Opportunity Title: Characterization of Normal and Ultra High Strength Concrete to High Frequency Direct Shear Loading
Opportunity Reference Code: IC-17-03

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	IC-17-03
How to Apply	**Create and release your Profile on Zintellect** – Postdoctoral applicants must create an account and complete a profile in the on-line application system. **Please note: your resume/CV may not exceed 2 pages.** **Complete your application** – Enter the rest of the information required for the IC Postdoc Program Research Opportunity. The application itself contains detailed instructions for each one of these components: availability, citizenship, transcripts, dissertation abstract, publication and presentation plan, and information about your Research Advisor co-applicant.
Application Deadline	3/31/2017 11:59:00 PM Eastern Time Zone
Description	**Research Topic Description, including Problem Statement**: Direct shear is a sudden and catastrophic failure mechanism that is often associated with high-frequency dynamic loading of reinforced concrete (RC). Direct shear failure is characterized dynamically by the rapid propagation of a vertical crack through the depth of the RC member. This failure type can severely compromise the integrity of an RC member and can result in the complete or partial collapse of the structure. Although there has been previous research on this topic, the details of the high frequency direct shear failure mechanism are still largely unknown. An improved understanding of the relationship between construction parameters (e.g. concrete strength, soil cover, geometry, amount and type of reinforcing, and boundary conditions) and reinforced concrete (RC) member performance is sought. This includes understanding the effect of increasing concrete strengths from normal strength concrete (NCS) up to and including ultra-high performance concrete (UHPC). **Example Approaches:** An approach may be to perform a parametric study using numerical simulations. Previous tests and studies can be used to inform the initial numerical models. Testing can then be used to improve and validate the numerical models. Testing may include precision impact tests designed to gain a comprehensive understanding of high frequency direct shear behavior in RC members to include both NSC and UHPC. Concrete parameters (e.g., material type and its ingredients, its strength, structural and geometrical details, presence of steel fibers, main reinforcement ratio, and specimen geometry) might be investigated.

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Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Business** (11 👁)
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (6 👁)
  - **Computer, Information, and Data Sciences** (16 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (45 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Other Non-Science & Engineering** (13 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (28 👁)