

2.3.3 CLEARANCES

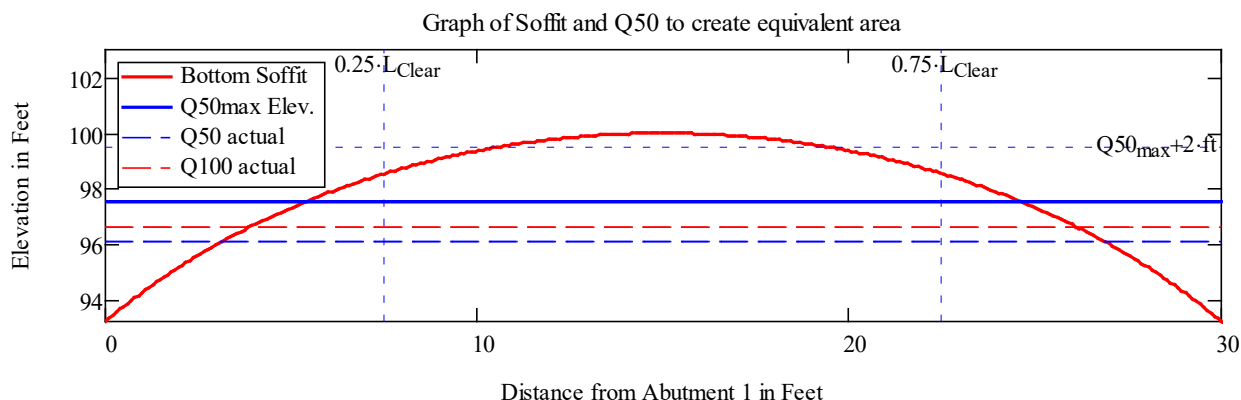
BRIDGES/CULVERTS OVER WATERWAYS OTHER THAN CANALS

For all closed bottom pipes with a clear span less than 12', the ratio of the headwater to diameter during Q25 flow should be equal to or less than 1.25. In addition, the Q100 flow must pass through the pipe without overtopping the roadway.

For all closed bottom rectangular structures with a clear span less than 12', the ratio of the headwater to height during Q50 flow should be equal to or less than 1.25. In addition, the Q100 flow must pass through the structure without overtopping the roadway.

All open bottom structures and all bridges and culverts with spans at least 12' but not greater than 20' should have a minimum 1' of clearance above the Q50 elevation at the crown point (highest point) of the span. In addition, the Q100 flow must pass through the structure without overtopping the roadway.

All single span bridges and culverts and multi-span culverts (non-girder structures) with clear spans greater than 20' should have a freeboard cross-sectional area over the Q50 water surface elevation between the span quarter points equal to 2' times one-half the span length (each span of a multi-span culvert shall be treated individually). In addition, the Q100 elevation shall be less than the crown point of pipes and arches and below the lowest girder soffit elevation of beam structures.



All multi-span beam type bridges should have a minimum 2' clearance above Q50 elevation at all points. In addition, the Q100 elevation shall be less than the lowest girder soffit elevation of the structure.

BRIDGES AND CULVERTS OVER CANALS

All structures over canals shall have a minimum of 1' clearance above the design flow and the maximum flow must pass beneath the lowest chord of the structure.

2.3.3.1 NAVIGATIONAL

Bridges over navigable waters shall meet the vertical clearances required by the Coast Guard.

The State of Idaho is in the 13th District of the U.S. Coast Guard. The Waterways Management Branch within the 13th District handles bridge permitting and modifications. From time to time, the Coast Guard makes navigability determinations of specific waterways, or portions thereof, in order to determine its jurisdiction on those waterways. Copies of these determinations are maintained by the District Commander in the 13th District office. Decisions are subject to change and are available for review on lists and charts. Inquiries concerning whether a determination has been made for specific waters, for the purposes of Coast Guard jurisdiction, should be directed to the District Commander of the 13th District. The current contact for bridge permitting in the 13th District is:

Steve Fischer
 13th Coast Guard District
 Waterways Management (dpw)
 Bridge Program Administrator/Chief
 Thirteenth Coast Guard District
 (206)220-7282
steven.m.fischer3@uscg.mil

Attached is a list of Navigable Water in the State of Idaho. These are legal determinations not necessarily determinations that a water way is in fact presently navigated. The information is dated December, 2017.

These are navigable Coast Guard waters in Idaho:

Bear Lake
 Clark Fork River (from mouth to 2 miles upstream of city of Clark Fork, ID)
 Clearwater River (from mouth to approx. 2 miles upstream from city of Orofino, ID)
 Coeur d'Alene Lake
 Coeur d'Alene River (from mouth to Rose Lake, ID)
 Deadwood River
 Kootenai River (entire river in Idaho)
 Lake Pend Oreille
 Moyie River (entire river in Idaho)
 North Fork of Clearwater River (all of Dworshak Reservoir pool)
 Payette River, South Fork
 Pend Oreille River (entire river in Idaho)
 Priest Lake
 Priest River (from mouth to Priest Lake)
 Salmon River (from mouth to City of Salmon, ID at Bridge Key 17885)
 Sand Creek (from mouth to 2 miles upstream, near Sandpoint, ID)
 Snake River (from mouth to Swan Falls Dam)
 Spokane River (from Washington state line to Lake Coeur d'Alene)
 St. Joe River (from mouth to Bridge Key 20355, about 13 mi. east of St. Maries, ID as the crow flies)

These waterways have been considered but found to NOT be navigable Coast Guard waters in Idaho:

American Falls Reservoir
 Latour Creek (tributary of Coeur d'Alene River)
 Middle Fork of the Salmon River
 North Fork of Payette River
 Pack River (tributary of Lake Pend Oreille)
 Payette Lake
 Payette River
 Squaw Creek (tributary to Payette River)
 St. Maries River
 Teton River

The Bridge Inspection Report also identifies navigable Coast Guard waters in item 38, Navigation Control. A2.7 lists the bridges over navigable waters as of March 2021.

2.3.3.2 HIGHWAY VERTICAL

All new bridges are to be designed for 17'-0" of vertical clearance. This clearance may be reduced with prior approval from the Roadway Design Engineer, Maintenance Engineer, and Bridge Engineer, but is not to be less than 16'-0".

During construction, as much vertical clearance as possible is desirable, with 14'-9" being the minimum desirable. The minimum legal vertical clearance is 14'-0". Check with the Permits Unit in Headquarters for restrictions for each particular site.

2.3.3.3 HIGHWAY HORIZONTAL

The structure width is generally controlled by the geometry of the approaching roadway. The required roadway widths are established in the *Roadway Design Manual*, Appendix A. For NHS Rural Highways & Local Roads refer to Appendix A.10. For Non-NHS Rural Roadways refer to Appendix A.15.

A desirable feature of a bridge structure is a full, continuous shoulder so that a uniform clearance to roadside elements is maintained. The actual roadway typical section proposed by the District should be carried through the bridge. The face of bridge rail is set to match the face of the approach roadway rail. The shy-line offset is the distance from the edge of traveled way beyond which a roadside object will not be perceived as an obstacle by the typical driver to the extent that the driver will change the vehicle's placement or speed. The offset distances shown in the Table below are recommended desirable values.

SHY-LINE OFFSET TABLE – ROADWAY RAILING	
DESIGN SPEED (MPH)	SHY-LINE OFFSET (FEET)
80	12
70	9
60	8
55	7
50	6.5
45	6
40	5
30	4

Refer to sketches on page A2.4 to determine the required bridge width.

Horizontal clearances should be verified with the District and the Bridge Engineer.

2.3.3.4 RAILROAD OVERPASS

For bridges carrying the railroad over the highway, the vertical clearances for highway crossings shall apply.

For bridges carrying highways over the railroad, the minimum vertical clearance shall be 23'-6" from the top of rail at a point directly over the centerline of track.

For exceptions, e.g. widening of existing structures, the railroad and PUC approvals should be obtained prior to final layout.

The UPRR and BNRR/SANTA FE "Guidelines for Railroad Grade Separation Projects" have not been approved by FHWA and are considered guidelines only. The dimensions shown as minimums on the Guidelines should be considered as maximums for the purpose of determining span lengths. Exceptions to the standards that will reduce the bridge cost should be considered in the preliminary design stage of the project. Any exceptions to the standards must be approved by the railroad Chief Engineer and approval should be obtained prior to the final layout.

Some of the items where exceptions should be considered on a project-by-project basis are:

- Ditch width
- Location of the railroad pole line to eliminate or reduce the distance between the pier and the ditch slope.
- Elimination of splash boards
- Use of 1½:1 slopes on slope paving

MSE Walls within the Railroad right-of-way require written justification and request for variance for the proposed design.

The Guidelines are at https://www.up.com/cs/groups/public/documents/document/pdf_rr_grade_sep_projects.pdf

FHWA Memorandum titled *Guidelines for the Design and Construction of Grade Separation Highway Structures over or under Railroads* issued April 16, 2013.

- Federal-Aid funds are not eligible to participate in costs solely for the benefit of the railroad.
- If the railroad establishes to the satisfaction of the State transportation agency and FHWA that it has definite demand and plans for installation of additional tracks within a reasonable time, for grade separation structures Federal funds may be used to provide space for more tracks than are in place. If FHWA is not satisfied regarding the demand and plans, participation would be limited to the cost of a structure that spans the existing tracks.
- If a railroad wants to protect their bridges against over-height vehicles by providing sacrificial beams, as long as the vertical clearance criteria established by the State transportation agency is met for the specific route under the bridge, installation of such beams should be allowed as it would not restrict any highway traffic on that route. This work would be solely for the benefit of the railroad, and would not be eligible for Federal funding. The railroad would have to incur these additional costs.

- For parapets, railings and fencing for use on NHS highways over railroads, the railroad's standards govern. On a Federal-Aid project, FHWA would participate in these costs.
- For a Federal-aid non-NHS highway over a railroad, the Federal share should be limited if the State transportation agency goes beyond its own normal standards to meet higher railroad standards.

Revisions:

April 2008	<p>Added Coast Guard clearance requirement for bridges.</p> <p>Modified waterway clearance requirements with the concurrence of the Hydraulics Engineer.</p> <p>Added references to highway horizontal sketches in A2.6.</p> <p>Changes culvert width for concrete porta-rail to roadway width + 10'-8".</p> <p>Changed minimum railroad vertical clearance to 23'-4" to comply with BNSF/UPRR Guidelines for Railroad Grade Separation Projects, January 2007.</p> <p>Added references to railroad drawings in A2.3.</p>
June 2013	<p>Added clarification to <u>FHWA Memorandum titled <i>Guidelines for the Design and Construction of Grade Separation Highway Structures over or under Railroads</i> issued April 16, 2013</u></p>
Mar 2015	<p>Added requirements for using MSE Walls on Railroad right-of-way.</p> <p>Revised curb-curb width for culverts with clear zone not provided using concrete porta-rail to roadway width + 7'-10".</p>
Aug 2016	<p>Changed the span length to 20' or less and greater than 20' to agree with the Roadway Design Manual in Article 2.3.3.</p> <p>Added freeboard criteria for haunched girders.</p> <p>Increased minimum vertical clearance to 23'-6" to comply with UPRR/BNSF Guidelines for Railroad Grade Separation Projects dated May 2016.</p> <p>Replaced railroad standard drawings in A2.3 with 1/05/2016 drawings.</p>
March 2018	<p>Revised Article 2.3.3.1 to identify navigable Coast Guard waterways.</p> <p>Revised Article 2.3.3.3 for the required bridge width to meet the criteria for rail offset distance in standard drawing 612-1 which is taken from Table 5-7 of the AASHTO Roadside Design Guide, 4th Edition 2011.</p>
Nov 2019	<p>Deleted railroad standard drawings from Article A2.3 and added a link to the Guidelines.</p>
May 2021	<p>Corrected email address for Steve Fischer.</p> <p>Added Article A2.7 that lists bridges over navigable waters.</p>
Oct 2023	<p>Revised reference from A2.6 to A2.4 in Highway Horizontal paragraph to match renumbered article.</p>