

Bo Dowswell, P.E., Ph.D.

2024 2nd Avenue North Unit 403 Birmingham, AL 35203 (205) 283-2078 bo@arcstructural.com

EXPERIENCE

- 11/2017–Present **Principal**
SDS Consulting. Birmingham, AL
Design of steel connections, industrial structures and plate/shell structures.
- 2/2014–Present **Consultant**
American Institute of Steel Construction. Chicago, IL
Technical advisor for the Steel Solutions Center.
- 9/2012–Present **Principal**
ARC International. Birmingham, AL
Design of steel connections, industrial structures and plate/shell structures. Research and continuing education for steel structures. Publication writing. Peer reviews. Expert witness testimony.
- 4/2009–Present **Consultant**
LBYD, Birmingham, AL
KBR. Birmingham, AL
Southern Company. Birmingham, AL
Robins and Morton. Birmingham, AL
Design and retrofit of steel structures for power generation plants, including pipe racks and support structures for large flue gas ductwork. Design of petrochemical facilities. Design and retrofit of steel connections. Consulting on structural steel and connection problems.
- 6/2000–Present **Adjunct Professor**
The University of Alabama at Birmingham
Teaching: CE 450 Structural Steel Design, CE 590 Connection Design for Steel Structures
Research: Square and Rectangular Tubes Bent About a Diagonal Axis. Strength and Fatigue Performance of Welded Transmission Pole Connections. Coped Beam Stability.
- 10/2007–4/2009 **Senior Engineer**
American Institute of Steel Construction. Chicago, IL
- 1/2007–10/2007 **Engineer**
Southern Company Generation. Birmingham, AL
Design of large flue gas ductwork and heavy support structures. Consulting on design procedures for structural steel and ductwork connections. Field inspection of structural steel and procedures for correction of fabrication errors.

- 2/1996–1/2007 **Principal and co-founder**
Structural Design Solutions. Birmingham, AL

Design of industrial structures including crane buildings and heavy support structures for the electric power industry. Design of steel connections for commercial and industrial structures. Design of plate and shell structures including stacks, silos, and large flue gas ductwork.
- 9/1999–3/2001 **Instructor**
Jefferson State Community College: CDT 222, Structural Steel Detailing; CDT 221, Structural Drafting and Detailing
- 9/1985–2/1996 **Steel Detailer, Steel Designer, Connection Designer**
McGee Detailing. Palmerdale, AL
Quality Detailing. Birmingham, AL
Trinity Steel Detailing. Birmingham, AL
Copeland & Associates. Birmingham, AL
Ferrell Engineering. Birmingham, AL

Steel detailing and connection design.

EDUCATION

The University of Alabama at Birmingham
Ph.D. in Civil Engineering, December 2005
Dissertation: “Design of Wrap-Around Steel Gusset Plates.”

The University of Alabama at Birmingham
Master of Science in Civil Engineering, December 1999
Thesis: “Lateral-Torsional Buckling of Wide Flange Cantilever Beams.”

Auburn University
Bachelor of Civil Engineering, June 1994

PROFESSIONAL ACTIVITIES

Professional Engineer in Alabama and several other states
Member of American Institute of Steel Construction (AISC)
Member of American Society of Civil Engineers (ASCE)
Member of Structural Stability Research Council (SSRC)

Member of the AISC Committee on Specifications
Member of the AISC Specification Committee TC-6 Connection Design
Member of the AISC Committee on Manuals

Member of AISC Manual Subcommittee M2-Connection Design Considerations
Member of the AISC Task Group on Industrial Buildings and Nonbuilding Structures
Member of the AISC Committee on Research

Developed and taught ASCE two-day seminar, "Connection Design for Steel Structures," in nine cities throughout the US.

JOURNAL PUBLICATIONS

Dowswell, B. (2018), "Reliability of the Equivalent Column Method for Gusset Plate Design," *Engineering Journal*, American Institute of Steel Construction, In review.

Dowswell, B. (2018), "Clearance for Welded Joints," *Engineering Journal*, American Institute of Steel Construction, In review.

Dowswell, B. (2018), "Strength of Single-Coped Beams," *Engineering Journal*, American Institute of Steel Construction, In review.

Dowswell, B. (2018), "Gusset Plate Stability Using Variable Stress Trajectories," *Engineering Journal*, American Institute of Steel Construction, In review.

Dowswell, B. (2018), "Torsion of Rectangular Connection Elements," *Engineering Journal*, American Institute of Steel Construction, In review.

Ahmad, M., Driver, R.G., Callele, L. and Dowswell, B. (2018), "Design of Steel Wide Flange Members for Torsion applied Through One Flange," *Journal of Constructional Steel Research*, Vol. 141, pp. 50-62.

Dowswell, B., Fouad, F., Davidson, J. and Whyte, R. (2017), "Design of Wrap-Around Gusset Plates," *Engineering Journal*, American Institute of Steel Construction, Third Quarter, Vol. 54, No. 3.

Dowswell, B. (2016), "Stability of Rectangular Connection Elements," *Engineering Journal*, American Institute of Steel Construction, Fourth Quarter, Vol. 53, No. 4.

Carter, C.J., Muir, L.S. and Dowswell, B. (2016), "Establishing and Developing the Weak-axis Strength of Plates Subjected to Applied Loads," *Engineering Journal*, American Institute of Steel Construction, Third Quarter, Vol. 53, No. 3.

Dowswell, B. (2015), "Plastic Strength of Connection Elements," *Engineering Journal*, American Institute of Steel Construction, First Quarter, Vol. 52, No. 1.

Dowswell, B. and Whyte, R. (2014), "Local Stability of Double-Coped Beams," *Engineering Journal*, American Institute of Steel Construction, First Quarter, Vol. 51, No. 1.

Dowswell, B. (2013), "Flange Bending in Single Curvature," *Engineering Journal*, American Institute of Steel Construction, Second Quarter, Vol. 50, No. 2.

Dowswell, B. (2013), "Calculation of Stress Trajectories Using Fracture Mechanics," *Engineering Journal*, American Institute of Steel Construction, First Quarter, Vol. 50, No. 1.

Dowswell, B. (2012), "Effective Length Factors for Chevron Gusset Plates," *Engineering Journal*, American Institute of Steel Construction, Third Quarter, Vol. 49, No. 3.

Dowswell, B. (2011), "A Yield Line Component Method for Bolted Flange Connections," *Engineering Journal*, American Institute of Steel Construction, Second Quarter, Vol. 48, No. 2.

Dowswell, B. (2010), "Bending of Top Plates in Base Chair Connections," *Engineering Journal*, American Institute of Steel Construction, Fourth Quarter, Vol. 47, No. 4.

Dowswell, B. (2010), "Transfer Forces in Steel Structures," *Engineering Journal*, American Institute of Steel Construction, Third Quarter, Vol. 47, No. 3.

Dowswell, B. (2010), "Stiffener Requirements to Prevent Edge Buckling," *Engineering Journal*, American Institute of Steel Construction, Second Quarter, Vol. 47, No. 2.

Dowswell, B. (2006), "Effective Length Factors for Gusset Plate Buckling," *Engineering Journal*, American Institute of Steel Construction, Second Quarter, Vol. 43, No. 2.

Dowswell, B., and Barber, S. (2005), "Shear Lag in Rectangular HSS Tension Members: A Comparison of Design Equations to Test Data," *Practice Periodical on Structural Design and Construction*, American Society of Civil Engineers, August, Vol. 10, No. 3.

Dowswell, B. (2004), "Lateral-Torsional Buckling of Wide Flange Cantilever Beams," *Engineering Journal*, American Institute of Steel Construction, Second Quarter, Vol. 41, No. 2.

PRESENTATIONS

Dowswell, B. (2016), "A Notional Load Yield Line Model for Gusset Plate Stability," Proceedings of the NASCC Steel Conference, April 13-15, Orlando, FL., American Institute of Steel Construction.

Dowswell, B. (2016), "Detailing of Steel Bridges," Structural Steel Services, February 4, Meridian, MS.

Ahmad, M., Driver, R.G., Callele, L., Dowswell, B. (2015) "Behavior of Unstiffened Wide-Flange Members Subjected to Torsional Moment Through One Flange" Proceedings of the CSCE 2015 4th International Engineering Mechanics and Materials Conference, May 27 to 30, Regina, SK.

Dowswell, B. (2015), "Stability of Connection Elements," Proceedings of the NASCC Steel Conference, March 25-27, Nashville, TN, American Institute of Steel Construction.

Dowswell, B. (2014), "Gusset Plate Stability Using Variable Stress Trajectories," Proceedings of the ASCE/SEI Structures Congress, April 3-5, Boston, MA.

Dowswell, B. (2014), "Design of Reinforced Steel Members, Part 2," AISC Webinar, February 13, American Institute of Steel Construction.

Dowswell, B. (2013), "Design of Reinforced Steel Members," AISC Webinar, November 14, American Institute of Steel Construction.

Dowswell, B. (2013), "Gusset Plate Stability Using Variable Stress Trajectories," Proceedings of the 10th Pacific Structural Steel Conference, October 8-11, Sentosa, Singapore.

Dowswell, B. (2013), "Localized Web Buckling of Double-Coped Beams," Proceedings of the Annual Stability Conference, Structural Stability Research Council.

Dowswell, B. (2013), "Horizontal Bracing," Presented in the session, Industrial/Non-Building Structures Design Challenges, at the NASCC Steel Conference, American Institute of Steel Construction.

Dowswell, B. (2012), "Gusset Plate Design," SEAoAL Winter Seminar, Structural Engineers Association of Alabama.

Dowswell, B. (2012), "Design of Reinforced Steel Members," SEAoAL Winter Seminar, Structural Engineers Association of Alabama.

Dowswell, B. (2012), "Connection Design for Industrial Structures—Problems and Solutions," Proceedings of the Structures for Mining and Related Materials Handling Conference, South African Institute of Steel Construction, October 15-18, Vanderbijlpark, South Africa.

Dowswell, B. (2012), "Bending of Top Plates in Base Chair Connections," Presented in the session, Industrial/Non-Building Structures Design Challenges, at the NASCC Steel Conference, American Institute of Steel Construction.

Dowswell, B. (2010), "Plastic Collapse of Untiffened and Edge-Stiffened Plates," Proceedings of the Annual Stability Conference, Structural Stability Research Council.

Dowswell, B. (2009), "Stiffener Requirements to Prevent Edge Buckling," Proceedings of the Annual Stability Conference, Structural Stability Research Council.

Dowswell, B. and Fouad, F. (2007), "Design of Wrap-Around Gusset Plates," Proceedings of the Annual Stability Conference, Structural Stability Research Council.

Dowswell, B. and Fouad, F. (2006), "Testing of Wrap-Around Gusset Plates in Tension," Proceedings of the Annual Stability Conference, Structural Stability Research Council.

Dowswell, B. (2006), "Steel Connections: What You Didn't Learn in School," Proceedings of the Structures Congress, American Society of Civil Engineers.

Dowswell, B., Whyte, R., Davidson, J., and Fouad, F. (2006), "Finite Element Modeling of Wrap-Around Gusset Plates in Tension," Proceedings of the Structures Congress, American Society of Civil Engineers.

Dowswell, B. and Fouad, F. (2005), "Square Tubes Bent About a Diagonal Axis," Proceedings of the Annual Meeting of the Transportation Research Board.

Dowswell, B. (2005), "Stability of Gusset Plates Using the Yield Line Method," Proceedings of the Annual Stability Conference, Structural Stability Research Council.

Dowswell, B. (2005), "Shear Lag in Rectangular HSS Tension Members," Proceedings of the Structures Congress, American Society of Civil Engineers.

Dowswell, B. (2004), "Calculation of Transfer Forces in Steel Structures," Proceedings of the Structures Congress, American Society of Civil Engineers.

Dowswell, B., and Barber, S. (2004), "Buckling of Gusset Plates: A Comparison of Design Equations to Test Data," Proceedings of the Annual Stability Conference, Structural Stability Research Council.

Dowswell, B. (2002), "Lateral-Torsional Buckling of Wide Flange Cantilever Beams," Proceedings of the Annual Stability Conference, Structural Stability Research Council.

OTHER PUBLICATIONS

Dowswell, B. (2018), *Design of Curved Members*, Design Guide xx, American Institute of Steel Construction, In publication.

Dowswell, B. (2018), "Design of Coped Beams," *Modern Steel Construction*, American Institute of Steel Construction, In publication.

Dowswell, B. (2018), "Design of Curved Members," *Modern Steel Construction*, American Institute of Steel Construction, In publication.

Dowswell, B. (2017), "Clearance is Critical," *Modern Steel Construction*, American Institute of Steel Construction, December.

Ahmad, M., Driver, R.G., Callele, L. and Dowswell, B. (2016), *Behaviour and Design of Unstiffened Wide-flange Members Subjected to Torsional Moment Through One Flange*, Structural Engineering Report No. 307, Department of Civil and Environmental Engineering, University of Alberta, January.

Dowswell, B. (2014), "Reinforcing the Point," *Modern Steel Construction*, American Institute of Steel Construction, January.

Dowswell, B. and Muir, L. (2012), "Developing M_p , Does an $R=3$ directly welded flange moment connection do it?," *Modern Steel Construction*, American Institute of Steel Construction, May.

Dowswell, B., Brice, A., and Blain, B. (2010), "Horizontal Bracing, an Overview of Lateral Load Resisting Systems and How to Implement Them," *Modern Steel Construction*, American Institute of Steel Construction, July, Vol. 50, No. 7.

Wrote the section on stability of cantilever beams in the 6th and 7th Editions of the *SSRC Guide to Design Criteria for Metal Structures*.