Best Practices for Hurricane Season Utilization of Tower Cranes and Hoisting Equipment

Florida Department of Business and Professional Regulation
Florida Building Commission

and

Engineering School of Sustainable Infrastructure and Environment (ESSIE)
University of Florida (UF)

Project Leader: Jennifer A. Bridge, Ph.D., University of Florida

1. Introduction

Florida Senate Bill 180 directs the Florida Building Commission (FBC) to conduct a research project to assist with the development of minimum criteria/standards for best practices for the utilization of tower cranes and hoisting equipment on construction job sites for construction, demolition, or excavation during the hurricane season. The proposed research scope presented herein by researchers at the University of Florida (UF) is in response to this legislation.

Ensuring that crane collapses and failures are avoided during strong wind events relies on their proper design, construction, installation, operation, and maintenance, as well as the creation and implementation of job site safety protocols. In hurricane-prone regions, most contractors have a hurricane plan for each job site that includes practices such as lowering the crane each evening, switching off power to the crane, and "weathervaning" the crane in response to high wind conditions (allowing the crane to rotate in the wind). There is not currently a standard for the operation and storage of cranes during strong wind conditions, though OSHA directs operators to manufacturer recommendations. Maximum wind speeds and methods for securing cranes during windstorms are provided by the crane manufacturers, with the job site personnel bearing the responsibility for securing the equipment ahead of strong winds.

The proposed research project will draw on the input from an Advisory Group with expertise on the design, construction, operation, inspection, and risk assessment of construction cranes to develop a set of recommended best practices for utilizing cranes during the hurricane season with the purpose of improving job site safety during strong wind events.

2. Scope of Work

Task 1: Recruit and Convene an Expert Advisory Group

The objective of Task 1 is to form a group of experts who can advise on the development of best practices for the use of tower cranes and hoisting equipment on constructions sites during the hurricane season in Florida. These experts will be drawn from crane operator/training organizations, manufacturers, vendors, operators, and inspectors, as well as building officials. The following is a non-comprehensive list of potential advisory group member sources:

- Crane Companies
    - All Crane Rental
    - Beyel Brothers
    - H&E Crane Rentals
    - Liebherr
    - Terex
    - Sims Crane
- Industry Organizations
    - Crane Inspection & Certification Bureau (CICB)
    - Specialized Carriers & Rigging Association (SCRA)
    - National Commission for Certification of Crane Operators (NCCCO)
    - Occupational Safety and Health Administration (OSHA)
- Building departments
    - City of Miami Building Department
    - Cranes and Derricks Division of the New York City Department of Buildings

The Rinker School of Construction Management at UF has an active Industry Advisory Board with membership representing 25 of the largest contractors in Florida. This membership will also be leveraged for connecting with and recruiting potential Advisory Group membership.

The Advisory Group will be asked to meet virtually each month from August 2025 to May 2026 to discuss best practices and develop recommendations for standard practice guiding crane deployment before and during strong wind events in the hurricane season.

- UF ESSIE and Rinker shall convene an Advisory Group with a minimum of eight (8) members; schedule and facilitate monthly, virtual meetings; and collect, process and document the outcomes of the meetings in the development of standard best practices recommendations.

Task 2: Background Review

The objective of Task 2 is to collect and review available documentation on the common causes of crane failures due to strong wind events and on industry practices related to designing and securing equipment against various failure mechanisms caused by wind loads.

- UF ESSIE shall collect and review sources of information on wind-related crane failures, such as news reports, U.S. Department of Labor statistics, and other published documents and develop a summary of the specific wind and job site conditions most likely to result in crane failures. When available, information on the damaging wind events, such as the peak wind gusts, evolution of the wind event, duration of the wind event, and accuracy of the forecasts will be noted.
- UF ESSIE shall review and document crane operation requirements in other jurisdictions (e.g. the Cranes and Derricks Division within the New York City Department of Buildings).

- UF ESSIE and Rinker shall, with assistance from the Advisory Group, request documentation on job site safety protocols, hurricane plans, and best practices from contractors and operators. This information will be summarized to provide a basis for the development of recommendations for minimum safety standards for crane utilization during hurricanes.
- UF ESSIE and Rinker shall provide a report outlining the findings of this review of background information.

Task 3: Develop Recommendations

The objective of Task 3 is to provide recommendations for minimum standards for the use of tower cranes and hoisting equipment during the hurricane season.

- UF ESSIE shall provide the recommended best practices in a final report, including a detailed executive summary, for use by the FBC in their legislative report in response to SB 180. This task will draw on the input from the expert Advisory Group and background review to draft the recommended standards. Recommendations will provide guidance specific to the crane type (e.g. mobile vs. tower cranes) and the wind conditions, including recommended timeframes for action given the availability of weather forecasts and warnings.

3. Staffing

PI: Jennifer A. Bridge, Ph.D., Associate Professor, Engineering School for Sustainable Infrastructure and Environment, University of Florida

Co-PI: Christopher C. Ferraro, Ph.D. P.E., Associate Professor, Engineering School for Sustainable Infrastructure and Environment, University of Florida

Co-PI: James G. Sullivan, Ph.D., Senior. Lecturer and Program Director, M.E. Rinker, Sr. School of Building Construction, University of Florida

4. Proposed Budget

A purchase order will be issued to the University of Florida. This project shall start on date of execution of the purchase order and end at midnight on June 30, 2026. This purchase order shall not exceed $120,000.00 and shall cover all costs for labor, materials and overhead. Payment will be made for the study after the Program Manager and the Florida Building Commission's Hurricane Research Advisory Committee have approved the final report. Additionally, the Contractor agrees to provide additional documentation requested by the Program Manager to satisfy all payment and audit requirements.

5. Deliverables

a. An interim report shall be prepared and delivered by February 28, 2026. The interim report will serve as a progress update that details the current state of research, preliminary results,

and descriptions of any issues that may have been encountered. In addition, the interim report shall be formally presented to the Florida Building Commission's Hurricane Research Advisory Committee at a time agreed to by the Contractor and Department's Program Manager. The due date may be extended with the approval of the Department's Program Manager.

b. A draft final report shall be prepared and delivered no later than May 15, 2026, for comments by the Florida Building Commission's Hurricane Research Advisory Committee. The report shall contain a detailed executive summary and deliverables of the three tasks discussed in Section 2. This shall include a summary of the background information review and recommendations for standard practices for the use of cranes on construction sites during hurricanes. The final report shall be prepared with revisions to address Hurricane Research Advisory Committee comments and delivered by June 15, 2026. In addition, the draft final report and the final report shall be formally presented to the Hurricane Research Advisory Committee at a time agreed to by the Contractor and Department's Program Manager. The due date may be extended with the approval of the Department's Program Manager.

6. Financial Consequences

UF ESSIE is solely responsible for the satisfactory performance of the tasks and completion of the deliverables as described in this Scope of Work. Failure to complete the tasks and deliverables in the time and manner specified in Sections 2 and 5 shall result in a non-payment of invoice until corrective action is completed as prescribed by the program or contract manager.

7. Program Manager

The Program Manager for this project is Mo Madani. Mo Madani's email address is Mo.Madani@myfloridalicense.com and his phone number is 850-717-1825.