

## **REQUEST FOR EXPRESSIONS OF INTEREST (CONSULTING SERVICES– FIRMS SELECTION)**

INDIA

Disaster Mitigation and Management Centre  
Department of Disaster Management  
Government of Uttarakhand

**Assignment Title: Non- Structural Retrofitting of 400 schools buildings in District Rudraprayag and Bageshwar for the State of Uttarakhand**

**Reference No.** \_\_\_\_\_

National School Safety Program (NSSP) is being implemented in 400 schools of Rudraprayag and Bageshwar District of Uttarakhand. One of the key activities in this project is identification of Non- structural risks in various constituents of the schools building namely classrooms, administrative block, multipurpose hall, science laboratories, kitchen, office, staff rooms etc.

The consulting services (“the Services”) shall have objective to assess the non structural seismic performance of the buildings and its various constituents of school buildings in district Rudraprayag and Bageshwar of the state to prevent non-structural damage to buildings, for minimizing the affects of Earthquake. The work would also provide the sustainable and cost effective measures to ensure lesser impact of the Earthquake to the habitation and infrastructure of the state. The following activities are enlisted to be carried out as below:

- 1- Survey of 400 Schools and Identification of various non-structural hazards in those schools.
- 2- Non-structural mitigation measures in 400 School buildings.
- 3- Preparation and submission of report of work done in 400 Schools to Department of Disaster Management after assigned tasks.
- 4- Furnishing financial report for the expenditure incurred for surveying and implementation of work.
- 5- Documentation of progress work including videography of process events.

The Disaster Mitigation & Management Centre, Department of Disaster Management, Government of Uttarakhand now invites eligible consulting firms (“Consultants”) to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The short listing criteria are as following:

1. The firm should have experience in Non- structural mitigation of existing buildings of different types mainly Masonry and RCC buildings.
2. The firm should have experience of generating Non- structural mitigation schemes of existing building
3. The firm should have experience of earthquake resistant construction consultant services.
4. The firm should demonstrate that they have enough technical capacity (including personnel) in handling such projects;
5. The firm should have prior working experience in similar kind of projects.
6. The firms should have an annual turnover of at least INR 30 lakhs in any of the financial years in last 05 years.

Expressions of interest (EOI) must include:

- Introductory letter on letter head (with complete contact details – name of contact person, mailing address, telephone, fax, email etc.) expressing the willingness for the project and explaining how the firm is best suited to conduct the study
- Organization profile
- Financial statement of turnover of qualifying year (which meet criteria of financial eligibility).
- A Presentation in hard copy having the past experiences of the firm on all projects mentioned above and financial turnover.
- The EOI should contain sufficient supporting document to substantiate the claim of the Consultant towards their qualification as per the short listing criteria.
- Technical and Financial proposals must be in separate envelopes.

Consultants may associate with any other firms/societies in the form of a joint venture or a sub- consultancy. The submission should clearly state the nature of Association (JV or sub-consultant).

Further information can be obtained at the address below during office hours from 1000 hrs to 1700 hrs.

Expressions of interest must be delivered in a written form to the address below (in person, or by post) by 06<sup>th</sup> January, 2017.

**Executive Director**  
**Disaster Mitigation & Management Centre**  
**Department of Disaster Management**  
**Secretariat Campus,4, Subhash Road, Dehardun**  
**<http://dmmc.uk.gov.in>**

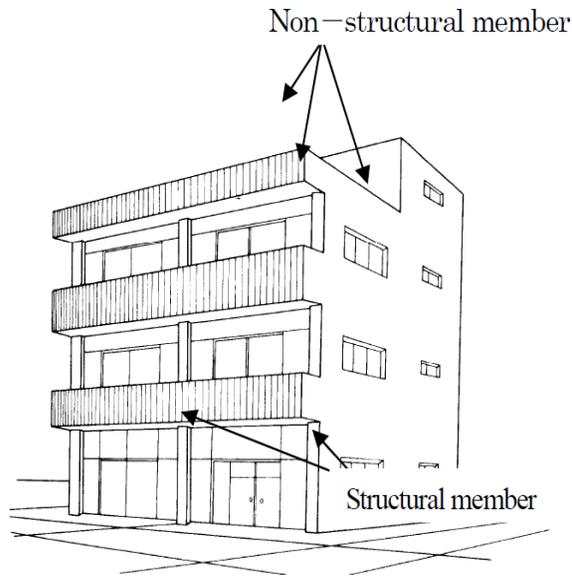
## **Terms of References**

### **Non- Structural Retrofitting of School Buildings in Uttarakhand**

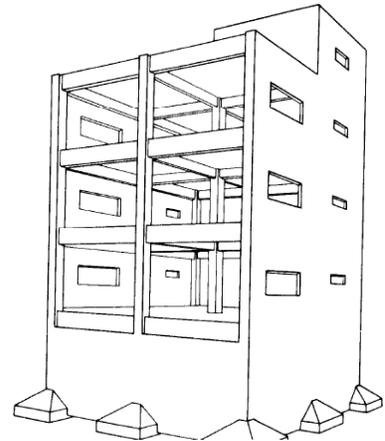
#### **1.0 Introduction:**

Securing the safety of school facilities against earthquakes is important because children spend large portion of their time studying and playing at schools. The school buildings are also often utilised as emergency evacuation facilities by the local community on the aftermath of a disaster. Retrofitting is a technique by which seismic performance of infrastructure is improved by making structures more resistant against the seismic forces. Generally the structures (building) are divided into two components; structural and non-Structural. Some of the structural components include (i) bearing wall system, (ii) building frame system, (iii) moment-resisting frame system and (iv) cantilever column system.

Some of the non- structural components of the building include (i) architectural features such as exterior cladding and glazing, ornamentation, ceilings, interior partitions, and stairs, (ii) mechanical components and systems including ducts, elevators, pumps, and emergency generators, (iii) electrical components including transformers, switchgear, motor control centers, lighting, (iv) fire protection systems including piping and tanks and (v) plumbing systems and components including piping, fixtures, and equipment.

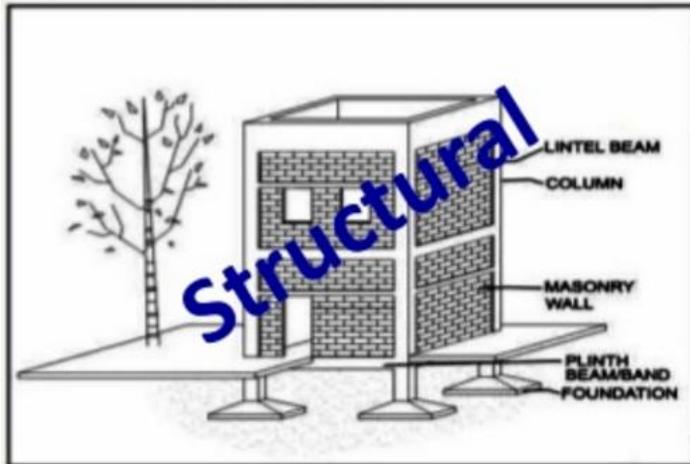


Overall structure  
(structural + non-structural members)

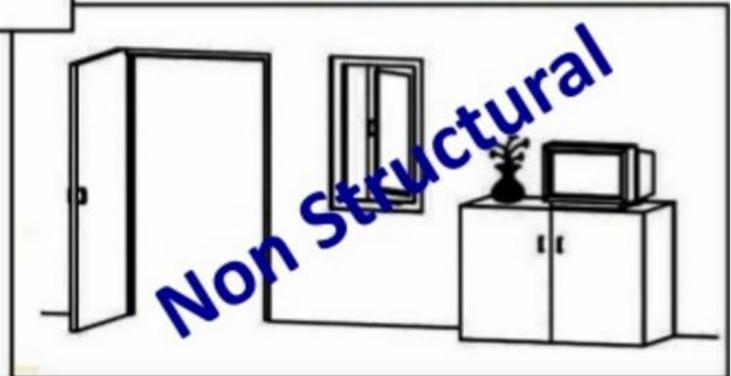


Only structural member

**What is "Structural"?**



**What is "Non-Structural"?**



## **2.0 Causes of Non-structural Damage**

Earthquakes shake the ground in all directions. Because of this multi-directional shaking, the structural and nonstructural elements of a building must be specially designed to resist earthquake forces in a variety of directions. Structural and nonstructural elements of a building

that are not secured to resist expected earthquake shaking pose a hazard to building occupants.

Earthquake ground shaking has three primary effects on nonstructural elements in buildings. These are inertial or shaking effects, distortions imposed on nonstructural components when the building structure sways back and forth, and separation or pounding at the interface between adjacent structures.

File cabinets, emergency power generating equipment, freestanding bookshelves, office equipment, and items stored on shelves or racks can all be damaged from the effect of inertial forces. When unrestrained items are shaken by an earthquake, inertial forces may cause them to

slide, swing, strike other objects, or overturn. Items may slide off shelves and fall to the floor.

One common misconception is that large, heavy objects are stable and not as vulnerable to earthquake damage as lighter objects, perhaps because we may have difficulty moving them. Because inertial forces during an earthquake are proportional to the mass or weight of an object,

a heavily loaded file cabinet requires much stronger restraints to keep it from sliding or overturning than a light one with the same dimensions.

## **3.0 General Principles and Concepts**

**Non-structural/Architectural Repairs:** The buildings affected by earthquake may suffer both non-structural and structural damages. Nonstructural repairs may cover the damages to civil and electrical items including the services in the building. Repairs to non-structural components need to be taken up after the structural repairs and retrofitting work are carried out. Care should be taken about the connection details of architectural components to the main structural components to ensure their stability. Non-structural

and architectural components get easily affected/dislocated during the earthquake. These repairs involve one or more of the following: a) Patching up of defects such as cracks and fall of plaster; b) Repairing doors, windows, replacement of glass panes; c) Checking and repairing electric conduits/ wiring; d) Checking and repairing gas pipes, water pipes and plumbing services; e) Re-building non-structural walls, smoke chimneys, parapet walls, etc; f) Re-plastering of walls as required; g) Rearranging disturbed roofing tiles; h) Relaying cracked flooring at ground level; and j) Redecoration — white washing, painting, etc.

#### **4.0 Scope of work**

The Scope of the present work is to reduce future damage from earthquakes are for the 400 schools in Uttarakhand district (200 are from Rudraprayag and 200 from Bageshwar district) is to non structural retrofitting structures in high seismic hazard areas to reduce the effects from earthquakes. A seismic rehabilitation or retrofit project can take the form of either a structural retrofit or a non-structural retrofit. The non-structural portions of a building include every part of the building and all its contents with the exception of the Structure; in other words, everything except the columns, floors, beams, etc. Common non-structural components include ceilings, windows, office equipment, computers lab, water tank, inventory stored on shelves, file cabinets, ventilating, electrical equipment, furnishings (Table and Chair), lights, almirahas, etc. Following are the key activities under this project:

- 6- Survey of 400 Schools and Identification of various non-structural hazards in those schools.
- 7- Non-structural mitigation measures in 400 School buildings.
- 8- Preparation and submission of report of work done in 400 Schools to Department of Disaster Management after assigned tasks.
- 9- Furnishing financial report for the expenditure incurred for surveying and implementation of work.
- 10- Documentation of progress work including videography of process events.

#### **5.0 Procedure**

Following procedure can be adopted for non-structural mitigation measures in the school buildings:

- Collect detail information of all the schools.
- Information regarding the applicable Hazard Mitigation Plan for each school.
- Descriptions of the hazard, the problem, and the project.
- Property inventory of each school.
- Description of the decision-making process and evaluation of alternatives.
- Schedule for completing the scope of work.
- Cost estimate.
- Implementation of non structural retrofitting measures in each school.

## **6.0 Steps to be adopted**

### **STEP 1: Gather Hazard Information for the Project Area.**

Information regarding seismic hazard level can usually be obtained from the different sources like BMPTC or DMMC for the community in which the project is located.

### **STEP 2: Prepare a Property Inventory**

For every school following property related information would be gathered.

- 1- Building type, number of stories, foundation type** (slab, basement, pier or post, crawl space) and **floor area**.
- 2- Occupancy** - average occupancy for a 24/7/365 basis.
- 3- Mitigation project useful life.** This is the estimated amount of time (in years) that the mitigation action will be effective.
- 4- Mitigation project cost.** This is the estimated total cost of the proposed mitigation action.
- 5- Replacement value of contents** and the method used for determining the value. Contents include items like furniture, office equipment, personal belongings, and non-permanent room dividers.

### **STEP 3: ALTERNATIVE SOLUTION**

Evaluate the project for feasibility and cost effectiveness, and the sub-applicant must describe why the proposed project is the best solution to the problem.

### **STEP 4: Project Cost**

All costs should be reflected in the project scope of work. Project costs should include all costs associated with non structural retrofitting of the structure. These costs should be shown in an itemized cost estimate and for all major components of the proposed project.

### **STEP 5: Seismic Non-Structural Retrofitting**

Describe the non structural retrofitting actions to be taken in the buildings.

### **STEP 6: Non Structural Retrofitting Process**

- As a safety precaution, the community should consider the installation of fencing that restricts entrance onto the site and placement of signage to secure the property.
- Coordinate utility disconnections with electricity, gas, and water pipelines.

## **7.0 Time Schedule**

The various activities are been divided in 10 phases which are mentioned below:

<b>Sl. No.</b>	<b>Particular's</b>	<b>Time Schedule (Days)</b>	<b>Payment</b>
Phase 1	Preliminary survey of 10 School buildings ( 5 in Rudraprayag and 5 in Bageshwar)	T+5 days	10 %
Phase 2	Submission of Report of Preliminary survey to Department of Disaster Management	T+10 days	
Phase 3	Demonstration of Non-structural mitigation activity in 03 schools (01 GIC, 02 primary schools) in each district, i.e., Bageshwar and Rudraprayag	T+15 days	20%
Phase 4	Organisation of one day workshop on 'Non-structural Mitigation Measures in Schools' in each district , i.e., Rudraprayag and Bageshwar	T+20 days	

Phase 5	Detailed Survey of all 400 Schools	T+35 days	20%
Phase 6	Submission of Report to Department of Disaster Management with estimated budget required to implement Non-structural measures in Schools	T+40 days	
Phase 7	Evaluation of report by technical committee constituted by Department of Disaster Management	T+45 days	
Phase 8	Implementation of non structural mitigation measures in all 400 schools.	T+ 90 days	
Phase 10	Submission of Report on each school to Department of Disaster Management for completion of works	T+100 days	50%

## **Disaster Mitigation and Management Centre**

### **Tender Notice**

Technical and financial proposals are invited from eligible firms / agencies for undertaking the non structural mitigation survey and measures in 400 identified schools of Rudraprayag and Bageshwar districts. The detail document can be downloaded from web site of Disaster Mitigation and Management Centre (<http://dmmc.uk.gov.in>). The proposal must be signed, stamped and certified by the authorized person of the firm and submitted in person or by post on or before 06 January, 2017.