

The Canadian Centre for Welding and Joining
proudly presents the seminar

DESIGN OF WELDED CONNECTIONS

WITH DUANE MILLER, SC.D

EDMONTON SESSION

STEEL STRUCTURES

May 6 and 7, 2019
University of Alberta
Van Vliet Centre 2-215

Register at: <https://ccwj2019yeg.eventbrite.com>

CALGARY SESSION

STEEL WELDMENTS

May 9 and 10, 2019
SAIT
Heritage Hall

Register at: <https://ccwj2019yyc.eventbrite.com>

\$400 each session for CWBA, ASM, ASME, AWS, NACE and SME members.
\$450 each session for non-members.
Register before April 6 and receive a \$50 early bird discount.
\$75 each session for students (must have valid student ID)

Special discounts available for two session registration.



Duane K. Miller, Sc.D., P.E. is the authority on the design of welded connections and is the lead presenter of Lincoln Electric's Blodgett Design Seminar Series. His enthusiastic teaching style and technical expertise have resulted in him being a much sought-after speaker around the world. Dr. Miller publishes frequently, and on three occasions has been awarded the Silver Quill Award of the American Welding Society (AWS) for the excellence of his published work. In 2001, he received the American Institute of Steel Construction's T. R. Higgins Lectureship Award, which annually recognizes an outstanding lecturer and author whose technical papers are considered an outstanding contribution to the engineering literature. In 2005, he received AISC's Lifetime Achievement Award and in 2013, the George E Willis award from the AWS for his work in advancing welding internationally. He has

authored and co-authored chapters of many texts, including the AISC Design Guide on Welding and the Mark's Handbook of Engineering, 11th Edition. He has appeared as a subject expert on the History Channel and Discovery Channel.

Dr. Miller earned his B.S. degree in Welding Engineering from Le Tourneau University in Longview, TX, an M.S. in Materials Engineering from the University of Wisconsin, Milwaukee, and was awarded an honorary Doctor of Science degree from Le Tourneau University in 1997. He was the first Chair of the Seismic Welding Subcommittee, a former chair of the AWS D1 Structural Welding Committee, a current member of the AISC Specification Committee, a Professional Engineer, Certified Welding Inspector and Qualified Welder

About the seminar

The CCWJ is fortunate and proud to host again Dr. Duane Miller's incredible seminar on weld design. This unique opportunity had not been available in Canada for decades, and it is happening for the second time following outstanding feedback from attendants to his seminar in 2017, and the requests from those who missed it. Welded connections are used in a wide range of industries, from construction of towering steel structures, to fabrication and assembly of high-alloy corrosion resistant tanks and pipelines. Regardless of the final application, proper design and placement of welded joints requires consideration of numerous complex phenomena in order to achieved desirable mechanical and metallurgical properties and ensure the integrity of the final structure or component. Dr. Miller will share his knowledge and experience in optimizing reliability, safety, economics, and design of welded connections of diverse shapes and sizes. This two-day seminar offers an invaluable opportunity for anyone with an interest in the design of any structures, equipment, or components featuring welded joints. Two separate 2-day seminars with a different focus will be held in Edmonton and Calgary. Sign-up today for one or both sessions for this unique opportunity of one-time seminars.

Session 1 – Steel Structures

Edmonton

2-215 Van Vliet Centre, University of Alberta

Day 1 (May 6, 2019)

- ***Basics of Welded Connections:***

Welding codes and standards, the essence of welding: atomic closeness, atomic cleanliness, fusion versus penetration, five joint types, five weld types, weld terminology.

- ***Principles of Connection Design***

Transferring loads through connections, paths of load transfer, bending of welds, secondary members in welded connections, watch out for “nothin’ welds”, difficult to manufacture joints, changes in force direction, respecting material properties.

- ***Details of Welded Connections***

Details of various welded joints, details of CJP groove welds, details of PJP groove welds, details of fillet welds, matching, undermatching, overmatching strength (E70 vs E90).

- ***How to Determine Weld Size***

Sizing CJP groove welds, sizing PJP groove welds, four approaches to sizing fillet welds, effect of direction of loading on fillet welds.

Day 2 (May 7, 2019)

- ***Welded Connections for Cyclic Service***

Principles of joint design for repeated dynamic loading conditions including relevant concerns and guidelines for joint selection, qualification, and inspection.

- ***How to Achieve Ductile Behavior***

Alberta's harsh winter climate presents many challenges to modern engineering practice, not the least of which is achieving adequate toughness and reducing the risk of catastrophic failure when the mercury drops below -40 °C.

- ***Fracture Mechanics: Theory and Practical Applications***

Overview on the fundamentals of fracture mechanics, with an emphasis on applying these principles to the design and inspection of welded connections, including real-world examples.

Session 2 – Steel Weldments

Calgary
SAIT, Heritage Hall

Day 1 (May 9, 2019)

- ***Basics of Welded Connections:***

Welding codes and standards, the essence of welding: atomic closeness, atomic cleanliness, fusion versus penetration, five joint types, five weld types, weld terminology.

- ***Principles of Connection Design***

Transferring loads through connections, paths of load transfer, bending of welds, secondary members in welded connections, watch out for “nothin’ welds”, difficult to manufacture joints, changes in force direction, respecting material properties.

- ***Details of Welded Connections***

Details of various welded joints, details of CJP groove welds, details of PJP groove welds, details of fillet welds, matching, undermatching, overmatching strength (E70 vs E90).

- ***How to Determine Weld Size***

Sizing CJP groove welds, sizing PJP groove welds, four approaches to sizing fillet welds, effect of direction of loading on fillet welds.

Day 2 (May 10, 2019)

- ***Principles of Fatigue of Welded Connections***

Welded fatigue versus mechanical systems, stress range, stress ratio, influence of stress ratio, influence of steel strength, fatigue categories A-F, and fatigue calculations.

- ***“Listen to the Steel” (Case Studies)***

Failure to provide a load path, welds placed into bending, an overlooked “secondary” member, overloaded members, make it easy for the welder, and failure in compression.

- ***Distortion: Causes and Cures***

Types of distortion causes of distortion, 18 distortion control principles, heat shrinking, calculations, and examples.