

July 19, 2022

NEX-2200253.00

Mr. Trevor R. Yandow, P.E.
Meridian Land Services, Inc.
31 Old Nashua Road
Amherst, NH 03031

SUBJECT: Trip Generation Letter
Elderly Housing Development
23 Main Street (Tax Map H-42)
Brookline, New Hampshire

Dear Mr. Yandow:

Greenman-Pedersen, Inc. (GPI) has prepared this letter to evaluate the expected trips associated with the proposed elderly housing development to be located on Main Street (NH Route 130) in Brookline, New Hampshire. The site contains 13.15(±) acres, and is primarily vacant, but for a single residential home on the east side of the property which will be razed as part of the current development proposal. The project consists of multiple buildings, with each building containing either one (1) or two (2) dwelling units. A total of 17 age-restricted (55+) dwelling units are proposed. Access and egress are proposed to the site via a new subdivision road on the west side of Main Street between Sargent Road and Old Milford Road. Main Street is under the jurisdiction of the New Hampshire Department of Transportation (NHDOT). Accordingly, in addition to local permits, this project will require a NHDOT Driveway Permit.

Trip Generation

To estimate the volume of traffic to be generated by the proposed 55+ residential development, trip-generation rates published by the ITE *Trip Generation Manual*¹ were researched. Land Use Code (LUC) 251 (Senior Adult Housing – Single-Family) based on seventeen (17) dwelling units was used to estimate the proposed trip generation. Table 1 summarizes the results of the trip-generation estimates.

As shown in Table 1 below, the proposed 55+ residential development is expected to generate 10 vehicle trips (3 entering and 7 exiting) during the weekday AM peak hour, 11 vehicle trips (7 entering and 4 exiting) during the weekday PM peak hour, and 6 vehicle trips (3 entering and 3 exiting) during the Saturday midday peak hour. On a daily basis, the proposed development is expected to generate 132 vehicle trips per day on a weekday and 174 vehicle trips per day on a Saturday. Trip generation calculations attached.

¹ *Trip Generation, 11th Edition*. Institute of Transportation Engineers; Washington, DC; 2021.

TABLE 1
Trip-Generation Summary

Peak Hour/Direction	Proposed Trips ^a
Weekday Daily:	132
Weekday AM Peak Hour: <i>Enter</i> <i>Exit</i> <i>Total</i>	 3 7 10
Weekday PM Peak Hour: <i>Enter</i> <i>Exit</i> <i>Total</i>	 7 4 11
Saturday Daily:	174
Saturday Midday Peak Hour: <i>Enter</i> <i>Exit</i> <i>Total</i>	 3 3 6

^a ITE LUC 251 (Senior Adult Housing – Single-Family) for 17 dwelling units.

Traffic Volume Increases

Based on most recent pre-pandemic traffic data collected by NHDOT², Main Street carried Annual Average Daily Traffic (AADT) of approximately 4,300 vehicles per day (vpd) in 2017. Weekday AM peak hour volumes during that count period averaged 380 vehicles per hour (vph) (ranging from 372 to 390 vph), while weekday PM peak hour volumes during that count period averaged 433 vph (ranging from 401 to 455 vph). Count data are attached for reference.

Traffic-volume increases on Main Street during the peak hours are expected to be in the range of 6 to 11 vehicle trips. These increases represent, on average, one additional vehicle trip approximately every 5 to 10 minutes during the peak hours. On a percentage basis, weekday peak hour volumes on Main Street are expected to increase by approximately 2.5-percent.

² NHDOT Count Station 82063055, Brookline – NH 130 (Main Street), over Store Brook

Sight Distance

Sight distance at an intersection is an important safety consideration. Vehicles on the mainline approaching an intersection should have sufficient visibility and distance to come to a complete stop in order to avoid a potential hazard, and vehicles under Stop-sign control should have sufficient visibility of oncoming traffic in order to safely complete their turning maneuver without conflict. Meridian Land Services has prepared a Sight Distance Exhibit (attached for reference) indicating that the NHDOT All-Season Safe Sight Distance requirement of 400-feet can be attained at the proposed driveway location on Main Street.

In order to maintain the sight distances at the proposed site driveway after development of the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) and/or set back sufficiently from Main Street so as not to inhibit the available sight lines.

Based on the information contained herein, it is anticipated that peak hour traffic increases will be negligible and are not expected to significantly impact prevailing traffic operations in the immediate area of the site. Further, based on the satisfaction of NHDOT sight distance criteria, the proposed residential development can be safely and efficiently accommodated along the existing roadway network, and no additional project-specific mitigation is warranted based on the incremental impacts of the development.

Should you have any questions, require additional information, or if I can provide any other assistance during the permitting process, please feel free to contact me at 603-766-5229.

Sincerely,

GREENMAN-PEDERSEN, INC.

Robert E. Bollinger, P.E., PTOE
Senior Project Manager

Attachments:

1. Trip Generation Data
2. NHDOT Count Data
3. Sight Distance Exhibit

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 251 - Senior Adult Housing - Single-Family

General Urban/Suburban

Average Vehicle Trips Ends vs: Dwelling Units

Independent Variable (X): 17

AVERAGE WEEKDAY DAILY

$$\ln T = 0.85 \ln (X) + 2.47$$

$$\ln T = 0.85 \ln (17) + 2.47$$

$$\ln T = 4.88$$

$$T = 131.40$$

$$T = 132 \text{ vehicle trips}$$

with 50% (66 vph) entering and 50% (66 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.76 \ln (X) + 0.16$$

$$\ln T = 0.76 \ln (17) + 0.16$$

$$\ln T = 2.31$$

$$T = 10.11$$

$$T = 10 \text{ vehicle trips}$$

with 33% (3 vph) entering and 67% (7 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.78 \ln (X) + 0.20$$

$$\ln T = 0.78 \ln (17) + 0.2$$

$$\ln T = 2.41$$

$$T = 11.13$$

$$T = 11 \text{ vehicle trips}$$

with 61% (7 vph) entering and 39% (4 vph) exiting.

SATURDAY DAILY

$$T = 2.64 * (X) + 128.49$$

$$T = 2.64 * (17) + 128.49$$

$$T = 173.37$$

$$T = 174 \text{ vehicle trips}$$

with 50% (87 vph) entering and 50% (87 vph) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.90 \ln (X) - 0.72$$

$$\ln T = 0.90 \ln (17) - 0.72$$

$$\ln T = 1.83$$

$$T = 6.23$$

$$T = 6 \text{ vehicle trips}$$

with 50% (3 vph) entering and 50% (3 vph) exiting.

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


List View

All DIRs

Record				1		of 1		Goto Record		go	
Location ID	82063055					MPO ID					
Type	SPOT					HPMS ID					
On NHS	No					On HPMS	No				
LRS ID	S0000130__					LRS Loc Pt.					
SF Group	04 ▶					Route Type					
AF Group	04 ▶					Route	NH 130				
GF Group	E ▶					Active	Yes				
Class Dist Grp	Default ▶					Category	3				
Seas Class Grp	Default ▶										
WIM Group	Default ▶										
QC Group	Default										
Funct'l Class	Major Collector					Milepost					
Located On	Main St										
Loc On Alias	NH 130 (MAIN ST) OVER STORE BROOK										
More Detail ▶											
STATION DATA											

Directions: **2-WAY** ?

AADT 								
	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2021	4,233 ³		10		3,849 (91%)	384 (9%)	Grown from 2020
	2020	3,817	391	10		3,472 (91%)	345 (9%)	
	2019	4,436 ³		11		4,062 (92%)	374 (8%)	Grown from 2018
	2018	4,383 ³		11		4,042 (92%)	341 (8%)	Grown from 2017
	2017	4,297	455	11		3,989 (93%)	308 (7%)	





1-5 of 16



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Volume Count Report

LOCATION INFO	
Location ID	82063055
Type	SPOT
Funct'l Class	5
Located On	Main St
Loc On Alias	NH 130 (MAIN ST) OVER STORE BROOK
Direction	2-WAY
County	HILLSBOROUGH
Community	BROOKLINE
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Tue 5/23/2017
End Date	Wed 5/24/2017
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	820630550000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude, Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	14
1:00-2:00	3
2:00-3:00	4
3:00-4:00	9
4:00-5:00	35
5:00-6:00	118
6:00-7:00	287
7:00-8:00	377
8:00-9:00	346
9:00-10:00	198
10:00-11:00	216
11:00-12:00	251
12:00-13:00	272
13:00-14:00	273
14:00-15:00	278
15:00-16:00	366
16:00-17:00	455
17:00-18:00	441
18:00-19:00	382
19:00-20:00	224
20:00-21:00	164
21:00-22:00	119
22:00-23:00	46
23:00-24:00	22
Total	4,900
AADT	4,365
AM Peak	07:00-08:00 377
PM Peak	16:00-17:00 455



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Volume Count Report

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Funct'l Class	5
Located On	Main St
Loc On Alias	NH 130 (MAIN ST) OVER STORE BROOK
Direction	2-WAY
County	HILLSBOROUGH
Community	BROOKLINE
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO

Count Status	Accepted
Start Date	Wed 5/24/2017
End Date	Thu 5/25/2017
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	820630550000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude, Longitude	

INTERVAL:60-MIN

Time	Hourly Count
0:00-1:00	13
1:00-2:00	7
2:00-3:00	3
3:00-4:00	8
4:00-5:00	29
5:00-6:00	109
6:00-7:00	282
7:00-8:00	372
8:00-9:00	366
9:00-10:00	236
10:00-11:00	244
11:00-12:00	254
12:00-13:00	240
13:00-14:00	239
14:00-15:00	319
15:00-16:00	385
16:00-17:00	416
17:00-18:00	443
18:00-19:00	412
19:00-20:00	245
20:00-21:00	206
21:00-22:00	127
22:00-23:00	42
23:00-24:00	27
Total	5,024
AADT	4,407
AM Peak	07:00-08:00 372
PM Peak	17:00-18:00 443



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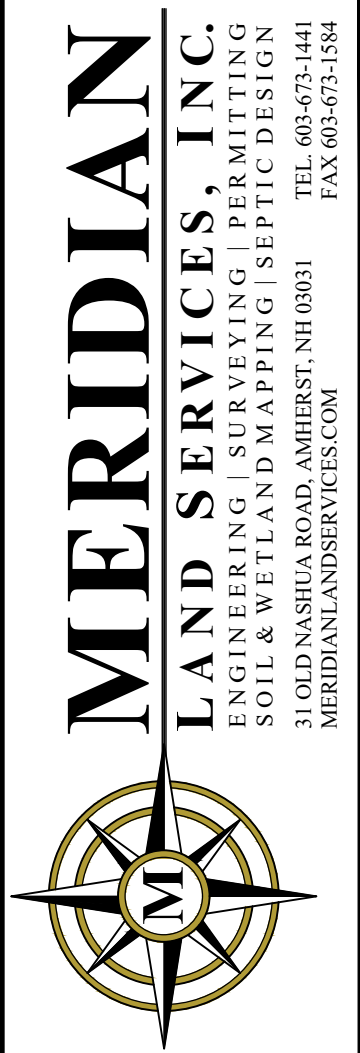
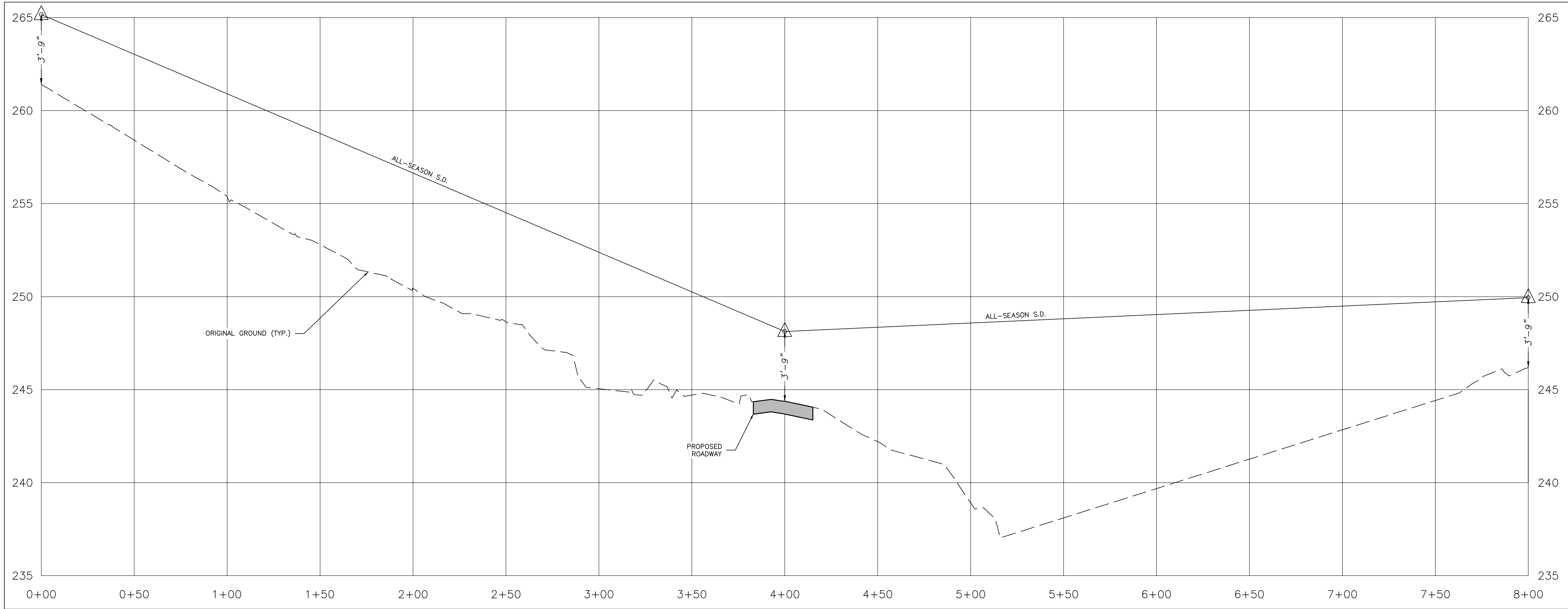
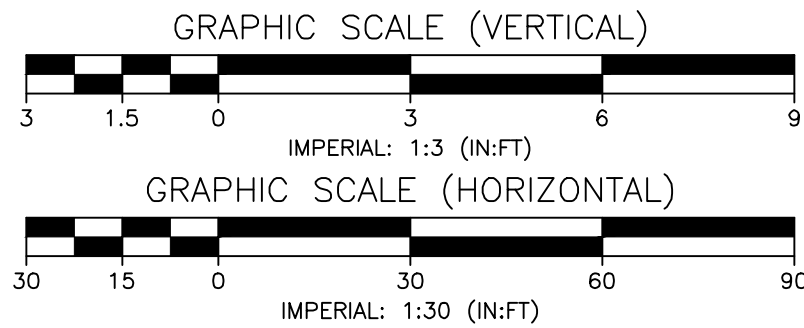
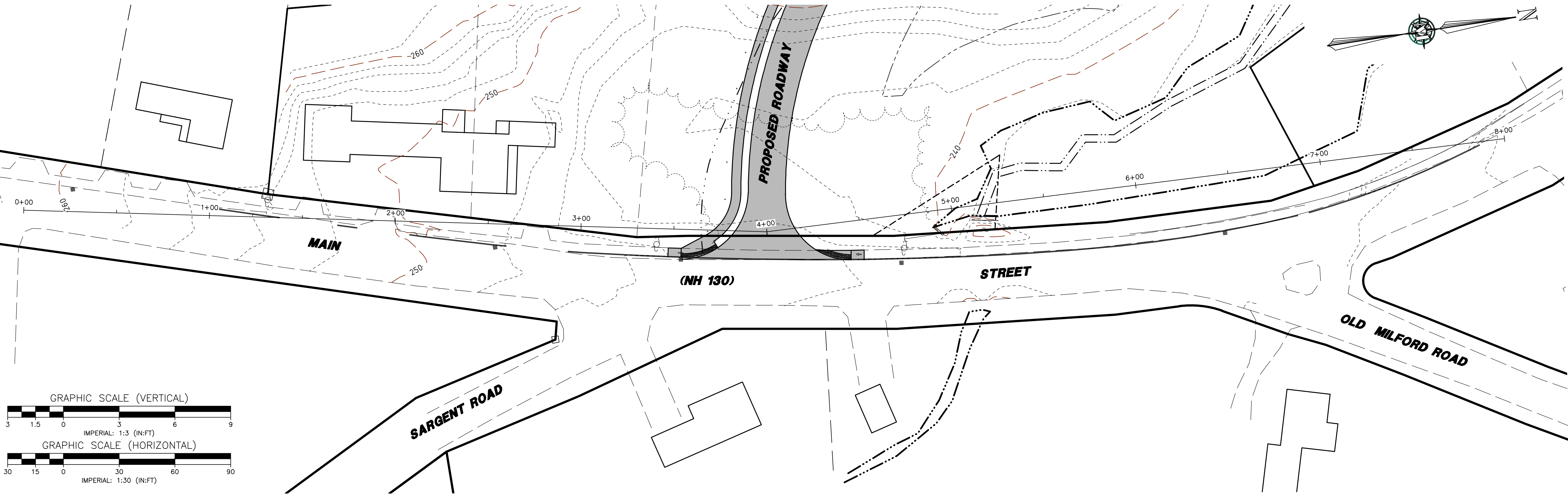
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Direction	2-WAY
County	HILLSBOROUGH
Community	BROOKLINE
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Thu 5/25/2017
End Date	Fri 5/26/2017
Start Time	12:00:00 AM
End Time	12:00:00 AM
Direction	
Notes	nhdot
Station	820630550000
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude, Longitude	

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	18
1:00-2:00	9
2:00-3:00	8
3:00-4:00	12
4:00-5:00	30
5:00-6:00	113
6:00-7:00	288
7:00-8:00	390
8:00-9:00	334
9:00-10:00	262
10:00-11:00	247
11:00-12:00	259
12:00-13:00	273
13:00-14:00	247
14:00-15:00	320
15:00-16:00	389
16:00-17:00	366
17:00-18:00	401
18:00-19:00	320
19:00-20:00	175
20:00-21:00	145
21:00-22:00	93
22:00-23:00	62
23:00-24:00	32
Total	4,793
AADT	4,119
AM Peak	07:00-08:00 390
PM Peak	17:00-18:00 401

Plotted: 7/15/2022 10:17 AM By: BLR
H:\MLS\03077\3077.05\0_Drawings\ENG\3077P05B.dwg



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REV.	DATE	DESCRIPTION	DR	CK
I	---	---	---	---
H	---	---	---	---
G	---	---	---	---
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E	---	---	---	---
D	---	---	---	---
C	---	---	---	---
B	---	---	---	---
A	---	---	---	---

COMMUNITY AT VILLAGE BROOK
SIGHT DISTANCE EXHIBIT

JAY CHRYSTAL
23 MAIN STREET
TAX MAP H PARCEL 42
BROOKLINE, NEW HAMPSHIRE
SCALE: 1" = 30'(HORIZ.)/3'(VERT.)

SD-1
SHEET
FILE: 3077P05B.dwg
PROJECT: 03077.05
SHEET NO. 1 OF 1