SELECTED ENGINEERING WORK

STRUCTURAL ENGINEERING PORTFOLIO

RAFAEL CAMILO GUTIÉRREZ MELGAREJO

Ph.D. in Civil Engineering — Structures | FIU

Existing Buildings • Structural Diagnostics • Concrete Restoration

Structural Inspections | Rehabilitation | Construction Coordination

From field observations to clear technical recommendations.





PROJECT PHOTOGRAPHY

Charles R. Drew Middle School, Miami-Dade

Source: original school inspection photo archive

+1 (786) 328-0343 | camiloin920830@gmail.com

PROFESSIONAL PROFILE

FIELD EXPERIENCE. TECHNICAL DEPTH.

Structural engineering experience connecting existing-building assessments, concrete restoration, field inspections and research.

12+ YEARS
International engineering experience

100+ INSPECTIONS
Structural and threshold inspections • M. Hajjar & Associates

01 STRUCTURAL DIAGNOSTICS

Existing-building assessments, visible cracking, deterioration and moisture intrusion.

02 RESTORATION & REHABILITATION

Repair recommendations, strengthening reviews and follow-up inspection planning.

03 FIELD INSPECTIONS & QA/QC

Foundations, reinforcement, concrete systems, drawing checks and technical reports.

04 TECHNICAL COORDINATION

Shop drawings, submittals, field discrepancies and contractor coordination.





Charles R. Drew Middle School • Original inspection photo archive

ACADEMIC FOUNDATION

- Ph.D., Civil Engineering — FIU, 2025
- M.Sc., Civil Engineering (Structures) — FIU, 2024
- M.Sc., Project & Construction Management — Javeriana, 2017

Research: UHPC interfaces and cementitious material durability

+1 (786) 328-0343 | camiloin920830@gmail.com

RAFAEL CAMILO GUTIÉRREZ MELGAREJO

PROJECT 01 | EDUCATIONAL FACILITIES

40-YEAR RECERTIFICATION.

Charles R. Drew Middle School

Building 1 • Miami-Dade, Florida • January 2026

Structural inspection and condition documentation | *M. Hajjar & Associates*

Visual assessment of existing structural components, review of available drawings, photographic documentation and reporting of rehabilitation needs.



Building exterior



Joint condition



Wall condition

01 WALL CONDITIONS

CMU cracking, deteriorated finishes and moisture-related distress.

02 JOINTS & CONNECTIONS

Expansion-joint separation and localized corrosion documented for further evaluation.

03 SLABS & MOISTURE

Localized soffit spalling, drainage concerns and recurring water intrusion recorded in the report.

FROM OBSERVATION TO ACTION

Document conditions → **Identify repair needs** → **Recommend follow-up evaluation**

Source: Building 1 structural report and original school photo archive.
Responsible design professional listed in report: Mohammad Hajjar, P.E.

+1 (786) 328-0343 | camiloin920830@gmail.com

PROJECT 02 | SEISMIC DAMAGE ASSESSMENT

POST-EARTHQUAKE FIELD INSPECTIONS

Visual condition surveys, damage documentation and recommendations for further structural evaluation.



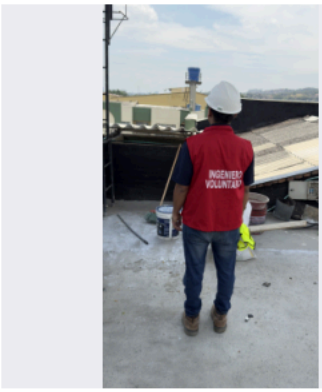
01 Wall condition assessment



02 Field documentation

INSPECTION FOCUS

- Record visible cracking and distress.
- Review walls, slabs, roofs and framing.
- Identify conditions requiring detailed analysis.
- Prepare repair and follow-up recommendations.



03 Exterior condition review

OBSERVE / DOCUMENT / EVALUATE
Support technically informed rehabilitation decisions.

Original photographs from Rafael’s seismic-inspection archive.
Images placed directly; no generative alteration.

PROJECT 03 | CONSTRUCTION INSPECTIONS

REINFORCED CONCRETE PRE-PLACEMENT REVIEW

Campbell Drive Self-Storage | Homestead, Florida

Report 019 • November 6, 2025 • M. Hajjar & Associates



Original report photograph: reinforcing steel before concrete placement.



Penetration detail



Edge and corner reinforcement



Perimeter work area

INSPECTION SCOPE

12-inch slab on grade; vapor barrier; top and bottom reinforcing steel; bar size, spacing, laps and cover.

FOLLOW-UP ITEMS RECORDED

Perimeter horizontal bars; top steel cover; diagonal and corner bars; reinforcement and cover around PVC penetrations.

Inspectors listed: Rafael Gutiérrez / Mike Shojaie. Re-inspection required.
Source: original progress inspection report 019 and its photographic attachments.

PROJECT 03 | FOLLOW-UP & QUALITY CONTROL

FROM FINDINGS
TO VERIFIED CORRECTIONS

Campbell Drive Self-Storage | Homestead, Florida

Reports 019 and 20 | November 6-7, 2025



Report 20: perimeter reinforcement detail



Report 20: reinforcing steel at slab edge

01 IDENTIFY

Report 019 recorded missing perimeter bars, top steel cover concerns, and diagonal/corner reinforcement and PVC penetration details.

02 RE-INSPECT

Report 20 documented a follow-up review of the 12-inch slab on grade, including the vapor barrier, reinforcing steel, laps, spacing and cover.

03 DOCUMENT THE OUTCOME

Report 20 states that the prior corrections were made and approved. Inspection status recorded: ACCEPTED.

Inspectors listed: Rafael Gutiérrez / Mike Shojaie.
Acceptance applies to the inspection scope documented in report 20.
Source: original reports 019 and 20; photographs reproduced from report 20.

PROJECT 03 | TILT-UP CONSTRUCTION

TILT-UP PANEL REINFORCEMENT REVIEW

Campbell Drive Self-Storage | Homestead, Florida

Report 30 • November 21, 2025 • Panels PNL-10 to PNL-19



Original report photograph: tilt-up panel reinforcing steel before casting.



Reinforcement detail



Panel edge reinforcing



Panel casting area

INSPECTION SCOPE

Panel steel size, spacing and cover; perimeter bars, openings and headers; ties, hairpins, diagonals and inserts.

FOLLOW-UP ITEMS RECORDED

Remaining headed-stud plates; lifting-point reinforcement; upright orientation of 90-degree hooks at the upturn beam.

Inspectors listed: Rafael Gutiérrez / Mike Shojaie. Re-inspection required.
Source: original progress inspection report 30 and its photographic attachments.

RESEARCH | UHPC INTERFACE BEHAVIOR

CONCRETE INTERFACES
RESEARCH & TESTING

Doctoral Research | Florida International University

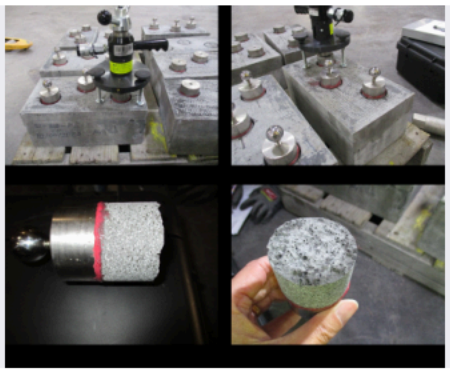
Curing time, surface conditions and interface reinforcement



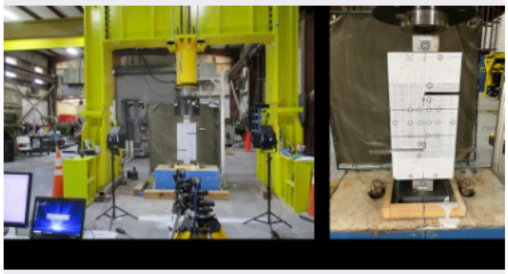
Original dissertation photographs: UHPC mixing, casting and specimen preparation.



Interface specimens



Pull-off testing



Shear push-off testing

EXPERIMENTAL FOCUS

UHPC-to-UHPC interface behavior; 28- and 90-day test ages; surface preparation and crossing reinforcement.

RELEVANCE TO PRACTICE

Evidence for evaluating bond and shear transfer at cementitious interfaces; context for repair and connection design.

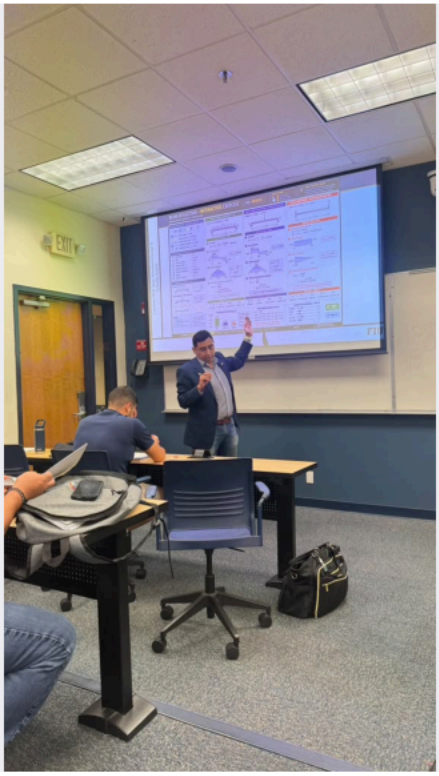
Dissertation: Effect of Curing Time and Conditions Upon Cementitious Interface Behavior.
Source: Rafael Gutiérrez doctoral dissertation draft, experimental-program figures 68, 70, 73 and 83.

TEACHING | ENGINEERING COMMUNICATION

TECHNICAL KNOWLEDGE.
CLEAR EXPLANATIONS.

Adjunct Professor | Florida International University

Structural behavior, construction practice and student mentoring



Classroom instruction



Learning with an engineering student cohort

FROM THEORY TO PRACTICE
Connect structural principles with worked examples, construction conditions and engineering decisions.

FIU COURSE EXPERIENCE

BCN 2405 - Structures I

BCN 4431 - Structural Design II

BCN 4465 - Temporary Structures

TEACHING RESPONSIBILITIES

Lectures and worked exercises

Assessments and student mentoring

Laboratory and technical support

VALUE TO ENGINEERING TEAMS

Experience presenting technical reasoning and connecting analysis with field practice.

Original classroom photographs from Rafael’s personal archive.
Course and appointment information: professional CV, teaching section.

THANK YOU.

Thank you for your time and consideration.
I look forward to discussing how my experience can support your projects.

CONCRETE & STRUCTURAL EXPERTISE

Reinforced concrete • Post-tensioned systems • Tilt-up construction
UHPC interfaces • GRC durability • Concrete restoration & rehabilitation
Structural inspections • Building assessments • Construction coordination

ACADEMIC BACKGROUND

Ph.D. in Civil Engineering | Structures
Florida International University | 2025

M.Sc. in Civil Engineering | Structures
Florida International University | 2024

M.Sc. in Civil Engineering
Project & Construction Management | Javeriana | 2017

B.Sc. in Civil Engineering
Universidad Católica de Colombia | 2013

Research Stay | Cementitious Materials
Universitat Politècnica de Catalunya | Barcelona, Spain

English Language Program | CESL
University of Arizona | Tucson, Arizona

LET'S CONNECT

Rafael Camilo Gutiérrez Melgarejo, Ph.D.
+1 (786) 328-0343
camiloin920830@gmail.com
Miami, Florida