

Memorandum

Project: 11-008.20 Spruce Creek Rd

To: Town of Blue River

From: Muller Engineering Company

Date: January 4, 2024

Subject: Spruce Creek Rd & CO 9 Sight Distance Memorandum

One of the major concerns at the intersection of Spruce Creek Road and CO 9 is sight distance. Vehicles stopped at the base of Spruce Creek Road have difficulty seeing northbound CO 9 traffic approaching from the south. With a posted speed of 50 mph on CO 9, vehicles turning left onto northbound CO 9 have little time to make the decision to turn or wait. At a design speed of 50 mph, the 2023 CDOT Roadway Design Guide specifies a minimum stopping sight distance of 425' with no grade adjustments (Table 6-1). This stopping sight distance assumes a vehicle driver eye height of 3.5' and an object height of 2' (CDOT, 6.2.2). Stopping sight distance profiles were analyzed based on Lidar data.

Figure 1 shows the existing sight distance profile from the driver seat of a vehicle stopped behind the stop sign on Spruce Creek Road to a point 425' south in the northbound CO 9 lane. The profile shows that there is virtually no sight distance along this minimum sight distance line. **Figure 2** shows the actual available sight distance to be roughly 280'; however, there is still an immediate obstruction that nearly blocks the line of sight. These two figures show the difficulty drivers face as they make a left turn from Spruce Creek Road onto northbound CO 9.

To improve the sight distance, Muller recommends reducing the corner radius of the intersection, which allows for the stop sign to be moved 16' closer to CO 9 and improves visibility for both CO 9 and Spruce Creek Road traffic. The proposed layout is shown in **Figure 5**. The new stop sign location is 15' off the white edge stripe of southbound CO 9. This placement is in accordance with the recommendations of the MUTCD 2009 Section 2B.10, which calls for a minimum distance of 6' to 12' between the stop sign and the edge of the major road and not more than 50' from the edge of pavement of the intersecting road. **Figure 3** shows that a driver, stopped at the new sign location, now has a sight distance of roughly 405' along CO 9. Although this sight distance still does not meet the 425' threshold, the increase in 125' significantly improves the decision time for drivers. **Figure 4** shows the maximum obstruction along the 425' sight distance to be 1.4'. Potential grading of the slope along the west side of CO 9 could provide the required sight distance for the intersection. However, grading of this slope is outside the scope of this project.

Figure 1. Existing Sight Distance Obstructions

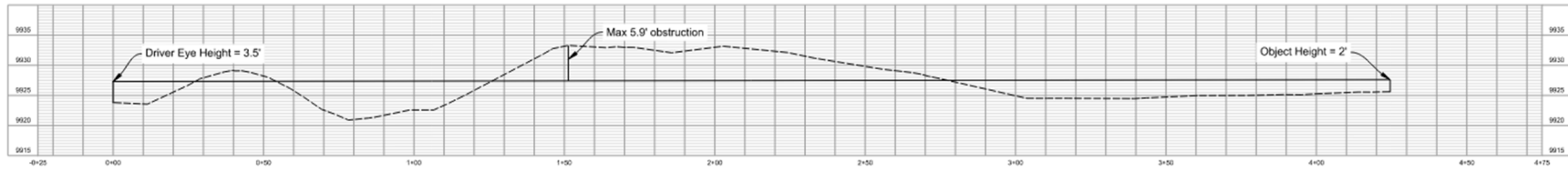


Figure 2. Existing Sight Distance

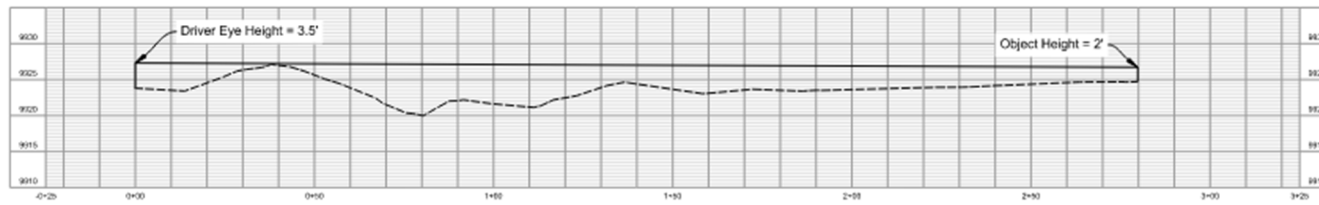


Figure 3. Proposed Sight Distance

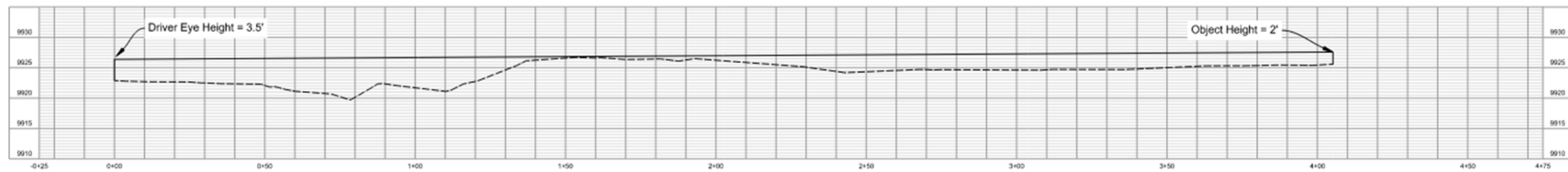


Figure 4. Proposed Sight Distance Obstructions

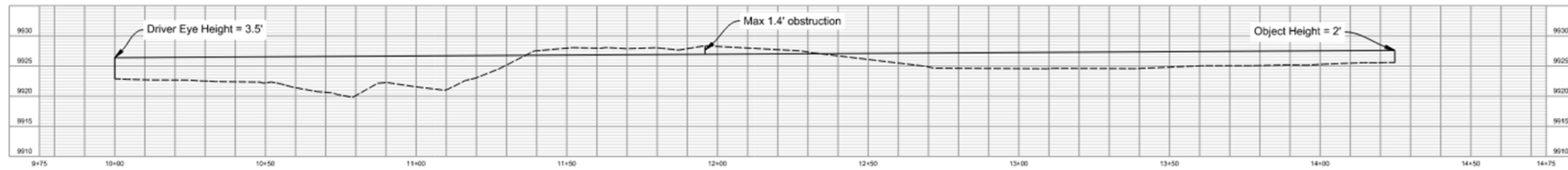


Figure 5. Proposed Intersection Layout

