

Title: Intersection Sight distance at Field Access, South of Mahaska Creek to Croat Creek

Memorandum Date: September 19, 2011

Design Exception Request Date: September 12, 2011

Region: North Central

Approval Status: Approved

Project Location					
Highway	Control Section	At km	From km	To km	Existing AADT
32	08		32.360		1510
	10			18.500	1510

Project Type (Mark all that apply with an X)			
Functional Planning:	New Construction:	Reconstruction:	Paving/Surfacing:
Bridge:	Operations:	Geotechnical:	Environmental:
Other: <input checked="" type="checkbox"/> Grade Widening			

Summary
Grade widening is taking place along Hwy 32 and as a result an existing field access is being relocated from km 3.98 to km 4.04 on Hwy 32:10. The new field access does not provide the minimum intersection sight distance (ISD) for WB-21 design vehicles. An ISD of 410m has been provided in the proposed design. Based on new construction standards and a design speed of 110 km/hr, the minimum ISD required is 500m. The field access will primarily be used by passenger vehicles, single unit trucks, farm combines in the fall and horse trailers in the spring and fall.

Rationale for Approval/Rejection
<ul style="list-style-type: none"> The exposure of the proposed field access is considered low due to its anticipated usage. The 20 year projected traffic volume AADT of 2265 vehicles per day is relatively low. Traffic volume for the field access will be very low. The field access will be used on a seasonal basis by combines and horse trailers. For horse trailers, a recreational double (truck, 5th wheel trailer and boat) would be considered a better representative design vehicle than the WB-21. Based on new construction standards and a design speed of 110 km/hr, the minimum ISD required is about 430m which is much closer to the available ISD of 410m. Refer to HGDG, Figure D-4.2.2.2 Sight Distance for Left turn onto Highway). AASHTO – A Policy on Geometric Design of Highway and Streets (2004) uses the gap acceptance methodology for determining ISD. Based on AASHTO Exhibit 9-54, a time gap of 11.5 seconds is indicated for a combination truck design vehicle. Using a time gap allowance of 12.2 seconds (an additional 0.7 seconds for each additional lane for the left turn in excess of one), the AASHTO ISD would be about 375m . The available ISD of 410m exceeds the recommended AASHTO ISD. Farm combine vehicles are not typical design vehicles used for ISD analysis in the HGDG. There are no specific ISD requirements for farm combines in the HGDG. As indicated, farm combines will only be using the field access in the fall. The existing crest K-value of 88 exceeds the 3R/4R crest K-value of 50 for a design speed of 110 km/hr.

- The existing safety record taken 0.5 km north and south of the proposed field access is very good. There have been 3 reported collisions between km 3.5 to km 4.5 for the 5 year period from 2005 to 2009. The 3 collisions were all PDO and animal related.

Additional Mitigation Required
No mitigation is required.

Key Words
Field access, Intersection sight distance, Design vehicle

Photograph/Diagram (If Available)

