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REQUEST FOR PROPOSALS (FEMA)**September 25, 2015****REQUEST FOR PROPOSALS TO CONDUCT TRIAL EVALUATIONS OF
BUILDINGS IN THE UNITED STATES USING THE ATC-78-3 METHODOLOGY**

Proposals are requested from qualified individuals or organizations located in the United States to perform trial evaluations of buildings using the ATC-78-3 Methodology in accordance with this Request for Proposals (RFP). **The proposal submittal deadline is October 30, 2015. Questions concerning this RFP should be submitted by email to atc@ATCouncil.org by October 16, 2015 and answers will be available by October 23, 2015.**

Purpose of Trial Evaluation Program. The primary purpose of this program, funded by the Federal Emergency Management Agency (FEMA), is to obtain and judge relative evaluation results from selected non-ductile concrete frame buildings in high seismic regions of the United States to enable calibration, if necessary, of the methodology described in the ATC-78-3 Report, *Seismic Evaluation of Older Concrete Frame Buildings for Collapse Potential* (ATC, 2015). A secondary purpose is to test the clarity and usability of the methodology and to determine the level of effort required for implementation.

Background. Responding to concerns that available seismic evaluation methods for non-ductile concrete buildings are conservative and expensive, particularly with respect to the risk of global collapse, the Federal Emergency Management Agency (FEMA) started an initiative in 2009 to develop an efficient evaluation methodology to identify older concrete buildings with a high risk of collapse during strong ground shaking. It was reasoned that if all, or most, pre-1976 *Uniform Building Code (UBC)* concrete buildings were evaluated to be deficient using currently available methods, the need for voluntary seismic retrofits or local mitigating ordinances would lack credibility. Although the damageability of older concrete buildings is generally accepted, the life safety risk is thought to come from a small percentage of buildings in this class. However, because of their typically large size, this small percentage of buildings poses a risk to a large number of building occupants. For example, the earthquake in Christchurch, New Zealand, in February 2011 caused damage to hundreds of unreinforced masonry (URM) buildings, killing about 40 people, while the collapse of two concrete buildings killed 140.

ATC-78 Project Series. This FEMA-funded initiative was implemented by the Applied Technology Council (ATC) in a multi-year series of projects known as the ATC-78 Project Series. Following recommendations made in the National Institute of Standards and Technology (NIST) GCR 10-917-7 Report, *Program Plan for the Development of Collapse Assessment and Mitigation Strategies for Existing Reinforced Concrete Buildings* (NIST, 2010), the concept of “collapse indicators” was initially investigated as the basis for an evaluation methodology. This investigation resulted in the ATC-78-1 Report, *Evaluation of the Methodology to Select and Prioritize Collapse Indicators in Older Concrete Buildings* (ATC, 2012). Although the study of collapse indicators resulted in important insights into performance, a method based solely on collapse indicator relationships proved to be impractical. A more direct method, based on story drifts and the resulting potential for column failure and collapse, was subsequently investigated and developed. This effort has resulted in a complete method for the evaluation of frames that is now documented in the ATC-78-3 Report, *Seismic Evaluation of Older Concrete Frame Buildings for Collapse Potential* (ATC, 2015). The resulting methodology is initially limited to frame structures consisting of either lateral force-resisting moment frames or gravity frames consisting of columns and beams, or columns and slabs, which is the focus of this Trial Evaluation Program.

Qualifications to Perform a Trial Evaluation. Individuals or teams must be headed by a registered Professional Engineer in the United States, that is familiar with seismic evaluation and retrofit of concrete buildings, particularly the ASCE/SEI 41-13 Standard, *Seismic Evaluation and Retrofit of Existing Buildings* (ASCE, 2013), or its predecessor documents ASCE/SEI 31-03, *Seismic Evaluation of Existing Buildings* (ASCE, 2003), and ASCE/SEI 41-06, *Seismic Rehabilitation of Existing Buildings* (ASCE, 2007). The lead engineer must have access to complete structural drawings for the concrete building that is proposed for evaluation, and must have permission from the building owner to use the drawings and share the results with the ATC-78 project team.

Selection Criteria. Selection of participants in the Trial Evaluation Program will be based on the type and configuration of the proposed building and on the qualifications of the proposed individual or team. The building proposed for evaluation must be located in regions of moderate or high seismicity in the United States. The desired characteristics of a building proposed for evaluation are:

- constructed using cast-in-place concrete;
- built to standards adopted and enforced prior to the 1976 *Uniform Building Code*;
- beam-column or slab-column frame structural system (either lateral force-resisting or gravity) with little or no concrete walls or stiffening masonry walls;
- 2-12 stories in height;
- previous evaluation using ASCE/SEI 31-03, *Seismic Evaluation of Existing Buildings* (ASCE, 2002), ASCE/SEI 41-13, *Seismic Evaluation and Retrofit of Existing Buildings* (ASCE, 2013), or equivalent, available to enable comparison with the results of the ATC-78-3 methodology; and
- previously retrofitted (a preferred characteristic) to eliminate concerns related to identification of potential earthquake risk.

Participants in the Trial Evaluation Program should have demonstrated professional experience in the evaluation and retrofit of existing buildings, and the ability to meet deadlines in a timely fashion.

Scope of Services. Individuals or teams selected to participate in this Trial Evaluation Program will be invited to attend a four-hour training session (online webinar) on the use of the ATC-78-3 evaluation methodology. Each team will then perform an ATC-78-3 evaluation of the proposed building, using the same site seismic demand used in a prior seismic evaluation (prior evaluation for Collapse Prevention performance is preferred, but Life Safety performance is acceptable). A brief Evaluation Report summarizing the evaluation results will then be submitted to ATC. The report shall include:

- a description of the building, including typical plans and elevations;
- a brief description of the method of calculation, and a summary of the calculations and key intermediate results;
- the final building rating (as defined in the ATC-78-3 methodology);
- a professional opinion of the results and a comparison with prior evaluation results;
- the level of effort required to implement the ATC-78-3 methodology;
- a statement concerning the clarity and usability of the methodology; and
- recommendations regarding the potential development of a standardized calculation spreadsheet.

Following submittal of the Evaluation Report, a four-hour debriefing session will be held with the lead engineers who participated in the trial evaluations.

Subcontract Terms. ATC will engage selected engineers or firms in this Trial Evaluation Program through a subcontract agreement that specifies payment of a fixed fee in the amount proposed, contingent upon successful completion of the Evaluation Report for a specified building and attendance at the training session and debriefing meeting.

Selection Process. In consultation with representatives of FEMA and the ATC-78 project team, ATC will select approximately eleven (11) engineers or firms to participate in this Trial Evaluation Program, based on the selection criteria defined above.

Submittal Requirements. Proposals shall include:

- a brief description of the building to be evaluated, including its general location (city/county) and a summary (printable and readable in 8½ x 11 format) of the structural drawings (for example, typical plan and elevation);
- a brief description of the previous evaluation(s);
- a description of the current status of the building (e.g., vacant, demolished, current occupancy);
- a letter of approval for use of the structural drawings from the building owner (if the building is not demolished);
- a statement of qualifications for the proposed lead investigator; and
- the proposed fee (not exceeding \$10,000).

Proposals must be received by the Applied Technology Council no later than October 30, 2015, and must be submitted by electronic mail with Request for Proposals (FEMA) in the subject line to the following address: atc@ATCouncil.org.

Availability of ATC-78-3 Report. The ATC-78-3 Report, *Seismic Evaluation of Older Concrete Frame Buildings for Collapse Potential* can be downloaded from: <https://www.atcouncil.org/58-frontpage/268-identification-and-mitigation-of-nonductile-concrete-buildings>.

Schedule.

- Announcement of request for proposals: September 25, 2015
- Submittal of written questions: October 16, 2015
- Posting of answers to questions: October 23, 2015
- Submittal of proposals: October 30, 2015
- Selection of trial evaluation participants: November 25, 2015
- Training session (on or about): December 11, 2015
- Submittal of evaluation report: January 8, 2016

Future Requests for Proposals. Development of the evaluation methodology is ongoing, and expansion of the methodology to address concrete wall systems is underway. The following additional Trial Evaluation Programs are currently planned:

- A future RFP funded by the City of Los Angeles Department of Building and Safety (LADBS), to be announced approximately one year from now, that will solicit the involvement of Southern California engineers to conduct a trial evaluation of the methodology for concrete wall buildings located in California.

Response and/or participation in one Trial Evaluation Program will not preclude response and/or participation in future programs.

References.

ASCE, 2003, *Seismic Evaluation of Existing Buildings*, ASCE/SEI 31-03, American Society of Civil Engineers, Structural Engineering Institute, Reston, Virginia.

ASCE, 2007, *Seismic Rehabilitation of Existing Buildings*, ASCE/SEI 41-06, American Society of Civil Engineers, Structural Engineering Institute, Reston, Virginia.

ASCE, 2013, *Seismic Evaluation and Retrofit of Existing Buildings*, ASCE/SEI 41-13, American Society of Civil Engineers, Structural Engineering Institute, Reston, Virginia.

ATC, 2012, *Evaluation of the Methodology to Select and Prioritize Collapse Indicators in Older Concrete Buildings*, ATC-78-1 Report, Applied Technology Council, Redwood City, California.

ATC, 2015, *Seismic Evaluation of Older Concrete Frame Buildings for Collapse Potential*, ATC-78-3 Report, Applied Technology Council, Redwood City, California.

NIST, 2010, *Program Plan for the Development of Collapse Assessment and Mitigation Strategies for Existing Reinforced Concrete Buildings*, NIST GCR 10-917-7, prepared by the NEHRP Consultants Joint Venture, a partnership of the Applied Technology Council and Consortium of Universities for Research in Earthquake Engineering, for the National Institute of Standards and Technology, Gaithersburg, Maryland.