Description of Exception:
Standard shoulder width per AASHTO is 8' for the given ADT and 50 mph design speed. The project proposes to stripe shoulders on 760’ radius curve at 6’ outside and 10’ inside. Stopping sight distance should be 425’ for 50 mph design but even with the 10’ inside shoulder striping, only 40 mph stopping sight distance of 305’ will be provided. The available stopping sight distance was calculated to be over 311’ using 2004 AASHTO Formula 3-36, using a Horizontal Sightline Offset of 16 to center of inside lane, which has a radius of 756’.

The proposed curvature of the replacement structure also limits intersection sight distance for left hand movements out of one driveway. Recommended intersection sight distance for this movement is 555’ whereas only 490’ is achievable with the 10’ inside should striping.

Description of Project:
The Pudding River (Whiskey Hill Road) Bridge #1559 is located on Whiskey Hill Road on the border of Marion and Clackamas Counties, approximately 0.4 miles to the west of the Meridian Road intersection, and near the City of Hubbard. Whiskey Hill Road is a rural major collector per ODOT functional class mapping connecting OR 99E to the west and Barlow Road, Canby-Marquam Highway, and OR 213 to the east.
The bridge, built in 1931, is rapidly deteriorating with cracking and spalling throughout. There are also patches of exposed rebar and scour related issues. Inspectors have deemed the bridge as structurally deficient with critical scour and have rated the deck as intolerable, giving the bridge an overall sufficiency rating of 4.5.

The proposed solution for the Pudding River (Whiskey Hill Road) replacement bridge is a new steel multi-span structure spanning the Pudding River inside of the current curve, slightly south of the current location. Goals for the new bridge were to include improving the alignment, minimizing scour issues, providing two (2) 12-foot lanes and two (2) 8-foot shoulder/bike lanes. The travel lanes will be striped so the final outside shoulder will be 6 feet and the inside shoulder will be 10 feet to improve both stopping sight distance and intersection sight distance on the inside of the curve.

Location of Design Feature:
Majority of project is on 760’ radius curve.

The driveway with impaired sight distance is located approximately 225’ off the east end of the new structure.

Accident History & Potential: (Specifically as it applies to requested exception)
Between January 2008 and December 2012 there were 4 recorded accidents within the project limits. All were attributable to the existing sharp horizontal alignment that occurs on the bridge coupled with the restricted horizontal width of the bridge (20’ roadway width, no shoulders). All four crashes involved driving too fast for the conditions and resulted in bridge rail impacts or run-off-the-road fixed object collisions.

The existing horizontal alignment is posted with 35 mph advisory signs, whereas the new bridge is designed with a 50 mph horizontal alignment and 6’ and 10’ shoulders. The improved horizontal alignment and wider shoulders will substantially improve sight distance and reduce future accident potential.

Reasons For Not Attaining Standard: (Such As Benefit/Cost, Accident History, Environmental, Etc.)
The horizontal alignment would need to be flattened to a 1625’ radius curve to achieve 425’ of stopping sight distance on the bridge, which would also correct the impaired access sight distance. This would result in a much longer bridge with an unacceptable skew angle across the river and require replacement of the overflow structure just west of the new bridge.

The other option to achieve design stopping and intersection sight distance would be to further widen the inside shoulder. This would require approximately a 24.5 foot shoulder. This would substantially increase the structure cost and it would be very difficult to taper out the extra width before impacting the westerly overflow structure. It would also require raising the bridge an additional 1.16’ to maintain the hydraulic opening.

Effect on Other Standards:
The offset shoulder striping was incorporated to achieve the best possible stopping and intersection sight distance attainable for the proposed practical design solution.

Compatibility with Adjacent Sections:
Sections of Whiskey Hill Road to the west are fairly level. Sections of Whiskey Hill Road to the east are more rolling with some sections of substandard horizontal alignment. Adjacent sections of Whiskey Hill Road only have 1’ – 3’ shoulders. This section will not be incongruous with other Clackamas County sections of Whiskey Hill Road.

Probable Time before Reconstruction of Section:
Unknown at this time, anticipate only preservation type work on this road for the foreseeable future.

Mitigation For Exception Included In Design:
Horizontal curve warning signs with 45 mph speed riders and chevron signs facing both directions on 120’ spacing on the outside of the curve are included in the construction documents.

Supporting Documentation (Include the appropriate Plan Section, Cross Section, Alignments Sheets & Plan Details): Plan Sheets 2, 3, S-1, S-2, and Intersection Sight Distance Exhibit
OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST

Signatures

Prepared By: 
(Date: 14 FEB 2014)

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City: Portland
ST: OR Zip: 97201

Approved By: 
Date:

(Print Name)

PREPARED BY:

ENGINEER OF RECORD
PROFESSIONAL
ENGINEER STAMP

REGISTERED PROFESSIONAL
ENGINEER
OREGON
51,631
JULY 11, 2000
TED CHARLES STEWART
EXPIRES 30 JUNE 2014