

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, 11th 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, 7th 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 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

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

BRUSH HILL ROAD MOTOR VEHICLE CRASH DATA

Crash Number	City/Town Name	Crash Date	Day	Crash Severity	Crash Stat	Crash Time	Crash Year	Max Injury	Number of Police	Ager	State	Police	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 police	16-17	45-54		05:00PM tc				
4299432	SHERBORN	12/12/2016	Mon	Property damage only (none injured)	Closed	7:02 AM	2016	No injury	2 Local police	25-34	25-34		07:00AM tc				
4524215	SHERBORN	03/27/2018	Tue	Property damage only (none injured)	Closed	7:21 AM	2018	No injury	2 Local police	45-54	45-54		07:00AM tc				
5248360	SHERBORN	04/18/2023	Tue	Property damage only (none injured)	Open	1:13 PM	2023	No Apparel	2 Local police	55-64	55-64		01:00PM tc				
5339437	SHERBORN	12/18/2023	Mon	Property damage only (none injured)	Open	1:01 PM	2023	No Apparel	1 Local police	65-74	65-74		01:00PM tc				

Driver Contributing Circumstances (All Drivers)	Driver Dist First Harmful Event	Is Geocode	Light Conditions	Manner of Collision	MassDOT	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	Jt	RPA	Abbre	Total	Fatal	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	Rep	FMCSA	Rep	First	Harmf
PW20142: Dry		Not at junc	MAPC		0	0	No control: Two-way, r V1: Backing V1:(Light tr V1:(No) / VV1:(No) / VV1: W / V2: W																			Clear	MIDDLESEX	14-105-AC		Roadway								
PW20163: Slush		Not at junc	MAPC		0	0	No control: Two-way, r V1: Travelli V1:(Passen V1:(No) / VV1:(Yes, ve V1: W / V2: E																			Snow/Rain	MIDDLESEX	16-168-AC		Roadside								
PW20181: Dry		Not at junc	MAPC		0	0	No control: Two-way, r V1: Slowing V1:(Passen V1:(No) / VV1:(Yes, ve V1: E / V2: W																			Clear	MIDDLESEX	18-54-AC		Roadway								
PW20234: Dry		Not at junc	MAPC		0	0	No control: Two-way, r V1: Travelli V1:(Light tr V1:(No) / VV1:(No) / VV1: S / V2: N																			Clear	MIDDLESEX	23SHE-48-V1:(No, not No, not fed	Roadway									
PW20234: Wet		Not at junc	MAPC		0	0	No control: Two-way, r V1: Turning V1:(Passen V1:(No) V1:(No) V1: W																			Rain	MIDDLESEX	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	X	Y	Latitude	Longitude	Street Num
At Address No hit and	V1:(Collision None	No, school		Not report	V1:(Collision No								207956.1	889293.5	42.25406	-71.4036	52
At Address No hit and	V1:(Collision Road surfac	No, school		30	Not report	V1:(Ran of No							208454.6	889588.5	42.25671	-71.3975	17
At Address No hit and	V1:(Collision None	No, school		30	Yes, device	V1:(Collision No							207803.4	889243.7	42.25362	-71.4054	60
At Address No hit and	V1:(Collision None	No, school		25	Not report	V1:(Collision No							207733.9	889217.6	42.25339	-71.4063	67
At Address No hit and	V1:(Collision Road surfac	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 Number	Exit Route	Distance ar Landmark	Distance ar AADT-link	Year	Peak %	Single-Unit Peak %	Cor	Combinatic	Curb-link	Jurisdiction	Truck Rout	Left Sidew	Right Sidew
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 Shoulder	Left Shoulder	Surface Wi	Surface Tyr	Right Shoulder	Number of Median Wi	Median Type	Urban Type	Functional	Urbanized	Federal Aid Facility	Street Type	Open Access	Con	Number of Speed Limi	Street Name	From Street N	To Street N	City-linked	Structural	(Terrain-link)	Urban Loca
	18	Surface-tre 2	Stable - Un 2	0	None	Urbanized , Local	Boston (M)	Mainline rc	Two-way tr	No control	BRUSH HILLWESTERN / HUNTING L	Sherborn	Fair	Level	Not applica						
	18	Surface-tre 2	Stable - Un 2	0	None	Large Urba Local	Boston (M)	Mainline rc	Two-way tr	No control	BRUSH HILLWESTERN / HUNTING L	Sherborn	Fair	Level	Not applica						
	18	Surface-tre 2	Stable - Un 2	0	None	Large Urba Local	Boston (M)	Mainline rc	Two-way tr	No control	BRUSH HILLWESTERN / HUNTING L	Sherborn	Fair	Level	Not applica						
0	No Shoulder	18	Surface-tre 2	Stable - Un 2	0	0	None	Large Urba Local	Boston (M)	Mainline rc	Two-way tr	No Access	1	BRUSH HILLWESTERN / HUNTING L	SHERBORN	Fair	Level	Terra			
0	No Shoulder	18	Surface-tre 2	Stable - Un 2	0	0	None	Large Urba Local	Boston (M)	Mainline rc	Two-way tr	No Access	1	BRUSH HILLWESTERN / HUNTING L	SHERBORN	Fair	Level	Terra			

AADT Deriv AADT Stati Opposing L Undivided Undivided Truck Exclu Truck Exclu Federal Functional Classification-linked RD

		Local
		Local
		Local
0	0	
0	0	Local
		Local

SIGHT DISTANCE CALCULATIONS

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/s²

Grade (G): -3.7 percent

Distance Travelled During Break Reaction Time:

$$d_t = 1.47Vt$$

Breaking Distance:

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

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

Stopping Sight Distance (SSD):

$$(G < 3\%) \quad \begin{aligned} SSD &= d_t + d_b \\ d_t &= 91.9 \text{ ft} \\ d_b &= 60.0 \text{ ft} \\ SSD &= 151.9 \text{ ft} \\ \text{Rounded: } &152 \text{ ft} \end{aligned}$$

$$(G \geq 3\%) \quad \begin{aligned} SSD &= d_t + d_b \\ d_t &= 91.9 \text{ ft} \\ d_b &= 67.0 \text{ ft} \\ SSD &= 158.9 \text{ ft} \\ \text{Rounded: } &159 \text{ ft} \end{aligned}$$

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/s²

Grade (G): 3.8 percent

Distance Travelled During Break Reaction Time:

$$d_t = 1.47Vt$$

Breaking Distance:

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

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

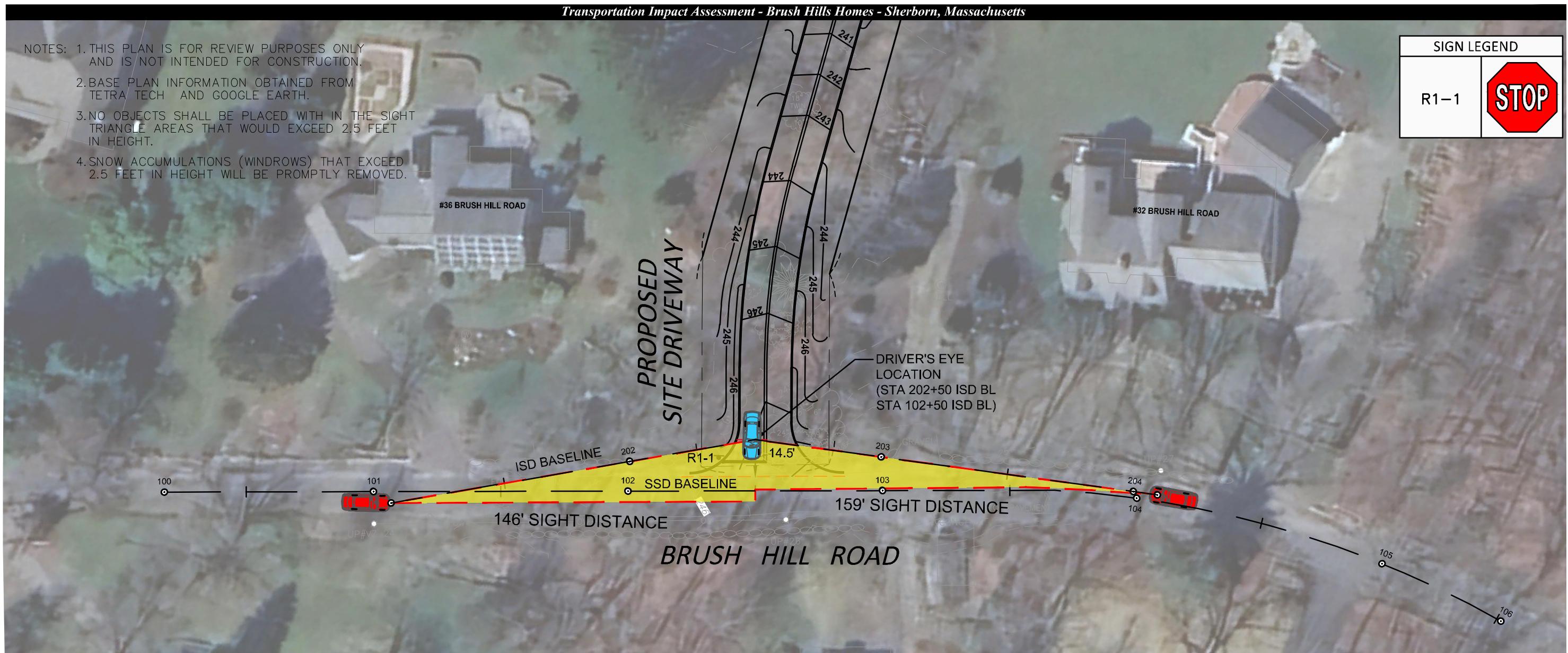
Stopping Sight Distance (SSD):

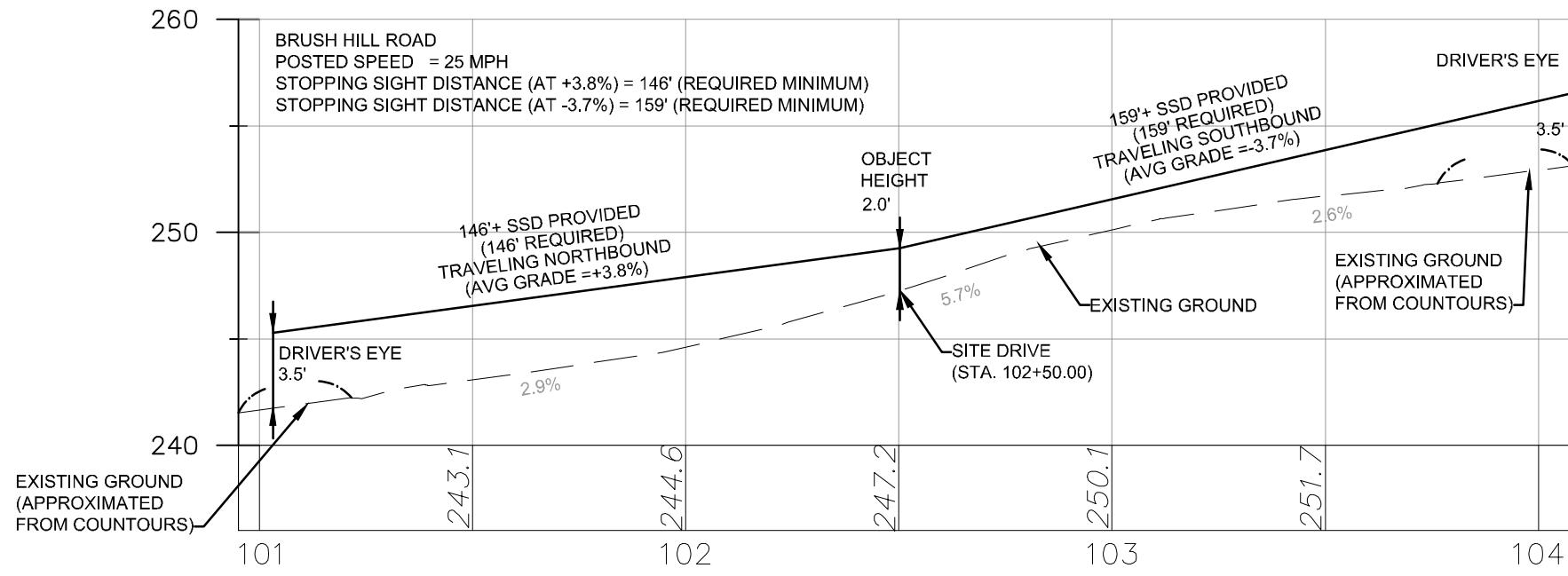
$$(G < 3\%) \quad \begin{aligned} SSD &= d_t + d_b \\ d_t &= 91.9 \text{ ft} \\ d_b &= 60.0 \text{ ft} \\ SSD &= 151.9 \text{ ft} \\ \text{Rounded: } &152 \text{ ft} \end{aligned}$$

$$(G \geq 3\%) \quad \begin{aligned} SSD &= d_t + d_b \\ d_t &= 91.9 \text{ ft} \\ d_b &= 54.0 \text{ ft} \\ SSD &= 145.9 \text{ ft} \\ \text{Rounded: } &146 \text{ ft} \end{aligned}$$

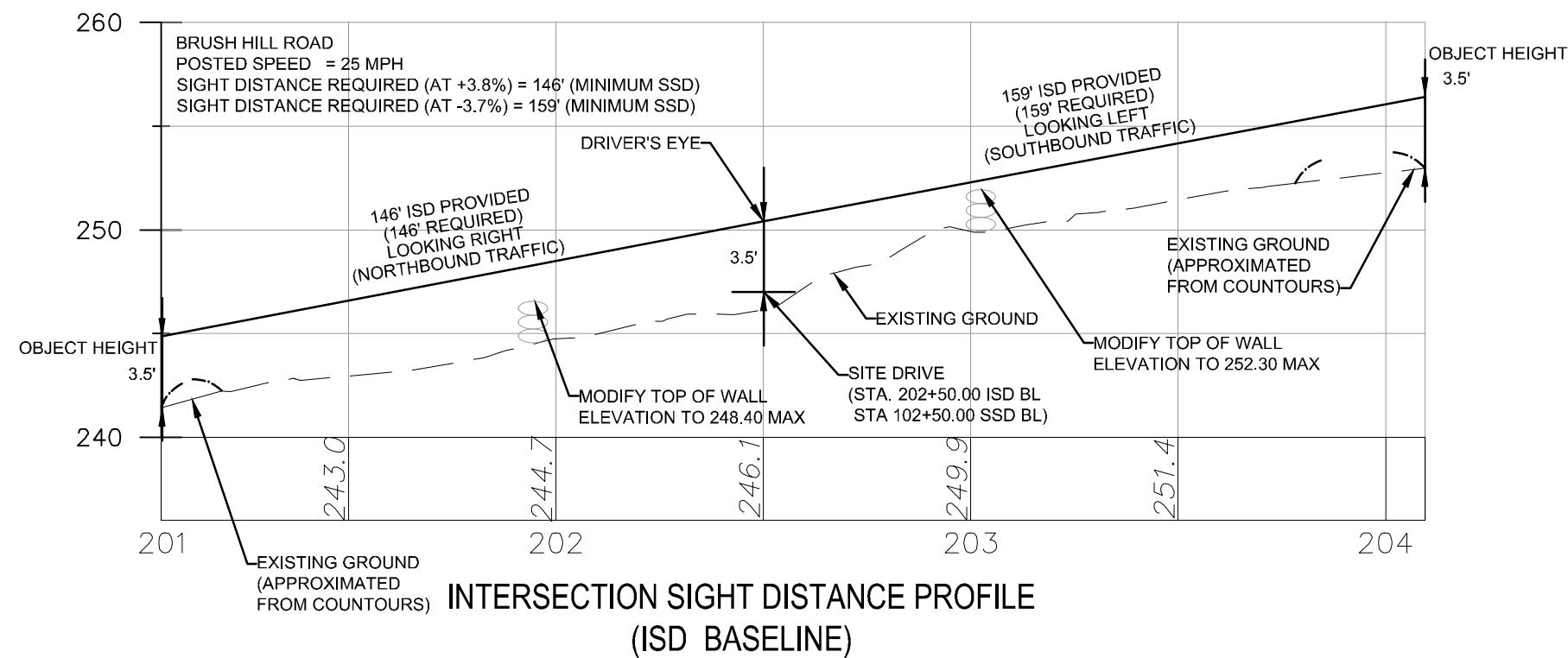
SIGHT DISTANCE PLANS

Transportation Impact Assessment - Brush Hills Homes - Sherborn, Massachusetts





STOPPING SIGHT DISTANCE PROFILE
(SSD BASELINE)



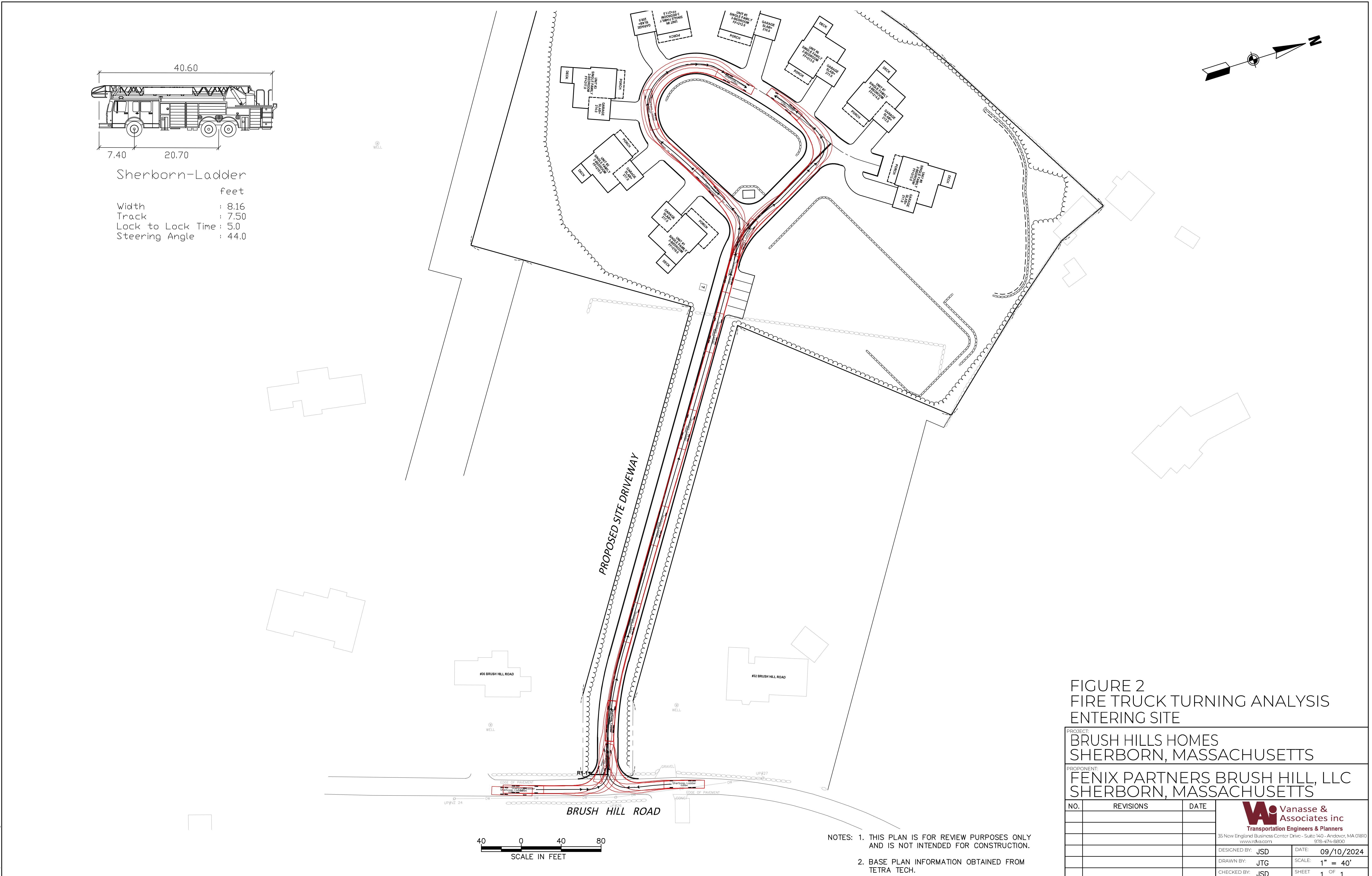
INTERSECTION SIGHT DISTANCE PROFILE
(ISD BASELINE)

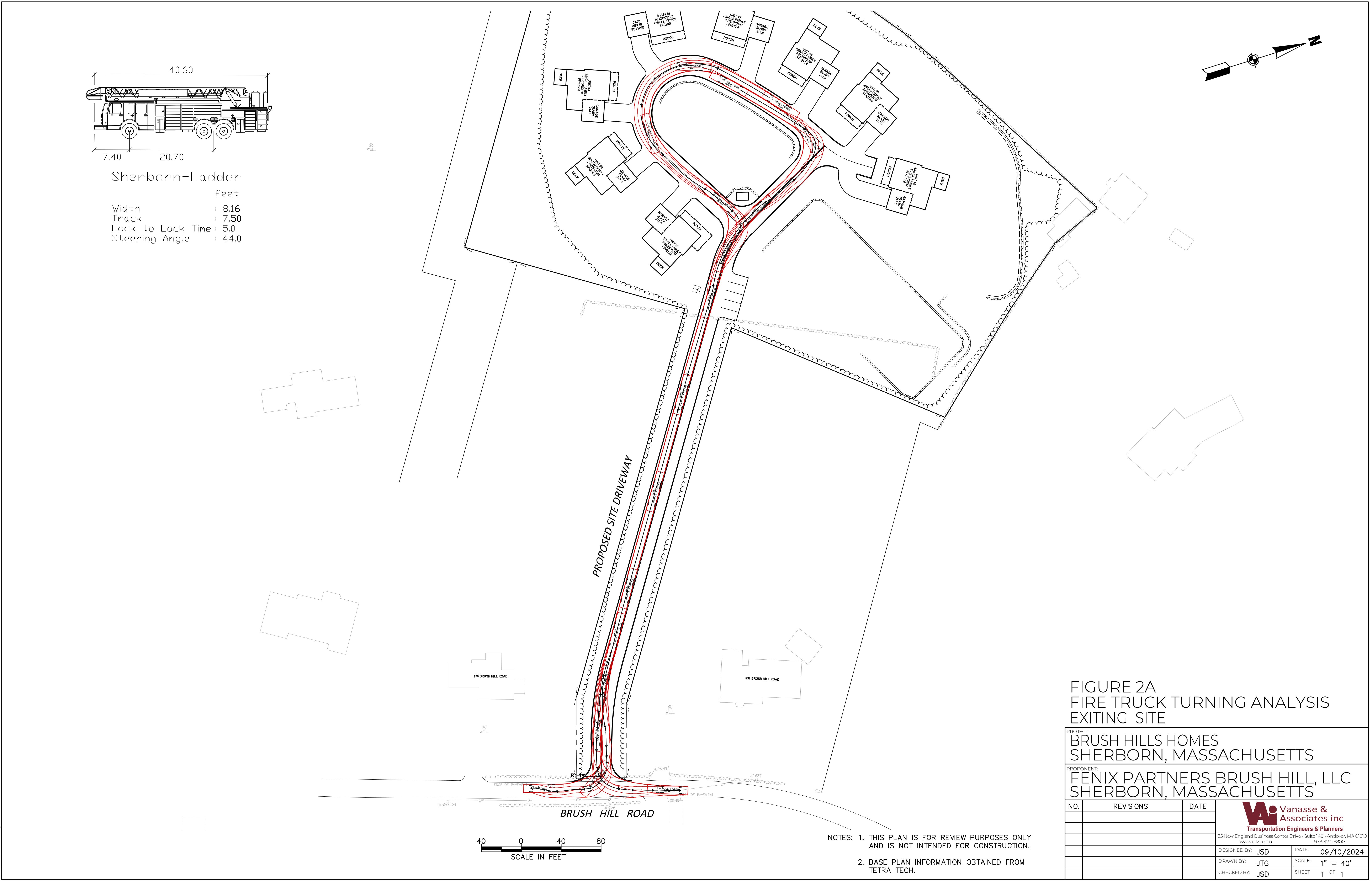
HOR. SCALE IN FEET
40 0 40 80
8 0 8 16
VER. SCALE IN FEET

Figure 1a

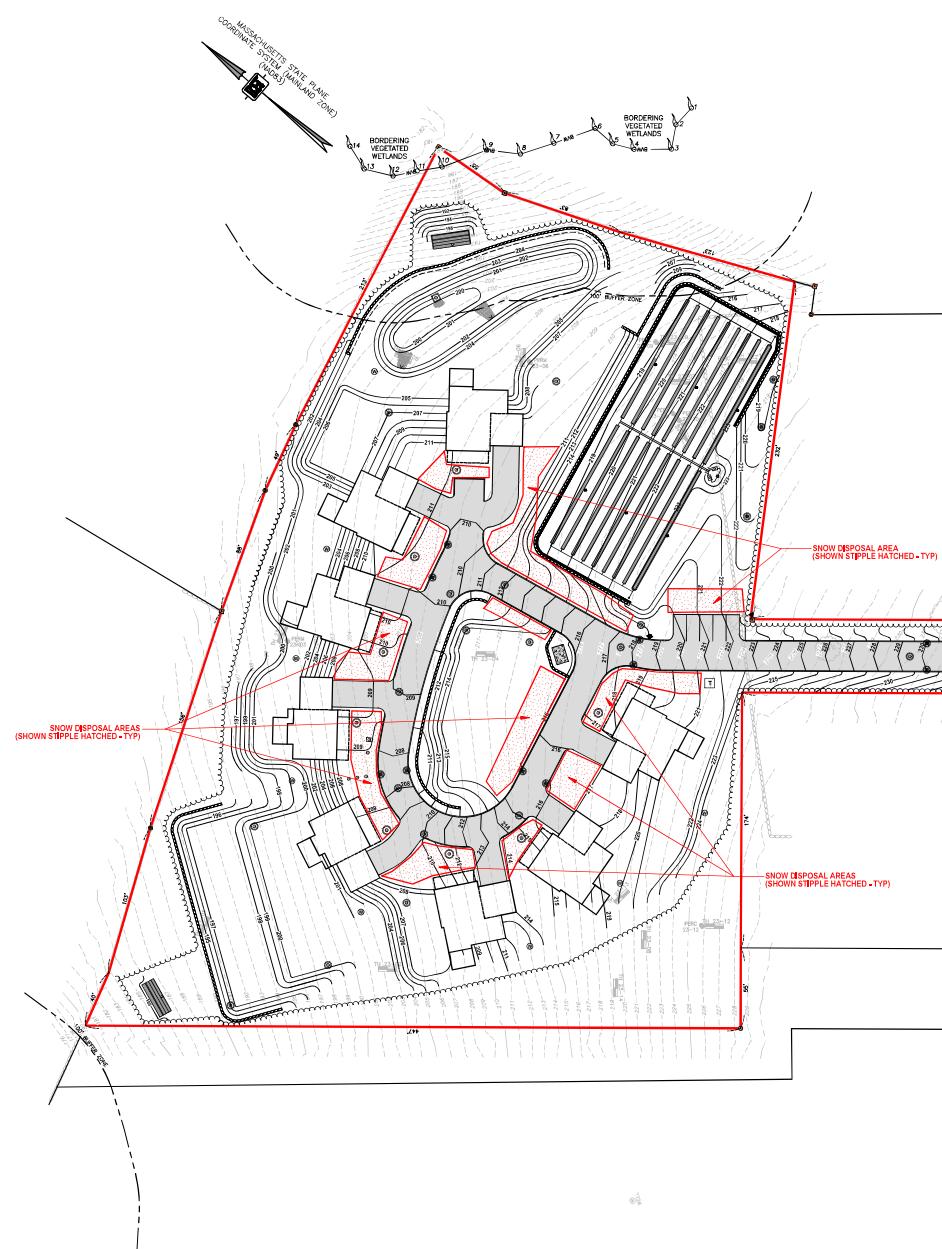
Profile Plan
Brush Hill Road at Site Driveway

SHEREBORN LADDER TRUCK TURNING ANALYSIS





SNOW STORAGE PLAN



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

OWNER:
FENIX PARTNERS BRUSH HILL, LLC
 ref.
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
 DATE: **JUNE 26, 2024**

SCALE: **1" = 40'**

DESIGN: **KMR** DRAFTED: **KMR** CHECKED: **BEC**

PROJECT TITLE:

BRUSH HILL HOMES

34 BRUSH HILL ROAD
 SHERBORN, MA 01770

MAP 1, LOT 0, BLOCK 18, Subdivision, MA (F-25889)

SNOW DISPOSAL EXHIBIT PLAN

MAP 1, LOT 0, BLOCK 18, Subdivision, MA (F-25889)

1 OF 1
SNOW

PROJECT NO.: **F-25889**

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40 0 20 40 60 80 100 120 140 160

SCALE: **1" = 40'**