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Richard Benevento
Zoning Board of Appeals
Town of Middleton
195 N Main Street
Middleton, MA 01949

October 12, 2023

Ref. T1404

Re: 10 Boston Street, Middleton, MA
40B Comprehensive Permit Application
Civil Engineering and Traffic Engineering Peer Review #1

Dear Mr. Benevento:

On behalf of the Town of Middleton, TEC, Inc. (TEC) has reviewed documents as part of the traffic and civil engineering peer review for a proposed multi-family residential development via a MGL Chapter 40B Comprehensive Permit located at 10 Boston Street (Route 60) in Middleton, Massachusetts ("the Project"). The Project will include the construction of sixty (60) single-family rental units in a single multi-family building.

The following materials were considered as part of our review:

- *Comprehensive Permit Application Package – Villebridge Middleton – 10 Boston Street – Middleton, MA*; prepared by Villebridge Real Estate Development, dated August 22, 2023.
- *Traffic Impact Assessment – Villebridge – 10 Boston Street – Middleton, MA*; prepared by Vanasse & Associates, Inc., dated August 2023.
- *Comprehensive Permit Plans – Villebridge – 10 Boston Street – Middleton, MA*; prepared by The Architectural Team, Inc., dated August 2023.
- *Preliminary Stormwater Report – 10 Boston Street – Middleton, MA*; prepared by Hancock Associates, dated August 22, 2023.

TEC completed a review of these documents consistent with Town of Middleton zoning requirements and other industry standards and offers the following comments:

Civil Engineering Site Plan Review

1. Plans as submitted are labeled as "Preliminary", and in the opinion of TEC, do not provide sufficient detail to determine adequacy of the site and stormwater design.
2. A waiver has been requested for the requirements of Section 9.5 of the Middleton Zoning Bylaws, "Site Plan Review". The plans as submitted do not meet the following requirements:
   a. Plans shall be submitted on twenty-four-by-thirty-six-inches sheets whereas the plans currently are thirty-by-forty-two-inches. TEC defers to the Board.

b. Plans should provide a locus plan at a scale of one-inch equals to 100 feet, showing the entire project and its relation to existing areas, buildings, and roads for a distance of 1,000 feet from the project boundaries.
c. Plans should indicate snow storage areas.

3. A waiver for maximum building height is requested. The allowable height is 35ft (3 stories) – the applicant's proposed building height is 42ft (3 stories). TEC defers to the Board.

4. Per the MA Stormwater BMP Handbook, a minimum of (2) test pits should be conducted within the footprint of each subsurface infiltration system. Several test pits are shown on the plans, however none appear to have been conducted within the footprint of the (2) proposed infiltration systems. Additional test pits in the footprint of the proposed infiltration systems should be conducted to confirm soil classification, infiltration rate, and estimated seasonal high groundwater elevation.

5. (8) test pit locations are indicated on the plans. It appears that test pit results are only provided for (4) test pits. The locations of (2) of the test pits for which results are provided are not indicated on the plans.

6. The Applicant should provide turning templates showing the ability of fire apparatus to access, circulate, and egress the site through the circulation pattern without leaving the paved surface. This includes a Town of Middleton fire apparatus. The Applicant should coordinate with the Town of Middleton Fire Department for preferred locations of fire lanes (if needed), confirmation of hydrant locations, and sign requirements for fire lanes within the site. TEC defers to local police and fire.

7. The site layout plans indicate trash will be stored inside the building and trash pickup access will be through the south side of the building from the adjacent parking lot of "Lot 3". Grading of this access should be confirmed as it appears the first 20' of the access path will be greater than 20% until the parking lot is regraded/reconstructed on "Lot 3". The Applicant should provide turning templates showing the ability of dump trucks to access, circulate, and egress the site through the circulation pattern without leaving the paved surface while accessing the location of the trash room. Adequate access for trash removal should be incorporated into the development of "Lot 2". Should the refuge truck need to access the trash room from Lot 3 as depicted, and common ownership of "Lot 2" and Lot "3" ceases, a cross-access easement may need to be in place to conduct this business.

8. The plan set does not include any construction details.

9. No construction period erosion and sediment controls are indicated on the plans.

10. No drainage conveyance structure inverts are indicated. No drainage conveyance pipe size, material, length, or slope are indicated. Assuming a minimum of 36" from rim to invert for proposed catch basins to the west of the proposed infiltration systems indicate a potential backflow condition (inverts of catch basins approximately elevation 101.2, 101.5; bottom of chambers elevation 101.5).

11. The plan set does not provide for details regarding proposed retaining walls. A DMH is proposed in between the retaining walls and detail on the walls should be provided to ensure constructability.

12. Infiltration system construction details should be provided. Isolator row details should be provided. Infiltration system inlet manholes and manifold details should be provided. The outlet control structure call outs indicate weir elevation but do not indicate orifice size and elevation as included in the HydroCAD model. Outlet control structure details should be provided.

13. Plans indicate a minimum offset from infiltration system to subsurface soil absorption system of 25', assumed to be taken from Title 5 for the setback from SAS to dry wells. Per the MA Stormwater BMP handbook, the offset from infiltration BMPs (basins and trenches) to soil absorption systems is 50'. TEC defers to MassDEP as to the superseding regulation. TEC defers to the local Health Department and MassDEP on septic system design.

14. Per the standard Stormtech construction details, a minimum of 18" is required from the top of the chambers to the bottom of pavement for adequate structural integrity under parking areas. The current proposed design indicates approximately 16" from the top of the chambers of infiltration system "1P" to the top of pavement along the western side of the system.

15. The applicant proposes connecting the new drainage system to the existing drainage network on "Lot 3" via a proposed utility easement. The existing drainage network on Lot "3" is connected to the existing drainage system within MassDOT jurisdiction on South Main Steet (Route 114). A DOT Access Permit may be required for the expanded drainage connection. TEC suggests the applicant and DPW engage MassDOT regarding the proposed expanded drainage system interconnection.

16. Proposed lighting is indicated on the provided landscape plans, however no photometrics are provided to ensure no light spillage/pollution and conformance with local regulations.

17. Lighting plan shows proposed light pole within infiltration system "1P", details on how that would be constructed should be provided.

18. The landscape plan shows a proposed tree within infiltration system "2P." There is also a proposed tree at the southwest corner of the site that is proximate to a proposed area drain and pipe connection.

19. The landscape plan proposes plantings within the Boston Street right-of-way adjacent to the proposed entry sign. With regards to ownership of on-going landscape maintenance, TEC suggests proposed landscaping remain outside the public right-of-way.

20. Is a cross-access easement to be established between the subdivided lots to allow for residential traffic to utilize the South Main Street parking areas and driveway?

21. The Applicant should verify the location of bus stops for resident children with the local school district and ensure the location is easily accessible by a school bus.

22. The Applicant shall provide a dedicated plan for all traffic signage and pavement markings to be installed as part of the project. A sign summary shall also be included which depicts the sign legend, sign size, and sign lettering dimensions in compliance with the *Manual on Uniform Traffic Control Devices* (*MUTCD*).

    a. This includes the placement of a stop sign and stop lines along the site driveways at its intersection with Boston Street and South Main Street.

b. This includes placement of a stop sign and stop lines along the Boston Street Driveway and its intersection with the main drive aisle leading to Lot 3's surface parking.

c. The Applicant should provide standard details and/or notes that denote the height of traffic signage on-site. Note that the height of some signage will be different than others.

23. The proposed site provides for 102 off-street parking spaces. The land use is identified in Bylaw Section 5.1.2. The site would require 120 parking spaces to satisfy the Bylaw. The Applicant has noted a need for relief from parking spaces with 1.7 spaces per unit.

a. Parking demand calculations published by the Institute of Transportation Engineers (ITE) in the most recent industry standard *Parking Generation, 5th Edition* for Land Use Code (LUC) 221 – Multifamily Housing Mid-Rise denote an average peak parking demand of seventy-nine (45) parking spaces needed for sixty (60) units or sixty-eight (68) parking spaces for ninety (90) bedrooms. Parking demand calculations also note an 85th percentile peak parking demand of eighty-nine (89) parking spaces needed for sixty (60) units or seventy-eight (78) parking spaces for ninety (90) bedrooms. Even under the most limited parking demand combination from the ITE publication would suggest the Applicant's parking spot count would be sufficient to meet demand.

24. Dimensions are provided for a typical parking space on-site in compliance with the Bylaw. In addition, dimensions for the accessible spaces on-site are in compliance with 521 CMR 23.4.1. The Applicant should revise the plans to show accessible signage at the head of each accessible parking space with the associated 'Van Accessible' plaque.

25. The plans should be revised to depict both intersection sight distance and stopping sight distance measurements for both directions at Boston Street and South Main Street. Intersection sight distance measurements should be taken from a point 14.5-feet from the proposed edge of travel way on each mainline roadway. The sheet should denote all areas of clear view and resulting from the sight lines both on the public ROW and land under the control of the Applicant.

26. Concrete sidewalks are provided along Boston Street opposite the site frontage. A proposed sidewalk is shown on-site connecting from the building frontage out to Boston Street and terminating. The location is not ideal for a crosswalk to allow connection to the sidewalk along the northerly side of the roadway. The Applicant should provide a pedestrian connection along the southerly side of Boston Road connecting to the intersection with South Main Street.

27. The Applicant should provide standard details for all accessible ramp types and crosswalks.

28. The plan does not show electric vehicle charging stations on-site. The Applicant should clarify if spaces on-site will be constructed as EV-compatible or EV-ready.

29. The Applicant shall define the location of resident bicycle storage including weather-protection and security.

MassDEP Stormwater Standards

30. Standard 1 (Untreated discharges): *No new stormwater conveyance may discharge untreated stormwater directly to or cause erosion in wetlands or water of the Commonwealth.*

Standard appears to be met. All stormwater runoff from the site is proposed to be discharged to an existing drainage network within South Main Street. See Standard 4 regarding water quality treatment.

31. Standard 2 (Peak rate control and flood prevention): *Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for land subject to coastal storm flowage.*

TEC provides the following comments in relation to Standard 2:

a) The existing watershed analysis map indicates (3) analysis points. The proposed watershed analysis indicates (1) analysis point. The majority of the site runoff has been redirected towards the South Main Street drainage network analysis point, however, there appears to still be a small area of the post development condition which drains towards Boston Street. The watershed maps and analysis should be revised to incorporate the Boston Street analysis point. All (3) analysis points should be indicated in the Stormwater Report discharge rate table. It appears peak flows will likely still be met.

b) The HydroCAD analysis indicates the proposed pipe network to an existing drainage manhole will be constructed within 12" reinforced concrete pipe. The outlet of the existing drainage manhole appears to be an 8" cast iron pipe. The analysis should include the existing pipe to ensure the reduction in flow capacity of the 8" pipe will not negatively impact or cause backflow of the proposed stormwater management system for the development.

c) The plans do not indicate size, material, length, slope, or inverts of the proposed pipe network. Some pipes are included in the HydroCAD analysis. All proposed pipes should be modeled to ensure adequate size and flow capacities for the site. TEC recommends adding all structures and pipes to the HydroCAD model.

d) The HydroCAD model and the plan call outs indicate a total of 192 chambers in infiltration system "1P". It appears there are 191 chambers as (1) chamber appears to have been removed for the inlet of the CB in the northeast corner of the proposed parking area. TEC recommends this CB be directed the system manifold DMH in the northeast corner of the system, allowing for 192 total chambers.

32. Standard 3 (Recharge to Ground water): *Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures, including environmentally sensitive site design, low impact development techniques, best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts's Stormwater Handbook.*

TEC provides the following comments in relation to Standard 3:

a) Per the plan call out for infiltration system "1P", the bottom of the system is 2' above seasonal high groundwater. The system is also used proposed for peak flow attenuation for storms greater than and equal to the 10-year storm, therefore a mounding analysis should be provided.

b) As mentioned prior, additional test pits should be conducted within the footprint of infiltration systems.

c) The checklist indicates that runoff from all impervious areas at the site discharges to infiltration BMPs. There are areas (sidewalks to the north, east, and south of the building; a portion of the driveway draining to Boston Street) which are not conveyed to the proposed infiltration systems. The checklist should be revised.

d) It appears that required recharge volumes are met.

33. Standard 4 (80% TSS removal): *Stormwater management systems must be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).*

TEC provides the following comments in relation to Standard 4:

a) It appears that required water quality volumes are met for the (2) infiltration systems.

b) As mentioned prior, there is a portion of the proposed driveway which discharges to Boston Street. This runoff is not captured and therefore is untreated. The water quality analysis should provide calculations showing that the site averages the required 80% TSS removal for all impervious areas requiring treatment.

c) The proposed parking area catch basin located in the southwest corner of the site is proposed as an inline structure. Per the Stormwater BMP Handbook, all deep sump catch basins should be off-line structures.

d) A Long-Term Pollution Prevention Plan should be provided per the stormwater checklist.

34. Standard 5 (Higher Potential Pollutant Loads): *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.*

Standard does not apply to this proposed project. The checklist should be revised as it indicates the EPA NPDES MSGP covers the land use.

35. Standard 6 (Critical Areas): *Stormwater discharges to a Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or any other critical area require the use of the specific source control and pollution prevention measures and the specific stormwater best management practices determined by the Department to be suitable for managing discharges to such area, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters or Special Resource Waters shall be set back from the receiving water and receive the highest and best practical method of treatment. A "stormwater discharge," as defined in 314 CMR 3.04(2)(a)1. or (b), to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to Zone I or Zone A are prohibited unless essential to the operation of the public water supply.*

Standard does not apply to this proposed project.

36. Standard 7 (Redevelopment*). A redevelopment project is required to meet Standards 1-6 only to the maximum extent practicable. Remaining standards shall be met, and the project shall improve existing conditions.*

    Standard does not apply to this proposed project.

37. Standard 8 (Erosion, Sediment Control): *A plan to control construction-related impacts, including erosion sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan), must be developed, and implemented.*

    TEC provides the following comments in relation to the Standard 8:

    a) No construction period pollution prevention and erosion and sediment control plan is provided with information as required per the stormwater checklist. The plan should also include any additional information as required by the Middleton local stormwater management regulations.

    b) No construction period controls are indicated on the plans.

    c) The project will be required to obtain coverage under the EPA NPDES CGP as it will disturb over an acre. This will require the development of a SWPPP as indicated on the stormwater checklist. If the project were to be approved, TEC recommends this be added as a condition of approval.

38. Standard 9 (Operation and Maintenance): *A long-term operation and maintenance plan must be developed and implemented to ensure that stormwater management systems function as designed.*

    Standard appears to be met. The operation and maintenance plan should be revised to indicate that local police and fire will also be notified of any potential spills per the Middleton local stormwater management regulations. Based on the Massachusetts Stormwater Handbook the operation and maintenance plan should include mosquito control for subsurface infiltration systems.

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

    Standard appears to be met. Measures for the prevention of illicit discharges are provided within the Long-Term Operation and Maintenance Plan. No illicit discharge compliance statement is provided, and the report indicates one will be provided prior to discharge of stormwater to post construction BMPs. If the project were to be approved, TEC recommends this be added as a condition of approval.

Traffic Impact Assessment Comments

40. The Transportation Impact Assessment (TIA) indicates driveway related trips accessing directly to/from South Main Street, signed as Route 114, which is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). The Applicant should consult with MassDOT for the Permit to Access State Highway.

41. The TIA indicates that the overall subdivision project is directly associated with an abutting commercial development on “Lot 3” of the subdivision at the South Main Street / Boston

Street / Town Hall Driveways intersection corner. TEC notes that the Board should take this into consideration for conditions on any approval that the overall traffic impact of the several lots should be evaluated without segmentation as traffic impacts will be compounded with each part of the development process. This may result in any off-site mitigation being pushed to a subsequent development phase once the compounded impact, if any, becomes a further hinderance to traffic operations and safety.

42. The TIA included the following intersections within the study area:

- South Main Street (Route 114) / Boston Street (Route 62) / Town Hall Driveways
- South Main Street (Route 114) / Maple Street (Route 62)
- North Main Street (Route 114) / South Main Street (Route 114) / Central Street / Lake Street
- South Main Street (Route 114) / Orchard Circle

TEC generally concurs with the scope of the study area intersections based on the Massachusetts Department of Transportation (MassDOT) *Traffic Impact Assessment (TIA) Guidelines* (Section 3.I.C) to evaluate intersections in which the site-generated trips increase the peak hour traffic volume by more than 5 percent and/or by more than 100 new vehicles per hour. Note that based on the compounding of development area with Lot 3, the study area in subsequent traffic studies for Lot 3 may need to the expanded.

43. Existing traffic volumes at the study area intersections were collected May 2022 while area schools were in general session. TEC concurs with the usage of existing traffic volumes.

44. The TIA evaluates traffic volumes for a COVID adjustment comparing May 2022 traffic volumes at the nearest permanent count station along Interstate 95. The TIA does note, with which TEC agrees, that MassDOT no longer requires COVID adjustments following March 2022 unless the predominant land uses in the area is office. The COVID adjustment institutes an 8.8 percent upward increase in traffic volumes from May 2022 taking into account that seasonally, traffic volumes in May 2022 are 5.3 percent higher than average-month conditions. Existing traffic volumes were further increased to a 2023 condition utilizing a year-over-year background growth rate. TEC generally concurs that this methodology results in a conservative scenario for traffic volumes in the area.

45. The TIA presents motor vehicle crash data for each of the study area intersections. The crash data indicates the number, type, and severity of crashes at the study area intersections between 2016 and 2020 obtained from MassDOT's IMPACT crash portal. The TIA notes that several study area intersections experience crash rates below statewide and district wide averages with the exception to the intersection of South Main Street / Maple Street which experiences a rate well above those respective averages. The intersection is also designated as HSIP-eligible which represents a top 5 percent crash location in the region. The Applicant has noted commitment to implement safety-related improvements at this location further described in this review letter.

46. The TIA references a 1.5% growth rate on traffic volumes per year (compounded) based on the growth of traffic of several roadways in the vicinity from 2009 to 2018 (prior to COVID). TEC generally concurs that the growth rate of 1.5% as used by the TIAS.

47. The TIA documents five (5) specific developments by others which are anticipated to contribute additional traffic to the study area which are not accounted for in the March 2022 traffic counts. In addition, the TIA also projects traffic for the abutting subdivided lot as expected to contain a 5,000 square foot (SF) bank and an 8,000 SF coffee shop, restaurant, or pharmacy with drive-through; however, the TIA has projected traffic related to this abutting lot as separate from the subject project described in this TIA and included the traffic in both the No-Build and Build conditions. TEC disagrees that traffic related to Lot 3 should be assessed in the No-Build condition as it is directly related to subject residential project by subdivision. Its inclusion may affect the Build to No-Build comparison of traffic impacts from the subject project. TEC recommends that the Board identify a condition of approval that requires the Applicant, or future Applicant, to assess traffic for Lot 3 in its separate traffic study based on the site's segmentation; thereby, reassessing the residential development in conjunction with the commercial space of Lot 3 for the overall project subdivision's impact.

48. Site trip generation calculations for the proposed residential development were generated based on standard trip rates published in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 11th Edition* for Land Use Code (LUC) 220 – Multifamily Housing Low-Rise. Overall, the residential project is anticipated to result in 460 new vehicle trips on a typical weekday with 41 new vehicle trips during the weekday morning peak hour, 46 new vehicle trips during the weekday evening peak hour, and 25 new vehicle trips during the Saturday midday peak hour. The TIA identifies that trips were distributed on the roadway network based on US Census Journey to Work Data. This data is not provided in the TIA Appendix and the trip distribution cannot be verified.

49. Values within Table 6 – Peak Hour Traffic Volume Increases appear to be duplicated from 2030 No-Build to 2030 Build along South Main Street, south of Orchard Circle. Please adjust accordingly.

50. TEC agrees with the TIA that the projected site-specific traffic volumes are not expected to result in any significant change at the various study area intersections. TEC reiterates the recommendation for assessing traffic for Lot 3 in its separate traffic study based on the site's segmentation.

51. The capacity and queue analysis indicates that the queues along Boston Street would extend back to the location of the proposed site driveway. This is likely to be exacerbated as the queue for the Boston Street eastbound left-turn lane already exceeds the storage length of the lane provided where the Synchro software is not taking into account the actual storage length of the lane. The blockage of the site driveway may result in vehicles attempting to turn left into the site to be blocked and themselves block westbound traffic along Boston Street. Although a left-turn lane for this location may not be warranted, the Applicant should evaluate the need for a left-turn lane under the full build-out condition with Lot 3 to account for any need for this lane in the future (more through traffic on Boston Street). Furthermore, the Applicant should provide recommendations to reduce the likelihood of driveway blockage along Boston Street.

52. Similarly, the project projects a significant number of left turns into the South Main Street Driveway from the south. The Applicant should provide a left-turn warrant analysis for this location with and without the full build-out of Lot 3.

53. TEC agrees that stopping sight distance (SSD) measurements meet the minimum thresholds for the 85th percentile speeds as identified by the project's ATR counts. Intersection sight distance (ISD) looking east from the Boston Street Driveway is close to

the AASHSTO minimum and below the desired sight line. The Applicant shall ensure that the site frontage remains clear of obstructions so that this ISD is maintained following construction.

54. The Applicant has noted that it is committed to the following recommended off-site measures:

a) Traffic signal timing / phasing adjustments prior to the Certificate of Occupancy and at an 80-percent occupancy level for the South Main Street / Boston Stret / Town Hall Driveway intersection, the South Main Street / Maple Street intersection and the North Main Street / South Main Street / Lake Street / Central Street intersection.

b) Facilitation of a Road Safety Audit (RSA) at the intersection of South Main Street / Maple Street. The Applicant should provide information as to what, if any, improvements identified in the RSA would be implemented as part of off-site mitigation.

55. The Applicant should indicate if additional Transportation Demand Management (TDM) measures will be incorporated into the site, such as electric vehicle charging stations, preferential parking, parking for ride-hailing, or parking for delivery vehicles.

Please do not hesitate to contact me directly if you have any questions concerning our comments at 774-670-3569. Thank you for your attention to these matters.

Sincerely,
TEC, Inc.
*"**T**he **E**ngineering **C**orporation"*

Jared M. Duval, P.E.
Worcester Regional Director

Samuel W. Gregorio, PE, PTOE, RSP_1
Senior Traffic Engineer