

Received
Planning Division
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Memorandum

To: **Kim-Hien Nguyen**
From: **Myla Cross**
Date: **March 21, 2024**
Subject: **SW 139th Avenue Partition Sight Distance Analysis**



This memorandum provides a sight distance analysis to confirm that AASHTO sight distance standards can be met at the proposed shared driveway for the two-lot partition project located at 4975 SW 139th Avenue in Beaverton, Oregon.

Location & Project Description

The project site is located on Tax Lot 1S116CA03000, encompasses approximately 0.35 acres, and is zoned Residential Mixed C (RMC). The site is currently occupied by a single-family home, which will remain on Lot 1 after the proposed partition. A single-family attached home with two units will be constructed on Lot 2. A shared site access will be provided near the northern property line. A site plan is provided in the appendix of this memorandum. Figure 1 shows the subject site outlined in blue.

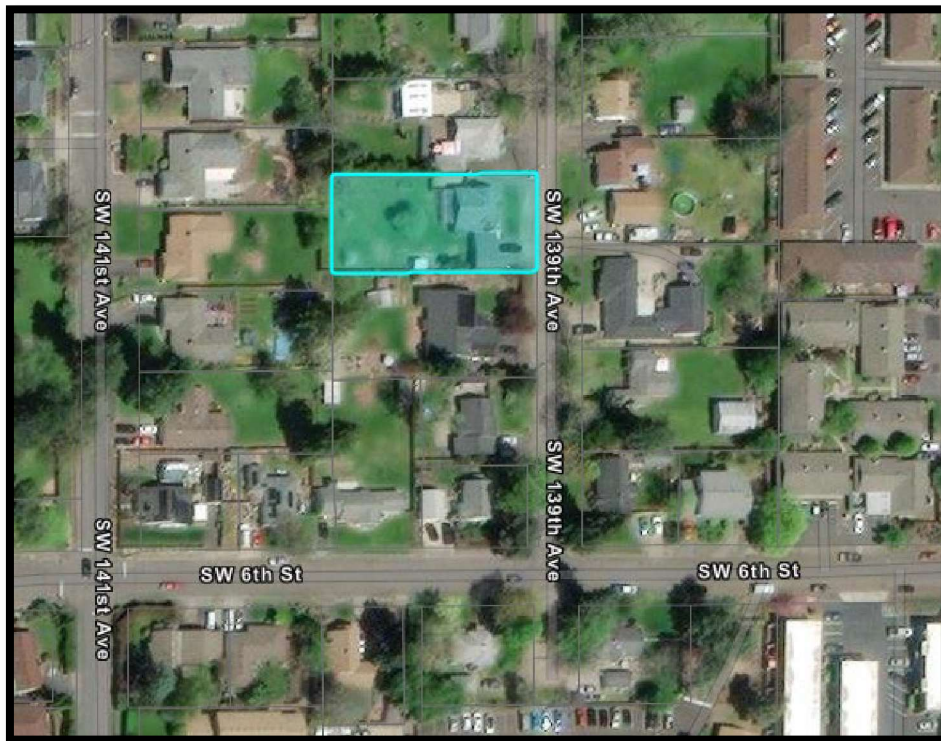


Figure 1: Vicinity Map (Image from City of Beaverton GIS)

Sight Distance Requirements

Intersection sight distance was measured and evaluated in accordance with the standards established in *A Policy on Geometric Design of Highways and Streets*¹, as required by the City of Beaverton's *Engineering Design Manual*. According to AASHTO, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the approach street pavement.

Vehicle/object height is assumed to be 3.5 feet above the cross-street pavement. Using a vehicle/object height equal to the driver's eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle).

Both intersection sight distance (ISD) and stopping sight distance (SSD) are assessed. According to AASHTO, the ISD is an operational measure, intended to provide sufficient line of sight along the major street so that a driver can turn from the minor street without impeding traffic flow. The SSD is considered the minimum requirement to ensure safe operation of an intersection. Stopping sight distance is the distance that allows an oncoming driver to see a hazard in the roadway, react, and come to a complete stop if necessary to avoid a collision.

SW 139th Avenue is relatively flat near the project site, with approach grades measuring less than two percent over the braking distance. The posted speed along SW 139th Avenue is 25 mph; therefore, the recommended ISD is 280 feet and the required SSD is 155 feet. Calculation worksheets are provided in the appendix to this memorandum.

Sight Distance Measurements

The following observations were made at the proposed site access; all figures are located in the appendix of this memorandum.

Looking North from Site Access

Due to an existing wooden fence along the north property line, both the minimum recommended ISD and the required SSD north of the proposed site access could not be met along SW 139th Avenue at the standard distance of 14.5 feet from the near edge of the travel lane of the intersecting street. Figure 2 shows the available sight lines from the access at a location of 14.5 feet from the near edge of the travel lane. If the front portion of the existing wooden fence is removed, the available sight lines would exceed the minimum ISD recommendation of 280 feet.

According to AASHTO, the design vehicle length in front of the driver's eye for passenger cars in the US is nearly always 8 feet. When drivers pull forward to an eye position of 10 feet from the edge of the roadway, an additional 2 feet of space will remain between the front of the vehicle and the edge of the travel lane on SW 139th Avenue.

Figure 3 shows the available sight lines from the access at a location of 10 feet from the near edge of the travel lane. When the driver of the vehicle exiting the site access pulls forward to a location of 10 feet from the traveled way (rather than the standard 14.5 feet), the available sight lines exceed the minimum ISD recommendation of 280 feet as shown in Figure 4.

¹ American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.



Looking South from Site Access

The available sight lines south of the access were measured to exceed the minimum ISD recommendation of 280 feet. Figure 5 shows the available sight lines from the access. Figure 6 is taken 280 feet south of the access.

Conclusions

Based on the analysis, the stopping sight distance requirements and intersection sight distance recommendations in accordance with AASHTO standards to the south of the project site are met.

While adequate intersection sight distance can be met to the north when the driver of the vehicle exiting the site access pulls forward to a location of 10 feet from the traveled way (rather than the standard 14.5 feet), it is recommended that the front portion of the existing wooden fence be removed. This will allow for the intersection sight distance recommendation of 280 feet to be met from 14.5 feet back from the traveled way and therefore, be in compliance with the City of Beaverton EDM sections 210.18.1 and 210.21.F.4.

Appendix:

- *Sight Distance Photos*
- *Sight Distance Calculations*
- *Site Plan*





Figure 2: Available Sight Distance Looking North at 14.5 feet from Edge of Travel Lane



Figure 3: Available Sight Distance Looking North at 10 feet from Edge of Travel Lane



Figure 4: Looking South to Site Access from 280 Feet North of Site Access



Figure 5: Available Sight Distance Looking South at 14.5 feet from Edge of Travel Lane



Figure 6: Looking North to Site Access from 280 Feet South of Site Access

Stopping Sight Distance***Northbound***

Travel Speed 25 mph
 Reaction Time 2.5 seconds
 Acceleration 11.2 ft/sec²
 Grade (percent) 0.00%

SSD 155 feet

Southbound

Travel Speed 25 mph
 Reaction Time 2.5 seconds
 Acceleration 11.2 ft/sec²
 Grade (percent) 0.00%

SSD 155 feet

Reaction Distance

Travel Speed 25 mph
 Travel Speed 36.8 fps
 Reaction Time 2.5 seconds

Reaction Distance 91.9 feet

Travel Speed 25 mph
 Travel Speed 36.8 fps
 Reaction Time 2.5 seconds

Reaction Distance 91.9 feet

Braking Distance

Travel Speed 25 mph
 Acceleration 11.2 ft/sec²
 Grade (percent) 0.00%

Braking Distance 59.9 feet

Travel Speed 25 mph
 Acceleration 11.2 ft/sec²
 Grade (percent) 0.00%

Braking Distance 59.9 feet

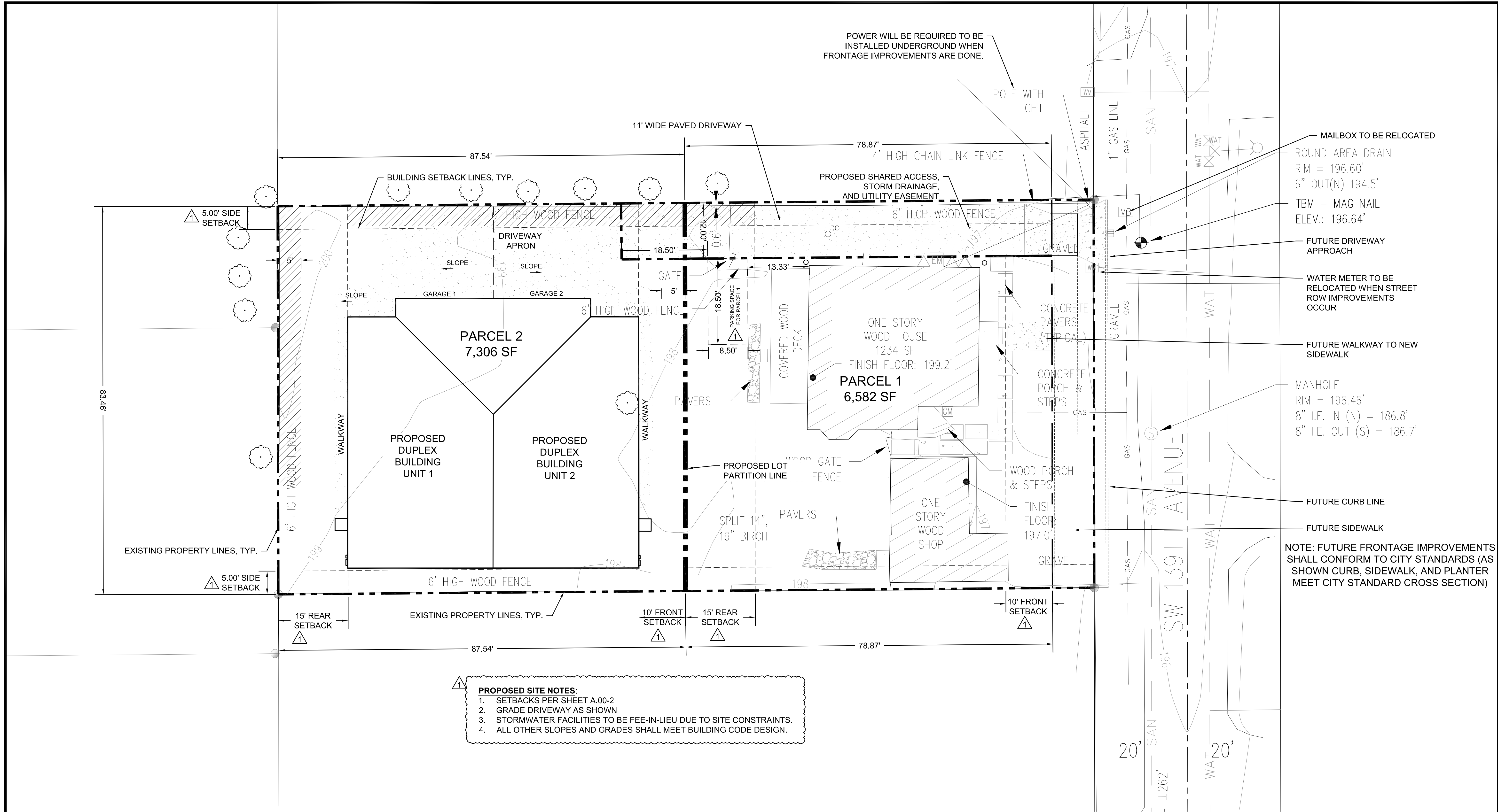
Note: If grades are less than 3%, no adjustment is needed.

Intersection Sight Distance

	<i>Left Turn Looking Left</i>	<i>Left Turn Looking Right</i>	<i>Right Turn Looking Left</i>
Approach Speed	25 mph	25 mph	25 mph
Number of Lanes	2 lanes	2 lanes	2
Vehicle Type (P/S/C)	P Passenger Car	P Passenger Car	P Passenger Car
Extra Crossing Lanes	0	0	
Time Gap	7.5 seconds	7.5 seconds	6.5 seconds
AASHTO Intersection Sight Dist	280 feet	280 feet	240 feet
Washington County	250 feet	250 feet	250 feet

Notes:

- 1) For Approach speed, use the design speed of the roadway (typically 85th percentile speed).
- 2) For Time Gap, use 7.5 seconds for passenger cars, 9.5 seconds for single-unit trucks, and 11.5 seconds for combination trucks.
- 3) The above values are for 2-lane highways without medians and grades of 3 percent or less.
- 4) For grades in excess of 3 percent on the minor street, add .2 seconds for each percent grade.
- 5) For additional lanes, add 0.5 seconds per lane for passenger cars and 0.7 seconds per lane for trucks.

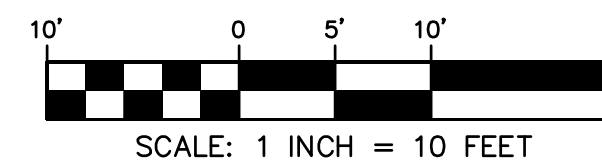


- PROPOSED SITE NOTES:**
1. SETBACKS PER SHEET A.00-2
 2. GRADE DRIVEWAY AS SHOWN
 3. STORMWATER FACILITIES TO BE FEE-IN-LIEU DUE TO SITE CONSTRAINTS.
 4. ALL OTHER SLOPES AND GRADES SHALL MEET BUILDING CODE DESIGN.

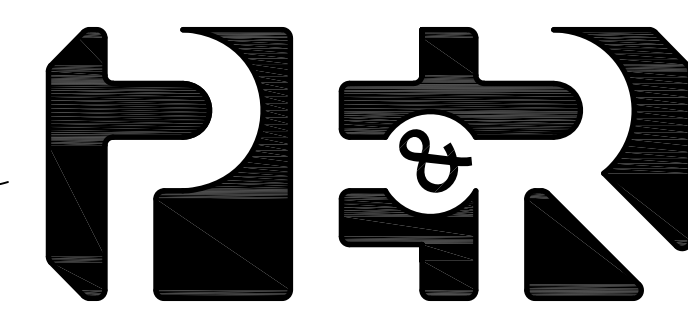
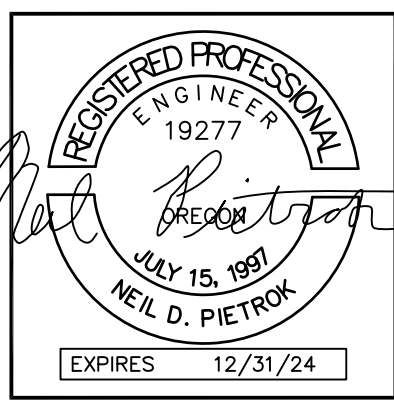


PROPOSED SITE PLAN
SCALE: 1"=10'

1
C3



- MAILBOX TO BE RELOCATED
 - ROUND AREA DRAIN
RIM = 196.60'
6" OUT(N) 194.5'
 - TBM - MAG NAIL
ELEV.: 196.64'
 - FUTURE DRIVEWAY APPROACH
 - WATER METER TO BE RELOCATED WHEN STREET ROW IMPROVEMENTS OCCUR
 - FUTURE WALKWAY TO NEW SIDEWALK
 - MANHOLE
RIM = 196.46'
8" I.E. IN (N) = 186.8'
8" I.E. OUT (S) = 186.7'
 - FUTURE CURB LINE
 - FUTURE SIDEWALK
- NOTE: FUTURE FRONTAGE IMPROVEMENTS SHALL CONFORM TO CITY STANDARDS (AS SHOWN CURB, SIDEWALK, AND PLANTER MEET CITY STANDARD CROSS SECTION)



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13539 NW Springville Road
Portland, OR 97229
PH: 503-793-3469

FILENAME	178-C3
DATE	02/15/2024
DESIGNER	NDP
DRAFTER	NDP
REVIEWER	DI

TWO LOT PARTITION FOR
TL ID: 1S116CA03000
4975 SW 139TH AVENUE
BEAVERTON, OREGON 97005
R129462
ZONING: SFR, RMC

SW 139TH AVENUE

BEAVERTON, OR

**LOT PARTITION
PROPOSED SITE PLAN**

No.	REVISION	DATE	BY
1		12/12/23	NDP

SHEET	3
OF	9
DRAWING NUMBER	178-C3