



Exponent[®]
Engineering & Scientific Consulting

Matthew Phillips, Ph.D.

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Professional Profile

Dr. Phillips specializes in the design, analysis, and fabrication of steel members and structural systems for buildings and bridges. He has evaluated the performance and stability of structures using buckling simulations and nonlinear analyses, and he has investigated structural damage due to fatigue and fracture.

Dr. Phillips has experience in both computational and experimental analysis methods, including material characterization, large-scale fatigue and stability/strength testing, and nonlinear finite element analysis (FEA) including elastic and inelastic buckling simulations.

Prior to joining Exponent, Dr. Phillips was a graduate student researcher in the Structural Engineering Mechanics and Materials (SEMM) group at the Georgia Institute of Technology, where he earned a Ph.D. in civil engineering. His research focused on the behavior and performance of steel materials and structures; specifically, he conducted analytical and experimental investigations into the design and performance of built-up steel I-section members and the effects of weld repairs on the strength and service life of built-up members. Dr. Phillips developed novel experimental techniques and datasets, created nonlinear finite element models, performed buckling simulations, and conducted small- and large-scale experimental tests. His work involving the behavior and flexural design of steel I-section members proved that the current flexural design standards overpredict the strength of certain built-up I-section members, and his work contributed to changes in the flexural design provisions used in the United States. His work involving the effects of weld repairs proved that weld repairs could be performed many times with little-to-no effect on the strength or service-life of the welded joint.

Aside from research, Dr. Phillips gained experience teaching and assisting in both undergraduate and graduate level courses while at Georgia Tech, including courses such as statics, behavior of steel structures, introduction to bridge engineering, and prestressed concrete. Dr. Phillips also has industry experience through full-time positions and co-ops with various engineering firms. His industry experience included engineering design, inspection, fabrication, and specialized lift planning.

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, Georgia Institute of Technology, 2026

M.S., Civil Engineering, Georgia Institute of Technology, 2022

B.S., Civil Engineering, Mississippi State University, 2018

President's Fellowship, Georgia Institute of Technology, 2020-2024

GT Sigma Xi Best MS Thesis Award, Georgia Institute of Technology, 2023

Lawrence D. McDowell Fellowship, Georgia Institute of Technology, 2022-2023

CEE Best MS Thesis Award, Georgia Institute of Technology, 2022

AISC Student Travel Grant – Task Force Committee Meetings, American Institute of Steel Construction, 2022

IRA Hardin Fellowship, Georgia Institute of Technology, 2020-2021

Georgia Power CEE Fellowship, Georgia Institute of Technology, 2020-2021

Robert H. Wood Scholarship, Mississippi State University, 2016-2017

Pickering Alumni Scholarship, Mississippi State University, 2016-2017

Phi Theta Kappa Scholarship, Mississippi State University, 2015-2016

Prior Experience

Civil Engineer (EIT), Smith Seckman Reid, Memphis, TN, 2018-2020

Project Engineer (Co-op), Barnhart Crane and Rigging, Memphis, TN, 2016-2017

Professional Affiliations

American Society of Civil Engineers

American Welding Society

Publications

Journal Publications

Phillips, M., Slein, R., Sherman, R.J., & White, D.W. (2024). "[Proposed Improvements to AISC 360-22 Chapter F for Built-Up I-Section Members](#)." Journal of Constructional Steel Research, Vol. 217.

Slein, R., Kamath, A.M., Phillips, M., Toğay, O., Sherman, R.J., & White, D.W. (2024). "[Flexural resistance of thin-web singly-symmetric steel I-sections exhibiting early tension flange yielding](#)." Journal of Constructional Steel Research, Vol. 221.

Phillips, M., Slein, R., Sherman, R.J., and White, D.W. (2023). "[Experimental Investigation of Doubly-Symmetric Built-Up I-Girders Subjected to High Moment Gradient](#)." Engineering Structures, Vol. 283.

Phillips, M., Kamath, A.M., Sherman, R.J., and White, D.W. (2023). "[Influence of Web Distortion and Onset of Yield on Doubly Symmetric Built-Up I-Girders Subjected to High Moment Gradient](#)." Thin-Walled Structures, Vol. 185.

Slein, R., Kamath, A.M., Phillips, M., Sherman, R.J., Scott, D.W., and White, D.W. (2023). "[Experimental and Analytical Assessment of LTB Resistance of Built-Up Steel I Section Members](#)." Journal of Constructional Steel Research, Vol. 204.

Archived Datasets and Guidance Documents

Phillips, M., Stewart, L., Sherman, R.J. (2026). GDOT Steel Fabrication Quality Manual – 1st Draft

(Report No. FHWA-26-2220). Georgia Department of Transportation & Georgia Institute of Technology.

Phillips, M., Slein, R., Sherman, R.J., and White, D.W. (2024). "Experimental Database for Lateral-Torsional Buckling of Built-Up I-Section Members." Mendeley Data, V1, doi: 10.17632/v2pr9rbxyk.1

Doctoral Dissertation and Master's Thesis

Phillips, M. (2026). Effects of Multiple Repair Welds on A709 Grade Steels. Georgia Institute of Technology. (Doctoral Thesis)

Phillips, M. (2022). Experimental and Analytical Investigations of Doubly Symmetric Built-Up I-Girders with Large Moment Gradient Factors. Georgia Institute of Technology. (Master's Thesis)

Published Research Reports

Phillips, M., Stewart, L., Sherman, R.J. (2026). Effects of Multiple Repair Welds on A709 Grade Steels (Report No. FHWA-26-2220). Georgia Department of Transportation & Georgia Institute of Technology.

Slein, R., Kamath, A.M., Latif, W., Phillips, M., Sherman, R.J., Scott, D.W., and White, D.W. (2022). Enhanced Characterization of the Flexural Resistance of Built-Up I-Section Members (Report No. 22-03). Georgia Institute of Technology.

Phillips, M., Slein, R., Sherman, R.J., and White, D.W. (2022). Residual Stress Measurement of Built-Up I-Section Members via the Center Hole Drilling Method (Research Report No. 22-01). Georgia Institute of Technology.

Phillips, M., Slein, R., Kamath, A.M., Sherman, R.J., and White, D.W. (2022). Experimental and Analytical Investigations of Built-Up I-Girders Subjected to Large Moment Gradient (Report No. 22-02). Georgia Institute of Technology.

Conference and Workshop Presentations

Phillips, M., Sherman, R.J. (2025). "Effects of Multiple Weld Repairs on A709 Grade Steels." NSBA Technical Committee. Chicago, IL.

Phillips, M., Stewart, L., Sherman, R.J. (2025). "Effects of Multiple Weld Repairs on A709 Grade Steels." GDOT/GTI Annual Research Expo. (Poster)

Phillips, M., Sherman, R.J. (2025). "Impact of Multiple Weld Repairs at One Location." NASCC: The Steel Conference, World Steel Bridge Symposium. Louisville, KY.

Sherman, R.J., Stewart, L., Phillips, M. (2024). "Influence of Multiple Weld Repairs on A709 Steels." Transportation Research Board Annual Meeting. Washington, DC.

Phillips, M., Stewart, L., Sherman, R.J. (2024). "Quality Manual for Steel Bridge Fabrication." GDOT/GTI Annual Research Expo. (Poster)

Phillips, M., Stewart, L., Sherman, R.J. (2023). "Quality Manual for Steel Bridge Fabrication." GDOT/GTI Annual Research Expo. (Poster)

Phillips, M., White, D.W., Sherman, R.J. (2022). "Experimental and Analytical Investigation of Built-Up I-Girders Subjected to Large Moment Gradient." AISC Technical Committee 4: Design. Chicago, IL.

Sherman, R.J., White, D.W., Phillips, M., Slein, R., Kamath, A.M. (2022). "Enhanced Characterization of the Flexural Resistance of Built-Up I-Section Members." Transportation Research Board Annual Meeting. Washington, DC.