

Ref: 9633

September 11, 2024

Mr. Zachary McBride, Chair  
Zoning Board of Appeals  
Town of Sherborn  
19 Washington Street  
Sherborn, MA 01770

Re: Response to Engineering Peer Review - Traffic  
Brush Hill Homes Residential Development – 34 Brush Hill Road  
Sherborn, Massachusetts

Dear Chair McBride and Member of the Zoning Board of Appeals:

Vanasse & Associates, Inc. (VAI) is providing responses to the comments that were raised in the August 27, 2024 *Engineering Peer Review – Traffic* letter prepared by Tetra Tech (TT) concerning their review of the August 5, 2024 *Transportation Impact Assessment* (the “August 2024 TIA”) that was prepared by VAI in support of the proposed Brush Hill Homes residential development to be located at 34 Brush Hill Road in Sherborn, Massachusetts (hereafter referred to as the “Project”). Listed below are the comments that were identified by TT in the subject letter followed by our response on behalf of the Project proponent.

### **Public Transportation**

*Comment 1: The TIA states that regularly scheduled public transportation service is not provided within the Town of Sherborn. The TIA states that the Sherborn Council of Aging provides discounted taxi rides through an agreement with JFK Transportation. The trip generation estimates presented in the TIA do not take a credit (reduction) for transit use. Tetra Tech generally concurs with this methodology.*

**Response:** No response required.

### **Crash Analysis**

*Comment 2: The TIA includes a crash analysis for the existing study intersections between 2016 and 2020 based on MassDOT crash data. The current MassDOT crash database includes data through 2022 (years 2021 and 2022 are still open and subject to change pending MassDOT's completion of processing all crash reports for these two years). Tetra Tech recommends that the Applicant review the two additional years of data to confirm the findings are consistent with the 2016 through 2020 data. The backup crash data should be provided in the appendix for the Town's review.*

**Response:** The MassDOT crash data is attached as requested and includes a review of crash data along Brush Hill Road for a 10-year period between August 2014 and August 2024. There were a total of five (5) motor vehicle crashes that were reported to have occurred along Brush Hill Road between August 2014 and August 2024, of which two (2) were reported between 2016 and 2020, all of which were identified as property damage only. Three (3) of the crashes involved a collision with another motor vehicle and two (2) involved a collision with a fixed roadside object or a tree. The contributing factor in four (4) of the crashes was identified as driving too fast for roadway conditions and “improper driving”. A specific roadway defect was not identified to be a contributing factor in the crashes.

### **Trip Generation**

*Comment 3:* Vehicle trip generation estimates for the proposed Project were based on trip generation rates presented in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11<sup>th</sup> Edition for Land Use Code (LUC) 210 (Single-Family Detached Housing) applied to eight (8) units. Tetra Tech generally agrees with this methodology.

**Response:** No response required.

### **Sight Distance**

*Comment 4:* Tetra Tech recommends that the Applicant conduct a sight distance analysis of the proposed site access roadway intersection with Brush Hill Road based on AASHTO's A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition (2018). It is recommended that the supporting sight distance calculations be provided to the Town for review.

**Response:** A detailed sight distance analysis has been completed for the Project (see response to Comment 5) and the sight distance calculations are attached. We note that the posted speed limit for Brush Hill Road is 25 miles per hour (mph) and that the centerline grade at the location of the driveway ranges from 2.6 percent to 5.7 percent, with an average centerline grade of between 3.7 percent and 3.8 percent. As such, a grade correction factor was applied to the stopping sight distance calculations in accordance with AASHTO standards.

*Comment 5:* Tetra Tech recommends that the sight distance plans and profiles for the site access roadway be added to the site plans to confirm that adequate sight distance will be provided at this location. Any existing vegetation or guardrail required to be removed to provide adequate sight lines should be identified for the Town's review. Additionally, the Applicant should ensure that all proposed landscaping and signage internal to the site (where vehicle conflicts may occur) will not impede sight lines.

**Response:** As requested, sight distance plans have been prepared for the Project site driveway intersection with Brush Hill Road that depict the sight lines in both plan and profile views and are attached. The plan view drawings illustrate the areas where the selective trimming/removal of trees and vegetation should occur. The



plan view drawings illustrate that the stopping sight distance along Brush Hill Road meets the recommended criteria and indicates the extent to which the existing stone walls on either side of the driveway need to be modified to provide the recommended minimum sight lines for a motorist exiting the driveway and looking to the left and right. The selective trimming/removal of trees and vegetation and the identified stone wall modifications will be completed in conjunction with the Project subject to receipt of all necessary rights, permits and approvals. We note that it is not necessary to clear all vegetation within the sight triangle areas; however, large trees that are proximate to the driveway should be removed.

*Comment 6: The TIA recommends that any snow windrows at the proposed site driveway be promptly removed to sufficiently ensure adequate sight distance. Tetra Tech generally concurs with this recommendation.*

**Response:** No response required.

#### **Site and Emergency Vehicle Access/Circulation**

*Comment 7: Tetra Tech recommends that the Applicant conduct a turning analysis of the largest emergency, trash and delivery vehicles anticipated to use the site to confirm that the site access roadway design can accommodate the Project. Tetra Tech recommends that the Applicant review the site access and circulation with the Fire Department to confirm that the Town's largest emergency apparatus can adequately access the site.*

**Response:** A vehicle turning analysis has been completed for the Sherbon Ladder Truck and is attached. The turning analysis illustrates that the subject vehicle is able to enter and exit the Project site from Brush Hill Road and circulate within the development in an unimpeded manner. The trash/delivery vehicle is smaller in size than the Sherbon Ladder Truck (30 feet vs. 41 feet) and will maneuver in a comparable manner. As such, a separate turning analysis was not provided for the trash/delivery vehicle.

*Comment 8: The TIA states that the paved width of Brush Hill Road varies from 16 to 20 feet. The minimum roadway width guideline reported by AASHTO for low-volume roadways is 18 feet. Tetra Tech recommends that the Applicant work with the Town to identify potential solutions to increasing the roadway width to provide safer and more efficient travel along Brush Hill Road.*

**Response:** The Applicant will work with the Town to identify potential measures that could be implemented independent of the Project to increase the width of the traveled-way along Brush Hill Road. It has been noted by the Applicant that the Town undertook a similar a similar planning effort in the past and the widening of the existing roadway was not desired by the majority of the property owners along Brush Hill Road.

*Comment 9: The site plan indicates that the site access roadway will be 20 feet wide. The TIA recommends that on-street parking be prohibited along the site access roadway*



*so that site access and circulation is not impeded. Tetra Tech concurs with this recommendation.*

**Response:** No response required.

*Comment 10: The TIA recommends that vehicles exiting the Project site be placed under Stop-sign control and that all signs and pavement markings installed within the Project site be consistent with the Manual on Uniform Traffic Control Devices (MUTCD). Tetra Tech concurs with this recommendation.*

**Response:** A STOP-sign and marked STOP-line will be added to the Site Plans.

*Comment 11: Tetra Tech recommends that the Applicant label the snow storage areas and ensure that adequate snow storage will be available on-site without impeding parking, site access, sight distance and circulation.*

**Response:** A snow storage plan is attached.

*Comment 12: Tetra Tech recommends that the Applicant coordinate with the Dover-Sherborn Public School department to identify appropriate the pick-up location(s) within the site. Tetra Tech also recommends that the Applicant explore the feasibility of constructing a sidewalk connecting each home to Brush Hill Road.*

**Response:** The Applicant will discuss the location of the school bus stop for the Project with the Dover-Sherborn School Department and will provide the appropriate accommodations at the stop location.

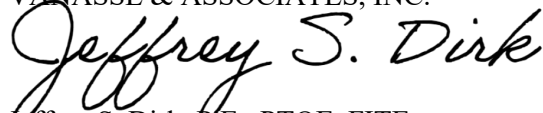
*Comment 13: There are currently no dedicated pedestrian or bicycle accommodations along Brush Hill Road in the site vicinity. Tetra Tech recommends that the Applicant explore the feasibility of implementing such accommodations in the study area.*

**Response:** The Applicant will work with the Town to explore the feasibility of establishing pedestrian and bicycle accommodations along Brush Hill Road in the vicinity of the Project site.

We trust that this information is responsive to the comments that were identified in the August 27, 2024 letter prepared by TT concerning their review of the Project. If you should have any questions or would like to discuss our responses in more detail, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.



Jeffrey S. Dirk, P.E., PTOE, FITE  
Managing Partner

*Professional Engineer in CT, MA, ME, NH, RI, and VA*



## ATTACHMENTS

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BRUSH HILL ROAD MOTOR VEHICLE CRASH DATA  
SIGHT DISTANCE CALCULATIONS  
SIGHT DISTANCE PLANS  
SHEREBORN LADDER TRUCK TURNING ANALYSIS  
SNOW STORAGE PLAN

## BRUSH HILL ROAD MOTOR VEHICLE CRASH DATA

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Crash Number	City Town Name	Crash Date	Day	Crash Severity	Crash Statu	Crash Time	Crash Year	Max Injury	Number of Police	Ager State Polic	Age of Driv	Age of Driv	Age of Vuln	Age of Vuln	Crash Hour
3909031	SHERBORN	08/08/2014	Fri	Property damage only (none injured)	Closed	5:29 PM	2014	No injury	2	Local polic	16-17	45-54			05:00PM t
4299432	SHERBORN	12/12/2016	Mon	Property damage only (none injured)	Closed	7:02 AM	2016	No injury	2	Local polic	25-34	25-34			07:00AM t
4524215	SHERBORN	03/27/2018	Tue	Property damage only (none injured)	Closed	7:21 AM	2018	No injury	2	Local polic	45-54	45-54			07:00AM t
5248360	SHERBORN	04/18/2023	Tue	Property damage only (none injured)	Open	1:13 PM	2023	No Appare	2	Local polic	55-64	55-64			01:00PM t
5339437	SHERBORN	12/18/2023	Mon	Property damage only (none injured)	Open	1:01 PM	2023	No Appare	1	Local polic	65-74	65-74			01:00PM t

Driver Contributing Circumstances (All Drivers)	Driver Dist First Harmful Event	Is Geocode	Light Conditions	Manner of Collision	MassDOT C Vulnerable Vulnerable
D1: (Visibility obstructed) / D2: (No improper driving)	Collision with motor vehicle in traffic	Yes	Daylight	Unknown	3
D1: (Driving too fast for conditions),(Failure to keep in proper lane or running off road) / D2: (No improper driving)	D1: Not Dis Collision with tree	Yes	Daylight	Angle	3
D1: (Unknown) / D2: (Unknown)	D1: Not Dis Collision with motor vehicle in traffic	Yes	Dawn	Rear-end	3
D1: (Failure to keep in proper lane or running off road) / D2: (No improper driving)	D2: Not Dis Collision with motor vehicle in traffic	Yes	Daylight	Sideswipe, opposite direction	3
D1: (Driving too fast for conditions)	D1: Not Dis Collision with unknown fixed object	Yes	Daylight	Single vehicle crash	3



Vulnerable	RMV Docu	Road Surfa	Roadway J	RPA Abbre	Total Fatali	Total Non-I	Traffic Con	Trafficway	Vehicle Act	Vehicle Cor	Vehicle Em	Vehicle To	Vehicle Travel	Directions (All Vehicles)	Weather Conditions	County Nar	Crash Repo	FMCSA Ref	FMCSA Ref	First Harmf
PW20142	5	Dry	Not at junc	MAPC	0	0	No control: Two-way, r	V1: Backing	V1: (Light tr	V1: (No) / V	V1: (No) / V	V1: W / V2: W	Clear		MIDDLESE	14-105-AC	Roadway			
PW20163	5	Slush	Not at junc	MAPC	0	0	No control: Two-way, r	V1: Travelli	V1: (Passen	V1: (No) / V	V1: (Yes, ve	V1: W / V2: E	Snow/Rain		MIDDLESE	16-168-AC	Roadside			
PW20181	0	Dry	Not at junc	MAPC	0	0	No control: Two-way, r	V1: Slowing	V1: (Passen	V1: (No) / V	V1: (Yes, ve	V1: E / V2: W	Clear		MIDDLESE	18-54-AC	Roadway			
PW20234	2	Dry	Not at junc	MAPC	0	0	No control: Two-way, r	V1: Travelli	V1: (Light tr	V1: (No) / V	V1: (No) / V	V1: S / V2: N	Clear		MIDDLESE	23SHE-48- V1: (No, not	No, not fed	Roadway		
PW20234	2	Wet	Not at junc	MAPC	0	0	No control: Two-way, r	V1: Turning	V1: (Passen	V1: (No) / V	V1: (No) / V	V1: W	Rain		MIDDLESE	23SHE-149 V1: (No, not	No, not fed	Roadside		

Geocoding Hit and Rur Locality	Most Harm Road Contr	School Bus	Speed Limi	Traffic Con	Vehicle Sec	Work Zone	Vulnerable	Vulnerable	Vulnerable	Vulnerable	Vulnerable	Vulnerable	Vulnerable	Vulnerable	X	Y	Latitude	Longitude	Street Num
At Address No hit and	V1:(Collisio	None	No, school		Not report	V1:(Collisic	No								207956.1	889293.5	42.25406	-71.4036	52
At Address No hit and	V1:(Collisio	Road surfai	No, school	30	Not report	V1:(Ran of	No								208454.6	889588.5	42.25671	-71.3975	17
At Address No hit and	V1:(Collisio	None	No, school	30	Yes, device	V1:(Collisic	No								207803.4	889243.7	42.25362	-71.4054	60
At Address No hit and	V1:(Collisio	None	No, school	25	Not report	V1:(Collisic	No								207733.9	889217.6	42.25339	-71.4063	67
At Address No hit and	V1:(Collisio	Road surfai	No, school	25	Not report	V1:(Ran of	No								207937.5	889287.6	42.25401	-71.4038	52

Roadway	Near Inters	Distance ar Milemarke	Milemarke	Distance ar Exit Numbe	Exit Route	Distance ar Landmark	Distance ar AADT-link	AADT Year-Peak % Sin	Single-Unit	Peak % Cor	Combinatic	Curb-link	Jurisdiction	Truck Rout	Left Sidew	Right Sidev
BRUSH HILL RD							200	0				None	City or Tow	Not a park		
BRUSH HILL RD												None	City or Tow	Not a park		
BRUSH HILL RD												None	City or Tow	Not a park		
BRUSH HILL RD Rte							1154					None	City or Tow	0	0	
BRUSH HILL RD Rte							1154					None	City or Tow	0	0	

Left ShoulderLeft ShoulderSurface WiSurface TjrRight ShoulRight ShoulNumber of Number of Median WiMedian TjrUrban TypFunctional Urbanized , Federal AidFacility TypStreet Ope Access ConNumber of Speed LimiStreet NamFrom Stree To Street NCity-linked Structural (Terrain-linkUrban Loca																									
	18	Surface-tre 2	Stable - Un 2	0		0		None	Urbanized , Local	Boston (M/			Mainline rc	Two-way tr	No control				BRUSH HILL	WESTERN / HUNTING L	Sherborn	Fair	Level	Not applica	
	18	Surface-tre 2	Stable - Un 2	0		0		None	Large Urba Local	Boston (M/			Mainline rc	Two-way tr	No control				BRUSH HILL	WESTERN / HUNTING L	Sherborn	Fair	Level	Not applica	
	18	Surface-tre 2	Stable - Un 2	0		0		None	Large Urba Local	Boston (M/			Mainline rc	Two-way tr	No control				BRUSH HILL	WESTERN / HUNTING L	Sherborn	Fair	Level	Not applica	
0	No Shouldr	18	Surface-tre 2	Stable - Un 2	0	0		None	Large Urba Local	Boston (M/			Mainline rc	Two-way tr	No Access i				BRUSH HILL	WESTERN / HUNTING L	SHERBORN	Fair	Level Terra		
0	No Shouldr	18	Surface-tre 2	Stable - Un 2	0	0		None	Large Urba Local	Boston (M/			Mainline rc	Two-way tr	No Access i				BRUSH HILL	WESTERN / HUNTING L	SHERBORN	Fair	Level Terra		



## SIGHT DISTANCE CALCULATIONS

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## Stopping Sight Distance Calculations

**Location:** Brush Hill Road, Sherborn  
**Job No.** 10053  
**Date:** 9/10/2024

**Design Speed (V):** 25 mph  
**Brake Reaction Time (t):** 2.5 Seconds  
**Deceleration Rate (a):** 11.2 ft/s<sup>2</sup>  
**Grade (G):** -3.7 percent

### Distance Travelled During Break Reaction Time:

$$d_t = 1.47Vt$$

### Breaking Distance:

**(G < 3 %)**  $d_b = 1.075 (V^2/a)$

**(G ≥ 3%)**  $d_b = V^2/30[(a/32.2) \pm G]$

### Stopping Sight Distance (SSD):

**(G < 3 %)**

SSD = $d_t + d_b$		
$d_t =$	91.9	ft
$d_b =$	60.0	ft
<b>SSD =</b>	<b>151.9</b>	ft
<b>Rounded:</b>	<b>152</b>	ft

**(G ≥ 3%)**

SSD = $d_t + d_b$		
$d_t =$	91.9	ft
$d_b =$	67.0	ft
<b>SSD =</b>	<b>158.9</b>	ft
<b>Rounded:</b>	<b>159</b>	ft

## Stopping Sight Distance Calculations

**Location:** Brush Hill Road, Sherborn  
**Job No.** 10053  
**Date:** 9/10/2024

**Design Speed (V):** 25 mph  
**Brake Reaction Time (t):** 2.5 Seconds  
**Deceleration Rate (a):** 11.2 ft/s<sup>2</sup>  
**Grade (G):** 3.8 percent

### Distance Travelled During Break Reaction Time:

$$d_t = 1.47Vt$$

### Breaking Distance:

**(G < 3 %)**  $d_b = 1.075 (V^2/a)$

**(G ≥ 3%)**  $d_b = V^2/30[(a/32.2) \pm G]$

### Stopping Sight Distance (SSD):

**(G < 3 %)**

SSD = $d_t + d_b$		
$d_t =$	91.9	ft
$d_b =$	60.0	ft
<b>SSD =</b>	<b>151.9</b>	ft
<b>Rounded:</b>	<b>152</b>	ft

**(G ≥ 3%)**

SSD = $d_t + d_b$		
$d_t =$	91.9	ft
$d_b =$	54.0	ft
<b>SSD =</b>	<b>145.9</b>	ft
<b>Rounded:</b>	<b>146</b>	ft

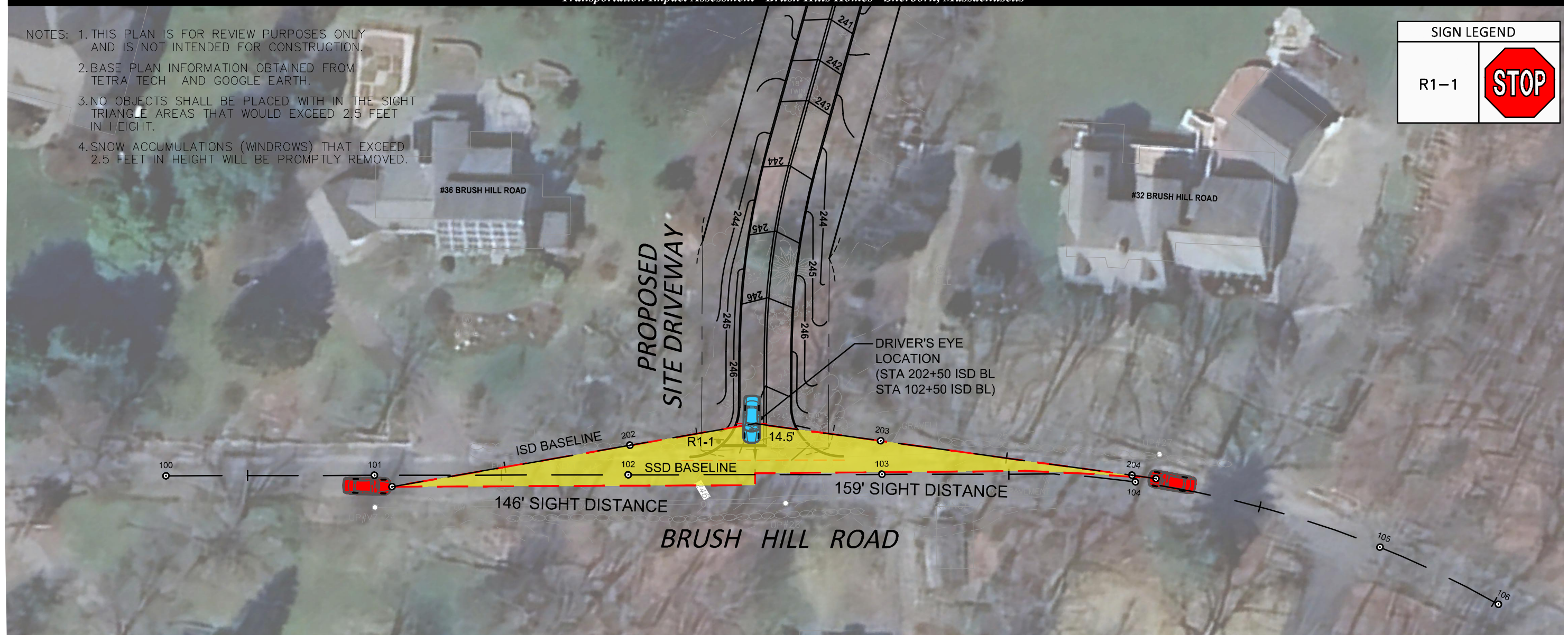


## SIGHT DISTANCE PLANS

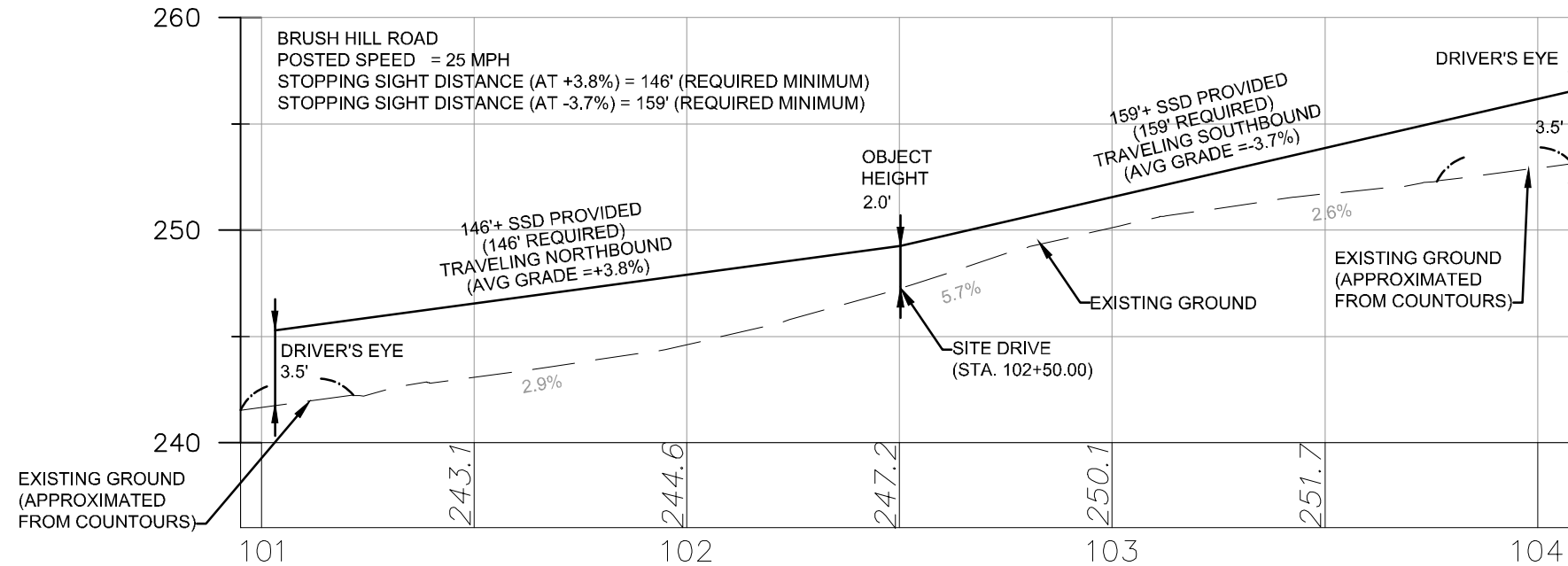
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- NOTES: 1. THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION.
2. BASE PLAN INFORMATION OBTAINED FROM TETRA TECH AND GOOGLE EARTH.
3. NO OBJECTS SHALL BE PLACED WITHIN THE SIGHT TRIANGLE AREAS THAT WOULD EXCEED 2.5 FEET IN HEIGHT.
4. SNOW ACCUMULATIONS (WINDROWS) THAT EXCEED 2.5 FEET IN HEIGHT WILL BE PROMPTLY REMOVED.

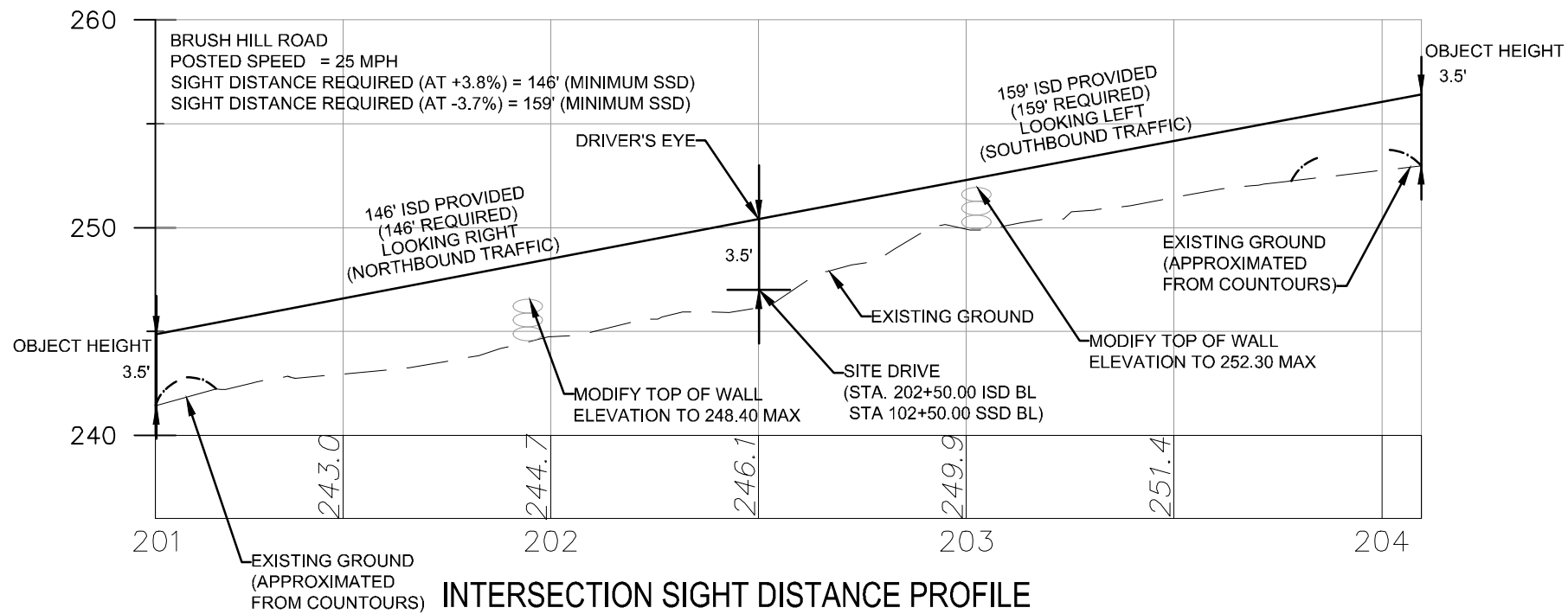
SIGN LEGEND	
R1-1	



**Figure 1**  
Sight Triangle Plan  
Brush Hill Road at Site Driveway



STOPPING SIGHT DISTANCE PROFILE  
(SSD BASELINE)



INTERSECTION SIGHT DISTANCE PROFILE  
(ISD BASELINE)

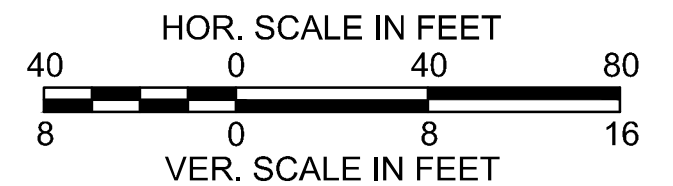
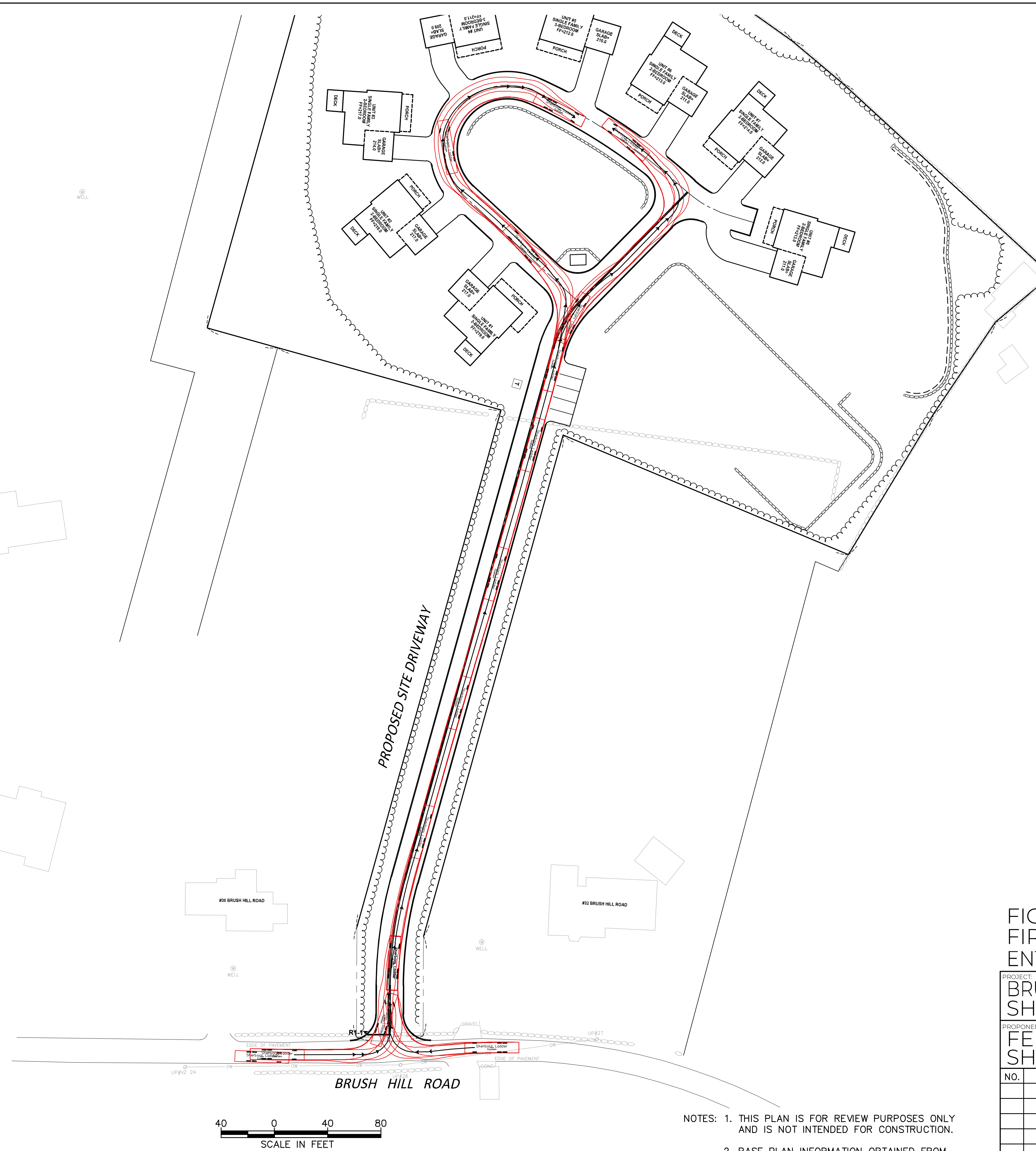
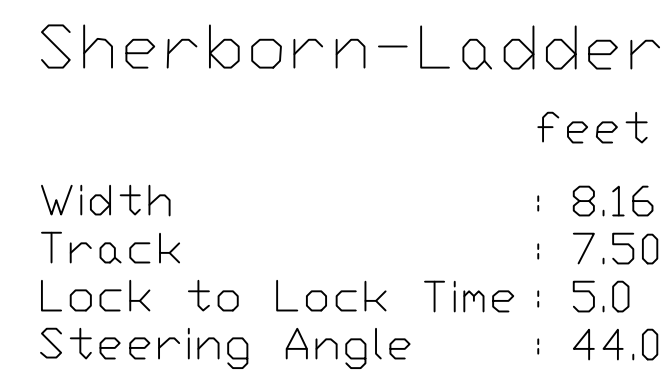


Figure 1a


Profile Plan  
Brush Hill Road at Site Driveway

## SHEREBORN LADDER TRUCK TURNING ANALYSIS





PROJECT:	BRUSH HILLS HOMES SHERBORN, MASSACHUSETTS
PROPOSER:	FENIX PARTNERS BRUSH HILL, LLC SHERBORN, MASSACHUSETTS

NO.	REVISIONS	DATE	 <b>Vanasse &amp; Associates inc</b> <b>Transportation Engineers &amp; Planners</b> 35 New England Business Center Drive - Suite 140 - Andover, MA 01810 www.rdfa.com 978-474-8800
DESIGNED BY: JSD			DATE: 09/10/2024
DRAWN BY: JTG			SCALE: 1" = 40'
CHECKED BY: JSD			SHEET 1 OF 1

NOTES: 1. THIS PLAN IS FOR REVIEW PURPOSES ONLY  
AND IS NOT INTENDED FOR CONSTRUCTION.

2. BASE PLAN INFORMATION OBTAINED FROM  
TETRA TECH.

40      0      40      80

SCALE IN FEET



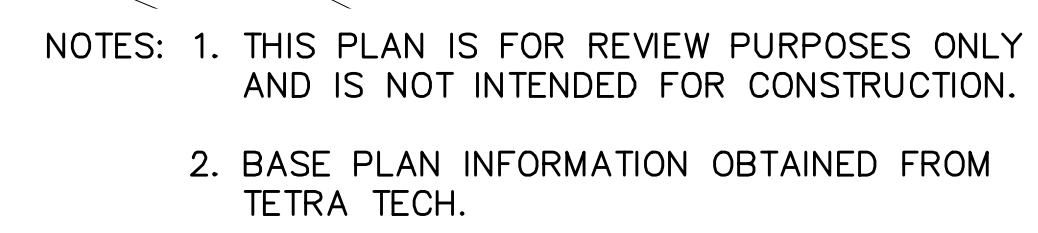
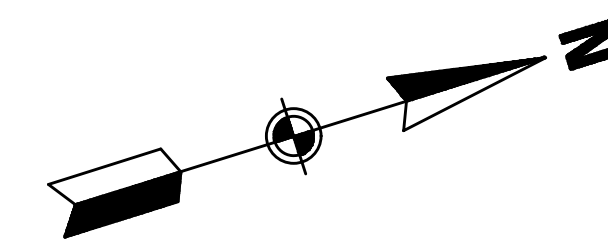
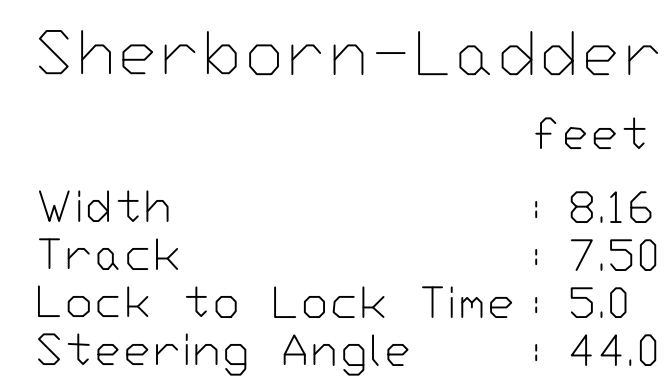



FIGURE 2A  
FIRE TRUCK TURNING ANALYSIS  
EXITING SITE

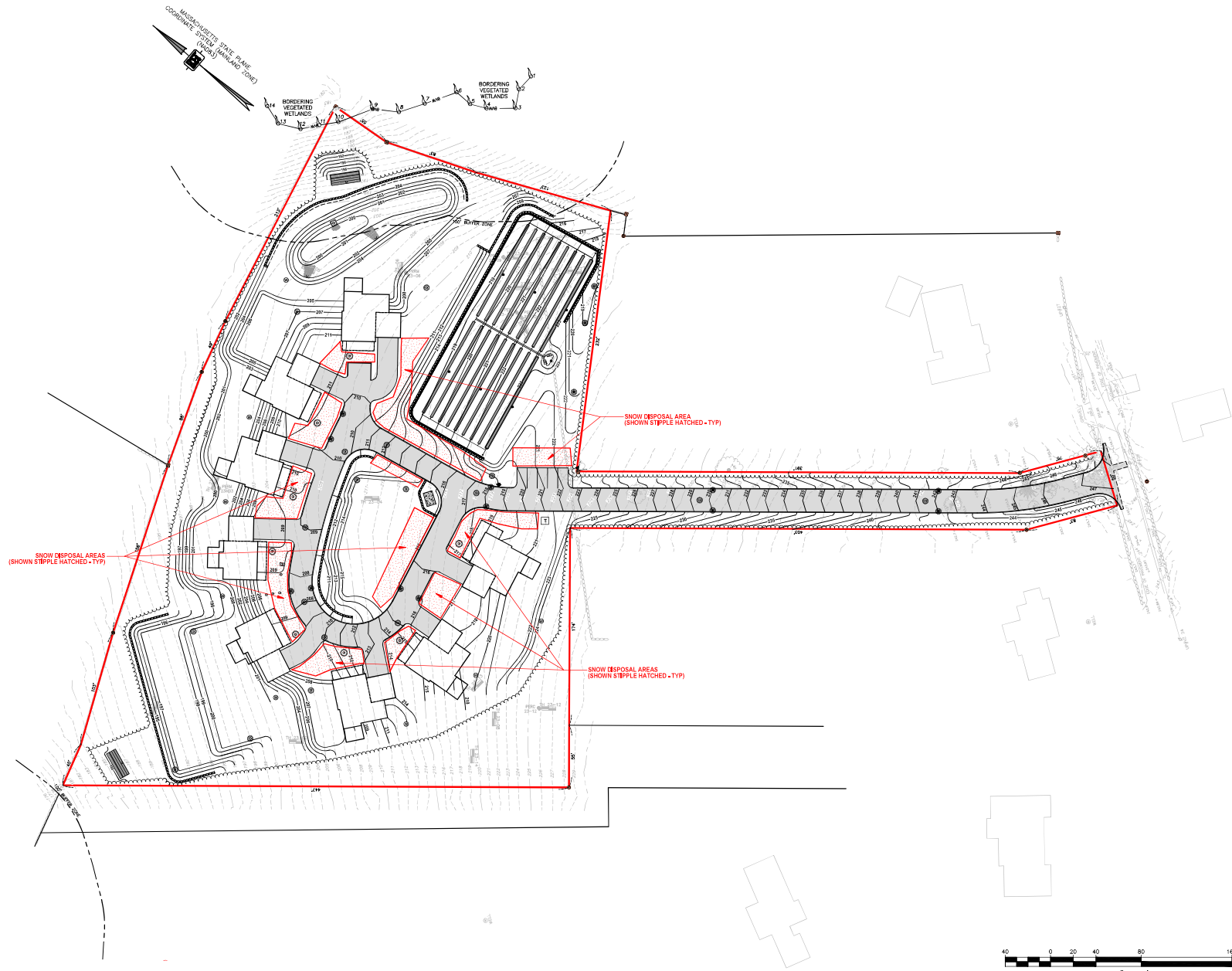
PROJECT:  
BRUSH HILLS HOMES  
SHERBORN, MASSACHUSETTS

PROPOSER:  
FENIX PARTNERS BRUSH HILL, LLC  
SHERBORN, MASSACHUSETTS

NO.	REVISIONS	DATE	 <b>Vanasse &amp; Associates inc</b> <b>Transportation Engineers &amp; Planners</b> 35 New England Business Center Drive - Suite 140 - Andover, MA www.dva.com 978-474-8800	
			DESIGNED BY: JSD	DATE: 09/10/2010
			DRAWN BY: JTG	SCALE: 1" = 40'
			CHECKED BY: JSD	SHEET 1 OF 1

## SNOW STORAGE PLAN

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Framingham  
Boston • Worcester • Preston, CT

1071 Worcester Road  
Framingham, MA 01701  
508-879-0030

www.DGTassociates.com

APPLICANT:  
**FENIX PARTNERS BRUSH HILL, LLC**  
177 LAKE STREET  
SHERBORN, MA 01770

OWNER:  
**FENIX PARTNERS BRUSH HILL, LLC**  
vs.  
**MIDDLESEX REGISTRY OF DEEDS**  
BOOK: 81892 PAGE: 265

PARCEL ID:  
**MAP 1, LOT 0, BLOCK 18**

ISSUED FOR:  
**COMPREHENSIVE  
PERMIT APPLICATION**

NO.	APP	DATE	DESCRIPTION
		<b>JUNE 26, 2024</b>	

SCALE: **1" = 40'**

DESIGN:	DRAFTED:	CHECKED:
<b>KMR</b>	<b>KMR</b>	<b>BEC</b>

PROJECT TITLE:

**BRUSH HILL  
HOMES**

**34 BRUSH HILL ROAD  
SHERBORN, MA 01770**

SHEET TITLE:

**SNOW DISPOSAL  
EXHIBIT PLAN**

SHEET:

**1 OF 1**

PROJECT NO.:

**F25889**

**SNOW**

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