

HSS Reference Guide No. 2: HSS Moment Connections

Design Manuals/Design Guides

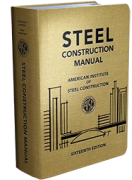


STI HSS Design Manual, Volume 3: Connections at HSS Members

- Section titled MOMENT CONNECTIONS AT HSS COLUMNS starting on pp. 3-6.70 provides details and design considerations for a variety of WF beam-to-HSS column moment connections.
- Section titled MOMENT CONNECTION EXAMPLES starting on pp. 3-7.74 provide examples including, but not limited to, Continuous Beam over HSS Column Connection, Directly Welded Moment Connection, Cut-Out/Collared Plate Moment Connection, etc.

AISC 360-22 Specification and 16th Ed. Steel Construction Manual

- Specification 360-22, Section K4 “HSS-TO-HSS MOMENT CONNECTIONS”
- 16th Ed. Steel Construction Manual, pp. 11-20 to 11-27, Fully Restrained and Partially Restrained Moment Connections with HSS
- 16th Ed. Steel Construction Manual, Part 9, “Plate Elements Subjected to Out-of-Plane Loads” outlines limit states to consider for out-of-plane loading of plate elements (i.e. an HSS connecting wall). Equations for limit states of punching shear and minor-axis flexural strength, also called plastification, are provided per Eqns. (9-43) through (9-50b).



STI Limit State Tables per AISC 360-22 Specification

These tables serve as a comprehensive guide to the HSS limit state checks required per AISC 360-2022 Specification for

- Round HSS-to-HSS Moment Connections
- Rectangular HSS-to-HSS Moment Connections
- Plate-to-Round HSS Moment Connections
- Plate-to-Rectangular HSS Moment Connections

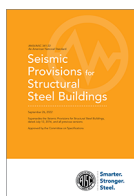


AISC Design Guide 24: Hollow Structural Section Connections (Second Edition)

By Jeffrey A. Packer and Kimberley Olson, 2024

Chapter 6, MOMENT CONNECTIONS

Chapter 10, HSS-TO-HSS MOMENT CONNECTIONS



AISC 341-22 Seismic Provisions for Structural Steel Buildings

- Chapter D2, General Member and Connection Design Requirements - Connections
- Chapter E, Moment Frame Systems

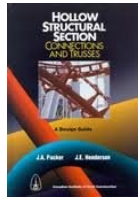
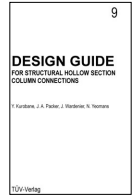


[CIDECT Design Guide 3 for Rectangular Hollow Section \(RHS\) Joints Under Predominantly Static Loading](#)

By J.A. Packer, J. Wardenier, X.-L. Zhao, G.J. van der Vegte, Y. Kurobane, 2004
Chapter 5, Welded RHS-to-RHS joints under moment loading

[CIDECT Design Guide 9 for Structural Hollow Section Column Connections](#)

By Y. Kurobane, J.A. Packer, J. Wardenier, N. Yeomans, 2004
Chapter 6, Semi-rigid connections
Chapter 9 Rigid (full strength) connections



[Hollow Structural Section Connections and Trusses, A Design Guide](#)

By Jeffrey A. Packer and J.E. Henderson, 1997
Chapter 6, HSS to HSS Moment Connections
Chapter 9.3.2 Beam to HSS Column Moment Connections

Articles: Beam-to-HSS Column Moment Connections

[STI Article: Wide-Flange Beam to HSS Column Moment Connections](#)

By Jason Ericksen, 2014



[STI Article: Expert Tips for Cost-Effective HSS Specification and Fabrication](#)

By Mike Manor and Cathleen Jacinto, 2023

Article includes a section on Moment Connections and Table 2 which highlights relative cost of WF beam to HSS column moment connections according to fabricators surveyed.

[STI Article: Beam-to-HSS Column Moment Connections Using Laser-Cut Columns](#)

By Jeffrey A. Packer, 2023



[STI Article: Transverse Plate-to-Square/Rectangular HSS Connections](#)

By Jeffrey A. Packer, 2015

Discussion on limit states for flange-plated WF beam-to-HSS column moment connections.



[STI Article: HSS Limit State: Plastification](#)

By Mike Manor, 2018

[STI Article: HSS Limit States in Cap Plate Connections](#)

By Cathleen Jacinto, 2019

Discussion on limit states for HSS column cap plate connections, such as WF or HSS beam over column moment connections.



[STI Article: Seismic Applications of HSS in Moment Resisting Frames](#)

By Emily Guglielmo, 2014

[Article: Shearly Perfect](#)

By Larry S. Muir and Carlo Lini, 2020



[Article: Connecting HSS](#)

By Donald R. Sherman, 2005

Articles: HSS-to-HSS Moment Connections

[STI Article: Square and Rectangular HSS-to-HSS Moment Connections](#)

By Jason McCormick, 2016



[STI Article: Stepped HSS T- and Cross-Connections Under Branch In-Plane and Out-of-Plane Bending](#)

By Jeffrey A. Packer, 2019

[STI Article: HSS-to-HSS Connection with Shear, Axial and In-Plane Moment Example](#)

By Brady Golinski, Mike Manor, and Cathleen Jacinto, 2023





[STI Article: Understanding Local Yielding Due to Uneven Load Distribution](#)

By Mike Manor, 2021



[STI Article: Round HSS Bolted End-Plate Connections Under Bending Moment](#)

By Jeffrey A. Packer, 2023



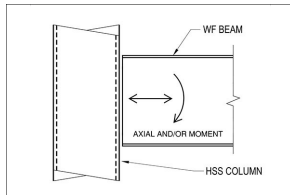
[STI Article: HSS Knee Connections](#)

By Jeffrey A. Packer, 2019

Webinars

[STI Webinar on Demand: HSS Moment Connections](#)

By Kim Olson, 2020

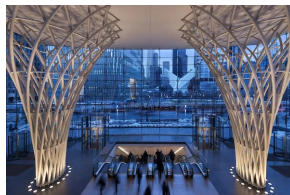
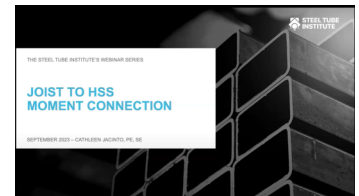


[STI Webinar on Demand: Beam to HSS Column Axial and Moment Connection Examples](#)

By Cathleen Jacinto, 2023

[STI Video: Designing Joist to HSS Column Moment Connections](#)

By Cathleen Jacinto, 2023



[STI Webinar on Demand: Know Your Way Around Round HSS](#)

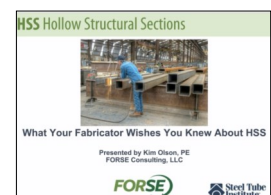
By Cathleen Jacinto, 2023

Webinar includes an exploration of details and design considerations for beam-to-round HSS moment connections.

[STI Webinar on Demand: What Your Fabricator Wishes You Knew](#)

[About HSS](#)

By Kim Olson, 2016

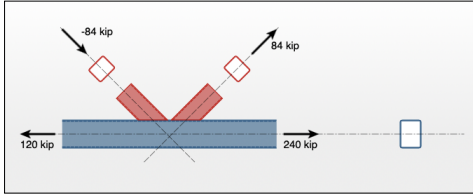


Software/Design Tools

[STI Article: HSS Connection Design Software](#)

By Mike Manor, 2021

Article includes Table 2, a summary of software that performs beam-to-HSS column moment connection design.

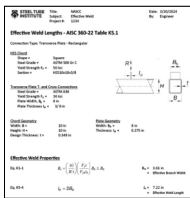
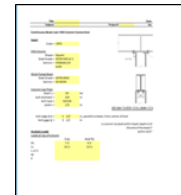


[STI HSS Connex](#)

This program calculates the connection available strength for branch plate-to-HSS with moment couple forces and HSS-to-HSS moment connections.

[STI HSS Spreadsheet Design Aids: Moment Connection of WF Beam-to-HSS Column](#)

This spreadsheet calculates the capacity of three types of HSS moment connections: directly welded, beam over HSS column, and through-plate.



[STI HSS Effective Weld Length Calculator](#)

This tool calculates the effective weld length for various connection types, including branch plate-to-HSS with moment couple forces or HSS-to-HSS moment connections.

Research Papers

[Journal of Constructional Steel Research: HSS-to-HSS seismic moment connection performance and design](#)

By Matthew Fadden and Jason McCormick, 2014



[Journal of Constructional Steel Research: Moment connections between rectangular hollow sections](#)

By Jeffrey A. Packer, 1993

[ASCE Journal of Structural Engineering: Cyclic Testing of Welded HSS-to-HSS Moment Connections for Seismic Applications](#)

By Matthew Fadden, Dan Wei, and Jason McCormick, 2015

