Washington State Department of Transportation

Memorandum

Date: January 27, 2005

RECEIVED
FEB 02 2004

From: Bill Gould BG
Phone: (509) 667-2909

Through: Dan Sarles, ARA Engineering
North Central Region

SUBJECT: Request for deviation: Sight distance at proposed intersection US 97, Vicinity MP 172.08 Left

To: Greg Lippincott
Mail Stop #47330

Chelan County, in cooperation with WSDOT, requests approval of a deviation from WSDOT Design Matrix 3 intersection sight distance full design level standards on a NHS highway.

This Deviation Request has been evaluated and documented in accordance with Washington State Department of Transportation Manuals and current design standards and Procedures.

☒ Deviation Approval Recommended ☐ Deviation Approved

Assistant Regional Administrator for Engineering — Date 1/28/05

☒ Deviation Approval Recommended ☒ Deviation Approved

Assistant State Design Engineer — Date 2/15/05

DOT Form 700-028 EF

Project Overview
Chelan County has received Federal Bridge Replacement funds for the replacement of Chelan County Bridge No. 324. Following a site review May 27, 2003 by the Federal Highways Administration (FHWA), WSDOT North Central Region, and Chelan County, a recommendation was made by the Bridge Replacement Advisory Committee (BRAC) to locate the new bridge upstream of the current location for more favorable stream dynamics. This change requires relocation of the intersection of Old Blewett Highway with US 97. In a June 18, 2003 letter from Kathleen Davis, Director WSDOT Highways and Local Programs, Chelan County was requested to work with the North Central Region to determine the best location to place the new intersection to US 97. Ms. Davis also requested Chelan County to submit a Type, Size, and Location (TS&L) study for review and approval prior to designing a replacement bridge.

Chelan County Bridge No. 324 crosses Peshastin Creek and is located on the Old Blewett Highway, approximately 0.10 mile west of US 97. The existing intersection is 12.55 miles south of the intersection with US 2 and 8.76 miles north of the summit of Blewett Pass on US 97. This section of Old Blewett Highway provides access to 15 recreation lots, mining claims and federal and private forest lands that are periodically logged. The ADT is 70 and seasonal with the heaviest use during fall hunting seasons.

Existing Conditions
The existing intersection angle is less than 60 degrees to US 97. Sight distance is adequate. The intersection is the result of the realignment of the highway to its current location with transfer of the old highway road to the county. The intersection does not have any advance warning or directional signing along US 97.

Approximately 900' of the Old Blewett Highway between the existing bridge and the point of new alignment is adjacent to Peshastin Creek and the shoulder embankment is raveling into the creek. Protection and maintenance of this section of road is costly not only in dollars but in terms of impact to Peshastin Creek.

Proposed Project
The existing bridge and 1,900 feet of Old Blewett Highway will be abandoned, the intersection with US 97 will be relocated approximately 2,000 feet to the south, a new bridge at a better location and 500 feet of new roadway alignment will be constructed.

Deviation Description
Design Manual reference—Design Manual Supplement dated 3/24/04 (Figure 440-1) lists the desirable design speed at full design level for non-freeways with a speed limit over 45 mph as 5 mph over the posted speed. The posted speed for this stretch of US 97 is 60 mph; the design speed to be used is 65 mph. Using Figure 910-18a for a SU vehicle, and a 65 MPH design speed, the minimum sight distance is 1,100 feet.

Below are intersection sight distance requirements for stopped vehicles to safely complete all legal maneuvers before an approaching vehicle can reach the intersection based on WSDOT and AASHTO computation criteria using the Design Vehicle SU:

- **WSDOT:** Intersection Sight Distance viewing traffic on US 97 coming from the north and south = 1,100'.

- **AASHTO** (4e Addition 2001, Formula 9-1): Intersection Sight Distance viewing traffic on US 97 coming from the south = 910'. Intersection Sight Distance viewing traffic on US 97 coming from the north = 820'

Proposed Intersection Sight Distance available: Intersection Sight Distance viewing traffic on US 97 coming from the north = 1015'. Intersection Sight Distance viewing traffic on US 97 coming from the south = 1069'

WSDOT required Mainline Stopping Sight Distance = 645'. WSDOT required Mainline Decision Sight Distance for Maneuvers for a rural stop = 695'.

Alternatives

1. **Keep the existing intersection in the present location and configuration:** This alternative will require closing the road and result in a long detour accessing the highway on the other side of the summit. The intersection currently has a substandard approach angle for entering highway traffic. There will not be enough room for a detour bridge.
2. **Improve angle at existing intersection:** This alternative will require road closure and a long detour, road maintenance problems and significant environmental impacts including more impact to Peshastin Creek and impacts to wetland buffers. The creek is approximately 125 feet from the edge of pavement on US 97 in this area.
3. **Proposed Alternative: Relocate intersection approximately 2000 feet to the south:** The new intersection will be at 90 degrees. It will require slope excavation of approximately 1,600 cubic yards on State right-of-way to improve sight distance. A sight distance of 1,069 feet to the south and 1,015 feet to the north is achievable at a cost of approximately $100,000.

Justifications

Deviating from WSDOT sight distance requirements for the proposed intersection location is justified based on the following:

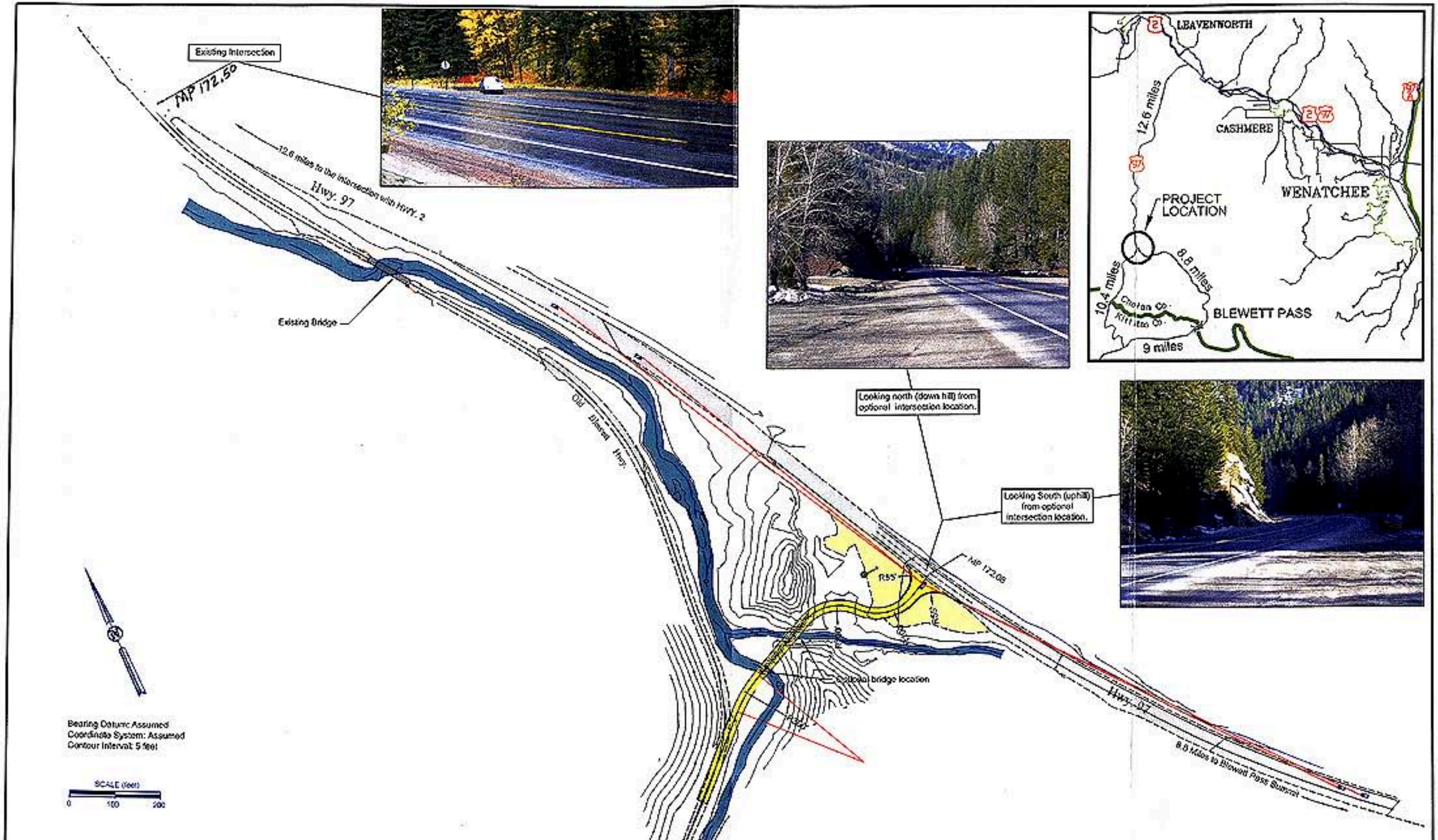
- ADT is low on Old Blewett Highway.
- The new intersection angle will be at 90 degrees.
- With the improved bridge location and abandonment of 1,900 feet of the Old Blewett Highway, there will be opportunities for enhancement to the creek along the old road from road restoration and maintenance.
- The proposed sight distances on US 97 north and south of the new intersection exceeds AASHTO requirements for a single-unit truck. WSDOT time gap requirements for stopped vehicles turning onto a two-lane highway are more conservative than ASSHTO resulting in WSDOT having a more conservative sight distance requirement.

- The heaviest usage of the Old Blewett Highway is during the fall hunting seasons. Usually the vehicles used for hunting are light utility trucks (Design Vehicle P). WSDOT's Design Vehicle P sight distance is 908', well within the sight distance limits proposed.
- To bring the sight distance up to 1,100' to the south requires adding an additional 31' of sight distance. To achieve this would require a costly sliver cut to an existing rock cut that has an extremely high plateau. The sliver cut could result in future stability issues within the remaining rock.
- To bring the sight distance up to 1,100' to the north requires an additional 85' of sight distance. To achieve this would require trees to be removed and long-term maintenance of vegetation adjacent to Peshastin Creek. This removal would have an environmental impact within the existing buffer area of Peshastin Creek and could undermine US 97's fill slope resulting in significant impacts to the highway and Peshastin creek.
- Both Mainline Design Stopping Sight Distance and Decision Sight Distance for Maneuvers for a rural stop are met.

Recommendation
The recommendation of Chelan County Public Works is to deviate the horizontal intersection sight distance for the new intersection. Chelan County proposes to build a new intersection to US 97 from the Old Blewett Highway with a sight distance of 1,069 feet to the south and 1,015 feet to the north. These sight distances exceed current AASHTO standards but do not meet WSDOT more conservative design standards for a Single Unit truck, but does meet design standards for the majority of vehicles (passenger cars and light utility trucks) using the roadway.
This recommendation is based on engineering judgment, environmental issues, and because the only other viable alternative is to leave the existing bridge and intersection in place.

Attachments: Vicinity Map and Plan sheets showing lines of sight

BG/go,bg
cc: Mike Horton, WSDOT, Mail Stop 47390
Gary Owen, P.E. Chelan County Assistant County Engineer, Chelan County Public Works 350 Orondo Avenue Wenatchee, WA 98801



Design Team: G. Owen PE, M. Sale PLS, P. Court, L. Lloyd, J. Pebeldt, K. Bird	REVISIONS		
Drawn by: MJ Sale	Date:	Description:	Made by:
Project Inspector:			
Survey Crew: 2004 E. McMahon, M. Dixon, P. Cutler			
Plot Date: 1/26/2005	As-Built: Date:	by:	

Preliminary

Gregory J. Pebeldt, PE
Director / County Engineer

Date Approved

Chelan County
Public Works Department
350 Orondo Avenue
Wenatchee, Washington, 98801

Phone: (509) 667-6415
Home Page: www.co.chelan.wa.us

Alternate Bridge Location
Sight Distance
on HWY. 97

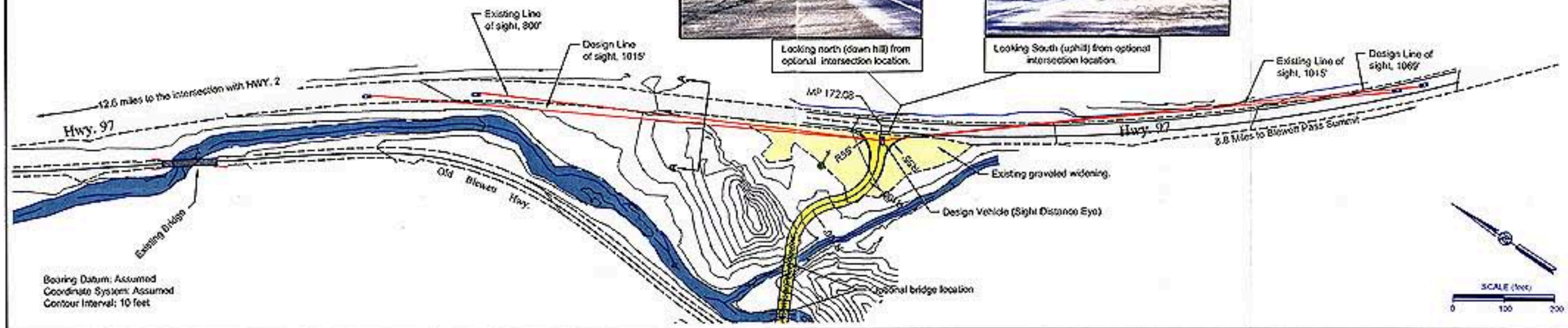
OLD BLEWETT BRIDGE No 1
Bridge Replacement Project

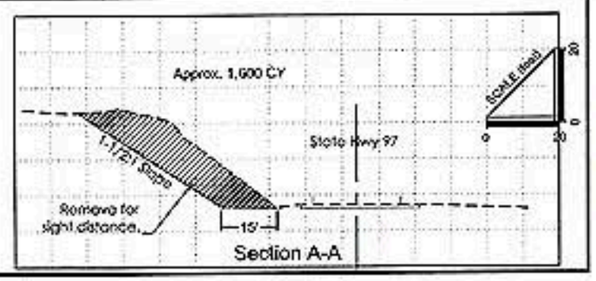
Sheet 1 of 2 | C.R.P. 597

Section 13, Township 22 North, Range 17 East, W.M.
Chelan County, Washington

Looking north (down hill) from optional intersection location.

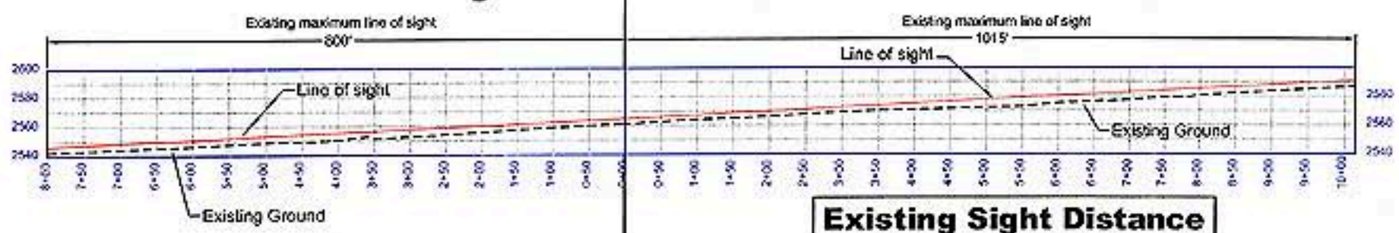
Looking South (uphill) from optional intersection location.



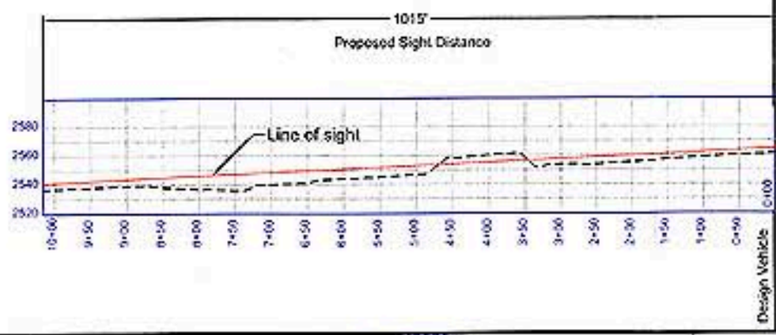


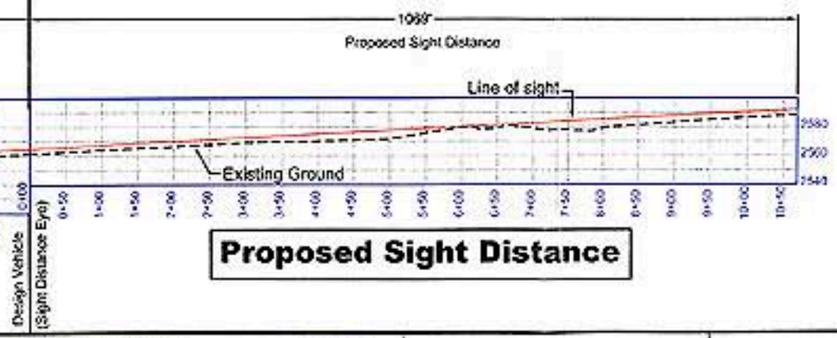
Section A-A

Sight Distance Profiles



Existing Sight Distance





Proposed Sight Distance

Vicinity Map

Design Team:	REVISIONS		
D. Quan P.E., W. Sea P.L.S., P. Cox P.E.	Date	Description	Made by
J. Kunyk, E. Fetterly, K. Boyd			
Owner's Rep: MB Sea			
Project Inspector:			
Survey Crew: 2004 C. McBurney, N. Baker, P. Cutler			
Plot Date: 1/26/2005	As-Built Date	by	

Preliminary

Gregory J. Pezoldt, PE
Director / County Engineer

Date Approved

Chelan County
Public Works Department
350 Orondo Avenue
Wenatchee, Washington, 98801

Phone: (509)667-6415
Home Page: www.co.chelan.wa.us

Alternate Bridge Location
Sight Distance
on HWY. 97

OLD BLEWETT BRIDGE No 1
Bridge Replacement Project

Sheet 2 of 2 | *C.R.P. 597*