Section VIII. Promotion and Tenure Vita

A. Education and Employment Information

A1. Education

2014	Ph.D., Civil Engineering North Carolina State University Advisors: William Rasdorf and Joseph Hummer
2008	MCE, Civil Engineering North Carolina State University
2007	B.S., Civil Engineering University of Puerto Rico - Mayaguez

A2. Professional Experience

Jan 2015-present	Assistant Professor
1	School of Civil and Construction Engineering
	Oregon State University

B. Teaching, Advising, and Other Assignments

B1. Instructional Summary

B1.1. Credit Courses

Number	Course Title	Term/Year	Credits	Enrollment
CEM 443/543	Project Management for Construction	Winter 2015	4	58
CEM 551	Construction Project Controls	Spring 2015	4	6
CEM 443/543	Project Management for Construction	Winter 2016	4	62
CEM 551	Construction Project Controls	Spring 2016	4	6
CEM 342	Construction Estimating II	Fall 2016	4	66
CEM 443/543	Project Management for Construction	Winter 2017	4	41
CEM 551	Construction Project Controls	Spring 2017	4	8
CEM 342	Construction Estimating II	Fall 2017	4	110
CEM 551	Construction Project Controls	Winter 2018	4	10
CE 507	CE 507 Construction Engineering Graduate Seminar		1	7
CE 406	Project: Construction in Puerto Rico – Codes, Techniques and Methods	Spring 2018	3	6
CEM 443 Project Management for Construction		Spring 2018	4	49
CEM 551	Construction Project Controls	Winter 2019	4	13
CE 507	Construction Engineering Graduate Seminar	Winter 2019	1	9
CEM 443	Project Management for Construction	Spring 2019	4	35
CEM 342	Construction Estimating II	Fall 2019	4	86

B1.2. Non-Credit Courses and Workshops

None

B1.3. Course and Curriculum Development

CEM 551 Construction Project Controls

This course was taught at OSU before and is a required course for MS and PhD students. I restructured this course to address concerns and to improve the connection with other graduate courses. Before teaching it for the first time, I communicated with past students to get their feedback on the course. I was able to develop a schedule for the class that addressed student concerns as well as the topics that I wanted to cover. In further years, I used students and peer teaching evaluations to continue improving the class. I developed learning objectives for the course and made sure that these are complementary to the other graduate courses.

B1.4. Team or Collaborative Efforts

CE 406 Project -Construction in Puerto Rico: Codes, Techniques, and Methods

This course has been developed as part of the Study Abroad program that will be completed in Puerto Rico during Spring Break 2018. The students will be working to improve the facilities of a middle school that was damaged by Hurricanes Irma and María. The learning objectives for the class include designing, planning, and reconstructing the roof of one of the classrooms of the school. This program was developed in collaboration with three faculty members at the College of Agriculture.

B1.5. International Teaching

			" D			D • 1
			# Ke-	Student	College Median*	Required
Course No.		Enroll-	spond-	Evaluation (#1/#2)	(#1/#2)	/Elective
(credits)	Term	ment	ing			
CEM 442/542(4)	Winter 2015	50	15	3.2/3.4 (443)	4.6/4.8 (443)	Required
CEM 443/343 (4)	winter 2015	38	43	Not Available(543)	Not Available (543)	-
CEM 551 (4)	Spring 2015	6	0	Not Available	Not Available	Required
CEM $442/542(4)$	Winton 2016	62	40	3.3/3.5 (443)	4.5/4.7 (443)	Required
CEN1 443/343 (4)	winter 2010	02	49	Not Available (543)	Not Available (543)	-
CEM 551 (4)	Spring 2016	6	0	Not Available	Not Available	Required
CEM 342 (4)	Fall 2016	67	52	3.8/4.0	4.8/4.8	Required
CEM $442/542(4)$	Winter 2017	20	20	3.6/4.0 (443)	5.0/5.2 (443)	Required
CEN1 443/343 (4)	winter 2017	39	29	Not Available (543)	Not Available (543)	
CEM 551 (4)	Spring 2017	8	8	5.8/5.8	5.1/5.3	Required
CEM 342 (4)	Fall 2017	110	66	3.9/4	5.1/5.3	Required
CEM 551 (4)	Winter 2018	10	6	5.9/5.9	5.1/5.3	Required
CE 507W (1)	Winter 2018	7	4	5.8/6	5.1/5.3	Required
CE 406 (3)	Spring 2018	6	1	6.0/6.0	5.0/5.2	Elective
CEM 443 (4)	Spring 2018	49	14	4.0/4.1	5.0/5.2	Required
CEM 551 (4)	Winter 2019	12	10	4.8/5.3	5.1/5.4	Required
CE 507W (1)	Winter 2019	9	7	5.0/5.0	5.1/5.4	Required
CEM 443 (4)	Spring 2019	35	10	5.7/5.9	5.1/5.4	Required
CEM 342 (4)	Fall 2019	85	25	4.4/4.7	5.2/5.4	Required

B2. Student and Participant Evaluations

* College median scores are shown separately for each level (e.g., 400, 500) taught.

B4. Advising

	Student	Degree	Thesis	Graduated
1.	Rebecca Yang	MS	Root Cause Analysis of Transportation	Summer
			Infrastructure Accidents Using Fault Trees	2016
2.	Nahush Montadka	MS	Comprehensive Analysis of PM2.5	Summer
			Pollution from Construction Activities	2017
3.	Sai Akhila Boddi	MS	Estimating Air Pollutant Emissions for	
	Reddy		Nonroad Equipment using EPA MOVES –	Fall 2017
			Case Study of a Building Project	
4.	Deepak Kumar	MS	Optimization of Construction Equipment	Summer
			Efficiency and Cost using Simulation and	2010
			Field Data	2019

B4.1. Graduate Advisees – Completed

B4.2. Graduate Advisees – Current

	Student	Degree	Expected Graduation	Advanced to Candidacy (Y/N)
1.	Asma Sharafeddin	PhD	Spring 2020	Y
2.	Sai Akhila Boddi Reddy	PhD	Spring 2021	Ν
3.	Shafayet Ahmed	PhD	Spring 2021	Ν
4.	Mohammed Alabdulmunem	MS	Spring 2020	
5.	Kanwar Angoj Guleria	MS	Spring 2021	

B4.3. Graduate Thesis or Project Committees

MEng Advisor:

Graduated

1. Manoj Sharana Basava, 2019

Current

None

Minor Professor or Committee Member: *Graduated*

- 1. Ding Liu, PhD, 2019
- 2. Fan Zhang, PhD, 2016
- 3. Catarina Pestana, PhD, 2016
- 4. Chukwuma Nnaji, MS, 2015

Current

- 1. Ziyu Jin, PhD
- 2. Qais Jahanger, PhD
- 3. Ali Karakhan, PHD
- 4. Mohammed Azeez, PhD

Graduate Council Representative: *Graduated*

- 1. Tyler Kirkendall, MS, 2015 (Environmental Engineering)
- 2. Lauren Crandon, PhD, 2018 (Environmental Engineering)
- 3. Adam Talamantes, PhD, 2019 (Education)

Current

- 1. Tanner Bushnell, PhD (Environmental Engineering)
- 2. Hannah Rolston, PhD (Environmental Engineering)
- 3. Bradley Jones, MS (Environmental Engineering)

B4.4. Undergraduate Research Assistants

None

B4.5. Postdoctoral Trainees

None

B4.6. Other Advising

None

B5. Other Instruction Related Assignments

C. Scholarship and Creative Activity

C1. Publications

The candidate's role on joint publications is indicated as part of each entry; if nothing has been included, the candidate's involvement was minor. The candidate should indicate in **bold font** students for which the candidate serves as a major advisor.

C1.1. Books & Book Chapters

None

C1.2. Refereed Journal Publications

- 1. **S. Ahmed** and I. Arocho, "A Comparative Study on a Cross Laminated Timber (CLT) and a Steel Building Construction Project," *Journal of Building Engineering*, Elsevier, 22, 2019, pp. 281-294. (secondary author)
- 2. J. Hummer, I. Arocho and W. Rasdorf, "Approach to Assessing the Tradeoff Between Construction Equipment Fleet Emissions and Cost," *Journal of Construction Engineering and Management*, American Society of Civil Engineers, 43 (5), 2017, 04016122. (primary author, author order rotated by Ph.D. advisor)
- 3. I. Arocho, W. Rasdorf, J. Hummer and P. Lewis, "Time and Cost Characterization of Emissions from Non-Road Diesel Equipment for Street and Utility Projects," *International Journal of Sustainable Engineering*, 10 (2), 2017, pp. 123-134. (primary author)
- W. Rasdorf, P. Lewis, I. Arocho and J. Hummer, "Characterizing Air Pollutant Emissions for Highway Construction Projects," *Smart and Sustainable Built Environment*, 4 (3), 2015, pp. 315-328. (primary author, author order rotated by Ph.D. advisor)
- 5. P. Lewis, H. Fitriani and I. Arocho, "Engine Variable Impact Analysis of Fuel Use and Emissions for Heavy-Duty Diesel Maintenance Equipment," *Transportation Research Record Journal*, 2482, 2015, pp. 8-15. (contributed with text)
- D. Hollar, W. Rasdorf, M. Liu, J. Hummer, I. Arocho and S. M. Hsiang, S. M., "A Preliminary Engineering Cost Estimation Model for Bridge Projects," *Journal of Construction Engineering and Management*, American Society of Civil Engineers, 139 (9), 2013, pp.1259-1267. (contributed with data collection and analysis)
- W. Rasdorf, P. Lewis, S.K. Marshall, I. Arocho and H.C. Frey, "Evaluation of Onsite Fuel Use and Emissions Over the Duration of a Commercial Building Project," *Journal of Infrastructure Systems*, American Society of Civil Engineers, 17 (2), 2013, pp. 119-129. (contributed text and figures)

C1.3. Peer-Reviewed Archival Conference Publications

The following papers appeared in archival proceedings that were distributed to libraries (the next section covers other types of proceedings). The acceptance rate is indicated as part of the entry whenever the selection process was rigorous.

- 1. S.A. Boddi Reddy and I Arocho, "Estimating Air Pollutant Emissions for Nonroad Equipment Using MOVES: Case Study of a Building Project," *Proceedings of the 2018 Construction Research Congress*, American Society of Civil Engineers, New Orleans, LA, April 2018 (secondary author).
- 2. N. Montadka and I Arocho, "Methodology to Measure Real-Time PM_{2.5} Levels in Equipment Cabins," *Proceedings of the 2018 Construction Research Congress*, American Society of Civil Engineers, New Orleans, LA, April 2018 (secondary author).
- 3. W. Rasdorf, J. Hummer and I. Arocho, "Comparison of Construction Equipment Emissions for Seven Construction Projects," *Proceedings of the 5th CSCE/CRC International Construction Specialty Conference*, American Society of Civil Engineers, Paper 17, June 2015, Vancouver, BC (primary author, author order rotated by Ph.D. advisor).
- 4. I. Arocho, W. Rasdorf and J. Hummer, "Methodology to Forecast the Emissions from Construction Equipment for Transportation Construction Projects," *Proceedings of the 2014 Construction Research Congress*, American Society of Civil Engineers, Atlanta, GA, May 2014, pp. 554-563 (primary author).

C1.4. Other Peer-Reviewed Publications

The following papers appeared in proceedings that were distributed primarily to attendees (as CDs, printed volumes, availability through a public website, etc.).

- 1. **S.A. Boddi Reddy** and I. Arocho, Assessment of Hurricanes Post-Disaster in the United States using COBRA Model, *Proceedings of the 7th CSCE/CRC International Construction Specialty Conference*, American Society of Civil Engineers, Laval, Quebec, Canada, June 2019. (secondary author)
- 2. **A. Sharafeddin** and I. Arocho, Post Occupancy Evaluation of Affordable Housing in the USA: Toward Indicators for Sustainable Affordable Housing, *Proceedings of the 7th CSCE/CRC International Construction Specialty Conference*, American Society of Civil Engineers, Laval, Quebec, Canada, June 2019. (secondary author)
- S. Ahmed and I. Arocho, Characteristics of the Emission of Particulate Matters in Construction Site: a Comparative Study on a Timber and a Steel Construction Project, *Proceedings of the 7th CSCE/CRC International Construction Specialty Conference*, American Society of Civil Engineers, Laval, Quebec, Canada, June 2019. (secondary author)
- 4. I. Arocho and **R. Yang**, Analysis of Construction Accidents Using Fault Trees, *Proceedings* of the 6th CSCE/CRC International Construction Specialty Conference, American Society of Civil Engineers, Vancouver, BC, June 2017. (primary author)
- 5. P. Lewis, I. Arocho, S.K. Marshall and W. Rasdorf "Project Based Fuel and CO₂ Emissions Performance of Construction Equipment," *Proceedings of the 3rd International Construction Specialty Conference, Paper CN-014, June 2011, Ottawa, Ontario, Canada* (provided text and graphs)

6. D. Hollar, I. Arocho, J. Hummer, M. Liu and W. Rasdorf. "Development of a Regression Model to Predict Preliminary Engineering Costs," *Proceedings of the 2010 Technical Conference and Exhibit: Meeting Transportation's 21st Century Challenges, March 2010, Savannah, GA* (contributed to data collection and analysis).

C1.5. Papers Currently under Peer Review

1. S.A. Boddi Reddy and I. Arocho, Estimating Air Pollutant Emissions for Nonroad Equipment using MOVES – Case Study of a Building Project, *Journal of Construction Engineering and Management*, American Society of Civil Engineers.

C1.6. Other Publications

C2. Professional Meetings, Symposia, and Conferences

<u>C2.1.</u> Presentations to Professional Groups (includes presentations of papers cited in C1.3)

- 1. Contributed Talk, 7th CSCE/CRC International Construction Specialty Conference, Vancouver, BC, "Characteristics of the Emission of Particulate Matters in Construction Site: a Comparative Study on a Timber and a Steel Construction Project," June 2019
- 2. Contributed Talk, 7th CSCE/CRC International Construction Specialty Conference, Vancouver, BC, "Post Occupancy Evaluation of Affordable Housing in the USA: Toward Indicators for Sustainable Affordable Housing," June 2019
- 3. Contributed Talk, 2018 Construction Research Congress, New Orleans, LA, "Methodology to Measure Real-Time PM_{2.5} Levels in Equipment Cabins," April 2018
- 4. Contributed Talk, 6th CSCE/CRC International Construction Specialty Conference, Vancouver, BC, "Analysis of Construction Accidents Using Fault Trees," June 2017
- Contributed Talk, 5th CSCE/CRC International Construction Specialty Conference, Vancouver, BC, "Comparison of Construction Equipment Emissions for Seven Construction Projects," June 2015
- 6. Contributed Talk, 2014 Construction Research Congress, Atlanta, Georgia, "Methodology to Forecast the Emissions from Construction Equipment for Transportation Construction Projects," May 2014
- 7. Contributed Talk, *3rd International Construction Specialty Conference, Ottawa, Ontario,* "Project Based Fuel and CO₂ Emissions Performance of Construction Equipment," *June 2011*

C2.2. Participation at Invitational Workshops

C3. Grant and Contract Support

List covers grants/contracts on which candidate served as PI or coPI only, including those funded through other institutions. "My share" indicates the amount of funding, if any, over which the candidate had control.

Agency &	PI (and coPIs)	Title	Total	My
Dates			Budget	Share
PacTrans	Hyun Woo "Chris"	Fault Tree Analysis for	\$30,000	\$15,000
(2015)	Lee and Ingrid	Accident Prevention in		
	Arocho	Transportation Infrastructure		
		Projects		
TallWood	Iain Macdonald and	Forging Links Between Land	\$176,000	\$76,000
Design	Ingrid Arocho	and People		
Institute and	_	_		
Oregon Forest				
Resources				
Institute				
(OFRI)				
		Totals	\$206,000	\$91,000

C3.1. Donations

Year	Source	Donation	Approx Value

C3.2. Proposals Currently under Review

Agency	PI (and coPIs)	Title	Budget	Duration

C4. Patents Filed and In Process

None

C5. Other Scholarship and Creative Activities

1. Arocho, I. "The Impact of Transportation Construction Projects and Activities on Emissions," PhD dissertation, North Carolina State University, 2015

D. Service

D1. University Service

- 1. Assistant Director of Outreach and Programming, Office of Institutional Diversity, Search Committee, 2017
- 2. CCE Head Advisor Search Committee, 2017
- 3. Graduation Marshall, 2016
- 4. CCE CEM Faculty Search Committee, 2015-2016
- 5. CCE Writing Coordinator Search Committee, 2015

D2. Service to the Profession

D2.1. Journal Editorships

None

D2.2. Conference and Workshop Organization

Session Moderator

- Infrastructure and Disaster Management (Construction Research Congress 2016)
- Controlling and Preventing Corrosion of Highway Maintenance Fleet Equipment (Transportation Research Board Annual meeting 2014)

D2.3. Conference Program Committees

None

D2.4. Reviewing

- Smart and Sustainable Built Environment Journal
- Journal of Construction Engineering and Management, ASCE (8 reviews)
- Transportation Research Board, Air Quality Committee
- Construction Research Congress, ASCE, 2016, 2014

D2.5. Other

- 1. Member of American Society of Civil Engineers Associate Member 2015 to Present
- 2. Member of Society of Women Engineers (SWE) Professional Member 2015 to Present
- 3. Member of the Transportation Research Board (TRB) Maintenance Equipment Committee 2012 to Present
- 4. Friend of the Transportation Research Board (TRB) Construction Management Committee 2009 to Present
- 5. Friend of the Transportation Research Board (TRB) Air Quality Committee 2011 to Present
- 6. Friend of the Transportation Research Board (TRB) Artificial Intelligence and Advanced Computing Applications Committee 2009 to 2011
- Certified as Concrete Field Testing Technician Grade I by American Concrete Institute (ACI) – 2012 to 2017

- 8. Certified as Concrete Field Technician by North Carolina Department of Transportation 2012 to 2017
- 9. Certified for 30-hour OSHA Construction Safety and Health Program North Carolina 2010 and Puerto Rico 2005
- 10. Engineer Intern, Puerto Rico, 2007
- 11. Inductee to Chi Epsilon, 2011
- 12. Inductee to Tau Beta Pi Honor Society, 2005

D3. Service to the Public

D3.1. Professionally Related

• Willamette Valley Section Society of Women Engineers (SWE) Liaison to the Graduate Student SWE club at OSU

D3.2. Other Public Service

• Rogers Foundation, Board Member, December 2015 to Present

E. Awards

E1. National and International Awards

- 1. Finalist for the ELECTRI International's 2019 Early Career Awards competition
- 2. Selected to participate on the ASCE Excellence in Civil Engineering Education (ExCEED) workshop on June 2016
- 3. Student Travel Grant to attend the Construction Engineering Conference at Seattle, WA, National Science Foundation, April 2014, \$900.
- 4. Student Travel Grant to attend the Construction Engineering Conference at Virginia Tech, National Science Foundation, August 2010, \$1,000.

E2. State and Regional Awards

None

E3. University or Community Awards

- 1. Diversity Enhancement Grant, NCSU Graduate School, Academic Fall 2013, \$1,020.
- 2. Outstanding Teaching Assistant Award, North Carolina State University, March 2013
- 3. Southern Transportation Center, Research Award, \$2,997, Spring 2013.
- 4. Southern Transportation Center, Research Award, \$4,500, Fall 2011- Spring 2012.
- 5. NCSU Graduate School, Preparing the Professoriate Program Participant, 2011-2012.
- 6. "Predicting Preliminary Engineering Cost for NCDOT Highway Projects Using Neural Networks and Bayesian Networks," National Science Foundation, Bridge to the Doctorate Program Fellowship, August 2009-August 2011, \$81,000.
- 7. Outstanding Teaching Assistant Nominations, North Carolina State University, 2008 and 2011.
- 8. Diversity Enhancement Grant, NCSU Graduate School, Academic Year 2010, \$1,000.
- 9. Ed Vick Fellowship Award winner, North Carolina State University, Academic Year 2009, \$2,000.