



October 8, 2023

Mr. John Lee, Chairman
135 School Street
Walpole, MA 02081
United States

**Re: Comment Letter 1
Residences at Darwin Common
Comprehensive Permit (40B) Peer Review
Walpole, Massachusetts**

Dear Mr. Chairman:

Tetra Tech (TT) has reviewed specific submittal materials for the above-referenced Project to assist the Town of Walpole Zoning Board of Appeals (Board) in its Comprehensive Permit review of the proposed Multi-Family Residential Development at the end of Darwin Lane hereafter referred to as the "Darwin 40B Project". The following letter provides comments generated during our review of Applicant submittals and generally focuses on substantive concerns that speak to issues whose eventual resolution may substantially impact Project design or could otherwise result in potentially unsafe conditions or unanticipated impacts.

The comments below are intended to guide discussion as well as inform development of the revised plans and we expect to provide more detailed comments as the design and discussion advances. The comments below are based on the following materials available on the ZBA's website as of October 2, 2023:

- A plan set titled "A Comprehensive Permit M.G.L. c. 40B – The Residences at Darwin Common – In – Walpole, MA" (Site Plans), dated May August 13, 2021 (Rev No. 1 – August 22, 2023) prepared by Glossa Engineering Inc. (Glossa).
- A plan titled "Planting Plan - The Residences at Darwin Commons – Walpole, MA" dated August 2023 (stamped August 24, 2023) prepared by Steven G. Cosmos.
- Two plan sheets titled "Fire Truck Circulation" dated August 17, 2023, prepared by Chappell Engineering Associates, LLC (Chappell).
- A Storm Water Report for the Residences at Darwin Common dated August 28, 2023 prepared by Glossa.
- A Traffic Assessment Memo for the Residences at Darwin Common dated August 9, 2021 prepared by Ron Muller & Associates (RMA).
- Related Exhibits
- Comment letters from residents and their representatives as well as Town Boards, Commissions and Departments.

The Plans and accompanying materials were reviewed for good engineering practice, overall site plan efficiency, stormwater, utilities, traffic, and public safety. In general, the plans and supporting materials were thoughtfully prepared and we appreciate the clarity and completeness of documents provided. However, the proposed density creates design and operational challenges which in our opinion require additional attention before the Board can render a suitably informed decision. In particular, the Project is completely within the Zone II watershed protection area and potentially within Zone I where any development would otherwise be precluded. The potential for impacts to the nearby public water supply should be thoroughly considered and clearly addressed given the Project will be among the closest developments to a Walpole public water supply and clearly the most densely developed. Our initial comments are provided below and are generally organized by submittal.

Groundwater Protections

1. It's important to note that the Project will be one of, if not the, closest developed property to a Walpole drinking water supply well with a proposed density that presents a greater risk than zoning compliant developments while severely limiting available options for protection of the water supply. As such, we recommend the Board require the applicant to clearly demonstrate and document its compliance with Massachusetts drinking water supply regulations and applicable local regulations and/or bylaws including providing the information required to support granting of a special permit per Section 12 of the Walpole Zoning Bylaw.
2. There appears to be some question as to if portions of the Project lie within the Zone 1 Wellhead Protection Area in which development is not allowed to protect drinking water supplies. Given its criticality we recommend the applicant be required to clearly document how the limit of the Zone 1 boundary shown on the plans was determined including locating the well(s) from which it is derived.
3. The Project is clearly within a Zone II Wellhead Protection area and as such "must comply with local source water protection regulation ordinances, bylaw, and regulations" to comply with Standard 6 of the Massachusetts Stormwater Standards. The Project is wholly located within the Water Resource Protection Overlay District (WRPOD) and is thereby subject to requirements of Section 12 of the Zoning Bylaw which regulates activities within the WRPOD as a means of protecting its water sources. Given the Project density exceeds that allowed under Section 12 - 3. (2) (d) and information listed under Section 12 - 4. A. has not been provided, in our opinion, it does not comply with Massachusetts Stormwater Standard 6.

Site Plans

Cover Sheet

4. Remove redundant Zoning Schedule or clarify its intended purpose.
5. Zoning Schedule indicates a 40% allowed impervious lot coverage which conflicts with the maximum coverage allowed as-of-right per Section 12. In our opinion indicating 40% as the allowed amount in the table is misleading and should be noted as 15% in the table with a corresponding note indicating a higher amount could be allowed with Special Permit.
6. Clarify if the "Total Area of Roads and Driveways" includes sidewalks and curb.

Existing Conditions Plan

7. Note the vertical reference datum used.
8. Clarify how the WRPOD Zone Limits noted on the plan were determined and note the source on the plan.
9. Explain the solid oval line shown along the west edge of the existing stormwater basin. If it is intended to note the 225 contour, then please show how the adjacent 225 through-contour traverses the area so the basin spillover geometry is more clearly represented.
10. Please provide the license number of the Massachusetts Licensed Soil Evaluator certifying the test pit information.

Site Plan

11. Note the proposed curb material on site and if the intent is to have “Cape Cod Berm” throughout the site as suggested by the plan and details we suggest only using it along the street and not extending to driveways as a means of reducing impervious area.
12. Extend granite curb to the limits of the public right-of-way so that only granite is used within the Darwin Lane layout.
13. Show proposed light fixtures on the Site Plan.
14. We recommend the mailbox and associated parking area be moved outside of the Darwin Lane layout as they are Project elements and not part of the public way.
15. The snow storage areas shown are inconsequential in comparison to the area required to be served and conflicts with other site plan considerations such as maintaining intersection sight lines, proposed landscaping, and emergency access. Recommend the Board request the applicant to provide a calculation demonstrating the depth of snowfall accommodated by the areas shown. Please note, the viability of the storage areas shown is limited due to proposed tree locations limiting access.
16. Describe how the “Proposed Recreation Area” is intended to serve the purpose noted.
17. The on-site sidewalk terminates at the “T” intersection at an accessible ramp with no opposite landing area. We recommend the Board consider requiring the applicant to extend the site sidewalk to at least the visitor parking areas including appropriate landings for accessible travel. Additionally, any driveway should be at least 20 feet deep as measured from the garage door to the nearest of either the sidewalk or edge of travel way.
18. The proposed 82’ cul-de-sac radius is substantially smaller than the 104’ radius required by the Walpole Subdivision Regulations which limits the size of vehicle that can navigate the turn without having to back up. We recommend the Board request the Applicant to provide a figure showing the largest vehicle accommodated by the geometry proposed.

Grading and Drainage Plan

19. Provide a vertical datum reference and show hydrant on which benchmark is noted.
20. Provide a summary of propose cuts and fills and an estimate of the total volume of fill material required.
21. Plans shows several critical areas with a 2:1 slope which require special attention during construction to ensure adequate stabilization and long-term viability of what are, and will continue to be, surfaces prone to damage from erosion. Given the proximity of these slopes to the property line and immediately upgradient from the public water supply, we recommend the Board require the applicant to provide documentation from a Massachusetts licensed geotechnical engineer certifying the stability and long-term viability of the slopes shown and any required construction details and post installation conditions required to maintain the slopes or otherwise modify the design to incorporate slopes no steeper than 3:1.
22. Show proposed light fixtures on the Grading and Drainage Plan for coordination purposes.

23. Grading plan suggests overland flow will be redirected toward the Parlon and Griffin properties and at least partially blocked (Elevation 220 and lower). Recommend the grading plan be adjusted to maintain all flow patterns at the boundary of the subject parcel.
24. Top of wall elevations and contours behind units 23-28 suggest flow from 31 Darwin Lane will no longer be allowed to flow south in an uninterrupted manner s the pathway will now be blocked by a significant fill section and a wall of homes. Additionally, a large area of runoff will be directed from the site toward the boundary with 31 Darwin. We recommend the Board require the applicant to provide analysis demonstrating drainage from 31 Darwin Lane will not be impacted by the proposed project.
25. The Plan shows a substantial shift in discharge location from existing conditions with no slope protection beyond a 10-foot rip-rap apron at the outlet . We recommend the existing discharge location be maintained to avoid potential offsite erosion that may occur from the change in flow pattern and intensity.
26. It appears CB-7 is intended to capture all overland flow entering the site from the north and direct it to the on-site infiltration system. Given the Project has no control over the off-site areas we recommend all off-site runoff be redirected around proposed infiltration systems. It also appears flow considered at CB-7 is significantly underestimated and should be addressed as part of any revision. This apparent underestimation is addressed later in this letter.
27. Given the proximity to the public water supply we recommend the applicant consider a more reliable and robust method of pretreatment prior to discharge than currently provided. In our opinion incorporating an isolator row (Stormtech) or similar pretreatment measure would enhance system performance and reliability.
28. Given the size and criticality of the infiltration system, we recommend the plans clearly indicate where inspection ports will be provided.
29. The proposed infiltration trench does not appear to comply with design or construction requirements of the Stormwater Handbook for Infiltration Trenches. The following should be addressed:
 - Describe how design meets soil testing requirements are met
 - Bottom of trench appears to be within 4' of estimated seasonal high groundwater (ESHGW) yet no mounding has been provided as required.
 - Confirm infiltration rates used are applied as required by the Handbook (not variable). Modeling results suggest a variable infiltration rate is being applied.
 - The infiltration trench is more than 14' deep which makes it effectively impossible to inspect, clean or repair and is fundamentally different than the example design provided in the Handbook.
 - Design guidance specifically precludes the use of perforated underdrains in the manner shown on the detail.
 - The proposed location beneath a 10-foot fill makes it impossible to comply with construction criteria noted in the Handbook.

Utilities Plan

30. Several water services as well as the proposed sewer force main are shown routed through the infiltration system where inadequate cover exists above the system to protect either from freezing. Please Show the proposed drainage system and light fixtures on the Utility Plan to confirm coordination of underground utilities in an extremely congested environment.
31. The water services to units 1-5 all cross the sewer force main. Suggest the water main and force main be swapped to avoid the need for water to cross sewer.
32. The plans show a 6" sewer service to remain but the service is not shown on the existing conditions plan. Please clarify what, if any, sewer infrastructure exists serving the project site and how it will be used, replaced, or removed. The operability of any infrastructure proposed to remain should be verified and the proposed force main should transition to gravity prior to entering the Darwin Lane layout.
33. Please describe where sewer pump station controls and alarms will be located and who will be responsible for responding to alarms and maintaining the system.
34. Please provide any testing that's been done confirming the adequacy of the existing water supply to serve the project without impacting existing users.
35. Confirm acceptability of proposed hydrant locations with Fire Department.

Details

36. It's unclear how the pump station float levels were set or how the sizing of the wet well volume correlates to the anticipated demand. Please provide the design basis used for sizing the pump station and its wet well volumes including any a description of provisions for emergency power. As shown the wet well volume between "pump on" and "pump off" is only 21 gallons which seems very small for a station serving a nearly 10,000 gpd design load.
37. The Allen Block Retaining wall detail indicates height is limited to 4' yet wall heights are shown as high as 6' on the grading and drainage plan. Please provide the detail anticipated for walls taller than 4'.
38. The Infiltration Trench Detail poses several fundamental issues that in our opinion make the design unsuitable to the application. See listing of concerns noted under prior comment.
39. The design of the Underground Infiltration System will submerge, and at times backflow through the critical water quality structures which will have trapped contaminants and sediments. We do not recommend routing flow in reverse through the water quality units. If the condition remains we recommend the Board require the applicant to obtain a certification from the manufacturer that the proposed design is acceptable and included in its performance analysis.

Construction Period Plan

40. It appears that the project is located outside Wetlands Protection Regulation jurisdiction and is not subject to review by the Walpole Conservation Commission. The Project will disturb more than an acre and thereby requires coverage under a NPDES Construction General Permit. We recommend a note requiring compliance NPDES permit conditions and associated Storm Water Pollution

Prevention Plan be added to the plan and that proof of coverage be provided to the Board before commencing any land clearing activities.

41. Temporary sedimentation areas are not shown nor are any details provided. Limitations on placement of such areas in location where infiltration is proposed leave few if any available options and as such should be clearly shown on the plan along with an indication of the area intended to be directed to them and its flow path.
42. No information is provided describing the proposed methods for installing fill material and preventing erosion of resulting slopes. At a minimum the plans should describe the fill sequence and provide a detail for slope stabilization. Simply loaming and seeding (with or without "straw guard") a 2:1 slope will not protect it from erosion and a 12' silt sock is unlikely to provide suitable protection for the downgradient property.
43. Suggest the applicant provide a concrete washout detail and designate its location on the plan.

Landscape Plan

44. Proposed tree locations appear to conflict with areas designated for snow storage. Please explain how proposed street trees are expected to survive in areas designated for snow storage.
45. Tree locations also appear to conflict with drain and sewer infrastructure. Most notably at the location of the proposed sewer pump station.

Lighting Plan

46. The plan indicates a modest amount of light from the project will spill partially onto abutting property at 31 Darwin Lane. Given the proximity of the proposed sidewalk to #31 it will be difficult to provide adequate lighting of the sidewalk without such spill onto #31.
47. The plan does not indicate any fixture type or mounting height. Please provide.

Fire Truck Circulation Plan

48. Show proposed trees and light poles on plan.
49. Plan does not show or describe the vehicle used or its assumed performance characteristics. Please provide the model of apparatus used in the analysis and its operational metrics (ie. Wheelbase, bumper overhang, turning radius etc.)
50. Plans show vehicle bumper is required to travel outside the travel way and through areas designated for snow storage and street trees. This is likely due to the 82' radius used instead of the 104' radius required in the Subdivision Regulations. Recommend all trees and snow storage be kept at least 2 feet from the intended path of the fire apparatus and swept path of any protruding feature (bumper, ladder, bucket etc.).
51. The proposed circulation should be reviewed and approved by the Walpole Fire Department.

Stormwater Report

52. The Project proposes to route all the flow coming from the existing detention basin behind 27 Darwin Lane and the surrounding area through a single catch basin grate and into the on-site infiltration system. As noted in prior comment, we do not recommend connecting any offsite flow into the infiltration system. The report suggests very little flow will discharge from the basin but bases this on what appear to be flawed analysis. In our opinion the model overestimates the amount of recharge provided by the existing basin. For example, the analysis suggests the existing basin has more than 5X the infiltrating rate of the proposed basin during the 10-year storm and nearly 10X the rate during the 25-yr storm despite it being less than 1/3 the size. In our opinion the analysis used to estimate offsite flow to the on-site infiltration system is materially flawed and under no circumstances should the flow be routed to the on-site infiltration system. Instead, off-site flow should be routed around the proposed stormwater management system and that routing should be sized based on guidelines provided in the Stormwater Handbook.
53. The Infiltration Trench analysis appears to apply a variable exfiltration rate which is not allowed per guidance of the Stormwater Handbook. Notwithstanding our concerns expressed about design suitability, we recommend the analysis be configured to apply a static exfiltration rate.
54. The Pre-Development Watershed Plan accurately depicts the existing flow path and discharge location which should be maintained under post-development conditions. The current design shows a significant shift in the discharge location and very little offset distance to the property line which may result in off-site erosion issues due to changes in off-site runoff patterns.
55. The Post-Development Watershed Plan and analysis appears to suggest all roof runoff from the Units 23-28 will be directed to the drain at the front of the units and directly to the infiltration system. This ignores the practical reality that rear portions of the roof slope toward the rear of the lot. Runoff from the rear facing section of roof should be routed through the swale and CB-7 otherwise documentation should be provided demonstrating the gutters are sized properly based on the pitch of the roof to accommodate the storm events analyzed and are routed to the front of the building.
56. Provide calculations or specifications demonstrating the proposed stormwater management system meets the 44% TSS removal requirement prior to infiltration. Include performance information for the proposed water quality unit.
57. The Construction Period Pollution Plan (sic.) which presumably should read “Construction Period Pollution Prevention Plan” assumes site capacity for construction activity that may not exist. For example item 6 indicates top and subsoil shall be stockpiled without realistically proposing a location where that can be done while accommodating the sequence of construction that follows. Nor does the plan provide any practical option for temporary sedimentation basins given the volume of fill proposed, resulting steep slopes and the proposed location and depth of the trench drain. Given the combination of factors including a relatively small site, very dense development, fill volume, required infiltration area protection, steep slopes, location within Zone II and lack of buffer to downgradient Zone I, we recommend the Board require the applicant to provide a more thorough and readily achievable construction phasing and execution plan addressing all activities that could negatively impact the downgradient watershed protection zones.

58. Walls and Slopes should be included in the list of stormwater system components and included in the inspection and maintenance section of the Operation and Maintenance Plan Storm (sic.) Water Control and Mitigation System.
59. Given the proximity to the public water supply we recommend the Board consider requiring an Annual Stormwater Management System Inspection Report prepared by an approved Massachusetts licensed professional civil engineer be submitted to the Town demonstrating the system is being inspected and maintained as required and is performing as intended.

Traffic

60. The traffic memo reports that the posted speed limits are 30 mph eastbound and 35 mph westbound on Common Street approaching Darwin Lane. Google Street view imagery indicates a posted speed limit of 30 mph westbound in the vicinity of 556 Common Street. Tetra Tech recommends that the Applicant confirm the regulatory speed limit in this area.
61. The traffic memo included an evaluation of stopping sight distance (SSD) and intersection sight distance (ISD) at the Darwin Lane/Common Street intersection. The evaluation was based on procedures outlined in the American Association of State Highway and Transportation Officials' (AASHTO) A Policy on Geometric Design of Highways and Streets 7th Edition, 2018 which is consistent with industry standards. Tetra Tech recommends that the sight distance calculations be provided to the Town for review.
62. The traffic memo recommends that any proposed landscaping, fences, walls, or signs in the vicinity of the site driveway be kept low to the ground (less than 2 feet above street level) or set back outside the sight triangles as defined by AASHTO. Tetra Tech recommends that the Applicant include sight distance triangles on the final site plans showing the areas to remain clear of obstructions (i.e., signage, vegetation, etc.) to ensure that safe stopping sight distance and intersection sight distance will be met.
63. Common Street has curved horizontal and vertical alignments through the intersection with Darwin Lane. Tetra Tech recommends that the Applicant prepare sight distance plans and profiles of this intersection to demonstrate that adequate sight distance is provided including stopping sight distance for the entire travel lane width in each direction on Common Street.
64. The Institute of Transportation Engineers' Trip Generation Manual, 10th Edition trip Generation Land Use Code (LUC) 220 (Multifamily Housing – Low-Rise) trip rates were applied to 28 units. Tetra Tech generally agrees with the use of this land use category. However, ITE has published a more recent version of the Trip Generation Manual. Tetra Tech recommends that the Applicant revise the trip generation estimates to be based on the 11th edition of the Trip Generation Manual.
65. The traffic memo recommends that the Applicant install a speed hump on the site driveway before its intersection with the Darwin Lane cul-de-sac. Tetra Tech recommends that the Applicant explore alternative traffic calming measures (including along Darwin Lane) as opposed to a speed hump on the site driveway since the proposed Stop bar and Stop sign at the site driveway/Darwin Lane intersection would be anticipated to slow vehicles down along the site driveway.
66. Tetra Tech recommends that the proposed landscaping on-site be less than 2 feet tall where the internal site driveway splits east and west. Additionally, designated snow storage in this area should be reconsidered so that it does not impede sight lines at this internal intersection.

67. Tetra Tech recommends that any proposed traffic signage and pavement markings be compliant with the Manual on Uniform Traffic Control Devices (MUTCD).
68. Tetra Tech recommends that the Applicant review proposed Fire Access with the Walpole Fire Department to ensure the proposed geometry is acceptable.

We recommend the Board require the Applicant to provide written responses to each of the comments provided above and we will track each comment to closure. Please be advised, we may have additional comments as our review continues. Any additional comments will be added to the list above and tracked similarly. If you have any questions or comments, please feel free to contact us at (508) 786-2200.

Very truly yours,



Sean P. Reardon, P.E.
Vice President

P:\309329\143-309329-23004 DARWIN COMMONS PEER\DOCS\DARWIN CIVIL REVIEW LETTER 1 (2023-10-08).DOCX