

Mouad MADHOUNI, Structural Engineer, PhD

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SUMMARY

Recently in 2021, I graduated as a Civil Engineer from the National Institute of Applied Sciences (INSA Rennes, France). In 2020, I had the chance to study, as an abroad student, in the University of Exeter. I also have a M.Sc. degree with an emphasis on research and advanced design engineering from the University of Rennes. I am currently pursuing a Ph.D. program in Steel Structures at INSA Rennes, GCGM Lab. The subject of my PhD thesis is part of the European project LASTTS, specializing in I-beam to rectangular hollow section (RHS) column connections using passing-through plates.

WORK EXPERIENCE

International visiting scholar - MITACS fellow (UofT, Toronto) Sep. 2024 - present

Comparison of design methods between European and North American codes for connections with through plates (with and without concrete infill), and an evaluation of how research findings from the LASTTS project can be integrated into North American practice. The aim of this work is to contribute to a jointly authored research article. Host supervisor: Prof. Jeffrey Packer - jeffrey.packer@utoronto.ca

R&D Engineer - PhD program - LASTTS project (LGCGM, Rennes) Sep. 2021 - present

As part of the European project LASTTS (for LASer Technology for Tubular Structures), I am conducting research at INSA Rennes regarding the mechanical behaviour prediction of beam-to-SHS column joints using a passing-through approach, both under gravitational and seismic loadings. The objective of my Ph.D. program is to develop a calculation method for these types of connections by laser cutting, providing design guidelines as well as worked examples. These methods should provide the initial rotational stiffness, bending moment resistance, and rotational capacity for a design in accordance with the principles of Eurocode 3 and 4. The developed analytical models need to be validated by comparison with the results of finite element analysis and experimental tests.

Supervisor: Associate Prof. Maël Couchaux - mael.couchaux@insa-rennes.fr

R&D Intern (CTICM, Paris Greater Metropolitan Area) Feb. 2021 - Aug. 2021

The CTICM is a french technical organization of reference in steel and composite construction.

I was assigned to the Department of Innovation and Valorization (DRV), where I had worked on the diaphragm effect of skin-stressed steel structures, more precisely on the lateral support of purlins/joists by steel sheet against lateral-torsional buckling (especially during the concrete pouring phase of floors with collaborative trapezoidal steel sheet).

The results of this work were published in the *Revue Construction Métallique*.

EDUCATION

2024	Mitacs fellow, University of Toronto
2021 - 2024	PhD on beam-to-column moment resisting joints, INSA Rennes
2021	M.Sc, double degree, in research and advanced design engineering at Université de Rennes
2020	Erasmus exchange at University of Exeter
2016 - 2021	Civil Engineering Degree at INSA Rennes, France (Q1 journal article published)

TECHNICAL SKILLS

- Solid Mechanics: **Elasticity, Visco-elasticity, Plasticity and thermal behaviours**
- Advanced Structural Analysis: **Beam and Plate structural elements**
- Construction Codes: **Eurocodes, AISC standards, CISC code**
- Finite Element Modelling: **Ansys, Abaqus, RDM7, Robot, CATIA**
- Programming: **APDL, Python, Maple, MATLAB, VBA**

LANGUAGES

English, French, Arabic

PUBLICATIONS [11]

- T. M. Nguyen and **M. Madhouni** (2021). “Calculation of shear flexibility of steel decks due to profile distortion”. In: *Revue Construction Métallique 4: 2021 (Written in both french and english)*.
- M. Couchaux and **M. Madhouni** (2022). “Theoretical models for T-stubs in contact with intermediate layer”. In: *Journal of Constructional Steel Research* 192, p. 107158. ISSN: 0143-974X. DOI: <https://doi.org/10.1016/j.jcsr.2022.107158>.
- M. Madhouni**, M. Couchaux, M. Hjiiaj, and A. Kanyilmaz (2023). “I-beam-to-SHS column moment resisting joints using passing-through plates under opposite bending moments: numerical and analytical studies”. In: *Proceedings of Eurosteel 2023* 6.3-4, pp. 1451–1457. DOI: <https://doi.org/10.1002/cepa.2370>.
- M. Madhouni**, M. Couchaux, M. Hjiiaj, and A. Kanyilmaz (2023). “I-beam-to-SHS-column moment resisting joints using passing-through plates under equal bendings”. In: *Proceedings of Eurosteel 2023* 6.3-4, pp. 1445–1450. DOI: <https://doi.org/10.1002/cepa.2367>.
- R. Das, A. Kanyilmaz, **M. Madhouni**, and H. Degee (2023). “Innovative One-way Connections between I-beams and CHS columns”. In: *Proceedings of Eurosteel 2023* 6.3-4, pp. 1539–1544. DOI: <https://doi.org/10.1002/cepa.2271>.
- M. Madhouni**, M. Couchaux, M. Hjiiaj, and A. Kanyilmaz (2024). “Passing-through I-plates-to-SHS moment resisting joints subjected to symmetric bending moments: Experimental, Analytical, and Numerical analyses”. In: *Thin-Walled Structures* (Published).
- M. Madhouni**, M. Couchaux, M. Hjiiaj, and A. Kanyilmaz (2024). “Antisymmetric in-plane bending of passing I-beam-to-RHS joints using laser cutting technology: Experimental, Analytical, and Numerical analyses”. In: *Thin-Walled Structures* (To be submitted).
- M. Madhouni**, M. Couchaux, M. Hjiiaj, and A. Kanyilmaz (2024). “I-beam-to-infilled RHS LCT-joints under lateral loads”. In: *Thin-Walled Structures* (To be submitted).
- M. Madhouni** (2024). “I-beam-to-SHS Column Moment Resistant Joints Using Passing-Through I-Plates with and without concrete infill”. In: *INSA de Rennes, France*. PhD thesis (submitted).
- M. Madhouni**, J.A. Packer, and M. Couchaux (2024). “Design Recommendations for Through Plates in beam-to-RHS Connections”. In: *AISC Engineering Journal* (in process).
- M. Madhouni**, M. Couchaux, J. Packer, et al. (2025). “Static and Cyclic Behavior of Beam-to-Infilled HSS Column Connections Using Through Plates”. In: *Proceedings of 10th International Conference on Composite Construction in Steel and Concrete (CCX) July 27-30, 2025, Blaine, WA (USA)* (submitted).