



# Memorandum

Subject: **INFORMATION:** Guidelines for the  
Design and Construction of Grade  
Separation Highway Structures over or  
under Railroads  
*/s/ Original Signed by Joe Krolak for*  
From: M. Myint Lwin, P.E., S.E.  
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In Reply Refer To:  
HIBT-30

To: Division Administrators  
Directors of Field Service  
Melisa Ridenour, FLH

This memorandum is intended to clarify Federal Highway Administration's (FHWA's) guidance on the design and construction of grade separated highway structures over or under railroads with regard to horizontal and vertical clearances, and parapets, railings and fencing. Specifically, this memorandum addresses the applicable requirements and funding eligibility of horizontal and vertical clearances selected and the parapets, railings and fencing detailed. In doing so, this memorandum replaces FHWA Memorandum titled *Railroad Guidelines for Design and Construction of Grade Separation Underpass and Overhead Structures* issued February 21, 2001.

Title 23, Code of Federal Regulations, Chapter I, Subchapter G, Part 646, Subpart B [23 CFR 646(B)], contains regulations on rail-highway projects and prescribes policies and procedures for advancing Federal-aid projects involving railroad facilities. Please note the following:

§646.212 covers the limits of eligibility for Federal-aid funding. Federal-aid funds are not eligible to participate in costs incurred solely for the benefit of the railroad.

§646.214(a)(1) covers facilities that the railroad is responsible for operating and maintaining. These facilities are to conform to the specifications and design standards used by the railroad in its normal practice, subject to approval by the State transportation agency and FHWA.

§646.214(a)(2) covers facilities that the State transportation agency is responsible for operating and maintaining. These facilities are to conform to the specifications, design standards, and guidelines used by the State transportation agency in its normal practice for Federal-aid projects.

§646.216(d) covers State-railroad agreements. An agreement in writing between the State transportation agency and the railroad company is specified where construction of a

Federal-aid project requires use of railroad properties or adjustments to railroad facilities. With this agreement in place any conflicts should be minimal.

With that background, the following clarification is provided for horizontal and vertical clearance requirements and parapet, railing and fencing requirements for highway structures over or under railroads.

#### Horizontal and Vertical Clearances

Title 23, Code of Federal Regulations, Chapter I, Subchapter G, Part 625.4, Paragraph (b) [23 CFR 625.4(b)], identifies the standards, policies and regulations that must be satisfied in order to advance Federal-aid highway structure projects. That section identifies the American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications and incorporates it by reference into the regulation as a Federal standard.

Section 2.3.3.4 of the AASHTO LRFD Bridge Design Specifications addresses clearances for railroad overpasses. The following provisions of that Section are specific to horizontal and vertical clearances:

- Structures designed to pass over a railroad shall be in accordance with standards established and used by the affected railroad in its normal practice. These overpass structures shall comply with applicable federal, state, county, and municipal laws.
- Regulations, codes, and standards should, as a minimum, meet the specifications and design standards of the American Railway Engineering and Maintenance of Way Association (AREMA), the Association of American Railroads, and AASHTO.

Regarding horizontal clearance for a highway structure over a railroad, clarification has been requested for situations where a railroad prefers to provide additional space than required by AASHTO for future tracks and maintenance roads. Section 646.212(a)(2) of the Federal regulations addresses Federal participation in the cost of providing additional space for railroad operations. As noted, FHWA does not participate in costs incurred solely for the benefit of the railroad. However, §646.212(a)(2) provides that 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.

Regarding vertical clearance for a railroad structure over a highway, clarification has been requested for situations where a railroad prefers to provide additional clearance than required by AASHTO or a sacrificial beam to protect the railroad bridge from impact of over-height vehicles traveling on the highway. For this case, the governing Federal

regulation is §646.214. Since the structures concerned are railroad bridges, the standards that apply call for compliance with standards established and used by the affected railroad in its normal practice subject to approval by the State transportation agency and FHWA. In particular, 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 railroad 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 per §646.212(a)(1) would not be eligible for Federal funding. The railroad would have to incur these additional costs.

#### Parapet, Railing and Fencing Requirements

For a highway bridge over a railroad, the governing regulation is §646.214(a)(2). The State transportation agency should follow its normal specifications, design standards, and guidelines for Federal-aid highway projects, depending whether it is on or off the National Highway System (NHS). For highways on the National Highway System (NHS), the States must comply with AASHTO standards.

However, this memorandum extends the provisions specific to clearances of Section 2.3.3.4 of the AASHTO LRFD Bridge Design Specifications to parapets, railings and fencing. Therefore, under this extension, parapets, railings and fencing for use on NHS highways over railroads, the railroad's standards would govern for parapets, railings and fencing, regardless of whether the bridge is owned by the railroad or the State transportation agency (i.e., whether the project is covered by §646.214(a)(1) or (2)). For the case where an NHS highway crosses over railroads operated by multiple authorities with conflicting parapet, railing or fencing requirements, standards as agreed by the various railroad authorities and approved by the State shall be used.

For all federally funded non-NHS highways including those over railroads, the States' design and construction standards are to be used. Therefore, the parapet, railing and fencing requirements would be governed by the State's standards, even if they differ from the railroad standards.

Within these standards, FHWA would determine the limits of eligibility for Federal-aid funding under §646.212. For parapets, railings and fencing, FHWA can participate in all costs that are incurred in complying with the applicable design standards under §646.214. On a Federal-aid project involving an NHS highway over a railroad, the AASHTO standards (i.e., the railroad standards) for parapets, railing and fencing would be met and 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. This is because §646.212(a)(1) prohibits the use of Federal funds for costs incurred on a Federal-aid project solely for the benefit of the railroad.

As a practical matter, any issues or concerns between the railroad and the State transportation agency should be resolved in advance. In fact, §646.216(d) of the Federal regulations requires an agreement in writing between the State transportation agency and

the railroad for Federal-aid projects where the project involves the use of railroad properties or adjustment to railroad facilities.

If you have any questions, please contact Mr. Everett Matias (202) 366-6712 ([Everett.Matias@dot.gov](mailto:Everett.Matias@dot.gov)), Mr. Tom Everett (202) 366-4675 ([Thomas.Everett@dot.gov](mailto:Thomas.Everett@dot.gov)) or Mr. Joey Hartmann (202) 366-4599 ([Joey.Hartmann@dot.gov](mailto:Joey.Hartmann@dot.gov)), of my staff.

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