

Wael I. Alnahhal, Ph. D., P. Eng.

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CURRENT AFFILIATION

Qatar University, Dept. of Civil & Architectural Engineering
Assistant Professor, September 2013–Present

EDUCATION

PH.D. CIVIL ENGINEERING

GPA: 3.95/4.0

University at Buffalo, State University of New York, January, 2007

Area of Specialization: Structural Engineering

Dissertation: “Structural Characteristics and Failure Prediction of Hybrid FRP-Concrete Bridge Deck and Superstructure Systems”

Coursework:

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|--|------------------------------------|
| ▪ Advanced Mathematics for Civil Engineers | ▪ Advanced Mechanics of Solids |
| ▪ Seismology | ▪ Advanced Finite Element Analysis |
| ▪ Structural Dynamics and Earthquake Engineering I | ▪ Composite Structures |

M.S. CIVIL ENGINEERING

GPA: 88.4 %

Jordan University of Science and Technology, Jordan, April, 2002

Area of Specialization: Structural Engineering

Thesis: “Active Control of Wind-Excited Tall Buildings Using Artificial Neural Network”

Coursework:

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|--------------------------------|--|
| ▪ Finite Element Method I | ▪ Advanced Concrete Technology |
| ▪ Advanced Applied Mathematics | ▪ Advanced Structural Mechanics |
| ▪ Advanced Reinforced Concrete | ▪ Civil Engineering Seminar |
| ▪ Retaining Structures | ▪ Special Topics in Structural Engineering |

B.S. CIVIL ENGINEERING (*with 1st Class Honor**)

GPA: 83.6 %

Jordan University of Science and Technology, Jordan, February, 2000

* I was ranked 1st in order of merit among 160 students.

LICENSES

- Registered Professional Engineer, Province of Ontario, January, 2009.
- Engineering-in-Training (E.I.T.) Certificate, New York, January 2006.

AWARDS AND HONORS

- Who's Who Among Students in American Universities & Colleges (2004).
- Civil, Structural and Environmental Engineering (CSEE) Graduate Fellowship-University at Buffalo, State University of New York (2002).
- Teaching assistant scholarship–Jordan University of Science and Technology, Jordan (2000-2002).
- University award for the Academic Distinction and Recognition award for the Top Rank student on the 2000 graduation batch in Civil Engineering- Jordan University of Science and Technology.
- University award honor recipient for five Consecutive years at Bachelor of Science in Civil Engineering- Jordan University of Science and Technology (1995- 2000).
- College of Engineering award honor recipient for five Consecutive years at Jordan University of Science and Technology (1995- 2000).
- Recognition award for the Top Rank student in Gaza Strip on the 1995 graduation batch at high school diploma from Palestinian Ministry of Education & Higher Education (1995).
- Excellency Certificate at high school diploma from Palestinian Ministry of Education & Higher Education (1995).

RESEARCH ACTIVITIES

FUNDED RESEARCH

- **Wael Alnahhal (LPI)**, Amjad Aref, and Jongmin Shim, “Spectral Band-structure Identification of Amplitude-dependent Viscoelastic Mechanical Metamaterials”, (1/11/2015 – 1/11/18).
Sponsor: **QNRF-NPRP**
Funding: **\$884,480**
- **Wael Alnahhal (PI)**, “Flexural Behavior and Evaluation of Deflection for high-strength MiniBar Reinforced Concrete Beams with Basalt FRP Reinforcing”, (1/12/15 – 1/12/16).
Sponsor: **QNRF-UREP**
Funding: **\$60,000**
- **Wael Alnahhal (PI)**, Alaa Al-Hawri, “Modeling of Sand Filters Using Artificial Neural Networks (ANN)”, (1/3/14 – 1/3/15).
Sponsor: **QNRF-UREP**
Funding: **\$60,000**
- **Wael Alnahhal (PI)**, “Flexural Behavior of Mini-Bar Reinforced Concrete Beams with Basalt FRP Reinforcing Bars”, (1/4/15 – 1/4/17).
Sponsor: **QATAR UNIVERSITY**
Funding: **\$33,000**
- **Wael Alnahhal (PI)**, “Behavior of Sustainable Self-Compacting Concrete Using Recycled Concrete Aggregate Produced in Qatar”, (1/9/15 – 1/9/16).
Sponsor: **QATAR UNIVERSITY**
Funding: **\$14,000**

- **Wael Alnahhal (PI)**, “Optimization of Hybrid FRP-Concrete Structures, (1/4/14 – 1/4/15).
Sponsor: **QATAR UNIVERSITY**
Funding: **\$33,000**
- **Wael Alnahhal (PI)**, “Effect of Chopped Basalt Fibers on the Flexural Behavior of Concrete Slabs Reinforced with FRP Bars”, (1/4/14 – 1/4/15).
Sponsor: **QATAR UNIVERSITY**
Funding: **\$41,000**

TECHNICAL REVIEWER

- Journal of Structural Engineering, ASCE
- Canadian Journal of Civil Engineering
- Journal of Civil Engineering, KSCE

GRADUATE STUDENT ADVISEMENT

1. PhD. Thesis (Ongoing): Spectral Band-structure Identification of Amplitude-dependent Viscoelastic Mechanical Metamaterials.

Role: Thesis supervisor

Student name: Ratiba Fatma Ghachi

Expected Completion date: September, 2018

2. MSc thesis (Ongoing): Effect of Chopped Basalt Fibers on the Shear Behavior of Concrete Beams Reinforced with BFRP Bars.

Role: Thesis supervisor

Student name: Yousef Adnan Rihan

Expected Completion date: September, 2016

3. MSc thesis (Ongoing): Behavior of Fiber Reinforced Concrete structures with Recycled Concrete Coarse Aggregates.

Role: Thesis supervisor

Student name: Omar Naji

Expected Completion date: September, 2016

4. PhD. Thesis: Elastic Properties of Nanocomposite Cementitious Material.

Role: Internal Examiner

Student name: Ala Ghassan Abutaqa

Expected Completion date: June, 2015

RESEARCH EXPERIENCE

University at Buffalo, State University of New York

Department of Civil, Structural and Environmental Engineering

Research Assistant, June 2003-January 2007

Jordan University of Science and Technology

Department of Civil Engineering

Research Assistant, September 2001 - June 2002

Research Interests

- Structural engineering.
- Application advanced composite materials (FRP) in the infrastructure and in upgrading deteriorating structures.
- Smart Materials.
- Composite materials damage mechanics.
- Computational mechanics.
- Earthquake engineering.

PUBLICATIONS

Refereed Journal Papers

1. **Alnahhal, W.** (2016), “Numerical Evaluation of Dynamic Response by Using Modified Newmark’s Method”, (submitted), *Journal of Computational Methods in Sciences and Engineering*.
2. **Alnahhal, W.** (2016), “Effect of Chopped Basalt Fibers on the Flexural Behavior of Concrete Slabs Reinforced with BFRP Bars”, (In preparation), *Journal of Composites for Construction-ASCE*
3. **Alnahhal, W.** (2016), “Flexural Behavior of Fiber Reinforced Concrete structures with Recycled Concrete Coarse Aggregates in Qatar”, (In preparation), *Construction and Building Materials*
4. **Alnahhal, W.**, and Aref, A.J (2008), “Structural performance of hybrid fiber reinforced polymer-concrete bridge superstructure systems”, *Journal of Composite Structures*, v 84, n 4, pp 319-336.
5. **Alnahhal, W.**, Aref, A. and Alampalli, S. (2008). “Composite Behavior of Hybrid FRP-Concrete Bridge Decks on Steel Girders.”, *Journal of Composite Structures*, v 84, n 1, pp 29-43.
6. **Alnahhal, W.**, Chiewanichakorn, M., Kitane, Y., Aref, A.J., and Alampalli, S. (2007). “Simulations of Structural Behavior of Fiber Reinforced Polymer Bridge Deck under Thermal Effects”, *International Journal of Materials and Product Technology*, v 28, n 1/2, pp 122-140.
7. **Alnahhal, W.**, Aref, A.J., and Chiewanichakorn, M. (2006), “Temporal Thermal Behavior and Damage Simulations of FRP Deck”, *Journal of Bridge Engineering*, ASCE, v 11, n 4, pp 452-465.
8. Aref, A.J., and **Alnahhal, W.** (2007), “Experimental Evaluation of a Hybrid FRP-Concrete Bridge Superstructure System Under Negative Moment Flexural Loads”, *Jordan Journal of Civil Engineering*, V 1, n 4, pp 336-342.

Conference Proceedings

1. **Wael Alnahhal**, Ahmed Elrefai (2016). “Behavior of Basalt Fiber Reinforced Concrete”, (**accepted**), International Conference on Infrastructure Management, Assessment and Rehabilitation Techniques, American University of Sharjah, UAE, 6-8 March 2016.
2. **Wael Alnahhal** (2015). “An Analytical Study of FRP-Concrete Bridge Superstructures” International Conference on Civil, Infrastructure and Urban Engineering, Vancouver-Canada, August 6-8, 2015.

3. **Wael Alnahhal** (2014). "Preliminary Optimization of Hybrid FRP-Concrete Bridge Systems" Scientific Cooperation International Workshops on Engineering Branches, Koc University, Istanbul, 8-9 August 2014.
4. Gordon P. Warn, **Wael Alnahhal**, and Amjad Aref (2010). "Analytical and Experimental Studies of Hybrid FRP--Concrete Bridge Systems." Fiber Reinforced Polymer (FRP) Composites for Infrastructure Applications Conference, San Francisco, November 4-6, 2009.
5. **Alnahhal, W. I.**, and Aref, A.J., (2008), "Experimental and Analytical Evaluation of Hybrid FRP-Concrete Bridge Deck System", ACMBS-V, Winnipeg, Canada, September, 2008.
6. Aref, A. and **Alnahhal, W.**, (2007), "Development of Hybrid FRP-Concrete Bridge Deck System," SAMPE '07 in Baltimore, Maryland, June 3-7, 2007.
7. **Alnahhal, W. I.**, Aref A.J., and Alampalli, S. (2007). "Composite Action of FRP decks on Steel Girders", ASNT 16th Annual Research Symposium Program Dates: March 27-29, 2007.
8. Aref, A.J., and **Alnahhal, W. I.** (2007), "Nonlinear Behavior of Hybrid FRP-Concrete Bridge Deck and Superstructure Systems", 8th International Symposium on Fiber Reinforced Polymer Reinforcement for Concrete Structures (FRPRCS-8), Patras, Greece July 16-18, 2007.
9. **Alnahhal, W.I.**, Chiewanichakorn, Alampalli, S., and Aref, A.J. (2006), "Simulations of Fire Temporal Thermal Behaviour of Fibre Reinforced Polymer Bridge Decks", Conference Proceedings, The Eighth International Conference on Computational Structures Technology (CST 2006), Las Palmas de Gran Canaria, Spain, September 12-15, 2006.
10. **Alnahhal, W. I.**, Aref, A.J., and Alampalli, S. (2006), "Experimental Evaluation of a Hybrid FRP-Concrete Bridge Deck on Steel Girders", 43rd Annual Technical Meeting Society of Engineering Science (SES 2006), University Park, Pennsylvania, August 13-16, 2006.
11. **Alnahhal, W. I.**, Aref, A.J., and Alampalli, S. (2006), "Evaluation of A Hybrid FRP-Concrete Bridge Deck on Steel Girders", 15th Annual Research Symposium of ASNT, Orlando, Florida, March 13-17, 2006.
12. Chiewanichakorn, M., **Alnahhal, W.I.**, and Aref, A.J. (2006), "Thermal Analyses of Fiber Reinforced Polymer Bridge Deck Systems", Conference Proceedings, Earth & Space 2006– 10th ASCE Aerospace Division International Conference on Engineering, Construction and Operations in Challenging Environments, Houston, Texas, March 5-8, 2006.
13. **Alnahhal, W. I.**, Aref, A.J., and Alampalli, S. (2005), "Performance of A Hybrid FRP-Concrete Bridge Superstructure System", ASNT Fall Conference & Quality Testing Show 2005, Columbus, OH, October 17-21, 2005.
14. Aref, A.J., Chiewanichakorn, M., Alampalli, S., **Alnahhal, W.I.**, and Kitane, Y. (2005), "On the Temporal Thermal Behavior of Fiber Reinforced Polymer Bridge Decks", The Fourth Middle East Symposium on Structural Composites for Infrastructure Applications 2005 (MESC 2005), Alexandria, Egypt, May 20-23, 2005.

Books and Technical Reports

1. **Alnahhal, W.I.** (2007), “Structural characteristics and failure prediction of hybrid FRP-concrete bridge deck and superstructure systems”, Ph.D. Dissertation, State University of New York at Buffalo. 301 pages.
2. Aref, A.J., and **Alnahhal, W.I.** (2007), “Hybrid FRP-Concrete Bridge Deck Systems”, Report submitted to New York State Department of Transportation, Albany, New York.
3. Aref, A.J., Chiewanichakorn, M., and **Alnahhal, W.I.** (2004), “Temporal Thermal Behavior and Damage Simulations of FRP Deck”, Report submitted to New York State Department of Transportation, Albany, New York.

SEMINARS AND PRESENTATIONS

- The Ninth U.S. National and Tenth Canadian Conference on Earthquake Engineering, Toronto, Canada, July 25-29, 2010.
- “Experimental Evaluation of a Hybrid FRP-Concrete Bridge Deck on Steel Girders”, 43rd Annual Technical Meeting Society of Engineering Science (SES 2006), University Park, Pennsylvania, August 13-16, 2006.
- “Evaluation of A Hybrid FRP-Concrete Bridge Deck on Steel Girders”, 15th Annual Research Symposium of ASNT, Orlando, Florida, March 13-17, 2006.
- “Analysis and Design of Innovative FRP Systems” Earth and Space 2006 Conference Houston TX, March 5-8, 2006.

PROFESSIONAL EXPERIENCE (Academia)

TEACHING EXPERIENCE

Qatar University, Qatar

Dept. of Civil & Architectural Engineering

Assistant Professor, September 2013–Present

Courses Taught:

Graduate Courses

- Advanced Topics in Civil Engineering (CVEN-500)
 Spring, 2014: Enrollment: 9
 Spring, 2015: Enrollment: 5

Undergraduate Courses

- Analysis of Indeterminate Structures (CVEN-321)
 Fall, 2013: Enrollment: 32
 Fall, 2014: Enrollment: 37
 Fall, 2014: Enrollment: 36
- Design of Steel Structures (CVEN-420)
 Fall, 2013: Enrollment: 25
 Fall, 2014: Enrollment: 14
 Fall, 2014: Enrollment: 27

- Analysis of Structures (CVEN-220)
Spring, 2014: Enrollment: 27
Spring, 2015: Enrollment: 33
Fall, 2015: Enrollment: 31
- Strength of Materials (CVEN-214)
Spring, 2014: Enrollment: 46
Spring, 2015: Enrollment: 47
- Practical Training (CVEN-399)
Summer, 2014: Enrollment: 41
- Senior Design Project I (CVEN-401)
Fall, 2013: Enrollment: Three groups
Spring 2014: Enrollment: one group
Fall, 2014: Enrollment: One group
Spring, 2015: Enrollment: One group
- Senior Design Project II (CVEN-402)
Spring 2014: Enrollment: Three group
Fall, 2014: Enrollment: One group
Spring, 2015: Enrollment: One group

University of Dammam, Saudi Arabia

Department of Construction Engineering

Assistant Professor, September 2012– September 2013

Courses Taught:

- Topics in Concrete Structures (CONEN-583)
Fall, 2012; Enrollment: 19
- Senior Graduation Project I (CONEN-521)
Fall, 2012; Enrollment: 4
- Strength of Materials (ENG-351)
Fall, 2012; Enrollment: 39
- Senior Graduation Project II (CONEN-522)
Spring, 2013; Enrollment: 4
- Topics in Structural Analysis (CONEN-573)
Spring, 2013; Enrollment: 11
- Statics (ENG-232)
Spring, 2013; Enrollment: 44

University at Buffalo, State University of New York

Department of Civil, Structural and Environmental Engineering

Instructor, August 2006–December 2006

- Structural Engineering I (CIE-323)
Fall, 2006; Enrollment: 27

University at Buffalo, State University of New York

Department of Civil, Structural and Environmental Engineering

Teaching Assistant, August 2002–May 2003

Duties:

- Organize, lecture, and grade two undergraduate classes in “Material Science” and “Dynamics”.
- Assist graduate-level “Finite Element Method” class in structural modeling using ABAQUS.

University at Buffalo, State University of New York

Department of Civil, Structural and Environmental Engineering
Teaching Assistant, September 2005

Duties:

- Assist in a Professional Engineer short-course (3 days workshop) on structural modeling using ABAQUS and PATRAN software.

Jordan University of Science and Technology

Department of Civil Engineering

Teaching Assistant, February 2000 – August 2001

Duties:

- Organize, lecture, and grade six undergraduate classes in “materials construction laboratory”, “structural analysis”, “concrete design”, “materials science”, “economic engineering”, and “construction of material and structure management”.
- Organize, lecture, and grade graduate-level class in “structural dynamics”.

Teaching Interests

- Engineering Mechanics.
- Structural Analysis.
- Structural Dynamics.
- Reinforced Concrete Design.
- Structural Steel Design.
- Finite Element Methods.
- Engineering Mathematics.
- Computer Applications in Civil Engineering.

PROFESSIONAL EXPERIENCE (Industry)

Halcrow Yolles, A CH2M- HILL Company, Toronto, Canada

Senior Engineer, January 02, 2007– September 01, 2012

Duties:

- Project engineer on a wide range of engineering projects, includes both large and small scale structures utilizing concrete, steel, timber, FRP composites, and masonry construction.
- A member in the research and development committee at Halcrow Yolles.
- Design and supervise the construction of a variety of projects in the Industrial, Commercial, Health Care, Institutional, and Transportation sectors in Canada, UK, and Middle East.
- Peer review of the seismic design of tall and ultra-tall buildings and bridges.
- Conceptual and detailed design according to American, Canadian, and British Standards, preparation of construction drawings and specifications, and site review of new construction, and structural evaluation of existing buildings.
- Develop and maintain client relationships as well as relationships with building officials and review agencies.
- Finite Element vibration analysis of various structures and pedestrian bridges.
- Supervise, mentor and train new engineers and interns.

Selected Project Experience:

- TTC Eglinton West LRT Extension – A new underground LRT Station at Eglinton West Station which provides a multi-modal link interchange with the main line TTC and bus routes – Toronto, Canada
- 18 York Street- 28-Story Tower, Toronto, Canada.
- Oqyana World First- Total gross floor area of the islands is about 494,000 m2, Dubai, United Arab Emirates.
- Millharbour Quarter- Four High-Rise Towers (1.2 million ft2 gross floor area), London, UK.
- Richmond Adelaide Centre-100 Adelaide Tower (38 story Tower), Toronto, Canada.
- Heron Quay West- Three High-Rise Towers, London, UK.
- Qatar Integrated Railway Project- Doha Metro- Redline North Underground Stations, Doha, Qatar.
- Riverside South- Two High-Rise Towers, and a Podium, London, UK.
- 20 Fenchurch Street- 38-Story Tower (91,200 m2 gross floor area), London, UK.
- Hotel Dieu Grace Hospital (19,200 m2 gross floor area), Windsor, Canada.

Industries for Construction Equipment Company, Jordan

Design Engineer, July 1999 – August 2002

Duties:

- Design of formwork for bridges, and high-rise buildings.
- Design of reinforced concrete residential buildings.
- Development of construction specifications.
- Conduct site visits and writing reports.

Maunsell Ltd., Beckenham, London, United Kingdom

Engineer-in-Training, June 1999 – August 1999

Duties:

- Construct a number of drawings and specifications for the Copenhagen Metro.

Rafah Municipality, Rafah, Palestine

Engineer-in-Training, September 1999 – October 1999

Duties:

- Design and monitor part of the Rafah Park.

WORKSHOPS:

- CISC continuing education course “Seismic Design of Steel Framed Buildings”, March, 2009.
- CISC continuing education course “Bolting and Welding for Design Engineers”, November, 2007.
- CISC continuing education course “Steel-Framed Commercial Building Design”, March, 2007.
- University at Buffalo CTLR Teaching Workshop for Teaching Assistants, January 2003.
- GIS (Arc View) Workshop at Yarmouk University, (January 02, 2000- January 15, 2000).
- Construction Management (Primavera) Workshop at Jordan University of Science & Technology, (June 28, 1999- July 5, 1999).

PROFESSIONAL AFFILIATIONS

- Registered Professional Engineer, Province of Ontario.
- Member of American Society of Civil Engineers.
- Member of Canadian Society of Civil Engineers.
- E.I.T., New York.

COMPUTER SKILLS

- Programming: FORTRAN 77, FORTRAN 90, Matlab and Maple.
- Engineering graphics: AutoCAD (14, 2000-2006).
- Finite elements: ABAQUS, SAP2000, and MSC PATRAN.
- Engineering software: ETABS, SAP, SAFE, RAM Steel, FASTRAK, S-Frame, S-Steel, RAM Concept, and S-Concrete.

ACTIVITIES

- Middle Eastern Student Club (MESC), Senator – University at Buffalo (August 2004 - September 2005).
- Middle Eastern Student Club (MESC), Treasurer – University at Buffalo (August 2004 – December 2006).