

## MEMORANDUM

**Date:** April 5, 2024 **TG:** 1.22178.00

**To:** Jeff Pantier, Hatton Pantier

**From:** Dan McKinney & Kassi Leingang PE – Transpo Group

**cc:** Raelyn Hulquist, DR Horton

**Subject:** Enclave at Oak Tree (McAllister Springs) Sight Distance Memo

The following memorandum summarizes the sight distance for the proposed site driveway on Marvin Road SE. The project background, review of City of Lacey Standards, Thurston County standards, the sight distance review, and recommendations are provided.

### Project Description

The proposed residential development is located in Thurston County within the City of Lacey's Urban Growth Area along the east side of Marvin Road SE. Access to the site is proposed via Marvin Road SE in alignment with Terri Court SE. A preliminary site plan shown is included below as Figure 1.

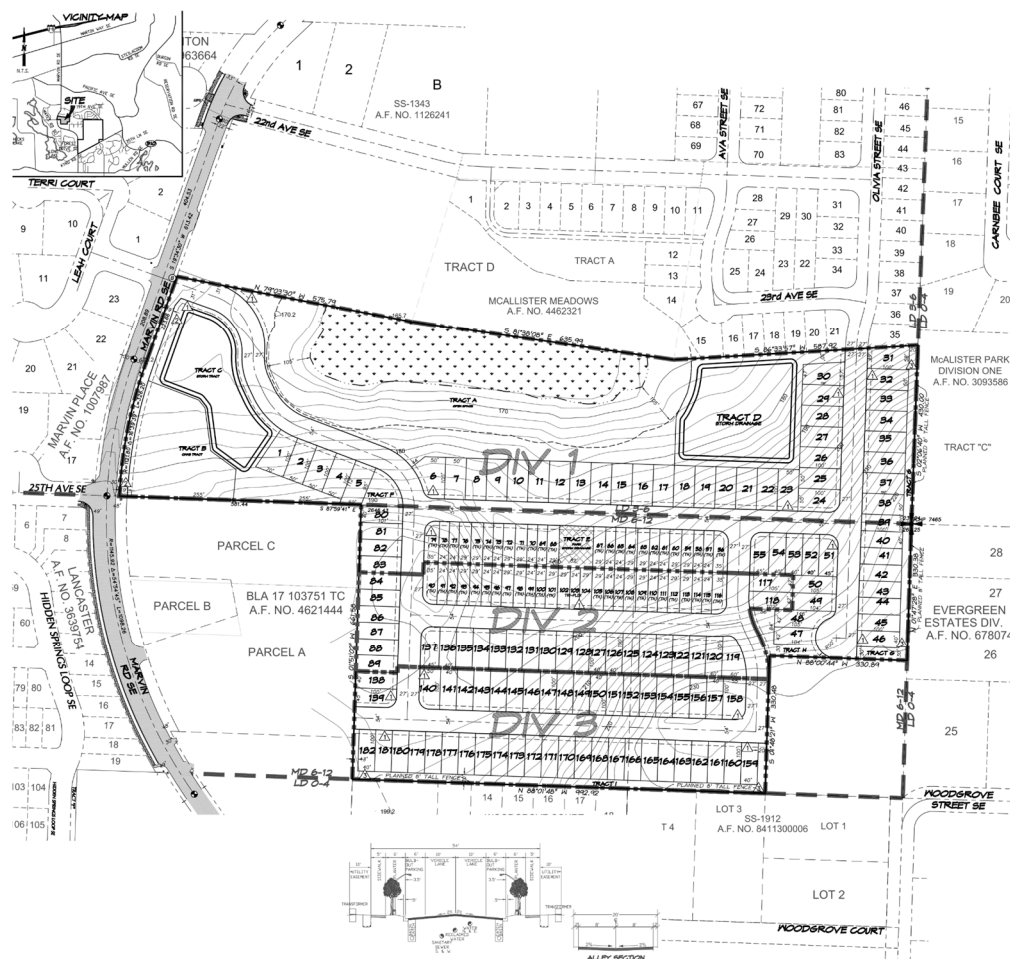


Figure 1: Site Plan

## City and County Applicable Standards

The City of Lacey Development Guidelines and Public Works Standards (2017) Chapter 4: Transportation section 4B.150 Sight Obstruction outlines that AASHTO Design Standards are to be used for sight distance criteria for all road and intersection designs. With City of Lacey's standards, the design speed was assumed to be +5 mph of the posted speed.

Similarly, the Thurston County Road Standards (2017) section 4.03 A. and B. outlines that AASHTO Design Standards are to be used for sight distance criteria for all road and intersection designs.

### AASHTO

AASHTO A *Policy on Geometric Design of Highways and Streets*, 2018 edition section 9.5.1 defines both stopping sight distance and intersection sight distance as noted below:

**Stopping Sight Distance** *“Stopping sight distance is provided continuously along each roadway so that drivers have a view of the roadway ahead that is sufficient to allow drivers to stop...is fundamental to intersection operation.”*

**Intersection Sight Distance** *– “if the available sight distance for an entering or crossing vehicles 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, a major-road vehicle may need to slow or stop 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.”*

As defined in AASHTO, the intersection (or entering) sight distance is the distance needed for a side-street vehicle to access the main roadway, accelerate to the posted speed and not impede travel for vehicles on the main roadway. AASHTO's definition of intersection sight distance acknowledges that the operational elements cannot always be achieved and sets the minimum criteria based on the stopping sight distance requirements.

AASHTO defines a required stopping sight distance of 360 feet for a design speed of 45 mph (posted speed limit +5 mph). The minimum intersection sight distance was assumed consistent with stopping sight distance as allowable per AASHTO. As noted above, section 9.5.1 of AASHTO states *“[i]f the available sight distance for an entering or crossing vehicles 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.”*

### Sight Distance Review

Field sight distance analyses were performed at the proposed site access on Marvin Road SE. As per AASHTO standards, intersection sight distance was measured with passenger car driver's eye height and object height of 3.5 feet measured from 14.5 feet from edge of traveled way. The stopping distance was measured with object height of 2 feet from the center of approaching lane.

The sight distance requirements and available sight distance are summarized in Table 1. The entering sight distance and the required stopping sight distance on aerial images of the site are illustrated in Figure 2 and Figure 3, respectively. Additionally, these distances are presented on CAD drawings of the site in Figures 4 and 5, respectively, for entering and stopping sight distances.

Note: Based on AASHTO A Policy on Geometric Design of Highways and Streets 2018, Table 3-1, Stopping Sight Distance for a 45-mph design speed (5 mph over the posted speed).

22ND AVE SE

N

TERRI CT SE

SITE DWY

MARVIN RD SE

360 FT

360 FT

## Stopping Sight Distance

McAllister Springs

FIGURE

2

transpogroup 



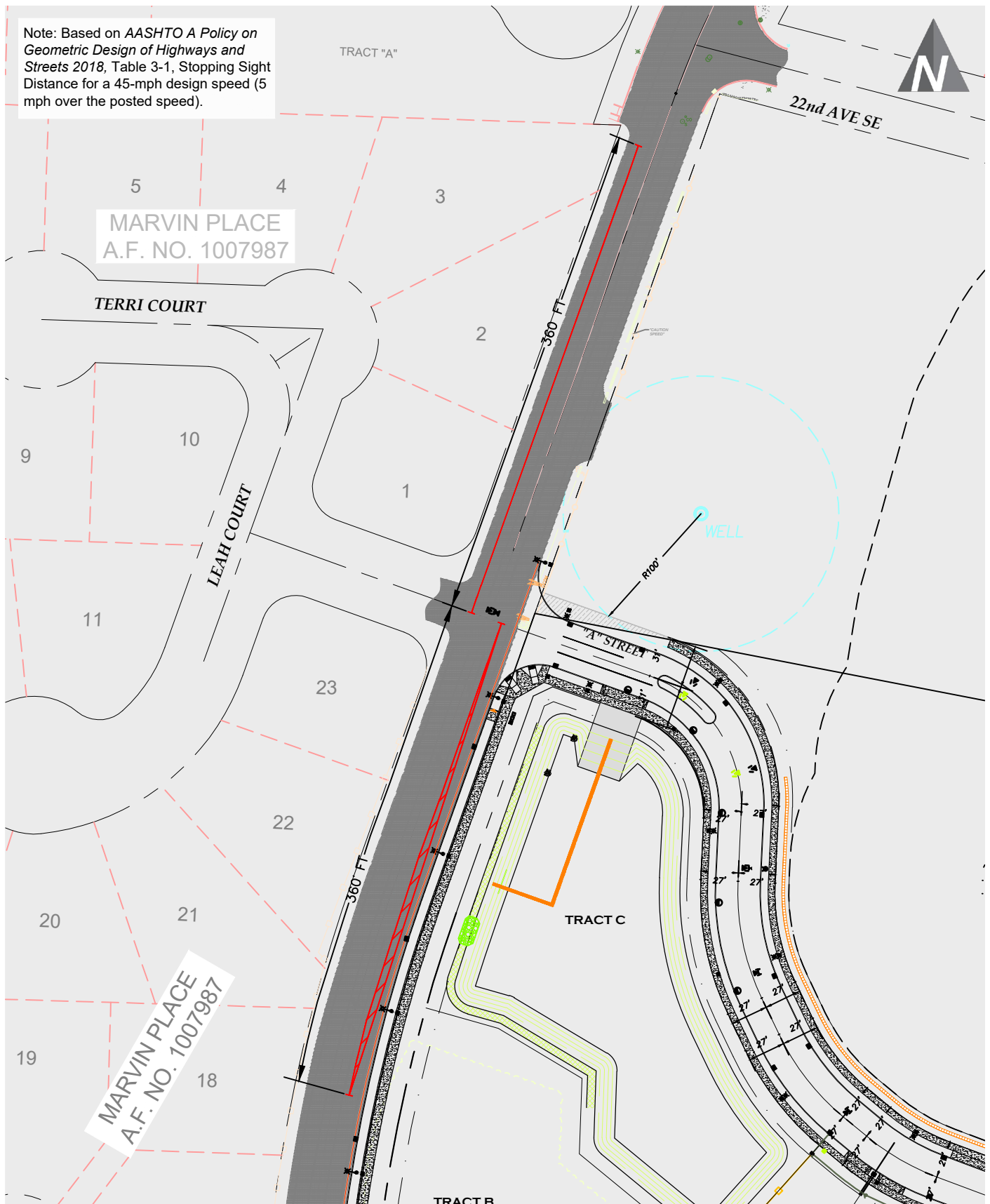
## Intersection Sight Distance

McAllister Springs

FIGURE

3

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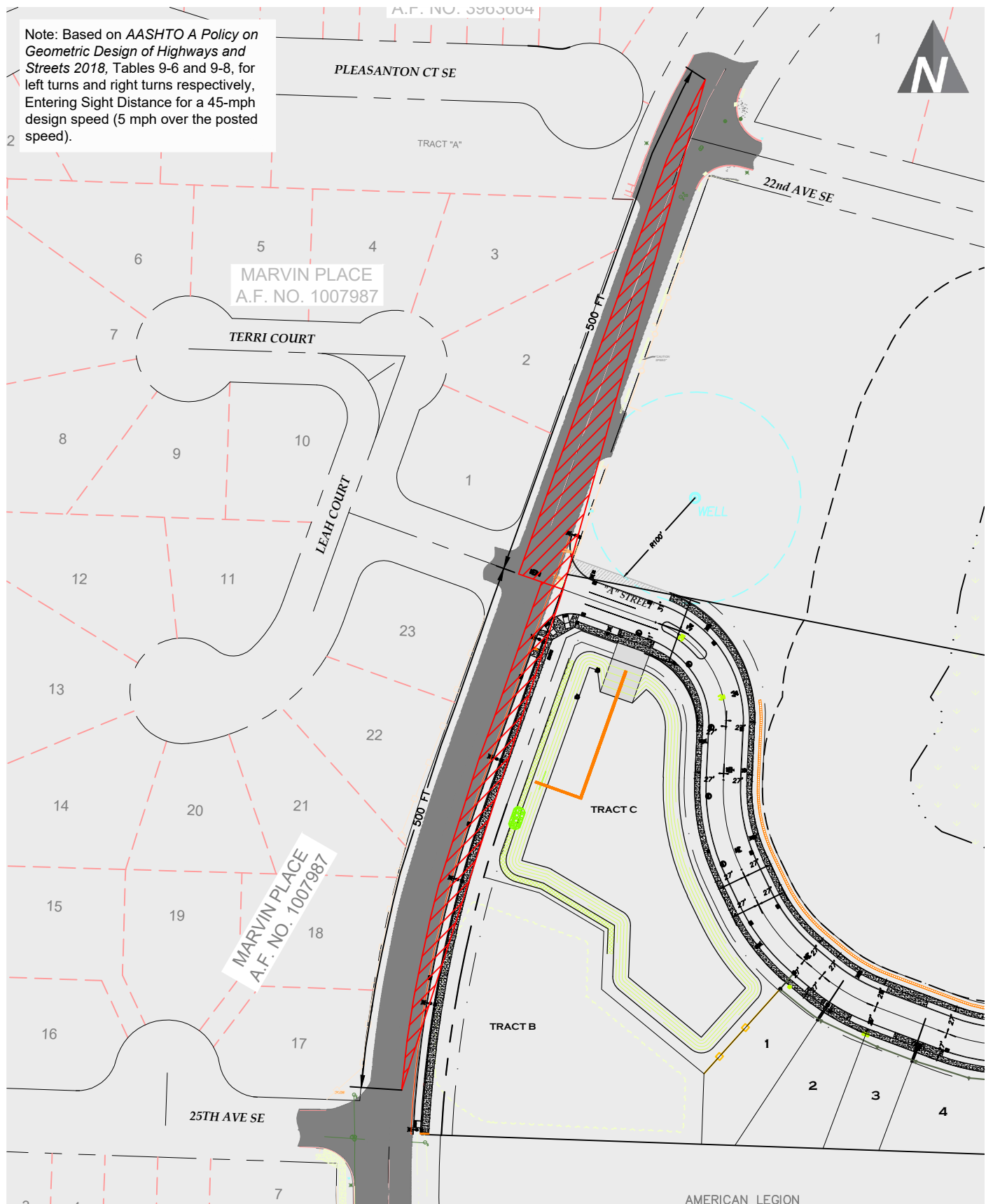
# Stopping Sight Distance

McAllister Springs

FIGURE

4

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FIGURE

5

**Table 1. Observed Sight Distance Summary**

Access	Jurisdiction	Standard	Posted Speed	Design Speed	Direction	Entering Sight Distance		Stopping Sight Distance	
						Recommended	Observed	Required	Observed
Marvin Rd SE/ Proposed Site Access	City of Lacey/ Thurston County	AASHTO	40 mph	45 mph	North	500'	540'	360'	680'
					South	500'	410'	360'	550'

Note: mph = miles per hour.

As shown in Table 1, the required (stopping) sight distance of 360 feet is met in both the north and south directions. Field observations showed that the entering sight distance is available on the north side of the driveway but was not met in the south direction due to sight obstructions by vegetation.

The AASHTO standards state that: *“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.”* An intersection sight distance that is greater than the stopping sight distance is desirable to improve traffic operations along the major road but in some cases, a major-road vehicle may need to slow or stop to accommodate the maneuver by a minor-road vehicle. In other words, stopping sight distance is required for safety reasons at the intersection while entering sight distance is recommended to enhance traffic operations.

The vegetation that obstructs existing entering sight distance is within the roadway right of way, which will be cleared and redeveloped as part of the project frontage improvements. The frontage improvements will include the development of curb, gutter, and sidewalk. Landscaping will also be included and it is recommended that the landscaping meets City/County requirements to minimize impacts to sight lines. According to the City of Lacey Development Guidelines: *“Sight obstructions that may be excluded from these requirements include: ... trees trimmed from the base to a height of 10 feet above the street.”*

## Conclusion

Sight distance was evaluated for the proposed site access on Marvin Road SE. Based on review of City of Lacey and Thurston County design standards, AASHTO design standards were used to determine the recommended entering sight distance and the required stopping sight distance. The City of Lacey’s design speed of +5 mph posted speed was used. Field observations showed the stopping sight distance which is required for safety was available in both directions. The entering sight distance that is recommended for enhancing traffic operations was available from the north but was not met in the south direction due to sight obstructions by vegetation within the road right of way. With the development of the proposed project, frontage improvements would be completed that would remove the vegetation that obstructs current sight lines; therefore, future sight lines will provide adequate sight distance.