STEEL INTERCHANGE

Steel Interchange is an open forum for *Modern Steel Construction* readers to exchange useful and practical professional ideas and information on all phases of steel building and bridge construction. Opinions and suggestions are welcome on any subject covered in this magazine. If you have a question or problem that your fellow readers might help you to solve, please forward it to *Modern Steel Construction*. At the same time, feel free to respond to any of the questions that you have read here. Please send them to:

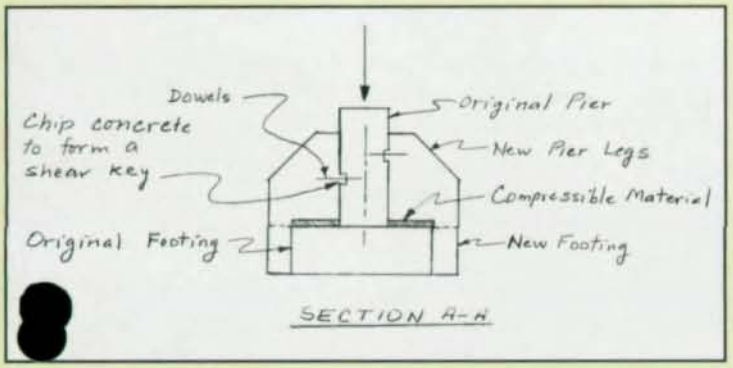
Steel Interchange
Modern Steel Construction
One East Wacker Dr., Suite 3100
Chicago, IL 60601-2001

Answers and/or questions should be typewritten and double-spaced. Submittals that have been prepared by word-processing are appreciated on computer diskette (either as a Wordperfect file or in ASCII format).

The opinions expressed in *Steel Interchange* do not necessarily represent an official position of the American Institute of Steel Construction, Inc. and have not been reviewed. It is recognized that the design of structures is within the scope and expertise of a competent licensed structural engineer, architect or other licensed professional for the application of principals to a particular structure.

Information on ordering AISC publications mentioned in this article can be obtained by calling AISC at 312/670-2400 ext. 433.

The following responses from previous Steel Interchange columns have been received:



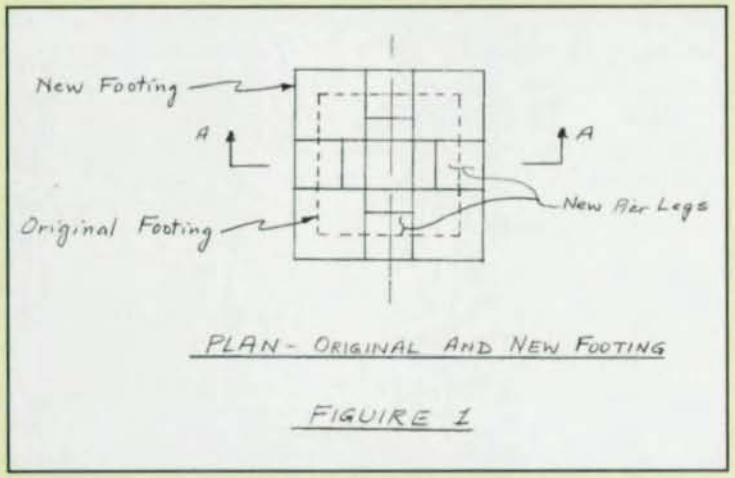


FIGURE 1

What is the most efficient way to enlarge an existing footing, when new loading conditions apply?

A conceptual arrangement for enlarging an existing footing for new loading conditions is shown in the accompanying figures (above).

Pier legs carry additional load which is transferred to the new footing by shear keys and dowels as shown. Design bearing pressure underneath both footings should be as uniform as possible.

Needless to say that all loads from the column should be removed before extension of the existing footing takes place.

Vijay P. Khasat, P.E.
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In what instances, if any, and under what criteria can the attachment of grating with mechanical fasteners be used to provide lateral bracing to the compression flange of the members supporting the grating in applications such as walkways and catwalks?

The American National Standard, ANSI/NAAMM MBG 531-93, *Metal Bar Grating Manual, 5th Edition*, which covers steel, stainless steel and aluminum grating, provides examples of anchorages to use to use in installations where grating is subject to removal. Locations of these clips are suggested also.

This standard also defines the three types of grating as follows:

•**Rivetted**—Grating composed of straight bearing bars and bent connecting bars, which are joined at their contact points, by riveting.

•**Welded**—Grating in which the bearing bars and the cross bars are joined at all of their intersections by either a resistance weld or conventional hand welding.

•**Pressure-locked**—Pressure-locked means bearing bars are locked in position by cross bar deformation instead of riveting or welding. Several proven methods are:

1) Expansion of extruded or drawn tubular cross bar;

2) Extruded cross bar deformed or swaged between bearing bars;

3) Press assembly of rectangular cross bars into slotted bearing bars.

The type of grating as defined above, the relative size of cross bars to bearing bars, the span-

depth ratio of the bearing bars, the lack of both theoretical and empirical data, and the possibility of the grating itself being removed, are reasons NAAMM does not encourage the use of metal bar grating to provide lateral torsional support.

Obviously, there is some support provided, but the design provisions have not been established.

The Metal Bar Grating Division of NAAMM is interested in knowing of any documented tests of beams relying on metal bar grating to provide support against lateral torsional instability.

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What is the most efficient and cost-effective way to connect a steel wide flange girder to a concrete column?

In the December 1994 *Steel Interchange*, one proposed solution showed a detail with a steel beam extending through the width of the concrete column. Connections similar to this have in fact been used in several composite framed structures in the US and Japan for cases where large bending moments are transferred between the steel beams and reinforced concrete columns. In addition, over the last ten years, there have been numerous tests of such connections conducted in the US and Japan to evaluate the effectiveness of various joint details. For further information and additional references on such connections, readers should consult the following document that was prepared by a task committee of the ASCE Committee on Composite Construction: Guidelines for Design of Joints Between Steel Beams to Reinforced Concrete Columns, ASCE *Journal of Structural Engineering*, August 1994, Vol. 120, No. 8, pp. 2330-2357.

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New Questions

Listed below are questions that we would like the readers to answer or discuss.

If you have an answer or suggestion please send it to the Steel Interchange Editor, Modern Steel Co nstruction, One East Wacker Dr., Suite 3100, Chic ago, IL 60601-2001.

Questions and responses will be printed in future editions of Steel Interchange. Also, if you have a question or problem that readers might help solve, send these to the Steel Interchange Editor.

For fire wall construction, building codes say the wall shall have sufficient stability under fire conditions to allow for collapse of construction on either side without collapse of the wall. In a tied fire wall application, a flexible anchor or break-away connection is recommended to laterally stabilize the wall and under fire conditions to let go and not to pull down the wall due to the collapse of the structure on the fire side. What is the optimum detail (effective and economical) for this type of connection? (If a melted anchor is not a preferred option.)

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