accordance with MassDOT Specification Section 415 & Section 450, not including any repair or replacement of curbing or structures. The work will be completed prior to the issuance of the 57th building permit for the permit. The intent is to retain 1 lot under the subdivision covenant until all of the work is completed.

The Applicant shall file for approval of said off-site improvements with the DPW Director and any other Town Board, Committee or Official the application(s) or request(s) for approval required to obtain the necessary permits and approvals for construction of each of the above described improvements. If the DPW Director or any other Town Board, Committee or Official does not approve the filed application or request for approval within sixty (60) days of filing said application or request for approval, then said improvement shall thereafter not be required to be constructed by the Applicant and no building permits will be withheld and no lots will be retained under the subdivision covenant because said improvement has not been commenced or completed.

If necessary easements or rights of entry to allow for the construction of any of the above described improvements are not obtained by the Town within sixty (60) days of the DPW Director's approval of the application for said improvement, then said improvement shall thereafter not be required to be constructed by the Applicant and no building permits will be withheld and no lots will be retained under the subdivision covenant because said improvement has not been commenced or completed.

If circumstances beyond the control of the Applicant delays the commencement or completion of any of the above described improvements so that building permits would otherwise not be issued, then the Planning Board shall upon request of the Applicant review this Approval and consider modifications to this Approval to allow the Applicant to be issued building permits so that Applicant may continue building and so that the improvements to be completed. Any such filed request for modification shall not be unreasonably denied by the Planning Board upon consideration of all the facts and circumstances.



PROJECT:

Maple Hill
Franklin
Massachusetts

OWNERS:

STEVEN LABASTIE
THE FRANKLIN
LABASTIE FAMILY, LLC
&
THE KATHLEEN A.
LABASTIE TRUST
469 MAPLE STREET
FRANKLIN, MA 02038

FITZGERALD FAMILY
IRREVOCABLE TRUST
441 MAPLE STREET
FRANKLIN, MA 02038

APPLICANT:

CARROLL
CONSTRUCTION
CORP.
BOX 395
FOXBOROUGH, MA
02035



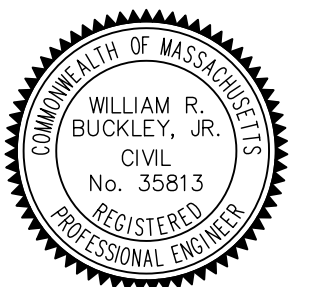
FOUR SCHOOL STREET
P.O. BOX 9136
FOXBOROUGH, MA 02035
508-543-3939

DATE APPROVED: _____
DATE ENDORSED: _____
FRANKLIN PLANNING BOARD

I HEREBY CERTIFY THAT 20 DAYS HAVE
ELAPSED SINCE PLANNING BOARD APPROVAL
AND THAT NO APPEAL HAS BEEN FILED IN
THIS OFFICE.

DATE _____ FRANKLIN TOWN CLERK

STAMP



DRAWING TITLE

Index & Phasing
Plan

SCALE: 1" = 150'

DEC. 15, 2019 SHEET NUMBER

16-0148J

2



TOWN OF FRANKLIN
DEPARTMENT OF PUBLIC WORKS
Franklin Municipal Building
257 Fisher Street
Franklin, MA 02038-3026

November 24, 2020

Mr. Anthony Padula, Chairman
Members of the Franklin Planning Board
355 East Central Street
Franklin, MA 02038

RE: Definitive Subdivision –Maple Hill, Maple St

Dear Mr. Chairman and Members:

We have reviewed the revised materials for the subject project and offer the following comments:

1. In our previous review of the proposed off-site traffic improvements we recommended that if the project is to be approved, construction of those improvements by the developer should be a condition of the approval.
2. The plan and typical section call out for vertical granite curb, however there is a detail showing sloped granite edging. We recommend replacing the sloped granite edging detail with one for vertical granite curb to avoid confusion.
3. The developer should construct the sidewalk connections from where the existing sidewalks on Kimberlee Ave and Bridle Path end and the proposed sidewalk within the subdivision begins to ensure a continuous path. As currently shown, there will be gaps in the sidewalk within the existing cul-de-sac areas.
4. As noted in previous comments, we recommend a maximum pavement width of 28 feet as opposed to the proposed 32 foot wide pavement.

Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

Michael Maglio, P.E.
Town Engineer



November 30, 2020

Mr. Anthony Padula, Chairman
Franklin Planning Board
355 East Central Street
Franklin, MA 02038

**Re: Maple Hill Subdivision
Peer Review Update**

Dear Mr. Padula:

BETA Group, Inc. continues to provide engineering peer review services for the proposed Definitive Plan application entitled "Maple Hill" located in Franklin, Massachusetts. This letter is provided to update findings, comments and recommendations.

BASIS OF REVIEW

The following documents were received by BETA and formed the basis of the review:

- Plans (40 Sheets) entitled **Maple Hill**, dated December 15, 2019, revised through October 22, 2020, prepared by Bay Colony Group, Inc. of Foxborough, MA
- Definitive Plan application, including:
 - Cover letter
 - Form C
 - Form R
 - Filing Fee
 - Certificates of Ownership
 - Certified Abutters List
- Drainage Analysis, dated January 10, 2020, revised through October, 2020, prepared by prepared by Bay Colony Group.

Review by BETA included the above items along with the following, as applicable:

- Site Visit
- **Zoning Chapter 185 From the Code of the Town of Franklin**, current through October 2019
- **Zoning Map of the Town of Franklin, Massachusetts**, attested to April 30, 2019
- **Stormwater Management Chapter 153 From the Code of the Town of Franklin**, Adopted May 2, 2007
- **Subdivision Regulations Chapter 300 From the Code of the Town of Franklin**, current through January 1, 2016
- **Wetlands Protection Chapter 181 From the Code of the Town of Franklin**, dated August 20, 1997
- **Town of Franklin Best Development Practices Guidebook**, dated September 2016

INTRODUCTION

The project site includes three parcels encompassing 73.3 acres located east of Maple Street in the Town of Franklin (the “Site”). Parcel 234-12 includes a large wooded area between Maple Street and High Ridge Circle containing a network of trails. Parcel 242-27 includes a wooded area abutting Kimberlee Avenue. Parcel 235-142 is developed with rural and residential uses, though all proposed development on this lot is within the undeveloped southeast corner. All three parcels and the surrounding region are within the Rural Residential II zoning district. The Site is not located within the Water Resource District.

Topography at the Site is moderate, sloping away from an elevated area within parcel 234-12 in all directions. Most of the Site is graded to the west towards an intermittent stream and associated bordering vegetated wetlands. The Site is not located within a FEMA-mapped 100-year flood zone, an NHESP-mapped estimated habitat of rare or endangered species, or any other critical area. Protected open space abuts the project to the northwest.

NRCS soil maps indicate the presence of three soil types that represent most of the Site. The northwesterly portion of the Site is listed as Montauk fine sandy loam with a Hydrologic Soil Group (HSG) rating of C (low infiltration potential). The northeasterly and central portions, comprising the largest area of the Site, is listed as Hollis-Rock outcrop-Charlton complex with HSG D (very low infiltration potential). The southern portion is listed as Charlton fine sandy loam with HSG B (moderate infiltration potential). A limited area in the south of the Site is listed as Charlton-Hollis-Rock outcrop complex and has an unrated HSG.

The project proposes to construct a 58-lot residential subdivision. Each lot will be developed with a 4-bedroom home and a septic system. The development will include the construction of 32’ wide paved roadways via the extension of Kimberlee Avenue by 3,735 ft. and Bridle Path by 3,529 ft. Associated site development includes paved driveways, water and private utilities, landscaping, and grading. Stormwater management is proposed through the creation of six drainage lots which will include the construction of six infiltration basins. Runoff will be conveyed to these basins via catch basin connections.

FINDINGS, COMMENTS AND RECOMMENDATIONS

GENERAL COMMENTS

- G1. Add Structures and Structures plus Paving criteria to Zoning Dimensional Requirements. *BCG: See Cover Sheet. BETA2: Information provided – issue resolved.*
- G2. Revise the plot style of the proposed contours within and adjacent to the roadway to be more legible. *BCG Proposed contours have been made darker (Sheets 14-24). BETA2: Plot style revised – issue revised.*
- G3. Depict the limit of tree clearing on the plans. *BCG: The limit of tree clearing is shown on Sheet 39. We have added conceptual limits of clearing and notations re erosion control for each of the homes with the notation that it is notional until actual house designs are prepared. BETA2: Information provided – issue resolved.*
- G4. **At the initial public hearing the designer indicated they would explore the option of providing the construction access for the project directly from Maple Street. Provide and update on this**

consideration. BETA2: The designer has indicated that they will not be providing access to the project from Maple Street – no further comment.

ZONING

The project is located within the Rural Residential II zoning district, generally intended for single-family residential uses in a rural and semirural environment. The proposed use as a subdivision complies with this objective.

SCHEDULE OF LOT, AREA, FRONTAGE, YARD AND HEIGHT REQUIREMENTS (§185 ATTACHMENT 9)

As proposed, each subdivided lot complies with minimum lot area, frontage, width; front, rear, and side yard dimensions; and maximum impervious coverage of structures and structures plus paving. It is assumed that proposed structures will comply with building height requirements.

- SC1. Lots 2, 18, and 34-30 do not meet the required lot depth as defined in §185-3. *BCG: After discussion with the Building Commissioner it was determined that Lots 2 and 24 are considered corner lots with no rear lot line and thus no lot depth. Lot 18 has been swapped with Drainage Parcel F and complies with the lot depth interpretation (Sheet 8). Lots 24-30 have either been confirmed to be 200' deep or have been revised to that depth (Sheets 9-11).* **BETA2: Lots revised to comply with dimensional regulations – issue resolved.**
- SC2. Revise the dimensions of the frontage lines for Lot 53 to exclude the length associated with the easement. *BCG: The lot frontage has been labelled to clearly show 150' of frontage (Sheet 12).* **BETA2: Clarification provided – issue resolved.**

SUBDIVISION REGULATIONS

GENERAL COMMENTS

- S1. Clarify and provide distinction between the existing and proposed lot lines throughout the project area. The existing lot line at the rear of Lot 5 appears to terminate unexpectedly. *BCG: The area that is unclear is to the rear of Lots 5, 6, and Drainage Parcel C and the existing and proposed have been labelled (Sheets 3 & 4).* **BETA2: Clarification provided – issue resolved.**
- S2. Revise Drainage “Lot” C and B to “Parcel.” These areas do not meet the definition of a lot (§300-2). *BCG: The drainage lots as defined in Section 300-11.A.(4) have been labelled parcels (Sheets 3,4,6,8).* **BETA2: No further comment.**

§300-8 DEFINITIVE PLAN

- S3. Request a waiver from providing all requirements of the Development Plan as detailed in (§300-8.(1)(c)). BETA notes that only houses on parcels directly abutting the Site are depicted. *BCG: We request a waiver from this section since it is not possible to go onto all adjoining property not owned by the applicants and gather the required information. The location of the adjoining houses has been taken from the MassGIS website and is shown in order to give the Board and neighbors an idea of how the project will interact with their home. Wetlands within 100' of the site have been flagged and confirmed by the Conservation Commission and in some places is on adjoining property.* **BETA2: BETA acknowledges that the applicant does not have access to adjoining properties and defers to the preference of the Board.**

- S4. Confirm the existing conditions aerial survey data meets the accuracy requirements of (§300-8.B.(2)). *BCG: The aerial survey meets the accuracy standards outlined.* **BETA2: Information provided – issue resolved.**
- S5. Provide the location and ownership information for the Fitzgerald Family Irrevocable Trust parcel (§300-8.B.(2)(c)). *BCG: The noted parcel is not an abutter, but is part of the project and is located at the end of Kimberlee Avenue.* **BETA2: Information provided – issue dismissed.**
- S6. Provide the existing widths of Kimberlee Avenue and Bridle Path on the plans (§300-8.B.(2)(i)). *BCG: The existing roadway pavement widths are listed on Sheets 14 & 23.* **BETA2: Information provided – issue resolved.**
- S7. Provide the street classification for all roadways (§300-8.B.(2)(n)). *BCG: The streets are classified as Collector Streets and it is noted as such on Sheets 3-13.* **BETA2: Information provided – issue resolved.**
- S8. Extend the roadway profiles to include at least 100 feet of the intersecting roadways (§300-8.C.(2)). Any grade difference of greater than 1% requires a vertical curve (§300-10.D.(4)). *BCG: The existing end of the roadways have been added to the profile and their existing grades have been added with a vertical curve that starts at the property line (Sheets 25 & 29).* **BETA2: Information provided – issue resolved.**
- S9. Request waiver from (§300-8.C.(10)). BETA notes that centerline stationing for the roadways has been provided and additional staking is not anticipated to be beneficial at this time. *BCG: A waiver has been requested.* **BETA2: BETA notes this waiver request appears reasonable and defers to the preference of the Board.**
- S10. Provide an Environmental Analysis in accordance with (§300-8.D.). *BCG: A letter report addressing the 6 items required for an EA is attached.* **BETA2: Analysis provided – issue resolved.**
- S11. Provide a separate Form R for each requested waiver (§300-8.G.(2)). *BCG: A separate Form R is included for each waiver.* **BETA2: Forms provided – issue resolved.**

§300-9 GENERAL

- S12. At the discretion of the Board, provide a brief description of any Mitigation and Enhancement measures implemented (§300-9.B. and C). *BCG: We have provided some recommended mitigation measures within the VAI Traffic Impact Report. There has also been some discussion at the hearing regarding other potential mitigation but no decisions have been made.* **BETA2: It is anticipated that any additional mitigation issues will be discussed by the Board – no further comment.**

§300-10 STREETS

- S13. Confirm the current roadway layout and connections to existing roadways match those approved by the Board as part of the preliminary submission. *BCG: The definitive design matches the preliminary plan approved by the Board.* **BETA2: Information provided – issue resolved.**
- S14. As the project roadways meet the definition of a collector, a 32-foot pavement width is proposed; however, the existing width of Kimberlee Ave. is 30 feet. BETA notes the Board may require physical improvements including widening of the roadways or the removal of cul-de-sacs as a

- condition of approval. *BCG: We will discuss these items with the Board.* **BETA2: BETA recommends for the Board to discuss how the proposed project roadways will integrate with the geometry, widths, and sight distances of the surrounding existing roadways in coordination with any proposed traffic calming measures. BETA3: This issue has been discussed extensively at previous public hearings – no further comment.**
- S15. Provide an earthwork estimate to confirm conformance with §300-10.D.(1). Earth removal of greater than 1,000 cubic yards of material requires a special permit by the Board of Appeals (§185-23). *BCG: An earthwork estimate is included for each of the roadways. The project is an import design and will require about 27,000 cy of material to be brought in to build the roadways which is about 3.7 cy/lf of roadway (see attached). If the site requires a special permit then it will be obtained, but it does not appear necessary at this time.* **BETA2: Information provided – issue dismissed.**
- S16. The project proposes both cuts and fills of greater than five feet within the right-of-way. Request a waiver from §300-10.D.(5) and evaluate the need for subdrains, particularly where groundwater flow patterns are anticipated to cross the roadway (e.g. Bridle Path from 10+00 to 18+00). With the understanding that significant subsurface investigations have been conducted throughout the site, recommend generating a groundwater profile. *BCG: Several areas of the site have cuts or fills that exceed five feet and a waiver request has been prepared. In those areas where cuts are proposed we have added subdrains to the design (Sheets 15-16,22-24).* **BETA2: Waiver request and subdrains provided. Clarify need for subdrains on Kimberlee Avenue from 15+00 to 22+25. The profiles appear to indicate no cut in the majority of these areas. Confirm groundwater elevations are not anticipated to reach the bottom of the roadway subbase at Bridle Path Sta. 27+50 – 30+00 and Kimberlee Avenue Ext. approx. Sta. 9+00 – 11+50, 12+00 – 14+00, 22+25 – 25+75, and at 29+00. BCG2: The subdrain on Kimberlee Avenue from 15+00 to 22+25 has been removed. The estimated high ground water level between 27+50 – 30+0 on Bridle Path is 80” – 96” below grade (TPs 81-84) and the maximum cut is about 40”. The estimated high ground water level between Kimberlee Ave. 9+0 – 11+50 is 4.5’ – 6’ below roadway finished grade (TPs 45, 47, & 50). The estimated high ground water level between Kimberlee Ave. 12+0 – 14+0 is 7’ to 11’ below roadway finished grade (TPs 11 and D7). The estimated high groundwater level between Kimberlee Ave. 22+25 – 25+75 is 3’ below finished grade (TP 25). The estimated high ground water level at Kimberlee Ave. 29+0 is 10’ below the roadway finished grade.** **BETA3: Information provided – issue resolved.**
- S17. The project is proposed to be constructed in three phases. Clarify the limits of paving for each phase and consider providing a temporary binder course connection between Kimberlee Avenue and Bridle Path Ext. at all times to ensure adequate emergency access §300-10.E.(2). *BCG: A notation on the limit of paving for each phase has been added to Sheets 16-17, 20-22. The emergency access has been changed to base course of pavement.* **BETA2: Information provided – issue resolved.**
- S18. In conjunction with comment S17, clarify if there will be a continuous water loop between Kimberlee Avenue and Bridle Path Ext. during all phases of development §300-10.E.(3). *BCG: Water mains will be looped through the easements on Lots 42 & 51 which will ensure that there will be a continuous loop through all phases of construction and will provide flexibility to the DPW if maintenance is required once the roadways are completed.* **BETA2: Information provided – issue resolved.**

- S19. Request a waiver from §300-10.E.(4). The dead-end portion of Bridle Path Ext. is less than 400 feet. *BCG: A waiver request form has been submitted.* **BETA2: BETA notes this waiver request appears reasonable and defers to the preference of the Board.**
- S20. Revise the curb setting detail to specify an angle between 45° and 60° and a reveal of plus or minus ¾" §300-10.H.(2). *BCG: The detail has been modified (Sheet 36).* **BETA2: Detail revised – issue resolved.**
- S21. At the discretion of the Board and DPW, revise curb reveal and frequency of expansion joints in concrete sidewalk to be consistent with MassDOT Standards. *BCG: We await the Board's decision.* **BETA2: Following consultation with the DPW, no revisions to the curb reveal or sidewalk are recommended at this time.**
- S22. At the discretion of the DPW and Board, consider removing the cul-de-sac where the project connects to Kimberlee Avenue. Alternatively, provide an island in the cul-de-sac, similar to that on Bridle Path, to facilitate traffic calming. *BCG: We will discuss this with the Board.* **BETA2: BETA recommends for the Board to discuss how the proposed project roadways will integrate with the geometry, widths, and sight distances of the surrounding existing roadways in coordination with any proposed traffic calming measures. BETA3: This issue has been discussed extensively at previous public hearings – no further comment.**
- S23. Revise the Roadway Cross Section detail to show the 16' travel lane coinciding with the bottom of curb/edge of pavement on the right side. *BCG: The detail has been revised in accordance with the comment (Sheet 36).* **BETA2: Detail revised – issue resolved.**
- S24. Provide a turning movement showing that a fire truck can adequately access the emergency connections between roadways. *BCG: A turning movement sketch is enclosed.* **BETA2: Turning movement provided – issue resolved.**
- S25. Confirm the proposed geogrid surface for emergency access is rated for H-20 loading and is acceptable to the Fire Chief. *BCG: The emergency access is now proposed to be paved.* **BETA2: Geogrid removed – issue resolved.**
- S26. It is anticipated that the emergency access connections will require plowing. Confirm the DPW can incorporate this into their operations and determine if the geogrid is susceptible to plow damage. *BCG: The paved emergency access connections will be maintained by the Applicant during construction and removed prior to acceptance of the roadway by the Town. No maintenance is required after they are removed.* **BETA2: Information provided – issue resolved.**
- S27. Provide calculations to demonstrate that proposed vertical curves meet AASHTO stopping sight distance (SSD) requirements for a 30 MPH design speed. *BCG: Stopping sight distances have been added to the vertical curves (Sheets 29-32).* **BETA2: Revise the calculations to indicate the calculated stopping sight distance instead of the passing sight distance. BETA notes that several crest vertical curves (e.g. Bridle Path Sta. 7+35, 10+29, and 13+35) do not appear to have the required 200 feet of SSD as calculated by AASHTO equation 3-44 (where S>L). Although not it is not an official Town regulation, it is desirable to utilize a minimum length of curve of 3 times the design speed (MassDOT Project Development & Design Guide pg. 4-43). Lighting is anticipated to provide the required sight distance on sag curves; however, the designer should evaluate the sags at Bridle Path Sta. 11+67 and Kimberlee Ave. Sta. 1+10 to ensure driver comfort and to consider a milder transition.** *BCG2: The SSD values have been added to the profile*

sheets. The sag curves at Bridle Path 11+67 and Kimberlee Ave. 1+10 have been modified to a milder transition. BETA3: Curvature revised to provide required sight distances and requested milder transitions – issue resolved.

§300-11 STORMWATER MANAGEMENT

- S28. In anticipation that the roadways will be accepted by the Town in the future, provide documentation on how the stormwater management system will comply with the new MS4 permit and Charles River TMDL (§300-11.A.(1)). *BCG: The referenced regulations require that the Town ensure that all new development meets the DEP Stormwater Standards which includes, among other standards, an erosion and sedimentation control plan and long- and short-term operation and maintenance plans for storm water controls. The Charles River TMDL includes E-coli, which is due to urban runoff/storm sewers and septic systems and phosphorous which is due to . The proposed regulations also require the retention of 1" of runoff volume to be retained on site unless 90% TSS and 60% phosphorous removal can be attained. As discussed, the phosphorous removal standard is obtained through the existing treatment train In order to determine if 1" of runoff volume can be retained tow methods outlined in the Massachusetts Stormwater handbook were used. The first is the Static Method which simply determines if the volume in the basin can accept the calculated volume. The method was used in Basins C-F. The second method is the Simple Dynamic Method and this was used in Basins A-B. The results are outlined in the Stormwater Volume Retention Analysis worksheet with back-up data in Appendix B. TSS removal meets the current standard of 80% removal, but to reach 90% removal would require the use of treatment units, which are not acceptable to the DPW. Based on the existing regulations the proposed design will not require retrofitting to comply with the MS4 standards. BETA2: Calculations provided indicating that project will comply with the forthcoming regulations – issue resolved.*
- S29. Expand the limits of the watershed analysis area to include off-site contributory areas (§300-8.A.(1)(d)). Off-site areas to the east are anticipated to flow into the detention basins and catch basins. *BCG: About a ³/₄ acre portion of the rear of the lots on High Ridge Circle has been added to the pre- and post-development conditions and the flow rates and volumes have been adjusted accordingly in the revised storm water report. BETA2: Watershed limits expanded – issue resolved.*
- S30. Include notes and details for handling stormwater following placement of binder course. All catchment structures and mitigation features must be fully operational at the time of paving and an edge treatment such as curb or temporary berm must be installed. *BCG: Notes have been added to the pavement notes on Sheet 36 & the Construction Sequence on Sheet 39. BETA2: Notes provided – issue resolved.*
- S31. The right-of-way access to Drainage Lot C is not of sufficient width to allow replacement of the proposed drainage line in the future. Revise the right-of-way to be a minimum of 20 feet or provide additional drainage easements (§300-11.A.(6)). *BCG: Additional easements have been added to Lots 3 and 4 so that the right of way and easement width together measure about 34' in width (Sheets 3 & 14). BETA2: Easements provided – issue resolved.*
- S32. Relocate the drainage line within the emergency access easement adjacent to lot 42 to provide a sufficient work area for future replacement (§300-11.A.(6)). *BCG: An easement has been added to*

Lot 41 to ensure that there is sufficient work area in the unlikely event of a future replacement (Sheet 6 & 17). BETA2: Easement provided – issue resolved.

- S33. Provide a minimum of 10 feet from the toe of basin berms to adjacent property lines (§300-11.A.(7)(b)). *BCG: Dimensions have been added to all basins to demonstrate at least 10' of setback of toe from property lines (Sheets 14, 15, 17, 19, 24). BETA2: Information provided – issue resolved.*
- S34. Request waiver to allow drainage pipes with cover less than 42" and specify Class V RCP at these locations (§300-11.B.(2)(a)). *BCG: A waiver has been requested for use in some areas and Class V RCP has been specified in those locations (Sheets 25-34). BETA2: Waiver requested and Class V pipe provided – issue resolved.*
- S35. Provide an additional catch basin between CB 25 and CB 26 on the right side of the roadway so the distance does not exceed 300 feet (§300-11.B.(3)(a)). *BCG: The profile in that area has been modified and CB #23C has been added so that there is not 300' overland flow (Sheet 19). BETA2: Additional catch basin provided – issue resolved.*
- S36. Provide catch basins and a manhole within the proposed cul-de-sac (§300-11.B.(3)(a)). *BCG: Catch basins and a DMH have been added at the cul-de-sac exit (Sheets 19 & 28). BETA2: Required structures provided – issue resolved.*

§300-12 UTILITIES

- S37. Relocate the water lines within the emergency access easements to provide a wider work area for any future replacement. *BCG: Easements have been added to provide a wider work area (Sheets 15 & 21). BETA2: Easements provided – issue resolved.*
- S38. Coordinate with the DPW to confirm the preferred roadway lighting (lumens, LED, color temperature, pole type, etc.). *BCG: Town Engineer Mike Maglio supplied spec and it was added to Sheet 36 (3/19/2020 email). BETA2: Information provided – issue resolved.*
- S39. Revise the hydrant assembly detail to indicate that the hydrant shall be factory painted in Town colors. *BCG: Note added to detail (Sheet 36). BETA2: Detail revised; however, BETA has been informed that the DPW is in the process of selecting a new standard hydrant. As no model has been selected yet, revise detail to remove reference to American Darling and replace with "Town Standard." BCG2: The detail has been modified as requested (Sheet 36). BETA3: Detail revised – issue resolved.*
- S40. Confirm adequate fire supply can be provided for hydrants proposed between elevation 320 and 330. Residences are also proposed at elevations that are recommended for or require individual booster pumps (§300-12.A.(1)(a)). *BCG: DPW Director Laurie Ruzala opined that there are no known flow issues on High Ridge Circle, which is at higher elevation than proposed project, and does not expect there to be any issues for this project (3/20/2020 email). BETA2: Information provided – issue resolved.*
- S41. Confirm that all electrical, telephone, and cable conduits will be placed underground (§300-12.C.(1)). *BCG: They are shown on plans as such. BETA2: Information provided – issue resolved.*
- S42. Provide a streetlight at the intersection of the project roadway and Kimberlee Avenue cul-de-sac (§300-12.C.(2)(b)). *BCG: A street light has been added to Station 0+80 to illuminate where road*

will connect to existing roadway and additional lights have been added to illuminate vertical sag curves (Sheets 14-23). BETA2: Requested streetlight provided. Also review need for streetlight at Bridle Path Sta. 11+67 sag. BCG2: The street light has been moved from 12+0 to 11+67 as requested (Sheet 15). BETA2: A new street light has been provided at Bridle Path Sta. 11+67 – issue resolved.

§300-13 OTHER IMPROVEMENTS

- S43. The applicant has requested a waiver from §300-13.A.(1) and proposes a concrete sidewalk on one side of the roadway. BETA notes the Board typically requires the installation of vertical granite curb when granting this waiver for sidewalks. The existing Kimberlee Avenue and Bridle Path roadways have slant granite curbing and a single bituminous sidewalk. *BCG: We have no objection and await the Board's decision. BETA2: BETA recommends for the Board to discuss this at the next hearing. BCG2: We have modified the design to show a concrete sidewalk on one side and vertical granite curbing (Sheets 14-24, 36). BETA3: Curbing revised – issue resolved.*
- S44. Provide continuous sidewalk connections from the proposed project roadways to the existing sidewalks on Kimberlee Avenue and Bridle Path. *BCG: We will discuss this with the Board. BETA2: BETA recommends for the Board to discuss this at the next hearing. BETA3: A continuous sidewalk connection to Kimberlee Avenue has been depicted as part of the Conceptual Improvement Plans provided by Vannase & Associates Inc. BETA recommends for the Board to include applicable conditions of approval for the offsite improvements, including providing the continuous sidewalk connections on Kimberlee Avenue and Bridle Path. The designer has indicated they are amenable to this condition.*
- S45. Coordinate with the DPW to confirm the preferred type of detectable warning. *BCG: The DPW prefers red (3/20/2020 email). BETA2: Information provided – issue dismissed.*
- S46. Provide a wheelchair ramp at the terminus of the sidewalk at the Bridle Path Ext. cul-de-sac. *BCG: A wheelchair ramp has been added at Station 34+40 (Sheet 19). BETA2: Ramp provided – issue resolved.*
- S47. Provide a detail for a wheelchair ramp perpendicular to the curb. *BCG: A detail has been added (Sheet 36). BETA2: Detail provided – issue resolved.*
- S48. Provide bounds at the intersections of the project roadways and existing roadways; one sideline of Drainage Lot D and Lot 39; and along both sides of drainage easements. *BCG: Bounds have been added as noted (Sheets 3-7 & 13). BETA2: Bounds provided – issue resolved.*
- S49. Provide a detail for the proposed bounds. *BCG: A detail has been added (Sheet 37). BETA2: Detail provided – issue resolved.*
- S50. Provide a schedule for the total number of plantings proposed and revise the Street Tree Planting detail to reference the Best Practices Development Guidebook. *BCG: The locations of proposed trees are shown as well as a notation that outlines the requirements in subdivision regulations regarding shade trees. A minimum of 3 trees per lot approximately spaced 50' apart are on the plan (a minimum of 174 trees) and a note has been added to the detail listing the minimum number of trees. The notation on the plan view and tree detail requires coordination with the DPW prior to planting as to number of species and location and that work shall be done in accordance with*

the Franklin Best Development Practices Guidebook. (Sheets 14-24 & 36). BETA2: Information provided – issue resolved.

- S51. Provide an additional street tree on Lots 6, 12, and 15 (§300-13.E.(1)). *BCG: Additional trees added (Sheets 15,16,18). BETA2: Additional trees provided – issue resolved.*
- S52. Revise the Residential Driveway detail to indicate that aprons between the road and *back of sidewalk* shall be concrete. *BCG: The detail has been revised (Sheet 36). BETA2: Detail revised – issue resolved.*
- S53. Consider relocating the proposed light at Bridle Path STA. 10+68 to the midpoint of the curve. *BCG: The street light was relocated to Station 10+25 (Sheets 15 & 23). BETA2: Light relocated – issue resolved.*
- S54. Provide street signs (§300-13.F(1)). *BCG: Street sign is shown at intersection of Kimberlee Ave and Bridle Path and at new entrances (Sheets 14,19,24). BETA2: Street signs provided – issue resolved.*
- S55. At the discretion of the Board, provide “Private Way” signs until the roadway is accepted (§300-13.F(3)). *BCG: We will discuss this with the Board. BETA2: BETA defers to the preference of the Board on this issue.*

§300-14 OTHER REQUIREMENTS

- S56. At the discretion of the Planning Board provide open spaces (parks/playgrounds) (§300-14.A.). *BCG: We will discuss with Board. BETA2: BETA defers to the preference of the Board on this issue.*

STORMWATER MANAGEMENT

The project proposes a closed drainage system consisting of catch basin to manhole connections within the proposed roadway. Runoff from the system discharges to a series of infiltration basins designed to attenuate flows.

Best Development Practices Guidebook

The project has been designed to meet portions of the stormwater management requirements of the BDPG (i.e. peak development discharge and volume rates). Further discussion on these topics, along with sedimentation and erosion control, is provided in the Massachusetts Stormwater Management Standards section below.

GENERAL

- SW1. Provide an intermediate DMH with drop to reduce scour potential for drainage lines with steep slopes (DMH 34 to DMH 7A and DMH 33 to DMH 10). *BCG: Additional manholes have been added as requested to decrease the velocity below 10 ft/sec (Sheet 34). BETA2: Additional manholes provided – issue resolved.*
- SW2. Review configuration of proposed drainage lines and manholes. DMHs 6, 13, 15, 17, 23, and 31 may require alternate layouts or larger structures to accommodate the proposed pipes. *BCG: A notation has been added the DMH detail on Sheet 37 alerting contractor that structure width might be more than 4' and to provide shop drawings to engineer for review. BETA2: Note provided – issue resolved.*

- SW3. In coordination with the DPW widen top of basin berms, as necessary, to allow for adequate maintenance access (10' minimum recommended). *BCG: The tops of berms have been widened to 10' (Sheets 14, 15, 17, 19, 24).* **BETA2: Berms widened – issue resolved.**
- SW4. Extend overflow rip rap to bottom of slope at drainage basins. *BCG: Overflow rip-rap has been extended to the toe of basins (Sheets 14, 15, 17, 19, 24).* **BETA2: Rip-rap extended – issue resolved.**
- SW5. Recommend eliminating reverse flow condition from CB1B to DMH1 to HW1. *BCG: DMH#1 has been relocated to eliminate reverse flow condition (Sheet 14).* **BETA2: DMH relocated – issue resolved.**
- SW6. Revise rip rap from outlet C2 to remain entirely within the drainage parcel. *BCG: Parcel C has been revised so that rip-rap is entirely within lot (Sheet 14).* **BETA2: Parcel revised – issue resolved.**
- SW7. The stormwater basins on Lot D and Lot E do not propose any clearing of the existing vegetation. There is a concern that regular inundation could impact the viability of the trees and create a maintenance issue for the Town in the future. *BCG: We have successfully used this type of design on other projects and have not observed any issues. That being said we recommend that a condition be included in the decision that would require the Developer to remove trees within the basin and replace with a bioretention mix if the trees show evidence of deterioration.* **BETA2: BETA recommends the Board include this in any future decision.**

MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS:

The proposed development will disturb greater than one acre; therefore, the project is subject to Chapter 153: Stormwater Management of the Town of Franklin Bylaws and MassDEP Stormwater Management Standards.

No untreated stormwater (Standard Number 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 untreated discharges to wetlands. Discharges from several proposed stormwater basins are within or near to wetland buffer zones; however, rip rap aprons are proposed to mitigate erosion potential.

Post-development peak discharge rates (Standard Number 2): *Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*

The project proposes to attenuate post-development peak discharge rates and volumes through the use of several infiltration basins. Stormwater will be conveyed to these basins via catch basin to manhole connections.

- SW8. Provide subarea quantifying the pre- and post-development impact on the isolated vegetated wetland (G-Series). *BCG: There is no requirement in the subdivision regulations, wetland regulations or Wetlands Protection Act to balance pre- and post-development impacts on isolated wetlands. The subdivision regulations are the most restrictive and they regulate runoff to off-site wetlands. That being said it is intuitively obvious that the post-development runoff to the wetland is less than the pre-development since the area contributing to the isolated wetland is being reduced by the construction of Bridle Path which will intercept runoff from the east and the Lot 42*

emergency access driveway which will direct runoff from the south toward Kimberlee Avenue.
BETA2: Information provided – issue dismissed.

- SW9. Verify lengths of existing/proposed flow paths. Lengths used in HydroCAD calculations do not appear to match lengths depicted on the watershed plans. *BCG: The Tc paths were reviewed and the Subarea DG & DJ paths were revised.* **BETA2: Clarify revisions. Review of the watershed plans and HydroCAD calculations does not appear to show any changes from original submission.** *BCG2: The Tc values were modified such that the Tc for Subarea DG went from 27.3 min to 25.8 min and for Subarea DJ it went from 13.5 to 16.6 min.* **BETA3: Clarification provided – issue resolved.**
- SW10. Clarify if there will be any substantial grading on the residential lots that will affect catchment areas and flow paths. *BCG: Since we will not know how each lot is graded we have made some assumptions on how the construction of the lots and houses will effect the flow paths. That is why in some cases the flow path doesn't hit the existing contours on a perpendicular – we are estimating how the grading will impact the topography.* **BETA2: Information provided. BETA notes that final grading will need to be confirmed during construction to ensure that there are no adverse stormwater impacts to adjacent residences.**
- SW11. Review the flow paths for Subareas DB and DE. As depicted, the flow paths do not follow the contours in these areas. *BCG: As depicted, the flow paths do not follow the contours in these areas. See response to SW10.* **BETA2: Information provided – issue dismissed.**
- SW12. Revise sizing calculations for CB #38B to match the 12" section size proposed in the plans. *BCG: The closed drain system worksheet has been revised to reflect changes in the design.* **BETA2: Calculation revised – issue resolved.**
- SW13. Revise slope of the drainage lines to maintain a self-cleaning velocity of 3 ft/s during full flow conditions. Lines such as those between CB#23B and DMH#23 have flat slopes, resulting in low velocity and inadequate capacity. *BCG: We have reviewed the closed drain system and adjusted the slopes to provide a minimum slope of 0.005 and where possible achieve at least 2.5 ft/sec, which is the Town standard. In some areas, due to the very low flow the velocity is below 2.5 fps for a full flow condition. All pipes continue to have adequate capacity even when flowing under pressure. HGLs are provided on the worksheet to show that under the design condition the water height does not reach rim elevations.* **BETA2: Evaluate proposed slopes at structures DMHs 5, 21, 38, and 39 and CBs 39A, 39B, which are all 0.003 or flatter. Also, although the Town does not have a written policy regarding the HGL, the DPW has indicated they generally follow the MassDOT policy of providing a minimum desired 2-foot separation from the rim to the HGL. Evaluate pipe capacities/HGLs at DMHs 1, 38, and 39 and CBs 17 and 39B.** *BCG2: The following table shows the data for the requested structures. Due to the topography and limitations on cuts/fills and roadway grades it would require significant filling in the area of DMHs 17 and 21 to meet the 2' separation. Due to the need to meet the existing grade at the end of Bridle Path and the elevation of Retention Basin E it is not possible to have 2' separation for DMH 38 and CBs 30A-C. The low flows at CB 17A&39A result in low velocities even though the slopes are greater than 0.005. While I respect BETA's opinion, it is my professional opinion that the design meets generally accepted engineering standards considering the site and regulatory constraints.* **BETA3: Pipe slopes revised to provided self-cleaning velocities – issue resolved.**

- SW14. If available, provide hydraulic profiles for the closed drainage systems. *BCG: Hydraulic grade lines are provided in the closed drain system worksheet for each structure.* **BETA2: Information provided – issue dismissed.**
- SW15. Review calculated flows and provide additional catchment as necessary for catch basins with flow rates that will exceed grate capacities. BETA notes calculated flows to catch basins such as 8B, 23B, 27B, 30B, and 34B are as high as 7.4 cfs. *BCG: Several catch basin grates/inlets have been doubled in order to capture more runoff. The catch basins are: 8B, 23B, 27B, 30B, 31B, 32B, 33B, 34B and 39B (Sheets 15, 19-24).* **BETA2: Double-grate catch basins provided. Recommend providing additional catchment in proximity to CBs 8B, 27B, and 39B, which are anticipated to have undesirable flow spreads reaching/exceeding the crown of the roadway for the design storm event.** *BCG2: Double CB 8C has been added at Kimberlee Ave station 12+0 and double CB 39C has been added at Bridle Path station 0+40 in order to ensure that the spread at the low points does not exceed the crown. It is not necessary at CB27B since the spread does not reach the crown of the roadway.* **BETA3: Additional catchment provided, where required – issue resolved.**
- SW16. Remove exfiltration component from the area of the sediment forebays. *BCG: The sediment forebay is an integral in-line part of the basin and is required to dewater within 72 hours along with the basin. There is infiltration happening in the forebay. I have never seen this comment from any other engineer in the 15 years the DEP Stormwater Standards have been in effect and while I respect the BETA opinion, I believe that it is their opinion and not a requirement of the regulations to remove that element of the design. I will also point out that it was not a requirement on the Maple Preserve project that was recently done and reviewed.* **BETA2: Following discussion, BETA notes that removing the exfiltration component from the basins is unlikely to alter the results of the analysis and may generate modeling issues – issue dismissed.**
- SW17. Recommend revising outlet control structures to eliminate or minimize flows over the overflow weir (typically reserved for emergency overflows). Basin B will have greater than 10 cfs directed to the overflow weir during the 10-year storm. If flow cannot be eliminated, provide substantial erosion control protection and size rip rap accordingly. *BCG: We looked at modifying the outfall structure but due to the limited area and inlet flow rate we need the higher capacity supplied by a weir. The proposed design was checked using the Isbash formula and the 6-12" stone on the rip-rap mat is significantly higher than required in order to retain slope stability.* **BETA2: Information provided. At the discretion of the designer, consider expanding the footprint of this basin to the north and south (while maintaining the required 20' high water offset to property lines) to provide additional stormwater mitigation.** *BCG2: The basin has been expanded to the north to the maximum extent allowed while still maintaining 10' setback from property line (Sheet 15) and storm water calculations revised to reflect increased volume.* **BETA3: Basin expanded and calculation revised – issue resolved.**
- SW18. Given the soils with rapid infiltration rates in the area of the proposed drainage basin on Lot E and the location of the overflow at the rear of a residential property, recommend expanding the basin area to fully attenuate the 100-year storm. *BCG: We have modified the basin to accommodate the full 100-year storm by raising the berm elevation (Sheets 24 & 34).* **BETA2: Basin expanded to fully retain the 100-year design storm. Confirm the area of the 298 contour in the HydroCAD calculations, which appears to be approximately 2,000 sq. ft. larger than depicted on the plans.** *BCG2: The basin has been modified by excavating a portion of the site to the 292' contour in order to ameliorate the potential for surcharging from CBs 39A & B. This allowed us to use the SAND*

Rawls rate between contours 292' – 296' while retaining the SL Rawls rate for the rest of the basin. This modification allows the basin to retain the entire 100-year storm with at least 1' of freeboard.

BETA3: Design revised – issue resolved.

SW19. The design includes an assumed impervious area for each residential lot. If the impervious footprint of homes and driveways varies substantially, additional mitigation may be required, such as recharge systems for roof areas on each lot. *BCG: A note has been added to Sheet 1 listing the assumptions and requiring a roof runoff recharge system if the estimated impervious values are exceeded.* **BETA2: Note provided – issue resolved.**

SW20. Revise design of Basin B to provide approximately 1' of freeboard above the 100-year storm elevation. *BCG: The basin berm has been increased to 296.4', which is 1' above the estimated 100-year event level of 295.4' (Sheet 15 & 33).* **BETA2: Requested freeboard provided – issue resolved.**

SW20A. **Review “Developed Conditions” runoff rate and volumes depicted on Table 2. Wetland E design point appears to show the “Existing Conditions” calculations.** *BCG2: The table has been modified to reflect the changes in the Tc for Subareas DG and DJ and the changes in Basins B, D, E, & F.* **BETA3: Table revised – issue resolved.**

Recharge to groundwater (Standard Number 3): *Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to maximum extent practicable.*

NRCS soil maps indicate the presence of Montauk fine sandy loam with a Hydrologic Soil Group (HSG) rating of C (low infiltration potential), Hollis-Rock outcrop-Charlton complex with HSG D (very low infiltration potential), and Charlton fine sandy loam with HSG B (moderate infiltration potential). A limited area in the south of the Site is listed as Charlton-Hollis-Rock outcrop complex and has an unrated HSG.

Calculations indicate the project will provide a recharge volume in excess of that required. All BMPs are shown to drain within 72 hours.

SW21. Correct recharge volume provided by Basin F to match the volume below 281.6' as depicted in the HydroCAD model. *BCG: Basin F has been relocated and redesigned and new data included in the storm water calculations.* **BETA2: Information provided – issue resolved.**

SW22. Exfiltration rates associated with the stormwater basins proposed on Lot D and Lot E are based upon the “C” layer soil documented in the test pits. It is anticipated that this rate will not be attained as there is a significant restrictive layer above consisting of sandy loam. Revise exfiltration rate or basin design for consistency. *BCG: The infiltration rates for Basins D & E have been adjusted to SANDY LOAM and the revised data is in Appendices A & B and Sheets 24, 33 & 34.* **BETA2: Rates revised – issue resolved.**

SW23. Revise infiltration rates used in drawdown calculations to match any revisions to the HydroCAD model. *BCG: The infiltration rate for Basin F was set to zero for the inflow/outflow analysis even though the soil evaluations found it to be a Sandy Loam. This was because we want to be conservative and could not obtain additional soil tests due to the shutdown. The drawdown analysis also used a Sandy Loam to confirm dewatering within 72 hours.* **BETA2: Sandy loam was recorded on the soil logs for test pits 73, 74, and D-13; however, the sieve analysis from D-13 indicated the presence of a silt loam. In consideration that there is limited data over the surface of the proposed basin the designer should consider the use of silt loam for the dewatering**

calculations or implementing a slow drain to ensure the basin can empty. Also, the provided drawdown calculations are based on the required recharge volume and not the total storage volume. As noted in the stormwater handbook (Volume 3, Ch. 1, pg. 25, footnote 21) the storage volume of the structure must be used in the calculations. BETA notes that in consideration that Basins D and E have very flat side slopes, the entire footprint of the basin is appropriate to use in the calculations. It is BETA's opinion that it is more desirable to fully attenuate the 100-year storm event and eliminate overflow to adjacent residences vs. fully draining the pond provided that at least the 10-year storm for Basins D and E can be fully infiltrated in 72 hours. *BCG2: Test Pit D-13 is over 100' from Basin F so we will continue to use TPs 73 & 74 which were done within the area of the basin in conformance with Standard 3 of the DEP Stormwater Standards and were witnessed by the Franklin Board of Health Consultant. A drawdown analysis was done for the 100-year storm event for all basins and the result is attached. Retention Basin D does not meet the 72 hour standard if the 294' elevation was used. However, if the 295' elevation was used then the drawdown is within 27 hours. As a further review the 10-year storm was analyzed for Basin D using the 294' elevation and the drawdown was accomplished within 38 hours.* **BETA3: Information provided – issue resolved.**

SW24. Provide an additional test pit at the rear of the stormwater basin proposed on Lot F to confirm the groundwater elevation is a minimum of 2 feet below the bottom of the basin (EL= 280.00). Test pit D-14 indicates estimated seasonal high groundwater at 280.3. *BCG: See response to SW23 comment.* **BETA2: Information provided – issue dismissed.**

SW25. Based upon Test pits D-12 and D-14, the estimated season high groundwater is 277.5 in detention basin A and 280.3 in detention basin F, respectively. Revise mounding calculations for consistency with test pit information. As an alternative, consider running a secondary HydroCAD analysis with the exfiltration components removed (basins A and F only). If peak flow rates can be attenuated, a mounding analysis is not necessary. *BCG: The calculations for Basin A have been revised to reflect the higher ground water and Basin F does not have an infiltration component.* **BETA2: Calculation revised – issue resolved.**

SW25A. **Provide confirmation that the required setbacks outlined in the Stormwater Handbook for infiltration structures have been provided for wells and septic systems on adjacent residences.** *BCG2: The Franklin Board of Health provided information of the lots on Kimberlee Avenue and Madison Avenue that are near Basins C, D, & E. Retention Basin D grading was slightly modified on the west side to ensure that the 100-year storm water lateral limit is 100' from the existing septic system at 35 Kimberlee Avenue. The septic system at 36 Kimberlee Avenue meets the 50' setback requirement from a septic system. The private well is 93' from the 100-year flood elevation, but it is an irrigation well. The DEP standards do not distinguish between irrigation and domestic wells. Title 5 does differentiate in that irrigation wells require a 25' setback from a septic system and domestic wells require a 100' setback. The irrigation well is only 85' from the home's septic leaching field. All of the systems on Madison Avenue meet the 50' setback requirement. There are no wells on Bridle Path and the residences are on sewer.* **BETA3: Information provided – issue resolved.**

80% TSS Removal (Standard Number 4): For new development, stormwater management systems must be designed to remove 80% of the annual load of Total Suspended Solids.

The project proposes to direct runoff from the roadway and surrounding lawns through a closed drainage system. The system discharges into several infiltration basins with sediment forebays for pretreatment. A Stormceptor water quality unit is proposed in place of a sediment forebay for Basin E. The proposed BMPs will treat a water quality volume that exceeds that of the proposed impervious increase and will provide the minimum required 80% TSS removal.

SW26. Provide confirmation the DPW is willing to maintain the proprietary stormwater unit, otherwise, replace with a standard DMH and add a sediment forebay to Basin E. *BCG: The Stormceptors have been replaced with standard DMHs and sediment forebays (Sheets 14 & 24).* **BETA2: Stormceptor removed – issue resolved.**

Higher Potential Pollutant Loads (Standard Number 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 land uses with Higher Potential Pollutant Loads – **not applicable.**

Critical Areas (Standard Number 6): *Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas.*

The project does not propose discharges to critical areas – **not applicable.**

Redevelopment (Standard Number 7): *Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable.*

The project does not meet the definition of a redevelopment – **not applicable.**

Construction Period Erosion and Sediment Controls (Standard Number 8): *Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.*

The project as currently depicted will disturb in excess of one acre of land; therefore, a Notice of Intent with EPA and a Stormwater Pollution Prevention Plan (SWPPP) are required. The project proposes the use of erosion control barrier (silt sock) and catch basin inlet protection. A draft SWPPP was provided as part of the Stormwater Management Report.

SW27. In consideration of the rolling topography of the Site and soils associated with high runoff potential, expand the proposed perimeter controls to include the entire downgradient perimeter of the limits of clearing. *BCG: We don't agree that placing erosion controls along the downgradient perimeter is necessary for the roadway construction phase. There is approximately 200' of woods between the limit of clearing and the property line which is more than adequate to ensure that siltation does not impact off-site areas. As the lots are cleared erosion control will be used and we have shown that in a conceptual manner along with a notation to that effect (Sheet 39).* **BETA2: Adequate notation provided – issue resolved.**

SW28. Revise the stabilized construction entrance at Bridle Path to be a minimum of 50' in length. *BCG: Revised as requested (Sheet 39).* **BETA2: Entrance revised – issue resolved.**

SW29. Although it is understood that the contractor will ultimately be responsible for the means and methods to comply with the SWPPP, it is recommended to provide typical locations for required temporary sediment basins. Also, notes should be provided to prohibit the use of proposed stormwater basins as construction period sedimentation basins. *BCG: The location of potential sediment basins has been added to the SWPPP and a note prohibiting the use of storm water*

*basins from being used as sediment basins has also been added (Sheet 39). **BETA2: Information provided – issue resolved.***

SW30. Depict the limits of each construction phase, as shown on the Index and Phasing Plan, on the SWPPP. *BCG: Modified as requested (Sheet 39). **BETA2: Information provided – issue resolved.***

SW31. Recommend depicting the limits of tree clearing for the residential lots and typical associated erosion controls. *BCG: The location of conceptual erosion control layout on each lot has been added to the SWPPP along with a note requiring controls on each lot as constructed (Sheet 39). **BETA2: Typical clearing limits provided – issue resolved.***

Operations/maintenance plan (Standard Number 9): *A Long-Term Operation and Maintenance Plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

A Long-Term Operation and Maintenance (O&M) Plan was included as part of the Stormwater Management Report.

SW32. Provide maintenance/inspection requirements for sediment forebays and outlet control structures. *BCG: Modified as requested (Appendix C Storm Water Report). **BETA2: Plan revised – issue resolved.***

SW33. Provide a plan showing the location of all stormwater BMPs for use by operation and maintenance personnel. *BCG: The plan shall be the definitive plan Sheets 14-24 since preparing a single sheet identifying 150'+/- storm water structures would be unreadable. **BETA2: Reference to definitive plan provided. Indicate latest revision dates on final plan.***

Illicit Discharges (Standard Number 10): *All illicit discharges to the stormwater management systems are prohibited.*

An Illicit Discharge Compliance Statement was provided.

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

Very truly yours,
BETA Group, Inc.



Matthew J. Crowley, PE
Project Manager



Stephen Borgatti
Staff Engineer

cc: Amy Love, Town Planner
Jennifer Delmore, Conservation Agent

Job No: 4830 - 52



FRANKLIN PLANNING & COMMUNITY DEVELOPMENT

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MEMORANDUM

DATE: December 2, 2020
TO: Franklin Planning Board
FROM: Department of Planning and Community Development
RE: Maple Hill
Definitive Subdivision Plan

Correspondence submitted for this Hearing:

1. Applicants Off Site Traffic Mitigation Proposal
2. Chat log from the October 5 Planning Board meeting
3. Revised Subdivision plans to address DPW and BETA comments
4. Phase Plan (Sheet 2) separately
5. Comments from BETA and DPW

Waiver Requests:

- **§300.13.A.(1) - Sidewalks. Location:** To allow a sidewalk on one side allowed where sidewalks are required on both sides of the road.
- **§300.11.B.(2)** – Waiving the requirement that pipes maintain 42’ cover in some areas
- **§300.8.A.(1)(c)** – Not require a new alternative development plan
- **§300.8.C.(10)** – Setting stakes every 100’ for sideline and sidewalks
- **§300.10.D.(5)** – Waiving the requirement that cuts/fills be no more than 5’ in some areas
- **§300.10.E.(4)** – Waiving the requirement that a dead-end be no less than 400’ long

DPCD Comments:

1. Applicant has submitted a phase development plan. The Planning Board should determine if they will allow the road way to be constructed in phases.
2. The Applicant has provided an off-site traffic improvements with details on when the improvements will be made. The Board should determine if they are satisfied with the timelines provided.
3. Town Water shall require a By-Law Amendment from the Town Council. Each lot will have individual septic systems.
4. Applicant has provided an extension until December 15, 2020

Recommended Special Conditions:

1. The Applicant's proposed off-site Traffic Mitigation shall be included in the decision, as written in the memo dated December 2, 2020.
2. Phasing – The Planning Board agrees to the construction of the project be done in 3 phases, as shown on sheet 2 and attached to this document.
3. The Street name and Street numbers will require approval from the Department of Public Works.

Standard Conditions

1. The subdivision shall be built in accordance with the Subdivision Rules and Regulations (Chapter 300, SUBDIVISION OF LAND) of the Town of Franklin, except as stated otherwise in this Certificate of Vote. The approval of said plan shall not be construed to be an acceptance or dedication of any way shown on said plan. In the event the Town must perform any service, maintenance and/or repair in an emergency, the Town shall not be held responsible for any damage to any property and shall be reimbursed fully by the owner/applicant for any such work performed.

The Planning Board will use outside consultant services for inspection of all construction of ways and the installation of water, drainage, erosion control systems, landscaping, sidewalks, and appurtenances thereto. The owner/applicant shall pay for the Inspector's time and any tests through an Inspector fee. The Construction Inspector fee is due before or at the time of the pre-construction meeting. Inspections are further outlined in condition #10.

2. The owner/applicant shall deliver to the Board, for review and approval by the Board and by Town Attorney, easements granting the Town, its agents and personnel, the right to enter the premises within such easements for the purposes of inspecting, maintaining, and/or making emergency repairs to the ways and municipal facilities and utilities, including, but not limited to, water, drainage, and electricity. Said easements shall be approved and delivered to the Town, as set forth above, prior to the endorsement of the definitive subdivision plan sheets.
3. No alteration of these plans shall be made or affected other than that by an affirmative vote of the members of the Board at a duly posted meeting and upon the issuance of a written amended decision.
4. All applicable laws, by-laws, rules, regulations, and codes shall be complied with, and all necessary permits and approvals shall be obtained by the owner/applicant.
5. Prior to the endorsement of the definitive plan, the following shall be done:
 - **The owner/applicant shall make a notation on the plans, which references the conditions and dates of this Certificate of Vote.**
 - A notation shall be made on the plans that all erosion mitigation measures shall be in place prior to major road construction commencing on the site.
 - All outstanding invoices for services rendered by the Town's Engineers and other reviewing Departments of the Town relative to their review of the owner/applicant's application and plans shall have been paid in full.
 - The owner/applicant shall submit the approved version of the plan on a CD, in AutoCAD (or

compatible software), to the Department of Public Works for review and approval. A transmittal letter from the Department of Public Works verifying receipt of such information and compliance with Department of Public Works standards shall be submitted to the Planning Board. Failure to submit such information to the Department of Public Works and obtain the compliance letter shall be cause for the Planning Board to rescind approval or not to endorse said plans.

6. Prior to endorsement of its approval of said plan, the owner/applicant shall agree to complete, without cost to the Town, all improvements required by the Town and shall provide security that he will do so, either by covenanting not to sell or build upon any lots until completion of the improvements (which covenant must be referred to on the plan and registered or recorded with it) or by posting bond or other security which the Town can utilize in the event that the improvements are not completed within two years or by some combination of these.
7. Prior to any work commencing on the subject property, the following conditions shall be met:
 - The owner/applicant shall provide plans to limit construction debris and materials on the site. In the event that debris is carried onto any public way, the owner/applicant and his assigns shall be responsible for all cleanup of the roadway. All cleanups shall occur within twenty-four (24) hours after first written notification to the owner/applicant by the Board or its designee. Failure to complete such cleanup may result in suspension of construction of the subdivision until such public way is clear of debris.
 - The owner/applicant shall submit to the Board two (2) complete prints of the recorded plan, and three fifty-percent (50%) reduced prints. One copy of each of the above shall also be submitted to the Town Clerk.
8. The owner/applicant shall supply erosion control devices as necessary and as directed by the Town's Construction Inspector and Conservation Agent.
9. All roadways, utility, and other improvements within the subdivision shall be built within four (4) years of the date of plan approval per §300-8H(8).
10. **Prior to construction activities, there shall be a pre-construction meeting with the owner/applicant, and his contractor(s), the Department of Public Works and the Planning Board's Construction Inspector. Actual and reasonable costs of inspection consulting services shall be paid by the applicant before or at the time of the pre-construction meeting. Should additional inspections be required beyond the original scope of work, the applicant shall be required to submit fees prior to the issuance of a Final Certificate of Completion by the Planning Board.**
11. Approval of this Definitive Subdivision Plan is subject to the rules and regulations and approvals of the Conservation Commission, Board of Health, Police Department, Fire Department, and Department of Public Works.
12. The drainage system must be in working condition prior to the issuance of lot releases for each phase of the project.

Bay Colony Group, Inc.
Professional Civil Engineers & Land Surveyors

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Foxborough, Massachusetts 02035
Telephone (508) 543-3939 • Fax (508) 543-8866
E-mail: mailbox@baycolonygroup.com

October 24, 2020

Mr. Anthony Padula, Chairman
Franklin Planning Board
355 East Central Street
Franklin, MA 02038

RE: "Maple Hill" Definitive Plan

Dear Mr. Padula:

I am submitting herewith a revised definitive plan that has been modified based on comments we have received from the Town's professional staff and consultants. For ease of review I have listed the comment and our response.

Modifications discussed at October 5, 2020 Planning Board Hearing

Jeffrey Dirk from Vanasse & Associates, Inc. (VAI) presented plans detailing traffic mitigation measures within the subdivision and on adjacent streets. The mitigation measure within the Maple Hill subdivision involved the construction of flush median strips at locations shown on Figure 5 Conceptual Improvement Plan attached to the September 21, 2020 VAI memo. The construction will consist of flush colored concrete median strips with a brick pattern that will be 40' long and 6' wide. They have been added to the definitive plan on Sheets 15,16, 18, 20, and 23. A detail has been added to Sheet 37 and a specification for the construction is attached to this memo.

Beta Group, Inc. memo dated August 4, 2020

- S16. *BETA2: Waiver request and subdrains provided. Clarify need for subdrains on Kimberlee Avenue from 15+00 to 22+25. The profiles appear to indicate no cut in the majority of these areas. Confirm groundwater elevations are not anticipated to reach the bottom of the roadway subbase at Bridle Path Sta. 27+50 – 30+00 and Kimberlee Avenue Ext. approx. Sta. 9+00 – 11+50, 12+00 – 14+00, 22+25 – 25+75, and at 29+00. The subdrain on Kimberlee Avenue from 15+00 to 22+25 has been removed. The estimated high ground water level between 27+50 – 30+0 on Bridle Path is 80"-96" below grade (TPs 81-84) and the maximum cut is about 40". The estimated high ground water level between Kimberlee Ave. 9+0 – 11+50 is 4.5' - 6' below roadway finished grade (TPs 45, 47 & 50). The estimated high ground water level between Kimberlee Ave. 12+0 – 14+0 is 7' - 11' below roadway*

finished grade (TPs 11 & D7). The estimated high ground water level between Kimberlee Ave. 22+25 – 25+75 is 3' below finished grade (TP 25). The estimated high ground water level at Kimberlee Ave. 29+0 is 10' below the roadway finished grade (TP D11).

- S27. *BETA2: Revise the calculations to indicate the calculated stopping sight distance instead of the passing sight distance. BETA notes that several crest vertical curves (e.g. Bridle Path Sta. 7+35, 10+29, and 13+35) do not appear to have the required 200 feet of SSD as calculated by AASHTO equation 3-44 (where $S > L$). Although not it is not an official Town regulation, it is desirable to utilize a minimum length of curve of 3 times the design speed (MassDOT Project Development & Design Guide pg. 4-43). Lighting is anticipated to provide the required sight distance on sag curves; however, the designer should evaluate the sags at Bridle Path Sta. 11+67 and Kimberlee Ave. Sta. 1+10 to ensure driver comfort and to consider a milder transition. The roadway profiles have been evaluated to confirm Stopping Sight Distance and modified as necessary. The SSD values have been added to the profile sheets. The sag curves at Bridle Path 11+67 and Kimberlee Ave. 1+10 have been modified to a milder transition.*
- S39. *BETA2: Detail revised; however, BETA has been informed that the DPW is in the process of selecting a new standard hydrant. As no model has been selected yet, revise detail to remove reference to American Darling and replace with "Town Standard." The detail has been modified as requested (Sheet 36).*
- S42. *BETA2: Requested streetlight provided. Also review need for streetlight at Bridle Path Sta. 11+67 sag. The street light has been moved from 12+0 to 11+67 (Sheet 15).*
- S43. *The applicant has requested a waiver from §300-13.A.(1) and proposes a concrete sidewalk on one side of the roadway. BETA notes the Board typically requires the installation of vertical granite curb when granting this waiver for sidewalks. The existing Kimberlee Avenue and Bridle Path roadways have slant granite curbing and a single bituminous sidewalk. BETA2: BETA recommends for the Board to discuss this at the next hearing. We have modified the design to show a concrete sidewalk on one side and vertical granite curbing (Sheets 14-24, 36).*
- SW9. *Verify lengths of existing/proposed flow paths. Lengths used in HydroCAD calculations do not appear to match lengths depicted on the watershed plans. BCG: The Tc paths were reviewed and the Subarea DG & DJ paths were revised. BETA2: Clarify revisions. Review of the watershed plans and HydroCAD calculations does not appear to show any changes from original submission. The Tc values were modified such that the Tc for Subarea DG went from 27.3 min to 25.8 min and for Subarea DJ it went from 13.5 min to 16.6 min.*

SW13. BETA2: Evaluate proposed slopes at structures DMHs 5, 21, 38, and 39 and CBs 39A, 39B, which are all 0.003 or flatter. Also, although the Town does not have a written policy regarding the HGL, the DPW has indicated they generally follow the MassDOT policy of providing a minimum desired 2-foot separation from the rim to the HGL. Evaluate pipe capacities/HGLs at DMHs 1, 38, and 39 and CBs 17 and 39B. The following table shows the data for the requested structures. Due to the topography and limitations on cuts/fills and roadway grades it would require significant filling in the area of DMHs 17 and 21 to meet the 2' separation. Due to the need to meet the existing grade at the end of Bridle Path and the elevation of Retention Basin E it is not possible to have 2' separation for DMH 39 and CBs 30A-C. The low flows at CB 17A& 39A result in low velocities even though the slopes are greater than 0.005. While I respect BETA's opinion, it is my professional opinion that the design meets generally accepted engineering standards considering the site and regulatory constraints.

Structure	Flow (ft ³ /sec)	Slope (ft/ft)	Velocity (ft/sec)	HGL to Rim (ft)
DMH#1	5.1	0.013	6.5	4.0
DMH#5	12.8	0.002	3.8	8.6
DMH#21	3.4	0.003	2.7	0.5
DMH#38	2.1	0.006	2.7	2.4
DMH#39	7.7	0.018	4.3	1.0
CB#17A	0.8	0.036	1.1	0.6
CB#17B	4.9	0.012	6.2	0.2
CB#39A	0.3	0.006	0.4	0.6
CB#39B	3.9	0.002	3.1	0.5

SW15. BETA2: Double-grate catch basins provided. Recommend providing additional catchment in proximity to CBs 8B, 27B, and 39B, which are anticipated to have undesirable flow spreads reaching/exceeding the crown of the roadway for the design storm even. Double CB 8C has been added at Kimberlee Ave station 12+0 and double CB 39C has been added at Bridle Path station 0+40 in order to ensure that the spread at the low points does not exceed the crown. It is not necessary at CB 27B since the spread does not reach the crown of the roadway.

SW17. Recommend revising outlet control structures to eliminate or minimize flows over the overflow weir (typically reserved for emergency overflows). Basin B will have greater than 10 cfs directed to the overflow weir during the 10-year storm. If flow cannot be eliminated, provide substantial erosion control protection and size rip rap accordingly. BCG: We looked at modifying the outfall structure but due to the limited area and inlet flow rate we need the higher capacity supplied by a weir. The proposed design was checked using the Isbash formula and the 6-12" stone on the rip- rap mat is significantly higher than required in order to retain slope stability. BETA2: Information provided. At the discretion of the designer, consider expanding the footprint of this basin to the north and south (while maintaining the required 20' high water offset to property lines) to provide additional stormwater mitigation. The basin has been expanded to the north to the maximum extent

allowed while still maintaining 10' setback from property line (Sheet 15) and storm water calculations revised to reflect increased volume.

SW18. *Given the soils with rapid infiltration rates in the area of the proposed drainage basin on Lot E and the location of the overflow at the rear of a residential property, recommend expanding the basin area to fully attenuate the 100-year storm. BCG: We have modified the basin to accommodate the full 100-year storm by raising the berm elevation (Sheets 24 & 34). BETA2: Basin expanded to fully retain the 100-year design storm. Confirm the area of the 298 contour in the HydroCAD calculations, which appears to be approximately 2,000 sq. ft. larger than depicted on the plans. The basin has been modified by excavating a portion of the site to the 292' contour in order to ameliorate the potential for surcharging from CBs 39A & B. This allowed us to use the SAND Rawls rate between contours 292' – 296' while retaining the SL Rawls rate for the rest of the basin. This modification allows the basin to retain the entire 100-year storm with at least 1' of freeboard.*

SW20A. *Review "Developed Conditions" runoff rate and volumes depicted on Table 2. Wetland E design point appears to show the "Existing Conditions" calculations. The table has been modified to reflect the changes in the Tc for Subareas DG and DJ and the changes in Basins B, D, E & F.*

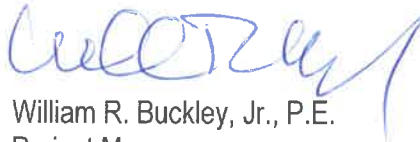
SW23. *BETA2: Sandy loam was recorded on the soil logs for test pits 73, 74, and D-13; however, the sieve analysis from D-13 indicated the presence of a silt loam. In consideration that there is limited data over the surface of the proposed basin the designer should consider the use of silt loam for the dewatering calculations or implementing a slow drain to ensure the basin can empty. Also, the provided drawdown calculations are based on the required recharge volume and not the total storage volume. As noted in the stormwater handbook (Volume 3, Ch. 1, pg. 25, footnote 21) the storage volume of the structure must be used in the calculations. BETA notes that in consideration that Basins D and E have very flat side slopes, the entire footprint of the basin is appropriate to use in the calculations. It is BETA's opinion that it is more desirable to fully attenuate the 100-year storm event and eliminate overflow to adjacent residences vs. fully draining the pond provided that at least the 10-year storm for Basins D and E can be fully infiltrated in 72 hours. Test Pit D-13 is over 100' from Basin F so we will continue to use TPs 73 & 74 which were done within the area of the basin in conformance with Standard 3 of the DEP Stormwater Standards and were witnessed by the Franklin Board of Health consultant. A drawdown analysis was done for the 100-year storm event for all basins and the result is attached. Retention Basin D does not meet the 72 hour standard if the 294' elevation was used. However, if the 295' elevation was used then the drawdown is within 27 hours. As a further review the 10-year storm was analyzed for Basin D using the 294' elevation and the drawdown was accomplished within 38 hours.*

SW25A. *Provide confirmation that the required setbacks outlined in the Stormwater Handbook for infiltration structures have been provided for wells and septic systems on adjacent residences.* The Franklin Board of Health provided information on the lots on Kimberlee Avenue and Madison Avenue that are near Basins C, D & E. Retention Basin D grading was slightly modified on the west side to ensure that the 100-year storm water lateral limit is 100' from the existing septic system at 35 Kimberlee Avenue. The septic system at 36 Kimberlee Avenue meets the 50' setback requirement from a septic system. The private well is 93' from the 100-year flood elevation, but it is an irrigation well. The DEP standards do not distinguish between irrigation and domestic wells. Title 5 does differentiate in that irrigation wells require a 25' setback from a septic system and domestic wells require a 100' setback. The irrigation well is only 85' from the home's septic system leaching field. All of the systems on Madison Avenue meet the 50' setback requirement.

I believe that this addresses the open issues. Thank you for your consideration.

Very truly yours,

BAY COLONY GROUP, INC.



William R. Buckley, Jr., P.E.
Project Manager

Encl.

ITEM 865.2**PAVEMENT SURFACE COATING****SQUARE FOOT**

The work under this Item shall be in accordance with Section 860 of Standard Specifications for Highways and Bridges and the following: The work under this Item shall include preparation of the pavement surface in conjunction with the application of one or more courses of a polymer modified flexible cement surfacing material that may be used as a complete light, durable, skid resistant, composite wearing surface, or textured and colored on sections of pavement to simulate hand laid brick and/or conventional masonry where shown on the plans or as directed by the Engineer.

This work shall be for the proposed "Maple Hill" residential subdivision in Franklin, MA and labeled as "pavement surface coating" on the plans. The color shall be brick red and pattern shall be standard size brick arranged in a running bond, brick orientation.

PREPARATION

The areas to be surfaced with the specified material(s) must be structurally sound and may consist of either asphalt or cement concrete. When these material(s) are intended for application on a newly paved asphalt surface a curing period will be required to ensure that no concentration of oils are present. A suitable approved pavement heater may be employed to expedite curing when a delayed work schedule is not advisable.

Surface preparation will then be performed in the following general manner:

The pavement surface is to be thoroughly cleaned by approved methods removing all contaminants that may prevent proper adhesion of the new surfacing material(s). A suitable approved pavement heater shall be employed where surface oils, fuel and the like exist on the surface, to remove these incompatible materials. New bituminous concrete shall be added as necessary, thermally bonded to the pavement and compacted to achieve a density equal to the surrounding or adjacent pavement. No work shall be initiated until the surface condition conforms to manufacturer recommended standards for both structure and cleanliness.

All applications shall be installed in a neat and uniform manner by approved methods. The Contractor will be responsible for furnishing and placing a sufficient number of safety cones together with caution tape to adequately protect all work zones, and to insure the orderly flow of vehicular and pedestrian traffic.

Residues resulting from this element of the work shall be immediately removed from the jobsite(s) and must be disposed of in a proper manner. There will be no additional compensation for the disposal of excess or unused materials. Pavement sections where the surfacing work is incomplete must be left in a neat and clean condition, satisfactory to the Engineer at the end of each workday.

INSTALLATION

Contractor shall be responsible for the preparation, placement and patterning of the polymer modified flexible concrete surfacing material(s) for all applications according to the

ITEM 865.2 (Continued)

TECHNICAL SPECIFICATIONS

manufacturer's guidelines and subject to the approval of the Engineer. When required, this composite paving material shall be uniformly and homogeneously formulated with color stable pigments and surface textured to simulate hand laid brick and/or masonry.

A simulated mockup consisting of the color(s) and pattern(s) as selected by the Engineer and the Town, will be constructed, within a designated section of the overall work area, at least five working (5) days prior to the initiation of this phase of construction. The mockup site will be determined by the Engineer. Weather permitting and only with approval of the completed sample section, the work shall begin. The cost of the mockup shall be included in the unit price for this item and shall encompass a minimum surface area of 3'x3'.

A working knowledge of the specialized technology contained within these specifications is required. Only certified applicators may be employed for this work. In the event that this material and/or surfacing system constitutes, or is claimed to constitute proprietary technology subject to U.S. Patent protection, the Contractor will be required to furnish written evidence satisfactory to the Owner that he/she is an accredited, authorized and/or licensed installer of the patented material/process.

The installation phase of this work shall be performed in the following general manner:

Using manufacturer prescribed methods and equipment as described herein, the Contractor shall properly blend and mix the water, polymer modified cement, aggregate and pigments (color will be selected by the City) to achieve the desired consistency. The polymer shall be an acrylic based material furnished in an aqueous emulsified state to prevent the loss of internal strength and bond which may result in cohesive and adhesive failure. The measuring and mixing operation shall be capable of producing a workable, consistent, homogeneous mixture for the intended application. Only then shall the Contractor apply the composite to the surface of a hardened, structurally sound bituminous concrete pavement as directed.

Using specialized equipment and tools as necessary the desired ultra-thin composite mixture shall be sufficiently and uniformly applied to the surface. The finished material must be capable of being spread to a consistent build thickness of as little as .0625 inches per layer. Segregation of the mixed material shall be avoided. Should this condition present itself the material and/or application must be corrected immediately or replaced, as determined by the Engineer. When this newly constructed ultra-thin finish is applied over bituminous concrete it shall provide a flexible, fuel, skid and UV resistant surface, which results in a reduction of susceptibility to natural oxidation.

No material shall be applied when precipitation is present or imminent inclement weather will prevent proper curing. No material may be allowed to exceed the workability limitations of the composite mixture.

Hand applications will be utilized for smaller sections when a color distinction and/or surface pattern is required. Patterned applications intended to resemble masonry will be constructed in two (2) layers and colors in accordance with the design drawings or as otherwise directed by the Town. Finish patterns and colors may only be applied after the first course has adequately cured.

ITEM 865.2 (Continued)

Once the newly finished surfaces have cured sufficiently, the application area may be opened to vehicular and/or pedestrian traffic. Any residue resulting from this work shall be removed and disposed of in a proper manner. The completed work area is to be left in a neat and clean condition, satisfactory to the Engineer.

The Contractor shall take reasonable precautions and steps during construction to prevent bodily harm or injury or damage to adjacent structures such as curbing, sidewalks, drainage, or water supply facilities. If during the execution of the work, the Contractor, through willfulness or carelessness, permits or causes any damage to public or private property, the cost of repair or replacement shall be the responsibility of the Contractor at no expense to the Town.

The Contractor shall maintain minimum eleven (11) foot vehicular travel lanes at all times during this operation unless otherwise approved.

MATERIALS

The composite material(s) used for this polymer modified thin surfacing system must support a documented performance history satisfactory to the Town that is compatible with the functions and characteristics detailed within these specifications. This material must also be able to demonstrate long term adhesion, flexibility and abrasion resistance characteristics, scrub ability, as well as color stability, chemical and fuel resistance.

The Contractor will be required to furnish to the Engineer five (5) applications that have been placed on main thoroughfares, complete with contact information and locations using the material(s) as specified herein. The ultra-thin layer polymer composite(s) used on these projects must support a documented history of field performance and integrity for the type of work described herein for a minimum period of five (5) years. No waiver of this condition will be allowed.

The composite material shall be flexible with form stability which is compatible with existing bituminous pavements and be formulated using polymer modifications as necessary to suit local traffic and climate conditions. The specified polymer modified composite material(s) when mixed and cured in accordance with manufacturer's guidelines shall demonstrate the physical properties outlined in the following table.

MATERIAL PROPERTIES

<u>Physical Properties</u>	<u>Test Method</u>	<u>Minimum Test Value</u>
Compressive Strength	ASTM C 39	3,100 PSI
Solar Reflectivity Index	ASTM EI918 ASTM C 1549	>29
Shear Bond Adhesion	ASTM C 1583	>250 PSI
Skid Resistance (mixed)	ASTM E-274	>40
Tensile Strength	ASTM C 190	615 PSI (3.9 MPa)
Freeze-Thaw Scaling Resistance	ASTM C672-98	0

ITEM 865.2 (Continued)

TECHNICAL SPECIFICATIONS

MATERIAL COMPONENTS

Water. The water used in mixing these composite(s) shall be of potable quality and free from soluble salts.

Chemical Admixtures/pigments. All chemical admixtures shall be introduced during the manufacturing process. Pigments may only be added on site to achieve a particular color quality or tint preference as directed.

Surface Sealer. A suitable approved surface sealer, if required, may be applied to the polymer modified composite(s) to provide additional protection in fueling areas, or to prevent surface efflorescence when colors are utilized.

Material Verification. Upon request the Contractor shall provide a Certificate of Analysis (COA) for the polymer emulsion, aggregate and aggregate dry blend verifying that the materials meet the specific requirements outlined herein.

Questionable product with just cause may be subjected to all of the specified testing procedures. All material testing will be conducted by a third party independent certified laboratory acceptable to the Engineer, and will be the financial responsibility of the Contractor. Samples failing in any test category will result in immediate rejection of the material from further consideration or use and may disqualify the contractor from this phase of the work.

Material(s) furnished pursuant to this work shall not be harmful to humans or the environment and must possess a Design for the Environment (DfE) as designated by the United States Environmental Protection Agency (EPA).

No payment will be rendered for any work until a manufacturer's certificate of compliance has been furnished by the Contractor. A Material Safety Data Sheet (MSDS) will also be required before any work is initiated.

EQUIPMENT

Contractor must have access to and be familiar with the specialized machinery and tools necessary to perform the procedures as outlined and contained within these technical specifications. These items shall include but not be limited to dedicated surfacing equipment designed exclusively for use in applying thin layer polymer modified composite(s), appropriate trucks, air compressors, miscellaneous dispensers, mixers, applicators, heaters, cutters and/or specialized tools etc.

To ensure optimum work site efficiency and project safety considerations, multiple crews may be required when hand applications or custom patterns as described previously are necessary.

TECHNICAL SPECIFICATIONS

ITEM 865.2 (Continued)

MOBILIZATION

Construction of these flexible ultra-thin surfaces shall commence within twenty-four (24) hours of written notification to proceed as issued by the Contractor. Work shall commence within this timeframe without regard to the number of mobilizations that may be required by the Engineer to complete this work.

Due to the logistical complications inherent to this type of specialized construction, and given the general project size, scope, schedule and public safety concerns, the Contractor may not assume that a single mobilization will be sufficient to complete this entire phase of the work required in a safe and orderly fashion. No separate payment will be made for any additional mobilization or demobilization as may be necessary to complete the project.

GUARANTEE / WARRANTY

The Contractor shall warranty all applications from defects resulting from improper workmanship and faulty or inferior materials for a minimum period of three (3) years. All defective materials and/or substandard work will be corrected or replaced within the warranty period as directed by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 865.2 Pavement Surface Coating will be measured for payment by the Square Foot, completed in place.

Item 865.2 Pavement Surface Coating will be paid for at the Contract unit price per Square Foot, which price shall include all labor, materials, equipment, mobilization, expansion joint filler, mockup and incidental costs required to complete this work including ancillary preparation of the pavement. No payment deductions will be made for structures within the work area such as manholes, catch basins or water covers.

Drawdown Analysis

PROJECT LOCATION: Maple Hill Franklin
 DATE: 10/22/2020
 PROJECT NUMBER: 16-0148

Detention Basin A

100-year Drawdown Within 72 hours	
Soil Type:	Sandy Loam
Infiltration Rate (in/hr):	1.02
Storage Volume (ac-ft):	0.923
Infiltration Area (sf):	7,749
Drawdown Time (hours):	61.1

Bottom basin el.280'

Detention Basin B

100-year Drawdown Within 72 hours	
Soil Type:	Sandy Loam
Infiltration Rate (in/hr):	1.02
Storage Volume (ac-ft):	0.295
Infiltration Area (sf):	2,552
Drawdown Time (hours):	59.3

Bottom basin el.292'

Detention Basin C

100-year Drawdown Within 72 hours	
Soil Type:	Sandy Loam
Infiltration Rate (in/hr):	1.02
Storage Volume (ac-ft):	1.200
Infiltration Area (sf):	14,609
Drawdown Time (hours):	42.1

Bottom basin el.296'

Retention Basin D

100-year Drawdown Within 72 hours	
Soil Type:	Sandy Loam
Infiltration Rate (in/hr):	1.02
Storage Volume (ac-ft):	0.488
Infiltration Area (sf):	9,231
Drawdown Time (hours):	27.1

Basin el.295'

10-year Drawdown Within 72 hours	
Soil Type:	Sandy Loam
Infiltration Rate (in/hr):	1.02
Storage Volume (ac-ft):	0.210
Infiltration Area (sf):	2,818
Drawdown Time (hours):	38.2

Basin el. 294

Detention Basin E

100-year Drawdown Within 72 hours	
Soil Type:	Sand
Infiltration Rate (in/hr):	8.27
Storage Volume (ac-ft):	0.512
Infiltration Area (sf):	1,340
Drawdown Time (hours):	24.1

Bottom basin el.292'

Detention Basin F

100-year Drawdown Within 72 hours	
Soil Type:	Sandy Loam
Infiltration Rate (in/hr):	1.02
Storage Volume (ac-ft):	0.931
Infiltration Area (sf):	10,695
Drawdown Time (hours):	44.6

Bottom basin el.280.0'

Chat Messages for October 5, 2020 Planning Board Meeting

-  **Jen Williams**40:26

hard to hear you Tony and can whoever is controlling this mute others in the audience who are not speaking?

-  **Michael Doherty**40:29

are other people having difficulty hearing the chairman?

-  **Jen Williams**01:02:26

Tony it is hard to hear you again...

-  **Marc's iPad**01:27:29

<https://www.amazon.com/Jabra-Wireless-Bluetooth-Softphone-Packaging/dp/B00AQUO5RI>

-  **Kerry Campbell's iPhone**01:40:22

striping on the road is not a minor detail if it pertains to a side street

-  **Rebecca**01:41:42

what about the existing portion of Bridle Path that has slanted granite and one sidewalk?

-  **Maegan Schlitzer**01:43:02

Will the homeowners be responsible for maintaining these new roundabouts?

-  **Stephen Comeau**01:45:59

The hill between 33 & 44 has a blind curve - what will be the size of the median? I have never seen a round-about within a neighborhood like ours.

-  **Marc's iPad**01:49:43

how do flush medians and roundabouts serve to calm traffic?

-  **Rebecca**01:49:52

he did not address my question about the current slanted granite curb and one sidewalk on the existing portion of Bridle Path...

-  **Kerry Campbell's iPhone**01:51:29

what is the point of having a roundabout if you can drive right over it?

-  **Marc's iPad**01:52:01

in exchange for vertical granite, they would waive the requirement of a 2nd sidewalk.

-  **Michael Itani**01:52:37

the contractor referred to this as an "urban" mini roundabout. This is a suburban neighborhood. they'll do nothing to slow down the traffic in the neighborhood. if anyone wants to speed, they'll slow down for a moment at the roundabout and immediately speed up.

-  **Kerry Campbell's iPhone**01:53:01

They aren't used in neighborhoods. That statement was already made.

-  **Kerry Campbell's iPhone**01:53:11

This will be the first of its kind.

-  **Kerry Campbell's iPhone**01:54:37

Can we also get some additional detail on whether Bridle Path will be lined?

-  **Marc's iPad**01:55:10

Was there any consideration of 3-way stops?

-  **Michael Itani**01:57:37

roundabouts are used to keep traffic flowing. There is very little traffic coming from the cul-d-sacs to warrant the need of these extreme measures.

-  **Emily Ellis**01:59:50

There is a fire hydrant on Surrey very close to Bridle Path. Will the island coming onto Surrey restrict access to that hydrant in the event of an emergency and how much time will be taken away from emergency vehicles having to get from one end of Bridle Path to the next?

-  **Marc's iPad**02:00:12

the through traffic is the issue, not the cul-de-sacs.

-  **Kerry Campbell's iPhone**02:03:02

Exactly. If the through traffic is the issue, it should be stop signs, not roundabouts. If you want traffic to keep moving, you install roundabouts. When you want them to slow down or stop, you install stop signs.

-  **Keith**02:04:29

How will the end of Franklin Springs Rd be impacted?

-  **Paul Irvine**02:09:41

When would Bridle Path get paved... after 58 homes are built and sold?

-  **Michael Itani**02:11:21

it'll probably get paved sometime after Lincoln street is paved, so 2035.

-  **Leon**02:12:02

looks like 22 houses in phase 1

-  **Marc's iPad**02:16:07

so is Lincoln street going to left in it's current horrible state for the next 15 years?

-  **Kerry Campbell's iPhone**02:18:59

Shouldn't you know where they are if they were suggested as a measure.

-  **Chris Peterson**02:19:55

Bryan, Can you let them know that The Norfolk roundabout has a raised island in the middle.

-  **Kerry Campbell's iPhone**02:23:15

If you cant find one, how does the Town Engineer know they are effective in residential areas. I would hope that would be a primary consideration when conducting research.

-  **Lechter 35 Kimberlee**02:24:49

if this had a raised piece in the middle that would help more than simple pavement you can drive straight over

-  **Marc's iPad**02:25:01

the Norfolk roundabouts are ringed by cobblestones as well.

-  **Stephen Comeau**02:26:03

and they are not in a residential area

-  **Lincoln**02:29:05

Based on Mr. Buckley's statement, the contractor's trucks can destroy Bridle Path's chip seal and not have to pay to replace the damage?

-  **Kerry Campbell's iPhone**02:32:12

But you stated the roundabouts are not part of current regulations.'

-  **Kerry Campbell's iPhone**02:33:04

But these roundabouts have not been built before, so maybe another opinion would be a worthy effort.

-  **Jane Hanson**02:33:44

Did I understand this correctly?... The traffic calming measures, to help insure the safety of so many children during this process, will not be completed for 8-10 years??

-  **Dave Snyder**02:41:04

how long will construction vehicles be using Bridle Path before it is repacked?

-  **Emily Ellis**02:41:25

So if they have to put the roundabouts in why don't they do it at the beginning of construction?

-  **Michael Doherty**02:41:42

Two points 1. What about the curve on Bridle Path, is that non-complaint too? ; 2. we should oppose phasing to avoid 12 years of construction .

-  **Brian Kane**02:45:52

Are you taking into consideration the building materials for all the homes including cement trucks for foundations? or just soil and stone?

-  **Dave Snyder**02:47:35

these comments assume the tractor trucks will be extended over 10 years - is that accurate? seems more likely they would be more heavy during certain times.

-  **Bryan Taberner**03:02:45

I apologize to all of you that did not get to speak. I count four of you. Any comments provided through Chat will be included in the next Planning Board agenda packet.