

Ref.: 23176

December 22, 2023

Mr. Lou Petrozzi
Wall Street Development Corp.
2 Warthin Circle
Norwood, MA 02062

Reg.: Response to Traffic Comments
Darwin Common, Darwin Lane, Walpole, MA

Dear Lou:

Chappell Engineering Associates, LLC (CEA) has prepared this letter to respond to traffic peer review comments by Tetra Tech in their letter to the Town of Walpole dated October 8, 2023. The Tetra Tech letter included comments specific to the Traffic Assessment¹ prepared by Ron Müller & Associates for the above-referenced project. Tetra Tech's comments are reiterated below followed by CEA's responses. The comments are numbered to correspond with the review letter.

Comment 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.”*

Response 60: The posted speed limit traveling both directions along Common Street near Darwin Lane has been confirmed to be 30 mph.

Comment 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*

¹ *Traffic Assessment, Residences at Darwin Common, Darwin Lane, Walpole, MA*; prepared for Wall Street Development Corp.; prepared by Ron Müller & Associates; April 12, 2022.

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.”

Response 61: The intersection sight distances (ISD) were based on AASHTO ISD requirements for a posted speed limit of 30 mph traveling eastbound and 35 mph traveling westbound on Common Street. As noted in Response 60, the posted speed limit traveling both directions is 30 mph. Table 9-6 of the AASHTO Green Book notes that 335 feet of intersection sight distance is required for the posted speed limit.

The stopping sight distance (SSD) calculations were developed by extrapolating between the SSD requirements for 35 mph (250 feet) and 40 mph (305 feet) looking west of the intersection and 40 mph (305 feet) and 45 mph (360 feet) looking east of the intersection, resulting in a minimum requirement of 272 feet looking west and 316 feet looking east. The SSD calculation shown below was also reviewed. Based on this calculation and 85th percentile speeds of 37 mph traveling eastbound and 41 mph traveling westbound, 268 feet of sight distance is required looking west of the intersection and 312 feet of sight distance is required looking east of the intersection. Regardless of which calculation is used the minimum required sight distances are exceeded looking both directions from Darwin Lane.

$$SSD = 3.675 * V + \frac{V^2}{10.44}$$

where V is the 85th percentile speed in mph

Comment 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.”*

Response 62: The intersection sight distance (ISD) sight triangles at the intersection of Darwin Lane and Common Street are shown attached. It should be noted that no improvements or signage are proposed at this intersection. Under existing conditions more than adequate sight distance exists and both the minimum required and desirable sight distances are exceeded.

Comment 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.”*

Response 63: Per Comment 62, ISD sight triangles have been shown on the attached plans. Survey, including elevation data, at the intersection of Common Street and Darwin Lane was not collected as part of the project since no improvements or signage are proposed at this intersection. A field review of sight distance confirms that 500+ feet of sight distance exists along Common Street looking both east and west of Darwin Lane, see Figures 1 and 2 below.

As noted in the study, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *“If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.”* Since the measured intersection sight distances exceed the minimum requirements, safe operation can be expected.

Figure 1 – Sight Distance Looking West



Figure 2 – Sight Distance Looking East



Additionally crash data was reviewed at the intersection of Darwin Lane and Common Street to assess if any safety issues exist. Crash data were obtained from MassDOT for the period between 2015 and 2019, the latest five years of available data, excluding 2020 when traffic volumes were impacted by COVID. Based on the data, only one crash has occurred at this location. The only crash was a rear-end type collision on the northbound Darwin Lane approach to the intersection. There were no crashes associated with vehicles turning off of Darwin Lane and onto Common Street, indicating that there are no sightline deficiencies at this location.

Comment 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.”*

Response 64: As proposed, 28 townhouse units are to be constructed on site. The townhouse units will be built attached in groups of three to six units each with its own outside entrance. Based on the most recent Institute of Transportation Engineers (ITE)

*Trip Generation Manual*², the most appropriate land use code (LUC) 215, Single Family Housing – Attached Housing, should be used. This use is defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance. The updated trip generation estimates using the 11th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* are shown in Table 1 below. The revised trip generation estimates are also compared to the original trip generation estimates from the April 2022 traffic study.

Table 1
Trip Generation Comparison

Time Period	April 2022 Traffic Study Trip Generation Estimates ^a	Revised Trip Generation Estimates ^b	Difference
Weekday Daily	170	160	-10
Weekday AM Peak Hour			
Enter	3	3	0
Exit	11	6	-5
Total	14	9	-5
Weekday PM Peak Hour			
Enter	12	7	-5
Exit	7	6	-1
Total	19	13	-6

^a ITE 10th Edition Land Use Code 220 (Multi-Family Housing Low Rise) for 28 units.

^b ITE 11th Edition Land Use Code 215 (Single Family – Attached Housing) for 28 units.

As shown, using the updated trip generation estimates, the 28 townhouse units are expected to generate 160 weekday daily vehicle trips of which 9 vehicle trips (3 in and 6 out) are expected during the weekday AM peak hour and 13 vehicle trips (7 in and 6 out) are expected during the weekday PM peak hour. These estimates are slightly less (5 fewer peak hour trips during the weekday AM peak hour and 6 fewer trips during the weekday PM peak hour) than what was estimated in the original study. The revised trip generation worksheet is provided attached.

² *Trip Generation Manual, 11th Edition*; Institute of Transportation Engineers; Washington, DC; 2021.

Comment 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.”*

Response 65: The proposed speed hump has been eliminated from the plans as recommended by Tetra Tech. Various other traffic calming measures have been reviewed. One option would be to provide a crosswalk at the site driveway entrance. This crosswalk could be either raised or flush. As part of this alternative, a sidewalk would be constructed along the east side of the driveway to connect the crosswalk.

Another alternative would be to convert the Darwin Lane cul-de-sac into a roundabout. This option would require construction of a center island and would provide traffic calming into the site as well as reduce conflicts between the proposed site drive and the two existing driveways. The site drive would then be placed under yield control via signage and pavement markings. This alternative would be developed in coordination with the Walpole Fire Department and the Department of Public Works.

Comment 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.”*

Response 66: Acknowledged. Landscaping in this area will be less than two feet in height and snow storage will be relocated so as not to impede sightlines.

Comment 67: *“Tetra Tech recommends that any proposed traffic signage and pavement markings be compliant with the Manual on Uniform Traffic Control Devices (MUTCD).”*

Response 67: Acknowledged. Any proposed traffic signage and pavement markings will be compliant with the Manual on Uniform Traffic Control Devices (MUTCD).

Comment 68: *“Tetra Tech recommends that the Applicant review proposed Fire Access with the Walpole Fire Department to ensure the proposed geometry is acceptable.”*

Response 68: Fire access will be reviewed and coordinated with the Walpole Fire Department.

Mr. Lou Petrozzi
December 22, 2023
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We hope the above adequately address Tetra Tech's traffic-related comments. Please feel free to contact me if you have any questions.

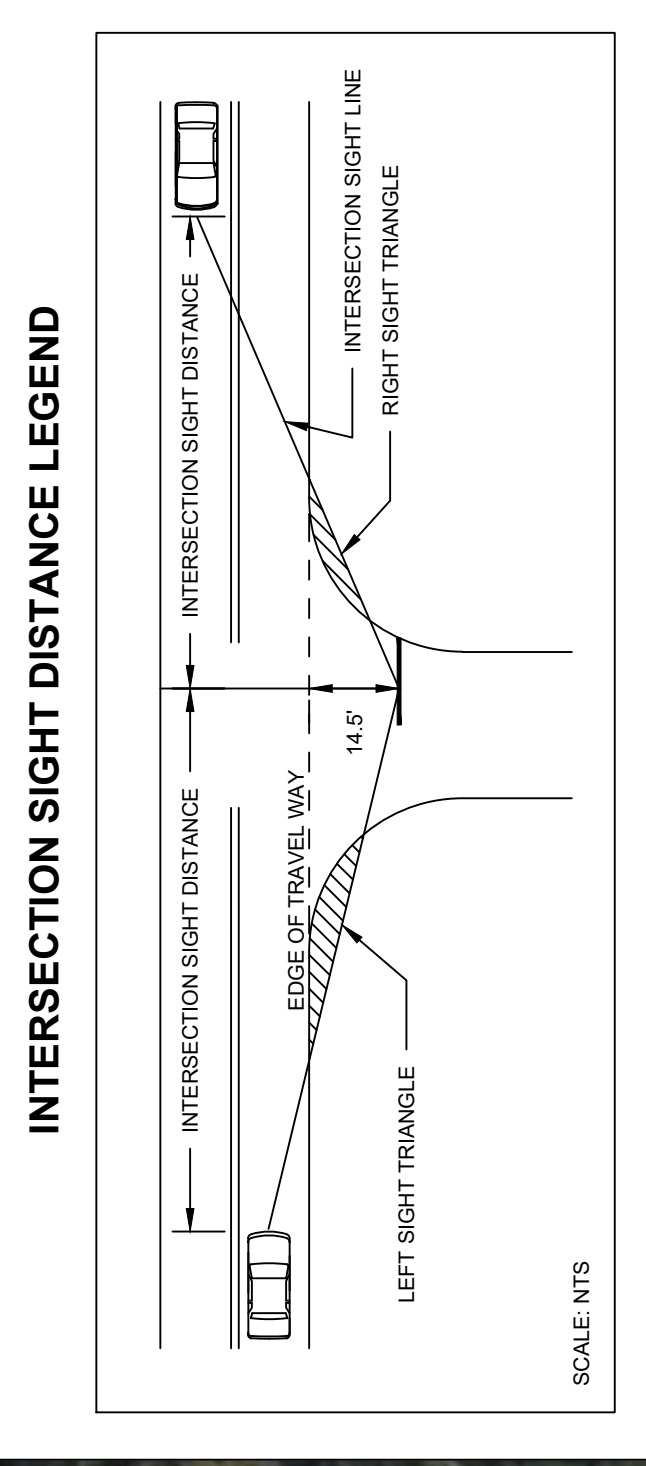
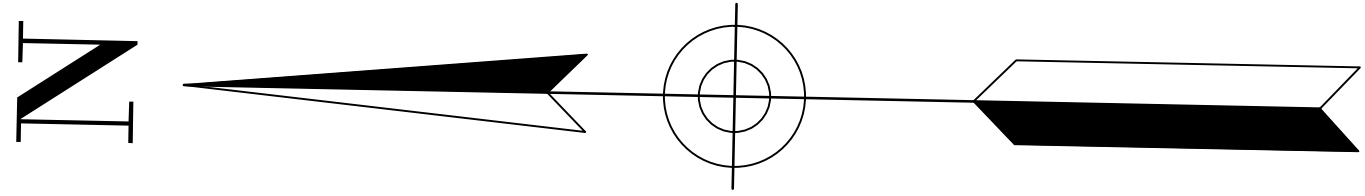
Sincerely,

Chappell Engineering Associates, LLC



Kirsten Braun, P.E.

Attachments



REV. #	DESCRIPTION	DATE
	Chappell Engineering Associates, LLC Civil, Structural, and Transportation Services 201 BOSTON POST ROAD W. SUITE 101 F: (508)851-7406 E: (508)851-7406	
DARWIN COMMONS DARWIN LANE WALPOLE, MA		
PREPARED FOR: WALL ST DEVELOPMENT CORP.		
COMMON ST AT DARWIN LN SIGHT TRIANGLES		
DATE:	12/20/2023	SHEET 1 OF 1

Institute of Transportation Engineers (ITE); 11th Edition
Land Use Code (LUC) 215 - Single-Family Attached Housing
General Urban/Suburban

Average Vehicle Trips Ends vs: Dwelling Units
 Independent Variable (X): 28 Units

AVERAGE WEEKDAY DAILY (8-585 Units)

$T = 7.62 * (X) - 50.48$
 $T = 162.88$
 $T = 160$ vehicle trips
 with 50% (80 vpd) entering and 50% (80 vpd) exiting.

Weekday Daily Average Rate

$T = 7.20 * (X)$
 $T = 201.60$
 $T = 200$ vehicle trips
 with 100 vpd entering and 100 vpd exiting.

WEEKDAY AM PEAK HOUR OF ADJACENT STREET TRAFFIC (8-700 Units)

$T = 0.52 * (X) - 5.70$
 $T = 8.86$
 $T = 9$ vehicle trips
 with 31% (3 vpd) entering and 69% (6 vpd) exiting.

Weekday AM Peak Hour Average Rate

$T = 0.48 * (X)$
 $T = 13.44$
 $T = 13$ vehicle trips
 with 4 vph entering and 9 vph exiting.

WEEKDAY PM PEAK HOUR OF ADJACENT STREET TRAFFIC (8-700 Units)

$T = 0.60 * (X) - 3.93$
 $T = 12.87$
 $T = 13$ vehicle trips
 with 57% (7 vpd) entering and 43% (6 vpd) exiting.

Weekday PM Peak Hour Average Rate

$T = 0.57 * (X)$
 $T = 15.96$
 $T = 16$ vehicle trips
 with 9 vph entering and 7 vph exiting.

SATURDAY DAILY (Caution: Only 5 studies at 48-147 Units)

$T = 13.21 * (X) - 444.34$
 $T = -74.46$
 $T = -70$ vehicle trips
 with 50% (-35 vpd) entering and 50% (-35 vpd) exiting.

Saturday Daily Average Rate

$T = 8.76 * (X)$
 $T = 245.28$
 $T = 250$ vehicle trips
 with 125 vpd entering and 125 vpd exiting.

SATURDAY PEAK HOUR OF GENERATOR (Caution: Only 7 studies at 48-462 Units)

$\ln T = 0.82 * \ln(X) + 0.43$
 $\ln T = 3.16$
 $T = 23.63$
 $T = 24$ vehicle trips
 with 48% (12 vph) entering and 52% (12 vph) exiting.

Saturday Peak Hour Average Rate

$T = 0.57 * (X)$
 $T = 15.96$
 $T = 16$ vehicle trips
 with 8 vph entering and 8 vph exiting.