

**Letter of Agreement between
Purdue University, on behalf of its Natural Hazards Engineering Research
Infrastructure (NHERI) – Network Coordination Office (NCO) Center
and
The National Research Institute for Earth Science and Disaster Resilience
on
Earthquake Engineering Research Using E-Defense and NHERI Facilities**

The National Science Foundation (NSF) of the United States of America (USA) launched the Natural Hazards Engineering Research Infrastructure in 2015 and 2016 (<https://www.designsafe-ci.org>). NHERI provides a network of shared state-of-the-art research facilities and tools at universities around the country to help us better understand and resist the impacts of wind, water and earthquake hazards. Three additional components include a network coordination office, a computational modeling and simulation center and a post-disaster, rapid response research facility. This network of facilities located at universities across the United States, linked through cyber-infrastructure ([designsafe-ci.org](https://www.designsafe-ci.org)) is managed and operated through NSF support for the benefit of the United States earthquake wind and coastal engineering communities. Through the NHERI-NCO Center, national and international partnerships as appropriate are built to enhance collaboration and accelerate in the USA and abroad the pace of mitigation of the risk associated with earthquakes, windstorms and associated natural hazards of tsunami and storm surge.

The mission of the National Research Institute for Earth Science and Disaster Resilience (NIED) is to conduct comprehensive fundamental basic study and fundamental research and development in order to increase the level of science and technology for disaster risk reduction and resilience. NIED functions as a core institute so that a diverse range of organizations and personnel from related government agencies, universities/research institutes and private companies can create partnerships for creating new innovations in science and technology for disaster risk reduction and resilience, while aiming to maximize R&D results. NIED implements the steady operation of a foundational observation hub that integrates the land seismic observation network with the ocean area seismic observation network, and also operates its cutting-edge research facilities including the 3-D full-scale earthquake testing facility (E-Defense), large-scale rainfall simulator, and snow and ice disaster simulation facilities, while encouraging joint-usage with external research institutes. NIED developed and constructed the 3-D Full Scale Earthquake Testing Facility (E-Defense) to investigate the full range of seismic behavior of large-scale structures, including the collapse of structures and the damaging effects of earthquakes. E-Defense was completed in early 2005, and testing of full-scale structures commenced mid- 2005.

In consideration of the above, Purdue University on behalf of the NHERI-NCO Center, and NIED (hereinafter, each a “Party” and collectively, the “Parties”) agree to cooperate in the implementation of joint research in earthquake engineering, utilizing NHERI facilities ([designsafe-ci.org](https://www.designsafe-ci.org)) and E-Defense, to the extent possible within the existing laws and regulations of their respective countries, under the conditions as set forth below:

1. Under the Implementing Arrangement for Cooperative Activities in the Area of Disaster Prevention Research (the “Implementing Arrangement”) between the NSF and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan, this Agreement will cover the common understanding for U.S.–Japan joint research on earthquake engineering using E-Defense and NHERI facilities.
2. The purpose of this joint research is to improve scientific knowledge and engineering practice in earthquake-resistant design and retrofit of built infrastructure by conducting

experimental research in earthquake engineering using E-Defense and NHERI facilities.

3. The Parties agree to serve as the principal points of contact between the U.S. side and the Japanese side, and to provide the required mutual liaison on matters of implementation of the joint research program. The NHERI-NCO Center Director is the principal coordinator of NHERI activities under this Agreement. The Executive Vice President of NIED is the principal coordinator of NIED activities under this Agreement.
4. The Parties will establish a Joint Technical Coordinating Committee (JTCC), which will coordinate the implementation of this Agreement and the joint research program. The JTCC shall meet as often as necessary to meet this objective but not less than once per year. The JTCC will be responsible for:
 - (a) Exercising oversight and direction of this Agreement and the joint research and establishing guidelines, as necessary, for the use of the facilities.
 - (b) Reviewing and forwarding to the Parties for approval recommended amendments to this Agreement.
 - (c) Defining the cooperative activities subject to this Agreement.
 - (d) Monitoring and reporting to the Parties the cooperative activities and the joint research program, and providing an annual status report to the Parties.
 - (e) Developing and maintaining guidelines and procedures to be followed by researchers when making application to use E-Defense and NHERI facilities in consultation with the Parties (Item 6)
 - (f) Developing and maintaining policies and guidelines concerning intellectual property rights and inventions for the approval of the Parties (Item 9), and
 - (g) Developing and maintaining data sharing policies and guidelines that reflect the special character of NHERI/E-Defense collaboration for the approval of the Parties (Item 11).

The JTCC will consist of the members listed below. Additional members may be added to the JTCC from time to time, subject to the approval of the Parties:

- (a) Director for NHERI-NCO Center, or his/her representative who will act as Co-Chairperson
- (b) Executive Director, or his/her representative, who will act as Co-Chairperson
- (c) Chair of the NHERI- Council (all NHERI Awardee Principal Investigators), or his/her representative
- (d) Principal Investigator/Project Manager NSF JTCC Award
- (e) President of NIED, or his/her representative
- (f) Principal Investigator/ Project Manager of NIED Project

Working Groups may be established from time to time by the JTCC to assist the JTCC with its responsibilities. In general, the Working Group(s) will comprise U.S. and Japanese earthquake engineering and information technology researchers, selected from those who are actively collaborating on joint research and development projects. These Group(s) will be co-chaired by a U.S. and a Japanese researcher.

5. The Parties agree that the scope of the collaboration on the joint research is as follows:
 - (a) Facilitating experimental research in earthquake engineering, including full-scale earthquake testing of structures.
 - (b) Facilitating research and development in the numerical simulation of seismic behavior and the collapse of structures.
 - (c) Facilitating research and development on cyberinfrastructure systems for the support of a collaboration network in earthquake engineering.

- (d) Organizing research coordination meetings, symposia and workshops.
 - (e) Facilitating research exchange programs.
6. Researchers who plan an experiment using E-Defense and/or NHERI facilities for U.S.-Japan joint research shall follow the application guidelines to use these facilities established by the JTCC. In general, researchers will be expected to submit a preliminary application to use these facilities to the host Party before submitting proposals for funding to sponsoring agencies. Once funding is approved, formal applications will be required according to a procedure to be determined by the JTCC in consultation with NIED and NHERI. The host Party, in its sole discretion, shall approve the use of its facilities based on consideration of the budget, schedule and feasibility (safety review). Participating researchers and users shall observe the laws and regulations of the host country and the rules and regulations of the host Party.
 7. Cooperative activities under this Agreement are subject to and dependent upon the availability of appropriate funds, personnel, and resources, in accordance with the Implementing Arrangement. Unless otherwise mutually agreed, each Party will bear all costs of its activities. The Parties shall make every effort to obtain the funds necessary for these activities. However the provision and availability of funds to conduct experimental research and the cooperative activities are outside the scope of this Agreement.
 8. Fees for using the facilities shall be paid by users in accordance with the schedule of fees to be published by the host Party on an annual basis.
 9. The Parties will provide for the protection of prior existing intellectual property rights and the protection of any intellectual property rights arising out of the joint research and any cooperative activities. The JTCC shall develop policies and guidelines on intellectual property rights and inventions, which shall be approved by both NIED and NHERI. Nothing in this Agreement will prejudice the rights and obligation of each Party under any existing or future international or multilateral agreement related to the protection of intellectual property.
 10. The Parties agree that the results of the joint research shall be made available to the scientific community through the normal publication channels.
 11. The Parties agree that the data and metadata derived from the experiments of joint research shall be stored in an electronic data repository as it is recorded for immediate access by members of the joint research team. In general, data publication shall be in accordance with NHERI Data Curation Guidelines until such time as specific policies and guidelines reflecting the special character of the NHERI/E-Defense collaboration are developed by the JTCC and approved by both NIED and NHERI. The public release of experimental data shall occur no later than two (2) years from the date of the experiment. This period supersedes that required in the NHERI policies and guidelines. It may be shortened by the JTCC with the approval of both NIED and NHERI.
 12. The Parties agree to conduct an annual project review, including an assessment of scientific and technical achievements for the past year, and to plan for the coming year. Additional reviews may be held at the request of either Party to address the terms and conditions of this Agreement and other matters of mutual interest.
 13. The Parties agree to not use the name of the other Party, nor of any member of the other Party's staff, in any publicity, advertising, or news release without the prior written approval of an authorized representative of that other Party.
 14. Purdue University and NIED represent and warrant to each other that they are aware of the

requirements of the United States Foreign Corrupt Practices Act (the "FCPA") and that they will not, and will not allow their owners, employees, representatives, officers, directors, contractors or other agents to take any action in connection with this Agreement or any separate cooperative agreement to provide, offer or promise to provide, or authorize the provision directly or indirectly of, any money, gift, loan, service or anything of value to (i) any government official (or any agent, employee or family member thereof), (ii) any political party or candidate for political office, or (iii) any person, while knowing that all or a portion of such money or thing of value will be offered, given or promised, directly or indirectly, to any of the foregoing in (i) or (ii), for the purpose of obtaining or retaining business or funding, to direct business or funding to any person or entity, or to secure any other improper advantage.

15. This Agreement reflects an arrangement that is currently satisfactory to the Parties. The Parties agree to negotiate additional amendments to this Agreement as required to meet the evolving requirements of the joint research program. Either Party may at any time propose amendments or modifications to this Agreement, which will be placed into effect upon approval by the other Party.

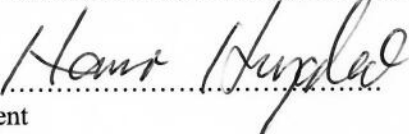
This Agreement will become effective upon the date of signature of the last cooperating Party to execute this Agreement and will continue in force for five (5) years from date of last signature or until modified or terminated by either Party giving written notice three months in advance to the other Party of its intention to terminate this Agreement. In case of termination, any existing joint research projects will be brought to an ordinary conclusion.
For the Natural Hazards Engineering Research Infrastructure (NHERI)



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Director, Sponsored Program Services, Purdue University
On behalf of the NHERI-NCO Center Director

Date: 7/28/17

For the National Research Institute for Earth Science and Disaster Resilience



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President

Date: 13/7/17