

TO: <b>SUPERSEDED BY EI 84-035</b> <b>EFFECTIVE 7/13/84</b>	<h1 style="text-align: center;">ENGINEERING INSTRUCTION</h1> <p style="text-align: center;">NEW YORK STATE DEPARTMENT OF TRANSPORTATION</p> <p>SUBJECT: BRIDGE DESIGN MANUAL          STANDARD DETAILS FOR HIGHWAY BRIDGES          REPLACEMENT CLAMPS FOR STEEL BRIDGE RAILING</p> <p>Subject Code: 7.35-5-1</p>
Distribution: <input checked="" type="checkbox"/> Main Office <input checked="" type="checkbox"/> Regions <input type="checkbox"/> Special	Code: EI 82-54 Date: Aug. 13, 1982
APPROVED: <i>E.V. Bourigan</i> E.V. Bourigan, Deputy Chief Engineer (Structures)	Supersedes: E.I. 82-13 E.I. 82-35

Several years ago, it was determined that the railing clamps used on two and four rail steel bridge railing installed between the mid 1960's and the mid 1970's (see attached Detail 1) were a serious maintenance liability. The clamps were easily broken when impacted by snow plow blades, resulting in loss of support for the railing tube. In some cases, the loss of support allowed the railing tube to drop to the bridge sidewalk or deck. In addition, the weld attaching the stud to the clamp had frequently found to be broken as a result of thermal stresses and/or stresses resulting from minor impacts. This break usually went unnoticed, because the railing tube was rigid enough to span between several broken clamps. At times of significant impact the railing tube could have been displaced upward or downward because it was not being properly restrained. The broken clamp, or broken weld, renders the railing tube ineffective for its intended purpose.

For this reason a new clamp was designed and made a part of the standard details for new railings. However, this clamp did not fit railing systems installed between the mid 1960's and the mid 1970's. Therefore, a third clamp was developed (see attached Detail 2R) for retrofitting railing systems built during that period. A similar clamp has been used by the Highway Maintenance Division for several years. In addition, the details for the third clamp were informally distributed to designers, on a job-by-job basis, in both the Main Office and Regional Offices for use on rehabilitation contracts.

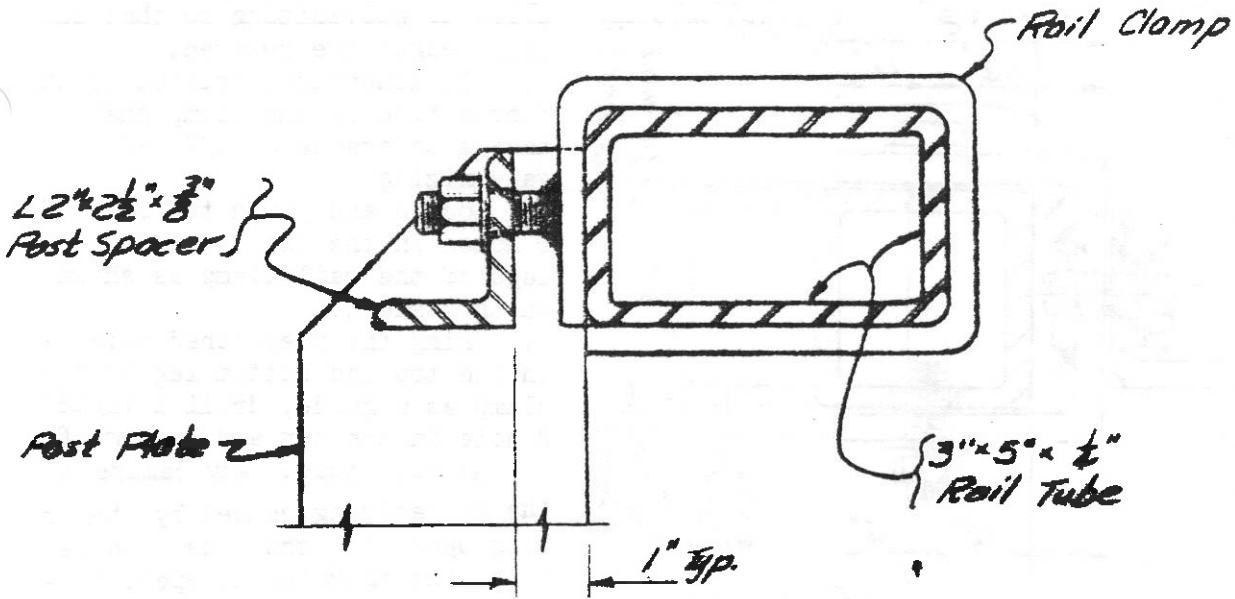
Effective immediately, rail clamps of the type depicted in Detail 1 shall be replaced by clamps as shown in Detail 2R on all bridge rehabilitation projects where encountered. Specification No. 15587.05 "Steel Bridge Railing Replacement Clamp", shall be used when clamp replacement is a part of a project. A copy of the specification is attached for your use and will be stocked as a Main Office insert. The clamp shown in Detail 2, issued with EI 82-13, and the one shown on Detail 2R, issued with this Issuance, are the same; some notes have been removed from Detail 2R because they are included in the specification.

Designers should assure themselves that the replacement clamps will fit the railing systems on which they are to be used. Railing systems may be encountered which were not built according to the contract documents. These will require adaptations of the clamp shown in Detail 2R.

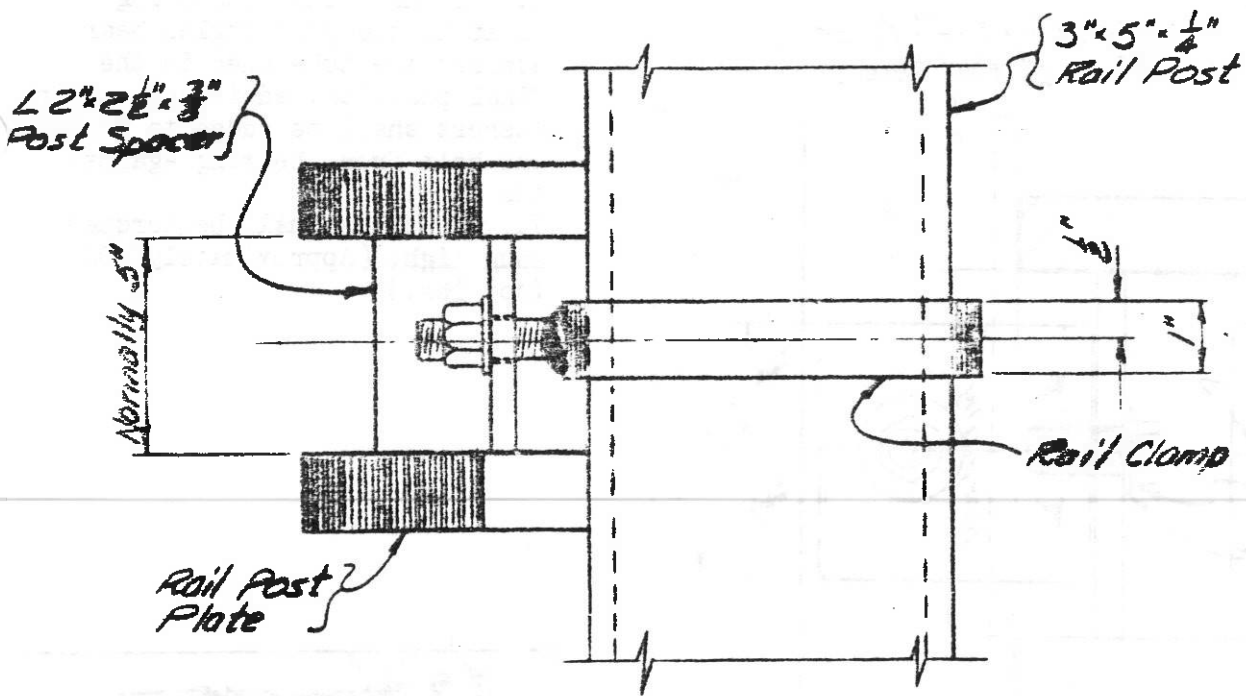
Subject: REPLACEMENT CLAMPS FOR STEEL BRIDGE RAILING

The Special Design Unit of the Structures Design and Construction Division should be contacted (518-457-2459) if there are any questions.

Attachments: Detail 1  
Detail 2R  
Specification Item No. 15587.05



PARTIAL ELEV.

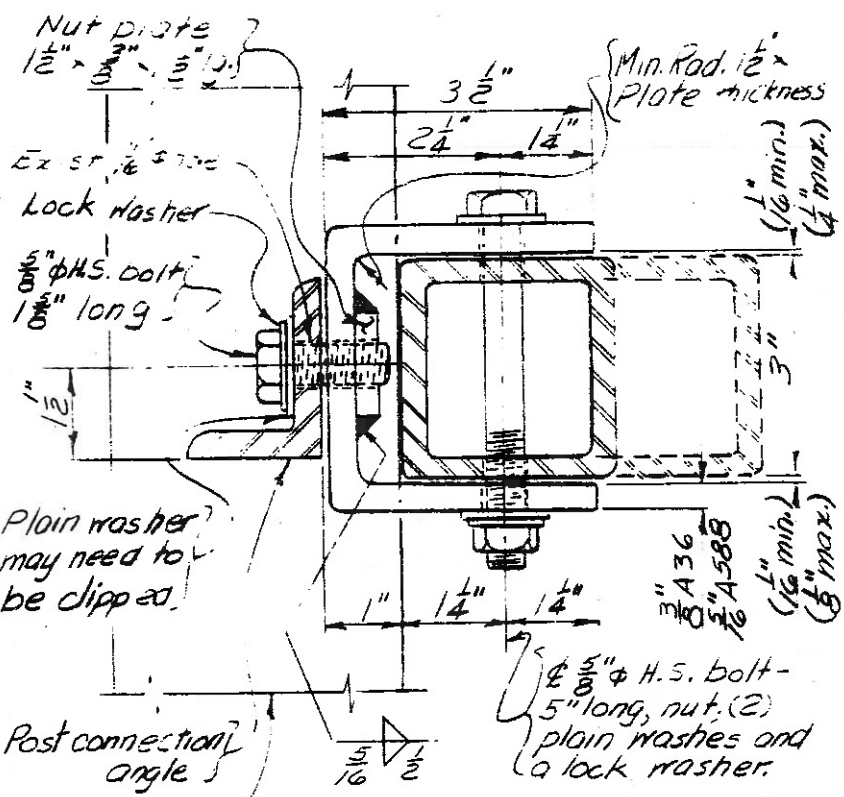


PARTIAL PLAN VIEW

DATE 10/01  
 DETAIL 1/3/01

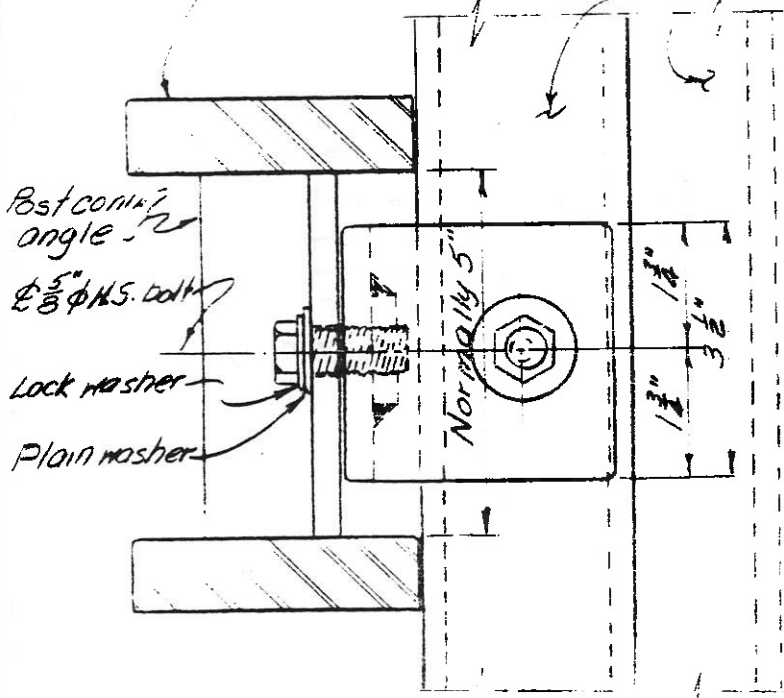
SCALE:  $\frac{3}{8}'' = 1''$

DETAIL # 1



**PARTIAL ELEV.**

Existing 3" x 3" x 3/16" or 5" x 3" x 1/4" Rail Tube



**PARTIAL PLAN VIEW**

1. Chamfer all edges and corners of the clamp 1/16" by grinding prior to galvanizing so that all sharp edges are removed.
2. All dimensions related to the fabrication of the clamp shall have a tolerance of 1/8" after galvanizing.
3. Locate and punch two (2) 3/4" Ø holes in the top and bottom legs of the rail clamp as shown on this sheet.
4. Using the prepunched holes in the top and bottom leg of the clamp as a guide, drill a 11/16" Ø hole in the top and bottom of of the rail tube. Any damage to the galvanizing caused by the drilling operation shall be repaired according to Material Spec. 719-01.
5. Drill and tap the nutplate and vertical leg of the railing clamp to accommodate the 5/8" Ø H.S. bolt after welding together.
6. If the bolts connecting the clamp to the post angles bear against the tube when in the final position, additional plain washers shall be added to prevent the bolt from bearing against the tube.
7. The bolts shall be torqued snug tight (Approximately 100 foot lbs.)

DATE: 04/82  
 DETAIL: S.F.C.

*E. J. [Signature]*  
 Director Struct. Design & Constr.

STATE OF NEW YORK  
 DEPT. OF TRANS.  
 ST. BR. RAILING  
 REPLACEMENT CLAMP  
 DETAILS

SCALE: 3/8" = 1" DWG. NO. 1

ITEM NO. 15587.05 - STEEL BRIDGE RAILING REPLACEMENT CLAMP

Description - This work shall consist of removal and disposal of existing bridge railing clamps and installation of replacement clamps.

Materials - Materials used for this work shall conform to the requirements listed below:

- A. Rail Clamp - ASTM Designation A500 Grade B; A-36; A-588; A-441; or A-572 Grade 50.
- B. Bolts, Nuts, and Washers - ASTM Designation A-325, Type I or Type III.
- C. All parts of the clamp and connection assembly shall be galvanized after fabrication in accordance with Material Specification 719-01.
- D. All bolts shall have a Class 2A thread fit prior to galvanizing. Nuts to have standard oversize tap to allow for galvanizing.
- E. All damage to the galvanizing, either on the clamp, connection assembly, or tube, shall be repaired according to the provisions of Material Specification 719-01.

Construction Details - Replacement clamps shall be new. They shall be the size and dimensions shown on the Contract Plans.

The existing bridge rail clamp shall be carefully removed in a manner satisfactory to the Engineer so as not to damage hardware that is to remain.

All welding shall conform to the requirements of the N.Y.S. Department of Transportation's Steel Construction Manual.

All components of the existing bridge railing system which are damaged due to the Contractor's operation shall be repaired or replaced to the satisfaction of the Engineer at no cost to the State. Such damaged material shall be repaired or replaced according to the provisions of Section 568-"Bridge And Culvert Railing".

At no time shall the bridge rail tubes be removed from the posts unless maintenance and protection of traffic, acceptable to the Engineer, is provided.

Upon the completion of clamp replacement work, the bridge railing shall conform to the original line and elevation unless otherwise ordered by the Engineer.

During non-working hours, all bridge railing tube shall be securely fastened to the existing posts in a manner acceptable to the Engineer.

Method of Measurement - Measurement will be made as the number of railing clamps replaced. No deduction shall be made for missing clamps.

Basis of Payment - The unit price bid per clamp shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work.

All maintenance and protection of traffic work shall be paid for under its' respective item.