



NATIONAL CENTRE FOR SEISMOLOGY



MINISTRY OF EARTH SCIENCES
NEW DELHI

EOI CUM LIMITED TENDER DOCUMENT

FOR

**“GEOTECHNICAL AND GEOPHYSICAL INVESTIGATIONS
OF EIGHT CITIES (PATNA, MEERUT, AMRITSAR, AGRA,
VARANASI, LUCKNOW, KANPUR AND DHANBAD)**

UNDER THE PROJECT

“SEISMIC MICROZONATION OF 30- CITIES IN INDIA”

Limited Tender Notice No. **SFS-CS/EHRA/3/2013-2016/3(B)**

NATIONAL CENTER FOR SEISMOLOGY
MINISTRY OF EARTH SCIENCES
NEW DELHI

SFS-CS/EHRA/3/2013-2016/3(B)
National Center for Seismology
Ministry of Earth Sciences,
IMD Campus, Lodhi Road, New Delhi . 110003

Dated: 11th December 2018

**EoI -Cum - LIMITED TENDER FROM POTENTIAL ORGANIZATIONS / INSTITUTES FOR
SEISMIC MICROZONATION OF PRIORITY CITIES**

In the context of Geotechnical and Geophysical Investigations under the Project **Seismic Microzonation of 30-Cities in India** [Hereinafter referred to as Seismic Microzonation] and on behalf of the President of India, National Centre for Seismology (NCS), Ministry of Earth Sciences (MoES), Government of India, (hereinafter called NCS-MoES) invites Limited Tender from potential Academic and Research organizations / Institutes in India as the Prime bidder (Hereinafter referred to as **PRIME BIDDERS, which are only bidder**), namely **IIT-Patna; IIT Kanpur; IIT (ISM)-Dhanbad; IIT-Hyderabad; IIT-Delhi; IIT-Kharagpur; IIT Roorkee; IIT-Guwahati; National Geophysical Research Institute (NGRI)-Hydrabad; Institute of Seismological Research (ISR)-Gandhinagar; Geophysics Division-BHU; IISc-Bangalore, and other institutes of Govt. of India/States of repute having credentials of doing similar works** to conduct Seismic Microzonation as per the guidelines of the approved RFP (www.moes.gov.in) document for the cities on priority basis namely **Patna, Meerut, Amritsar, Agra, Varanasi, Lucknow, Kanpur and Dhanbad** from the list of the approved 30-cities under the project Seismic Microzonation of 30-cities in India subject to their technical and financial qualifications. The priority of selecting above mentioned cities for Seismic Microzonation studies is based on several parameters as described under the approved RFP for Seismic Microzonation (www.moes.gov.in)

Technical bid (**Annexure-A**) and Financial bid (**Annexure-B**) evaluation of the proposed proposals received from the prime bidders for the specified city will be made by the competent Technical as well as Financial Evaluation committees of Govt. of India, constituted by NCS-MoES to adjudge the suitability based on various technical and financial parameters of all the applicants for the said job.

The proposed award of work to the selected prime bidders for the corresponding cities would be carried out as per the approved technical guidelines of NCS-MoES for conducting the study (A manual of Seismic Microzonation and Seismic Microzonation Handbook: www.moes.gov.in) under the scope of the work as per the guidelines given in the approved RFP (www.moes.gov.in). Applicants from the Prime Bidders must have proven track record of conducting the Seismic Microzonation. However, the work components may be completed in the joint venture with the Govt institutions/private

firms without compromising the quality of the work. The partner organisation(s) name(s) need to be informed by the Prime Bidders to NCS-MoES along with their technical bids.

All interested Prime bidders are requested to apply for conducting the Seismic Microzonation study as per the guidelines mentioned in the RFP (www.moes.gov.in) for their specified city / cities from the list given above within the three weeks of publication of this limited tender through e-procurement tender (online e-procurement website <http://eprocure.gov.in/eprocure/app> in two bid pattern [Technical and Financial] from qualified academic / research institutes for procurement of work Geotechnical and Geophysical Investigations under Project title SEISMIC HAZARDS MICROZONATION OF 30-CITIES OF INDIA FOR PRIORITY 8-CITIES of National Centre for Seismology (NCS), Ministry of Earth Sciences along with two copies in sealed envelope clearly super scribing on top of the envelope LIMITED TENDER for Seismic Microzonation of the Priority cities from the list of 30-cities in India. Name of the Institute, Limited Tender No.; and Date & Time shall also be clearly written on the sealed envelope. Sealed envelope containing Limited Tender in two parts (Technical & Financial) shall be submitted within the closing date of the Limited Tender at the following address:

. The tender document is available on www.moes.gov.in; www.imd.gov.in & <https://eprocure.gov.in/eprocure/app>

To:

The Program Head

Seismic Hazard and Risk Assessment Division
National Centre for Seismology-Ministry of Earth Sciences,
Room no-1, EREC Building, IMD
MausamBhavan, Lodhi Road
New Delhi-110003

1. QUALIFICATION CRITERIA:

Since all the institutions are under centre/state government, therefore following may kindly be noted for the limited tendering process:

1. Prime Bidders must have proven track of conducting the Seismic Microzonation study. However, the work components of the Seismic Microzonation may be completed in the joint venture with the Govt institutions/private firms without compromising the quality of the work with no involvement of extra finance of NCS-MoES.
2. The partner organisation(s) name(s) need to be informed by the Prime Bidders to NCS-MoES.
3. There is no fee for limited tendering process for Prime Bidders to apply for it.

4. Prime Bidders as the Academic / Research Institutions of Government of India, so no need to furnish an earnest money deposit (EMD) / Performance guaranty. But, if the associate / partner companies / agency / organisations of the Prime Bidders belongs to the category of private agency / company / organisation, then the associate / partner companies / agency / organisations must submit a requisite performance Guaranty to its concerned qualified Prime Bidder and a copy of which also to be submitted by the Prime Bidder to NCS-MoES, New Delhi before signing the MoU between the qualified Prime Bidder and NCS-MoES for the specific qualified city to be investigated for seismic microzonation study. A prior declaration on submission of requisite performance Guaranty from the associate / partner must be taken by the Prime bidders and to be submitted to NCS-MoES at the time of bidding.
5. Head of the Institute / Organisation of the qualified Prime Bidders have to sign MoU with NCS-MoES for completion of the work of Seismic Microzonation with every respect in accordance to the guidelines described in the approved RFP document as well as per the published documents: % manual of Seismic Microzonation and Seismic Microzonation Handbook+(www.moes.gov.in).
6. There should also be declaration by the Head of the Institute / Organisation of the qualified Prime Bidder as in case of failure of completing the assigned jobs as per MoU, the entire paid amount towards investigation to his / her institute / organization will have to be returned with the interest of 18% to NCS - MoES and declaration also contains that other necessary action whatever deemed fit to be taken by NCS-MoES, including the initiation of the process of black listing of the institute in case, the institute found failed in completing the assigned job as per the above mentioned guidelines to the satisfaction of NCS-MoES.
7. Audited financial Information for the last 3-years indicating annual turnover, Profit / loss are not required for the prime Bidders as these are the research / academic institutions /organisations/Universities. However, the Prime Bidders may take these information from their associates / partner if those are of private institute or agency.
8. Approval from the Head of the institution is required for participating in the limited tendering process.

All other conditions/criteria related to the limited tendering are as per the approved RFP (www.moes.gov.in) document by NCS-MoES.

2. OBJECTIVES TO BE ACHIEVED BY THE BIDDER INSTITUTION/ORGANISATION/UNIVERSITY:

- The work should be completed as per the guidelines described in the published and approved publications, %Seismic Microzonation Handbook; and Seismic Microzonation Manual documents by the Ministry of Earth Sciences.
- To delineate engineering bedrock configuration,

- To map out soil stratigraphy and lateral variations in soft sediments to supplement geological observations,
- Determination of Shear wave velocity of soil layers,
- To ascertain Soil Stratigraphy and define Geotechnical attributes of layers; creation of database of mutually validated geotechnical properties obtained from in-situ field tests and attributes ascertained based on laboratory examination specially of undisturbed samples,
- To generate parameters for different site typologies of targeted cities required for ascertaining transfer function following numerical methods using SHAKE, DYNEQ software etc.
- In reference to prognosticate earthquake induced ground deformation assessment and evaluation of liquefaction susceptibility, generate validated data base in specified format.
- Generating multi thematic maps viz. soil classification map, N value maps for different depth zones, liquefaction susceptibility maps, Vs 30 map, etc.
- Generation of subsurface lithological distribution, different lithological cross section in cities etc in grid pattern on 1:25,000 scale; 1:10,000 scale for smaller cities (Area <150 Sq km).
- Data generated in various investigations of the field and lab will be used for Integration of multi-thematic data in GIS base and preparation of ground Condition Map based on holistic Geotechnical Characterization and a complete final report must be submitted after approval by NCS-MoES, Govt. of India to NCS-MoES. The report will be the report of National Centre for Seismology (Ministry of Earth Sciences) on Seismic Microzonation of the Specific City investigated by the concerned qualified Prime Bidder.

3. SCOPE OF THE WORK:

According to the nature of work, the work components have been divided in five categories (I, II, III, IV, & V) as given below and detailed in **Tables1 – 6**, as given in **Annexure-A**.

Mobilization/Demobilization (Category-I): Mobilization/Demobilization of machinery, equipments, deployment of technical/non technical staff/personals, and expenditure on camping to the respective city for conducting geotechnical/geophysical investigations detailed in following categories. The rates are to be quoted city wise.

Survey (Category-II) (optional): Survey related to identification of sites for geotechnical geophysical investigations, contact with local government officials, private land owners, collection of N.O.C for government/private land owners for conducting field investigation. The rates are to be quoted city wise.

Geotechnical investigation (Category III): boreholes at different specified sites spread over the city up to 30 m depth, conducting SPT, disturbed and undisturbed sampling and routine laboratory tests for Index Properties and SCPT/DCPT (10%). The drilling is to be carried out by Hydraulic rig only. In case hard rock is encountered before reaching 30 m depth, core drilling has to continue for 3 m more in the rock. The

rates are to be quoted for per unit of specified components, which will be applicable for all the cities.

Geotechnical investigations (Category IV) (Optional) : Special laboratory test for dynamic soil property: Resonant Column test, Cyclic Triaxial tests on representative soil samples collected at selected locations of category I and II. The rates are to be quoted for per unit of specified components, which will be applicable for all the cities.

Geophysical investigations (Category V): At specified sites spread over the city, (i) Single station Microtremor survey for H/V analyses leading to predominant frequency distribution and evaluation of 1D shear wave velocity (ii) Shear wave velocity using Designated Multichannel Analysis of Surface Waves method (MASW), (iii) Shear wave velocity using Down Hole Test (DHT), up to 100 m depth along with conducting prescribed tests in same borehole as specified in Category III.

Complete GIS-based Report on Seismic Microzonation of the City (Category VI)

Final complete Report/ Reports with maps in A0-size must be submitted to NCS-MoES by the Prime Bidder. The report must contain all layered information in GIS-based format along with their prints. In hard (40-copies) and soft copies of the report and data files, processed records, maps, interpretational details of results need to be submitted to NCS-MoES by the qualified Prime Bidder on completion of the investigation of the city / cities. Final complete GIS-based Report along with entire data format containing all estimated parameters must be prepared in accordance to the guidelines given in the **Seismic Microzonation Handbook and Seismic Microzonation Manual** (www.moes.gov.in) and in consultation with NCS-MoES

4. GUIDELINES TO BE FOLLOWED DURING FIELD OPERATIONS

The present proposal is for geotechnical and geophysical investigations in various cities given above. It is mandatory that both types of investigations are to be carried out by same Institution.

Under geotechnical investigations Borehole drilling city-wise down to 30 m depth from existing ground level and conducting Standard Penetration Test (SPT) at 1.5 m intervals or at the changes of strata (IS:2131-1981) are to be carried out. The standard penetration test (SPT) is to be performed during the advancement of a soil boring to obtain an approximate measure of the dynamic soil resistance, as well as a disturbed drive sample (split barrel type). DCPT and SCPT will also be performed in the close proximity of the selected borehole locations (i.e., 10% of total sites). The details of the field tests are given in **Tables 1 to 6 (Annexure-A)**. The following conditions are to be noted while carrying out field investigations:

- i. In the same borehole DS, UDS and SPT will have be conducted as per relevant IS code. Special care is to be taken for collecting UDS by deploying suitable machine

- preferably hydraulic type machine and using appropriate samplers.
- ii. The Prime Bidders will have to provide bore logs as per the template provided by NCS-MOES in both hard and soft copies. Data sheet for preparing bore logs are given in IS:2131-1985. NCS/MoES may make necessary changes in the bore log format suiting the same for incorporating in GIS format and other requirements.
 - iii. SPT equipment need to be calibrated before their use in the field and the calibration sheets should be submitted to the NCS/ MOES.
 - iv. Wherever rocky strata is encountered within 30 m depth, boring will have to be made at least 3 m within the rock strata along with rock core sampling followed by laboratory tests for Designated Scientific classification (IS:11315 pt. 11-1985).
 - v. Collecting disturbed (DS) and undisturbed (UDS) samples as per IS:2132-1972, which after relevant laboratory tests and visual examinations, will be used for the Designated Scientific classification of the soil.
 - vi. There may be some unavoidable or unforeseen circumstances in field works wherein operations such as SPT, DS, UDS, rock boring etc. might go beyond control. In some cases extraction of the samples from samples might go wrong in the laboratory. It may also happen that results may not be acceptable due to poor quality samples/samplers. Under such situations (if any) the total no. of field and laboratory tests in each or all the boreholes are subject to the site conditions encountered during actual operations. However, any vital operation/information if not provided or obtained by the Bidder during field operation, it will be considered as a lapse on the part of Bidder. The Prime Bidder shall be required to repeat some of the vital field/laboratory tests wherever found necessary at Prime Bidder's own cost.
 - vii. Due to various unforeseen situations met during field test it may not be possible to obtain undisturbed samples at all specified locations as per IS code. It may also happen that at some particular site only clayey (where sieve analysis is not required) or sandy soils (where hydrometer analysis is not required) are sampled. In such cases, no. of tests actually performed will be counted for payment as per unit rate. Failure to provide any reliable sample or tests data either in the field or laboratory will be considered as lapse on the Bidder's part. In vital cases, if relevant samples or information or data are missing or failed, then the Prime Bidder will be held responsible. Repeating of some of the tests (field or laboratory) by the Prime Bidder will be at the discretion of MOES/NCS.
 - ix. Under geophysical investigation during down hole test, SPT, collection of soil samples (DS & UDS) should be carried out in same borehole.

5. GUIDELINES TO BIDDER INSTITUTE/ORGANIZATION/UNIVERSITY

- i. The specifications of any work, if not given or mentioned in this document the work shall be carried out in all respects in accordance with BIS specifications and / or the instruction of NCS - MoES official in-charge from time to time. BIS reference has been given for each test, however, if it is found to be irrelevant for that particular test, it may be brought to the notice of NCS-MoES officials and correct BIS codes should be used.
- ii. All equipments and machineries related to excavations, digging, preparing working platforms, boring, testing and collecting representative samples as per

specifications are to be carried out by the Prime Bidder (**Annexure-C**). The Prime Bidder shall ensure safe operation of the equipments subjected to the minimum disturbance / hazard to the neighborhood during entire period of working at all sites. After the work is completed proper replenishment of the site, e.g., filling of the pits / boreholes, has to be made to the full satisfaction of the site owner/agencies.

- iii. NCS-MoES shall facilitate in arranging the necessary ~~no~~ objection+from the site owner before actual drilling through intervention of local administration by issuing letters. The same has to be produced before the authorities for taking their assistance. All field and laboratory exercises would be documented in prescribed Performa and the documentation record would have to be submitted in both soft and hard copy.
- iv. The Prime Bidder has to ensure that all studies are to be conducted following prescribed BIS code/specifications. In case of some of the important field and laboratory equipments for which relevant BIS codal provisions may not be available, the Prime Bidder has either to adopt specified guidelines given in respective Instrument manual or interpret salient geotechnical parameters as per relevant ASTM standards. Wherever, possible the Prime Bidder has to indicate the guidelines being followed while interpreting test data derived from imported instruments. Relevant correlations/equations, if found, should be furnished in the report so that ground parameters obtained by using ASTM or other foreign standards can also be correlated with available Indian standards.
- v. The Prime Bidder is required to submit competency to all or substantial portion of the job/ items listed in tabular form indicating methods to be adopted and no. of instruments/units to be used for carrying out the work.
- vi. A tentative schedule to complete the work at each city which should be further sub divided for each location is to be provided by the Prime Bidder
- vii. **The Prime Bidder is required to indicate the name of the NABL accredited laboratory (ies) along with certified document as mutual agreement, in which all or substantial part of the laboratory works will be carried out as per BIS specifications.**
- viii. The Prime Bidder is required to submit unit cost (e.g. cost of borehole drilling per running meter, Undisturbed sampling etc) for each item
- ix. After completion of boring and specified field test at each site, the Prime Bidder is required to obtain a ~~no~~ certificate of completion+by the authorized officer of NCS - MoES. The Prime Bidder is to submit technical and Financial Bids separately but for technical evaluation he may submit the same table without indicating prices in the technical bid. Bidder(s) must provide two separate bids. A technical bid without prices of the items and a Financial price bid identical to the technical bid with a column containing price for each item.
- x. The Prime Bidder may also submit a list of organizations for which it has performed similar works along with the necessary testimonials from respective organizations as proof of its competence to undertake the present work.
- xi. NCS officials shall employ quality check during field and laboratory test in order to ensure that the specifications are met with.
- xii. The Prime Bidder shall associate NCS official/experts or nominated by NCS throughout the field and laboratory works and provide with all details pertaining to the work including all data and analysis. The Prime Bidder shall also make or

assist in making all the reports and recommendations as may be contemplated by the terms of reference or as may be reasonably required by the Project Authority within the general scope of this work and shall be at all times co-operate with the NCS-MoES and /or client, its employees and the agents in the interest of the work.

- xiii. All reports, notes, plans, design, estimation, data specifications, statistics and other documents and data prepared to be compiled by the Prime Bidder while performing the field and laboratory works that shall be the property of NCS-MoES, Govt. of India.
- xiv. The Prime Bidder shall be responsible for the correctness and accuracy of the data, design, drawings, estimation, specifications, and the final report, bill of quantity and all other documents under this contract, if any.
- xv. The Prime Bidder shall carry out the services with due diligence and efficiency in a professional manner and in accordance with sound practice designed to promote the purposes of safety and efficient operation of the system and with due regard to the environmental, climate conditions of the site and the obligation of the parties hereto.
- xvi. The work shall be completed in all respects including site clearance within stipulated period of time. Upon completion, the Bidder shall intimate the NCS-MoES official in charge or officer nominated by them in writing about the date of completion of work. The NCS authority will arrange to get the work inspected and defects, omissions etc. will be pointed out till a satisfactory rectification of the work. The certificate of completion shall be issued only after the remedial operations are found up to the mark.
- xvii. Prime Bidders have to make necessary arrangement for water during drilling operations.
- xviii. Prime Bidder shall not use any of the field, laboratory data, graphs, tables, etc. from entire work in publishing articles/technical papers, etc. without written permission from NCS-MoES;
- xix. Report will be purely on the name of NCS-MoES. No prior publication of any of the data, partly/fully, is allowed. The data will never shared with any other third party at any time.
- xx. Prime Bidder shall employ a qualified site Designated Scientist during Survey and field work.

6. SUBMISSION OF THE REPORT

Upon completion of the field investigation and laboratory-testing program, the Bidder, in consultation with NCS official will compile, evaluate, and interpret the data and represent all data in GIS platform. The specifications for the GIS applications will be made available by officials in due course of time. Additionally, the Prime Bidder will be responsible for producing a report that presents the subsurface information obtained from the site investigations and provides specific technical recommendations. The need for multiple types of reports on a single city project depends on the project size, phasing and complexity.

Final Report based on the guidelines of the **Seismic Microzonation Handbook and Seismic Microzonation Manual** (www.moes.gov.in) needs to be submitted to NCS-MoES on completion of the project. Entire data collected during investigation of

Field, Laboratory etc. should be handed over in form of soft as well as the hard copy along with the final report.

Data Report shall include:

- (a) Borelogs, site plan along with Latitude, Longitude, lithological section of borehole, local site geology, field and lab test data in a prescribed tabular format along with all graphical interpretations, supporting calculations, figures, maps, formula, practical and theoretical considerations/documents for the interpretation of tests results.
- (b) All laboratory test results in a suitable digital format for checking and reproduction.
- (c) On completion of all the field and laboratory work, the bidder shall have to submit a draft report containing all field and laboratory data and their useful interpretation, summarized test data, graphs, chart, maps, conclusion and recommendations in both hard and softy copy.

7. DOCUMENTS COMPRISING THE LIMITED TENDER

The limited tendering shall comprise of the following:

- (a) Letter of Transmittal (**Annexure-D**) as per approved RFP (www.moes.gov.in)
- (b) Pre Contract Integrity Pact (**Annexure-E**) as per approved RFP (www.moes.gov.in).
- (c) Technical Proposal given in **Annexure-A** as per approved RFP (www.moes.gov.in).
- (d) Completed Financial Bid as mentioned in the **Annexure-B** as per approved RFP (www.moes.gov.in).
- (e) Documentary evidence in support of the Prime Bidder Institutions / PI's / involved experts with their qualifications to perform the contract as specified in Bidding Document need to be furnished. If the bids submitted by the bidder Institute/Organization/University along with any partners then information about its partner company / agency / Institute, a Joint Venture Agreement / MoU / agreement between the bidder institute / organization / University and its partner company / agency / Institute need to be provided to NCS-MoES at the time of submitting EoI / tender bid. It is pertinent to note that NCS-MoES will not be involved in any form with any of the partners of the Prime bidder to deal with them separately. There will not be any extra financial implications of NCS-MoES for involving any partner by any of the prime bidder to which this limited tender is applied for the job.
- (f) **Contract Agreement (MoU)** Performa is enclosed (**Annexure-F**) to be submitted by the qualified Prime Bidder prior of issuance of the work order to the concerned Qualified Bidder.
- (g) Any other relevant document.

a) LETTER OF TRANSMITTAL AND SCHEDULES

The Letter of Transmittal shall be submitted using the relevant forms furnished in **Annexure-D**. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested referred to approved RFP (www.moes.gov.in).

b) DOCUMENTS COMPRISING THE TECHNICAL PROPOSAL

The Bidder shall furnish a Technical and financial Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in different sections, in sufficient detail to demonstrate the adequacy of the Bidders proposal to meet the work requirements and the completion time (**Annexure-A**) and (**Annexure-B**).

9. EVALUATION AND COMPARISON OF BIDS

As mentioned above, a two-stage procedure shall be adopted in evaluating the proposals from Prime Bidders (i) A Technical Evaluation, which shall be carried out prior to opening any Financial Proposal and (ii) A financial evaluation of the technically qualified prime bidders by the Competent Financial Evaluation Committee constituted by NCS-MoES

For each city, the RFP (www.moes.gov.in) primarily constitutes 3-components namely: Mobilization/Demobilization, Surveying, Geotechnical and Geophysical investigations. Out of these, the first two components are city-dependent. The 3rd one which is cost-wise a major component should be ideally uniform irrespective of the terrain, therefore

- (a) The prime bidder shall quote separately for the 3 said components (including their sub-components as detailed as per in RFP document (Table 1 to 5, **Annexure-B**).
- (b) The averaging will be done separately for Geotechnical components, Micro-tremor, DHT and MASW.
- (c) The normalized bidding amount of each bidder for each city will be calculated as follows, considering average number of investigations per city (Drilling at 50 sites, expecting 90% drilling in soils and 10% in rock at each borehole; Micro-tremor at 775 sites; DHT at 10 sites; MASW at 15 sites)

Mob/Demob charges + Survey cost + $(50 \times (0.9 \times \text{drilling average of soil} + 0.1 \times \text{drilling average of rocks})) + 50 \times (\text{sub-items of drilling work} \times \text{expected number}) + 775 \times \text{micro-tremor average} + 10 \times \text{DHT average} + 15 \times \text{MASW average} + \text{Cost for preparation of complete report quoted in Table 6 (Annexure-B)}$.

- (d) To evaluate the financial bids, L1 for each city will be decided based on the lowest normalized bid amount for each city.
- (e) Prime Bidder must have proven track record of conducting similar type of Geotechnical, Geophysical, Seismological and Geological investigations supported by the submission of the report containing detailed processing and interpretation of data with achievement of the objectives of the project(s) which have already been completed by the Prime Bidder.**
- (f) The Partner(s)/joint venture(s) of government or private with the Prime Bidder must also have proven track record of completing similar types of work as stated under (e) mentioned above.**
- (g) Prime Bidder must have sufficient number of technically qualified professionals supported by their experiences, expertise and rigorous ability to work in the field to acquire diverse set of data consisted of Geotechnical, Geophysical, Seismological and Geological investigations (CV to be submitted to NCS-MoES at the time of bidding).**
- (h) Qualified professionals must be the foremost criteria for the partner organisations/institutions (Government/private) of the Prime Bidder.**

10. CONFIDENTIALITY OF BIDS

No information regarding evaluation of bids or recommendations for award of work shall be divulged to the Bidders until the contract is awarded to the selected Bidder.

Canvassing in any form, whether directly or indirectly, in connection with the bids shall be strictly prohibited and the bid submitted by any Bidder who resorts to canvassing shall be liable to rejection.

11. CLARIFICATION OF BIDS

The NCS-MoES may, if needed during the examination, evaluation, and comparison of the bids, ask any Prime Bidder in writing for a clarification of its bid. The response of the Bidder shall also be in writing. However, no clarification submitted by a Bidder on its own without asking by the NCS-MoES shall be entertained. If a Prime Bidder does not provide clarifications of its bid by the date and time set in the NCS-MoES request for clarification, its bid may be rejected.

12. CORRECTION OF ARITHMETICAL ERRORS

While examining the bids, the NCS-MoES shall correct arithmetical errors. If there is found a discrepancy, the rates which correspond to the amount worked out by the Prime Bidder shall, unless proved otherwise, be taken as correct. If the amount is not worked out by the Bidder or it does not correspond with the rates written either in figures or words, the rates written in words shall be taken as correct. Where the rates written in figures and words tally but the amount is not worked out

correctly, the rates written by the Bidder shall, if not proved otherwise, be taken as correct and not the amount.

If any Bidder does not accept the correction of errors, its bid shall be disqualified.

13. NCS-MoES'S RIGHT TO ACCEPT ANY BID FOR THE CITY, PART BID FOR THE CITY AND TO REJECT ANY OR ALL BIDS FOR THE CITIES

The NCS-MoES reserves the right to accept or reject any or all bids without assigning any reason and shall not be bound to accept the lowest or any other bid.

The NCS-MoES reserves the right to accept the whole or any part of the bid and the Prime Bidder shall be bound to perform the same at its quoted rates for the corresponding part that is accepted.

13. Contract Price and Payment

13.1 Mobilization Advance

The NCS-MoES may give a mobilization advance not exceeding 10% of the contract amount, if requested by the Prime bidder in writing within one month of the order to commence the work. The Mobilization Advance will not be paid in less than two installments. The total advance payment, the number and timing of installments (if more than one) shall be decided by NCS-MoES. The first installment shall be released on receiving a request from the Prime Bidder and the second and subsequent installments, if any, shall be released only after the Prime Bidder furnishes a proof of the satisfactory utilization of the earlier installments to the entire satisfaction of the NCS-MoES. The mobilization advance as above shall bear a simple interest at the rate of 18 percent per annum calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced shall be made by deduction from Prime Bidder's bills commencing after the first ten percent of the gross value of the work is executed and paid, on pro rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time eighty percent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

13.2 Payment of Interim or Running Account Bills

The Prime Bidder shall submit the interim or running account bills for the work executed on the basis of recorded measurements in triplicate on or before the 10th day of every quarter. The Prime bidder shall not be entitled to be paid interim or running account bill if the gross work done together with net payment adjustment of advances, if any. The amount admissible to the Prime Bidder shall be paid by NCS-MoES after due verification of the measurements. In the event of failure of the Prime Bidder to submit the bill, no claim of the Prime Bidder whatsoever due to delay in payment including that of interest shall be payable to

the Prime Bidder. All interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskillful work to be rejected, removed, replaced or redone.

The payment will be made to the qualified Prime Bidders as follows:

Mobilization advance: 10% of the total contract value will be given as advance to commence the work by the Prime Bidder for the city concerned.

Payment during and after completion of project: On adjustment of given advance after submission of utilization certificate by the Prime Bidder, the rest payment of 90% amount of the total value of the contract will be made in four equal installments (22.5%) for the project duration of 1- year / 2-years only after the satisfaction of NCS-MoES on the progress of the works as per the guidelines for conducting the requisite investigations and submission of utilization certificate of the previous paid value, out of which the last installment will be released after submission of final report that completed in every aspect dealing with investigations of the city to NCS-MoES by the concerned Prime Bidders for the concerned city. This is to be noted that issuance of the completion certificate to the concerned Prime Bidders by NCS-MoES (mentioned in sub clause (13.3) given below) will be made well in advance so that completion of the GIS-based report on the city containing all requisite GIS based information, data, processed and raw files, maps as per the given size mentioned under deliverables in both hard and soft copy to be prepared by the prime bidders for submission of the complete report along with entire documents and files to NCS-MoES. Before

13.3 Final Payment

The Prime Bidder shall present the final bill within 60-days of issuance of the Completion ~ Certificate by the NCS-MoES. The NCS-MoES shall pay to the Prime Bidder the final payment within 90 days of receiving the final bill from the Prime Bidder.

14. Force Majeure

14.1 Definition of Force Majeure

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) mentioned in the Definitions are satisfied:

- (i) War, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (ii) rebellion, terrorism, sabotage by persons other than the Prime Bidder's Personnel, revolution, insurrection, military or usurped power, or civil war,
- (iii) Riot, commotion, disorder, strike or lockout by persons other than the Prime Bidder's Personnel,

(iv) Munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Prime Bidder's use of such munitions, explosives, radiation or radio-activity, and

(v) Natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

14.2 Notice of Force Majeure

If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure. The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them. Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

14.3 Consequences of Force Majeure

If the Prime Bidder is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given and suffers delay and/or incurs Cost by reason of such Force Majeure, the Prime Bidder shall be entitled to an extension of time for any such delay, if completion is or will be delayed.

15. Claims, Disputes and Arbitration

If any dispute or difference arises between the parties hereto as to the construction, interpretation, effect and implication of any provision of this contract, including the rights or liabilities or any claim or demand of any party (or its extent) against the other party or its partner or in regard to any matter under these presents but excluding any matters, decisions or determination of which is expressly provided in this contract, such disputes or differences shall be referred to an arbitrator to be appointed by the mutual consent of both parties. If the parties cannot agree on the appointment of the arbitrator within a period of one month from the notification by one party to the other of existence of such dispute, then the arbitrator shall be nominated by the Secretary to the Government of India, Department of Legal Affairs, Ministry of Law & Justice (Law Secretary). A reference to the arbitration under this clause shall be deemed to be submission with the meaning of the Arbitration and Conciliation Act 1996 and any modification or re-enactment thereof and the rules framed there under for the time being in force.

Any dispute arising out of the contract should be within the jurisdiction of New Delhi only. Minor cases of redressal, if any, can be referred to the NCS-MoES, New Delhi.

16. Performance Guarantee and Penalty Clause

Prime Bidders need to submit authorization on their own behalf as well as on

their partners or associates (if any) behalf to NCS-MoES in writing with clear declaration from their Head of Institute / Director / Vice Chancellor duly signed with stamp that the assigned job of conducting seismic microzonation study of the city as per the approved guidelines (namely, Seismic Microzonation Handbook; and Seismic Microzonation Manual available on www.moes.gov.in) must be completed in the stipulated time frame and with the finally awarded contract value of the project, without any further demand of extra time and without any escalation of the contract value for completion of the assigned job to the technically and financially qualified Prime Bidder as its institute / organization / University. If the Prime Bidders fail, in case to complete the work or deliver the outcomes as per MoU signed between NCS-MoES and the concerned Prime Bidders, then the Institute / Organization / University of the qualified Prime Bidders have to return the entire amount paid till date to them for the job by NCS-MoES with the simple interest of 18 % on the total amount paid to the Prime Bidders without making any deductions from the total amount plus interest, which required to be paid to NCS-MoES by the concerned failed institute / organization / University.

Additionally, failure of the Prime Bidders in not completing the allotted works will lead to black listing of the Institute / Organization / University for no consideration to award any of the projects of the Government in future, which would be implemented as per the Government of India's rules since the paid amount to the qualified Prime Bidders is of the Government fund and the awarded jobs to the qualified prime bidders are for the public interest.

TECHNICAL BID

PARTICULARS OF BIDDER

- 1 Name of the Bidder :
- 2 Address of the Bidder :
- 3 Bidder's proposal number and date:
- 4 Name & postal address of the officer :
to whom all reference shall be made
regarding this tender enquiry including
Fax/Telex/Telephone/E-mail.

Witness:

Signature

Name

Signature of the Bidder (s)

Address

Name _____

Designation _____

Institution/Organisation _____

Date:

Date: _____

Signature of the Head of Institution/Organisation with official Seal

WARRANTY

I / We warrant that the output supplied by me/us shall be in full conformity of the specification / output required by NCS-MoES as detailed in Clause 5.7 of approved RFP document. I / We also warrant that I/We shall handover all the data/records within 15 days of formal acceptance to NCS-MoES Official and no copies will be kept with us.

Signature of the witness

Signature of the Head of Institution/Organisation with official Seal

DATA SECURITY

I/We hereby certify that the NCS-MoES shall have absolute right on the raw, processed & analytical Geotechnical and Geophysical investigation data. I/We shall be responsible for security/safe custody of data during collection/ Data processing. I/We also certify that all NCS documents, scanned/hard copy of photographs, Microzonation map in GIS platform and/or control points coordinates and/or digital topographical data given to me/us or generated by me/us in full or part will not be taken out of the SHRA building premises on any media, and will not be produced by me/us in any form. I/We understand that violation of above clause shall attract criminal prosecution under Government copy right act 1957 and the Official Secrets Act 1923.

Signature of the witness with date

Signature of the Head of
Institution/Organisation with official Seal

- 1.
- 2.

Name of the Head of Institution/Organisation

Table-1 (Category I): Mobilization of machinery, equipments, deployment of technical/non-technical staff/personals, and expenditure on camping to the respective city for conducting geotechnical/geophysical investigations detailed in following categories. Consolidated rate are to be quoted city wise, based on tentative quantum of different types of work indicated for each city.

S.N.	Name of the city	Type of work	Indicative number of sites, which may increase/decrease by 10%	Bidder's Compliance Yes/No
1	Amritsar (220 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	55	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	900	
		Geophysical investigations as category V (ii)	6	
		Geophysical investigations as category V (iii)	12	
2	Patna (109 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	30	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	450	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	10	

3	Agra (188 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	50	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	750	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	15	
4	Varanasi (80 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	20	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	325	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	5	
5	Lucknow (310 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	80	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	1250	
		Geophysical investigations as category V (ii)	10	
		Geophysical investigations	20	

		as category V (iii)		
6	Kanpur (300 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	75	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	1200	
		Geophysical investigations as category V (ii)	10	
		Geophysical investigations as category V (iii)	20	
7	Meerut (172 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	43	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	700	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	10	
8	Dhanbad (258 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	65	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	260	
		Geophysical investigations as category V (ii)	7	

	Geophysical investigations as category V (iii)	15	
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Table-2 (Category II) Survey: On the basis of geological variability and urban area of the city number of sites will be identified for different type of investigations and tentative locations will be picked up from the topo-sheets and provided to bidders. All these selected sites are to be visited by the officials of the firm and identify exact location matching with given geology and collect GPS locations, contact government/private land owners, obtained permission to undertake field work for specified period.

S.N.	Name of the city	Type of work	Indicative number of sites, which may increase/decrease by 10%	Bidder's Compliance Yes/No
1	Amritsar (220 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	55	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	900	
		Geophysical investigations as category V (ii)	6	
		Geophysical investigations as category V (iii)	12	
2	Patna (109 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	30	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	450	
		Geophysical investigations	5	

		as category V (ii)		
		Geophysical investigations as category V (iii)	10	
3	Agra (188 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	50	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	750	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	15	
4	Varanasi (80 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	20	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	325	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	5	
5	Lucknow (310 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	80	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	1250	

		Geophysical investigations as category V (ii)	10	
		Geophysical investigations as category V (iii)	20	
6	Kanpur (300 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	75	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	1200	
		Geophysical investigations as category V (ii)	10	
		Geophysical investigations as category V (iii)	20	
7	Meerut (172 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	43	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	700	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	10	
8	Dhanbad (258 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	65	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations	260	

	as category V (i)		
	Geophysical investigations as category V (ii)	7	
	Geophysical investigations as category V (iii)	15	

Table 3 (Category III): Detail of tests to be conducted in all the cities proposed for Seismic Microzonation.

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Bidder's Compliance Yes/No
A	Field test . drilling (with Hydraulic rig only), sampling and preparation of Litholog as per the template provided.			
1a	Drilling of boreholes (with Hydraulic rig only) - up to 30 m [IS:5313-1980] depth or up to 3 m in rock strata if encountered within 30 m depth	30 running meter depth considering varied site conditions likely to be encountered <i>Rates are to be quoted for per running meter.</i>	Water table is to be recorded if found within 30 m. If hard rock is encountered within 30 m then rock drilling has to continue at least 3 m within rock	
1 b	Conducting Standard Penetration Test [SPT] (as per IS:2131-1981), alternatively at every 1.5m interval. Thus SPT will be conducted at every 3m interval. Samples obtained from SPT shall be treated as Disturbed Samples (DS)	Approximately 10 SPT in one bore hole). <i>Rates are to be quoted for per SPT</i>		

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted per unit of items	Remarks	Bidder's Compliance Yes/No
1c	Drilling (with Hydraulic rig only) and rock core sampling, Rock classification in terms of RQD, [IS:11315 pt. 11-1985] up to 3m of rock strata if encountered within 30 m depth	A very few running meter in some bore hole <i>Rates are to be quoted for Per running meter</i>	Subject to the field conditions wherever Rock is encountered within 30 m depth	
2	Disturbed sampling [DS] at 3.0 m interval from SPT sampler	Collection of DS for each borehole up to 30 m depth with DS @ 3.0 m intervals => 10 nos) <i>Rates are to be quoted for Per DS</i>		
3	Undisturbed sampling [UDS] (IS:2132-1986, IS:763-1978, IS:9640-1980, IS:10108-1982) at 3 m interval or at the changes of soil strata (Using appropriate soil samplers)	Collection of UDS for each borehole up to 30 m depth with UDS @ 3 m intervals => 10 Nos) <i>Rates are to be quoted for Per UDS</i>		
4	DCPT at or near to selected borehole locations up to depth of 30 m or refusal as per IS:4968 part-II (Dynamic Method using cone and Bentonite slurry)	20-25 running meter per borehole. DCPT is to be conducted around 10% of the total no. of drill-holes made under 1a. <i>Rates are to be quoted for Per Running Meter</i>	DCPT will be performed at or near to selected borehole locations	

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Bidder's Compliance Yes/No
5	SCPT at or near to selected borehole locations up to depth of 30 m or refusal	20-25 running meter per borehole. SCPT is to be conducted around 10% of the total no. of drill-holes made under 1a. <i>Rates are to be quoted for Per Running Meter</i>	SCPT will be performed at or near to selected borehole locations	
B	Routine Laboratory tests on sample collected in boreholes		Routine laboratory tests on soil samples	
1a	Complete Grain size analysis up to clay size by Sieve and Hydrometer/Pipette analysis (IS:2720 Part 4-1985)	20 number of samples per borehole (DS and UDS collected in boreholes) <i>Rates are to be quoted for Per sample</i>	Some laboratory tests to be conducted at designated laboratories for validation purposes will require collection of suitable samples and arrangements for delivery at the specified laboratories; therefore, separate rates are to be quoted for handling and testing charges.	
1b	Grain size by laser analyzer (IS:2720 Part 4-1985)	About 5 representative samples as decided by Centre for Seismology in each city) <i>Rates are to be quoted</i>		
2	Atterberg limits (LL, PL,SL) (IS:2720 Part 5 & 6 -1985)	20 number of samples per borehole (DS and UDS collected in boreholes) <i>Rates are to be quoted</i>		

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Bidder's Compliance Yes/No
3	Specific gravity, G (IS:2720 Part 3-1980)	20 number of samples per borehole (DS and UDS collected in boreholes) <i>Rates are to be quoted for Per sample</i>		
4	Natural water content, w% (IS:2720 Part 2-1973)	20 number of samples per borehole (DS and UDS collected in boreholes) <i>Rates are to be quoted for Per sample</i>		
5	Bulk density, (UDS)	20 number of samples per borehole (DS and UDS collected in boreholes) ? <i>Rates are to be quoted for Per sample</i>		
6	Coefficient of consolidation, Cc (UDS) . for cohesive soils (IS:2720 Part XV-1965)	About 5 Nos. per borehole as decided by official of CS <i>Rates are to be quoted for Per sample</i>		

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Bidder's Compliance Yes/No
7	Direct Shear [DS/remolded] (IS:2720 Part 13-1986) on Sandy type soils	About 15 samples in each city (Min. 3 specimen per sample to be tested. Representative samples will be scrutinized by official, which are to be obtained from borehole drilled in each city. Exact. No. of samples are subject to the quality field sampling and their successful operation with the sophisticated laboratory equipment)		
8a	Tri-axial shear (UDS) [Unconsolidated Undrained] / UCC (For cohesive material or where UDS is possible)	About 50 samples in each city (A min. of 3 specimens per sample shall be tested. The type of Tri-axial test (UU, CU or CD) to be conducted on each sample shall be decided by Official based on type of soil encountered.		
8b	(UDS) [Consolidated Undrained] with pore water pressure measurement			
8c	(UDS) [Consolidated drained] (for sandy soil and some cohesive soil samples if considered necessary)			<i>Bidder may quote per sample rates for each category of Tri-axial tes, UU, CU,CD)</i>

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted per unit of items	Remarks	Bidder's Compliance Yes/No
8d	Tri-axial shear (DS) [Consolidated Undrained]			
8e	(DS) [Consolidated drained]			
C	Tests on Rock samples from rock core at <30 m depth			
1	Unconfined Compressive strength of Rock sample [IS:9143-1979]	A very few samples <i>Bidders may quote rates per sample</i>	Subject to the site conditions found in borehole locations in cities	
2	Laboratory determination of V_p (Primary wave velocity), V_s (Shear wave velocity) & dynamic modulus of Rock core specimen [IS:10782-1983]	A very few samples <i>Bidders may quote rates per sample</i>	----do----	
3	Modulus of elasticity and Poisson's ratio in uni-axial compression [IS:9221-1979]	A very few samples <i>Bidders may quote rates per sample</i>	-----do----	
4	Point load strength index [IS:8764-1978]	A very few samples <i>Bidders may quote rates per sample</i>	----do----	

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Bidder's Compliance Yes/No
D	Reporting: Site details with Lat-Long/photograph/digital map, Physical Borelog (1:10), borelog chart containing equipment used, starting and completion date, N values, GL, GWT; laboratory and field test data, laboratory test results/plots/data interpretations, such as Plotting of grain size distribution, Dynamic Cone Penetration results, Preparation of Borelogs, Section/Fence Diagram along Boreholes, corrected SPT table alongwith the computation of average \bar{N}_q value, Analysis and Interpretation of test results of the sample tested		Borelog (1:10) at 20 specific site as per directives. Requisite format for data presentation will be supplied by official. Report is to be presented in both soft and hard copy	

Table 4 (Category IV): Special laboratory tests on representative samples

Item No.	Description of item	Quantum of Work	Bidder's Compliance Yes/No
1a	Cyclic Tri-axial test [UDS/DS] (standard sinusoidal pulse/ signature)	(Min. 3 specimens per sample and approx. 5 samples in each city) <i>Bidders may quote rates per sample and should be same as quoted in Table-3</i>	

		(Category III work for the same item)	
1b	Cyclic Tri-axial test [UDS/DS] {using Bhuj (2001)/ Chamoli (1999) Earthquake signatures}	Same as above (Nos.)	
2	Resonant column test . RCT (OPTIONAL)	Same as above (Nos.)	

Table 5 (Category V): Geophysical tests at specific sites

Description of work	Quantum of work (Tentative)	Remarks	Bidder's Compliance Yes/No
Microtremor Survey for H/V Analyses using Ambient noise	In a grid pattern of 500m x 500m preferably using Broadband Seismometer	Exact no., location, type and nature of test will be decided by officials	
Down-hole Shear wave velocity test . DHT up to 100 m @ 1.5 m. along with SPT and collection of DS and UDS as per category of work III & IV. SPT is to be conducted till 3 consecutive refusals (N>50). The drilling is to be carried out with Hydraulic rig only.	10% of the total number of drill sites in Category III or 5. Rates of SPT, DS, UDS and laboratory investigations will be applicable as per category III of the work. <u>In the present column rates are</u>		
Multiple Spectral Analysis of Surface Waves - MASW	At about 25% total number of drill sites in category III		

Table-6: Cost for preparing complete report as per the prescribed format in accordance to the guidelines given in the **Seismic Microzonation Handbook and Seismic Microzonation Manual** (www.moes.gov.in) and in consultation with NCS-MoES

Description of Work	Quantum of work	Remarks	Bidder Compliance YES / NO
Final complete Report/ Reports with maps in A0-size must be submitted to NCS-MoES by the Prime Bidder. The report must contain all layered information in GIS-based format along with their prints. In hard and soft copies of the report and data files, processed records, maps, interpretational details of results need to be submitted to NCS-MoES by the qualified Prime Bidder on completion of the investigation of the city / cities	40-Copies	Final complete GIS-based Report along with entire data format containing all estimated parameters must be prepared in accordance to the guidelines given in the Seismic Microzonation Handbook and Seismic Microzonation Manual (www.moes.gov.in) and in consultation with NCS-MoES	

NOTE:

- (a) The bidder shall separately quote for the 3 said components (including their sub-components as detailed in RFP document, Table 1 to 6).
- (b) To obtain a uniform cost of geotechnical and geophysical investigations for all the cities, the average price quoted by all the Technically shortlisted bidders will form the basis. The average has been taken in order to minimize the randomness in the rates of individual sub-components.
- (c) The averaging will be done separately for Geotechnical Investigations, Micro-tremor, DHT and MASW.
- (d) The normalized bidding amount of each bidder for each city will be calculated as follows, considering average number of investigations per city (Drilling at 50 sites, expecting 90% drilling in soils and 10% in rock at each borehole; Micro-tremor at 775 sites; DHT at 10 sites; MASW at 15 sites)

$$\text{Mob/Demob charges} + \text{Survey cost} + (50 \times (0.9 \times \text{drilling average of soil} + 0.1 \times \text{drilling average of rocks})) + 50 \times (\text{sub-items of drilling work} \times \text{expected number}) + 775 \times \text{micro-tremor average} + 10 \times \text{DHT average} + 15 \times \text{MASW average} + \text{Cost for preparing complete Final Reports as per quoted price in Table -6 of Annexure-B.}$$
- (e) To evaluate the financial bids, L1 for each city will be decided based on the lowest normalized bid amount for each city.
- (f) Only the finished report as per specifications will be accepted. No cost, full or part, will be borne by NCS-MoES in case of rejection/failure leading to repetition of any field or laboratory

tests or failure of collecting representative sample during field operations or extraction of the laboratory samples from Sampling tube or failure of the laboratory equipments/test.

- (g) The above cost figures will not be subject to escalation and the price shall remain valid for the period for which the work is allotted to a Bidder.
- (h) Tests results/data/report should be supplied in phases as per scheduled progress of the work.
- (i) Geotechnical & Geophysical Investigations (Table-3 to Table-6) is to be undertaken as turnkey basis.

**Name and signature of the Head of Institution/Organisation
with official Seal**

FINANCIAL BID

PARTICULARS OF BIDDER

1. Name of the Bidder :
2. Address of the Bidder :
3. Bidder's proposal number and date:
4. Name & postal address of the officer :
to whom all reference shall be made
regarding this tender enquiry including
Fax/Telex/Telephone/E-mail.

Witness:

Signature

Name

Signature of the Bidder (s)

Address

Name _____

Designation _____

Institution/Organisation _____

Date:

Date: _____

Name and signature of the Head of Institution/Organisation with official Seal

Table-1 (Category I): Mobilization of machinery, equipments, deployment of technical/non-technical staff/personals, and expenditure on camping to the respective city for conducting geotechnical/geophysical investigations detailed in following categories. Consolidated rate are to be quoted city wise, based on tentative quantum of different types of work indicated for each city.

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		Geotechnical (Field and laboratory) investigation as per category IV		
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2	Patna (109 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	30	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	450	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	10	
3	Agra	Geotechnical (Field and laboratory) investigation as	50	

	(188 Sq km)	per category III		
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	750	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	15	
4	Varanasi (80 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	20	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	325	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	5	
5	Lucknow (310 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	80	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	1250	
		Geophysical investigations as category V (ii)	10	
		Geophysical investigations as category V (iii)	20	

6	Kanpur (300 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	75	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	1200	
		Geophysical investigations as category V (ii)	10	
		Geophysical investigations as category V (iii)	20	
7	Meerut (172 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	43	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	700	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	10	
8	Dhanbad (258 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	65	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	260	
		Geophysical investigations as category V (ii)	7	
		Geophysical investigations	15	

		as category V (iii)		
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Table-2 (Category II) Survey: On the basis of geological variability and urban area of the city number of sites will be identified for different type of investigations and tentative locations will be picked up from the topo-sheets and provided to bidders. All these selected sites are to be visited by the officials of the firm and identify exact location matching with given geology and collect GPS locations, contact government/private land owners, obtained permission to undertake field work for specified period.

S.N.	Name of the city	Type of work	Indicative number of sites, which may increase/decrease by 10%	Rates to be quoted
1	Amritsar (220 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	55	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	900	
		Geophysical investigations as category V (ii)	6	
		Geophysical investigations as category V (iii)	12	
2	Patna (109 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	30	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	450	
		Geophysical investigations as category V (ii)	5	

		Geophysical investigations as category V (iii)	10	
3	Agra (188 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	50	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	750	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	15	
4	Varanasi (80 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	20	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	325	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	5	
5	Lucknow (310 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	80	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	1250	
		Geophysical investigations	10	

		as category V (ii)		
		Geophysical investigations as category V (iii)	20	
6	Kanpur (300 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	75	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	1200	
		Geophysical investigations as category V (ii)	10	
		Geophysical investigations as category V (iii)	20	
7	Meerut (172 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	43	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	700	
		Geophysical investigations as category V (ii)	5	
		Geophysical investigations as category V (iii)	10	
8	Dhanbad (258 Sq km)	Geotechnical (Field and laboratory) investigation as per category III	65	
		Geotechnical (Field and laboratory) investigation as per category IV		
		Geophysical investigations as category V (i)	260	

	Geophysical investigations as category V (ii)	7	
	Geophysical investigations as category V (iii)	15	

Table 3 (Category III): Detail of tests to be conducted in all the cities proposed for Seismic Microzonation.

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Rates to be quoted
A	Field test . drilling (with Hydraulic rig only), sampling and preparation of Litholog as per the template provided.			
1a	Drilling of boreholes (with Hydraulic rig only) - up to 30 m [IS:5313-1980] depth or up to 3 m in rock strata if encountered within 30 m depth	30 running meter depth considering varied site conditions likely to be encountered <i>Rates are to be quoted for per running meter.</i>	Water table is to be recorded if found within 30 m. If hard rock is encountered within 30 m then rock drilling has to continue at least 3 m within rock	
1 b	Conducting Standard Penetration Test [SPT] (as per IS:2131-1981), alternatively at every 1.5m interval. Thus SPT will be conducted at every 3m interval. Samples obtained from SPT shall be treated as Disturbed Samples (DS)	Approximately 10 SPT in one bore hole). <i>Rates are to be quoted for per SPT</i>		

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted per unit of items	Remarks	Rates to be quoted
1c	Drilling (with Hydraulic rig only) and rock core sampling, Rock classification in terms of RQD, [IS:11315 pt. 11-1985] up to 3m of rock strata if encountered within 30 m depth	A very few running meter in some bore hole <i>Rates are to be quoted for Per running meter</i>	Subject to the field conditions wherever Rock is encountered within 30 m depth	
2	Disturbed sampling [DS] at 3.0 m interval from SPT sampler	Collection of DS for each borehole up to 30 m depth with DS @ 3.0 m intervals => 10 nos) <i>Rates are to be quoted for Per DS</i>		
3	Undisturbed sampling [UDS] (IS:2132-1986, IS:763-1978, IS:9640-1980, IS:10108-1982) at 3 m interval or at the changes of soil strata (Using appropriate soil samplers)	Collection of UDS for each borehole up to 30 m depth with UDS @ 3 m intervals => 10 Nos) <i>Rates are to be quoted for Per UDS</i>		
4	DCPT at or near to selected borehole locations up to depth of 30 m or refusal as per IS:4968 part-II (Dynamic Method using cone and Bentonite slurry)	20-25 running meter per borehole. DCPT is to be conducted around 10% of the total no. of drill-holes made under 1a. <i>Rates are to be quoted for Per Running Meter</i>	DCPT will be performed at or near to selected borehole locations	

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Rates to be quoted
5	SCPT at or near to selected borehole locations up to depth of 30 m or refusal	20-25 running meter per borehole. SCPT is to be conducted around 10% of the total no. of drill-holes made under 1a. <i>Rates are to be quoted for Per Running Meter</i>	SCPT will be performed at or near to selected borehole locations	
B	Routine Laboratory tests on sample collected in boreholes		Routine laboratory tests on soil samples	
1a	Complete Grain size analysis up to clay size by Sieve and Hydrometer/Pipette analysis (IS:2720 Part 4-1985)	20 number of samples per borehole (DS and UDS collected in boreholes) <i>Rates are to be quoted for Per sample</i>	Some laboratory tests to be conducted at designated laboratories for validation purposes will require collection of suitable samples and arrangements for delivery at the specified laboratories; therefore, separate rates are to be quoted for handling and testing charges.	
1b	Grain size by laser analyzer (IS:2720 Part 4-1985)	About 5 representative samples as decided by Centre for Seismology in each city) <i>Rates are to be quoted</i>		
2	Atterberg limits (LL, PL,SL) (IS:2720 Part 5 & 6 -1985)	20 number of samples per borehole (DS and UDS collected in boreholes) <i>Rates are to be quoted</i>		

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Rates to be quoted
3	Specific gravity, G (IS:2720 Part 3-1980)	20 number of samples per borehole (DS and UDS collected in boreholes) <i>Rates are to be quoted for Per sample</i>		
4	Natural water content, w% (IS:2720 Part 2-1973)	20 number of samples per borehole (DS and UDS collected in boreholes) <i>Rates are to be quoted for Per sample</i>		
5	Bulk density, (UDS)	20 number of samples per borehole (DS and UDS collected in boreholes) ? <i>Rates are to be quoted for Per sample</i>		
6	Coefficient of consolidation, Cc (UDS) . for cohesive soils (IS:2720 Part XV-1965)	About 5 Nos. per borehole as decided by official of CS <i>Rates are to be quoted for Per sample</i>		

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Rates to be quoted
7	Direct Shear [DS/remolded] (IS:2720 Part 13-1986) on Sandy type soils	About 15 samples in each city (Min. 3 specimen per sample to be tested. Representative samples will be scrutinized by official, which are to be obtained from borehole drilled in each city. Exact. No. of samples are subject to the quality field sampling and their successful operation with the sophisticated laboratory equipment)		
8a	Tri-axial shear (UDS) [Unconsolidated Undrained] / UCC (For cohesive material or where UDS is possible)	About 50 samples in each city (A min. of 3 specimens per sample shall be tested. The type of Tri-axial test (UU, CU or CD) to be conducted on each sample shall be decided by Official based on type of soil encountered.		
8b	(UDS) [Consolidated Undrained] with pore water pressure measurement			
8c	(UDS) [Consolidated drained] (for sandy soil and some cohesive soil samples if considered necessary)			<i>Bidder may quote per sample rates for each category of Tri-axial tes, UU, CU,CD)</i>

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted per unit of items	Remarks	Rates to be quoted
8d	Tri-axial shear (DS) [Consolidated Undrained]			
8e	(DS) [Consolidated drained]			
C	Tests on Rock samples from rock core at <30 m depth			
1	Unconfined Compressive strength of Rock sample [IS:9143-1979]	A very few samples <i>Bidders may quote rates per sample</i>	Subject to the site conditions found in borehole locations in cities	
2	Laboratory determination of V_p (Primary wave velocity), V_s (Shear wave velocity) & dynamic modulus of Rock core specimen [IS:10782-1983]	A very few samples <i>Bidders may quote rates per sample</i>	----do----	
3	Modulus of elasticity and Poisson's ratio in uni-axial compression [IS:9221-1979]	A very few samples <i>Bidders may quote rates per sample</i>	-----do----	
4	Point load strength index [IS:8764-1978]	A very few samples <i>Bidders may quote rates per sample</i>	----do----	

Item No.	Description of the items	Indicative quantum of Work per bore hole. Rates are to be quoted perunit of items	Remarks	Rates to be quoted
D	Reporting: Site details with Lat-Long/photograph/digital map, Physical Borelog (1:10), borelog chart containing equipment used, starting and completion date, N values, GL, GWT; laboratory and field test data, laboratory test results/plots/data interpretations, such as Plotting of grain size distribution, Dynamic Cone Penetration results, Preparation of Borelogs, Section/Fence Diagram along Boreholes, corrected SPT table alongwith the computation of average \bar{N}_q value, Analysis and Interpretation of test results of the sample tested		Borelog (1:10) at 20 specific site as per directives. Requisite format for data presentation will be supplied by official. Report is to be presented in both soft and hard copy	

Table 4 (Category IV): Special laboratory tests on representative samples

Item No.	Description of item	Quantum of Work	Rates to be quoted
1a	Cyclic Tri-axial test [UDS/DS] (standard sinusoidal pulse/ signature)	(Min. 3 specimens per sample and approx. 5 samples in each city) <i>Bidders may quote rates per sample and should be same as quoted in Table-3 (Category III work for the same</i>	

		<i>item</i>	
1b	Cyclic Tri-axial test [UDS/DS] {using Bhuj (2001)/ Chamoli (1999) Earthquake signatures}	Same as above (Nos.)	
2	Resonant column test . RCT (OPTIONAL)	Same as above (Nos.)	

Table 5 (Category V): Geophysical tests at specific sites

Description of work	Quantum of work (Tentative)	Remarks	Rates to be quoted
Microtremor Survey for H/V Analyses using Ambient noise	In a grid pattern of 500m x 500m preferably using Broadband Seismometer	Exact no., location, type and nature of test will be decided by officials	
Down-hole Shear wave velocity test . DHT up to 100 m @ 1.5 m. along with SPT and collection of DS and UDS as per category of work III & IV. SPT is to be conducted till 3 consecutive refusals (N>50). The drilling is to be carried out with Hydraulic rig only.	10% of the total number of drill sites in Category III or 5. Rates of SPT, DS, UDS and laboratory investigations will be applicable as per category III of the work. <u>In the present column rates are</u>		
Multiple Spectral Analysis of Surface Waves - MASW	At about 25% total number of drill sites in category III		

Table-6: Cost for preparing complete report as per the prescribed format in accordance to the guidelines given in the **Seismic Microzonation Handbook and Seismic Microzonation Manual** (www.moes.gov.in) and in consultation with NCS-MoES

Description of Work	Quantum of work	Remarks	Rates to be Quoted
Final complete Report/ Reports with maps in A0-size must be submitted to NCS-MoES by the Prime Bidder. The report must contain all layered information in GIS-based format along with their prints. In hard and soft copies of the report and data files, processed records, maps, interpretational details of results need to be submitted to NCS-MoES by the qualified Prime Bidder on completion of the investigation of the city / cities	40-Copies	Final complete GIS-based Report along with entire data format containing all estimated parameters must be prepared in accordance to the guidelines given in the Seismic Microzonation Handbook and Seismic Microzonation Manual (www.moes.gov.in) and in consultation with NCS-MoES	

TECHNICAL SPECIFICATIONS

BROAD OUTLINE OF GROUND INVESTIGATIONS IN CITIES

National Centre for Seismology-Ministry of Earth Sciences has evolved a comprehensive ground investigation program in cities for the collection of seminal data set on:

I. Geotechnical characterization of sub-soil/rock up to 30 m depth (drilling with Hydraulic rig only) with an objective of identifying Liquefaction Potential/susceptibility, earthquake induced ground settlement and recommending mitigation measures for safe built environment and devising retrofitting measures for the important structures by resorting to:

1. Field tests (SPT - Standard Penetration Test, DCPT and SCPT- Dynamic and Seismic Cone Penetration Test): to know the penetration resistance of the granular and silty soil depending on its consistency, density and cementing bond due to ageing effect, overburden pressure and depth of water table. These data will be used for obtaining liquefaction potential of sub-soil of respective cities , for which following parameters are also required:

- i. Earthquake catalog, source, PGA (Peak Ground Acceleration) at base rock and Spectral acceleration amplification factor in case bed rock is underlain by soft sediment cover etc. This data will be obtained separately.
- ii. Designated Scientific soil classification type.
- iii. Borelog data up to 30 m depth and identification of liquefying layer, if any.
- iv. In-situ Density and initial overburden pressure. These are either obtained from correlations with SPT-N or directly from the undisturbed samples collected at specific depth within the boreholes.
- v. Water table depth. The same will be checked with CGWB data wherever feasible (IS: 6935-1973).
- vi. Grain size distribution and amount of fines. These are obtained from routine laboratory tests on disturbed samples, which are usually collected at 1.5 m intervals or at the changes of strata.
- vii. SPT (IS: 2131-1985)/ DCPT (IS: 4968-1976 Pt. I & II)/ SCPT count number at different depth. Any one of SPT/DCPT/SCPT data is enough for liquefaction calculation. However, both these test will be conducted to avoid ambiguity in results and also to workout empirical relation, so that any one test can be used in future to cover more no. of locations for better representation of sub-soil profile.

- viii. Dynamic Cone Penetration Test (DCPT – IS: 4968-1976 Pt. I & II) and SCPT are quick tests and it gives a continuous record of the penetration resistance of the soil with depth. This tests uses same monkey weight and height of fall as used in SPT and test results helps to understand the uniformity or variability in the subsoil profile which very useful in the preliminary exploration for extensive sites. The blow count for 75 mm penetration is recorded.

Note: In all the cities, SPT/DCPT and proper sampling will have to be made as per relevant IS codes (IS: 8763-1978, IS: 9640-1980, IS: 10108-1982). At locations where rock strata will be encountered within 30 m depths, rock coring shall be continued at least up to two runs or 3 m within the rock. Brief outline of major in-situ tests are given as under.

2. **Laboratory test** on disturbed (DS), undisturbed (UDS) and remolded (RM) samples: Grain size, plasticity, coefficient of consolidation, strength test such as Direct shear, Tri-axial shear test . Unconsolidated Undrained (UU), Consolidated Undrained (CU), Consolidated Drained (CD).
3. **Dynamic test: Resonant column** - To determine the shear modulus (G_{max} or G_0) and damping (D) characteristics of soils at small strains for cases where dynamic forces are involved, particularly seismic ground amplification and machinery foundations. Recent research has shown the results are also applicable to static loading at very small strains ($<10^{-6}$ percent).
4. **Cyclic tri-axial test** - To check shear strength of the soil under cyclic loading and also to check no. of cycles required causing liquefaction under recreated field condition, Cyclic tri-axial tests are used for projects with repeated and/or cyclic loading, resilient modulus determinations, and/or liquefaction analysis of soils. In each of these tests, the specimen is initially consolidated to the effective vertical overburden stress (σ_v) prior to shear.

Note: With limitations in the sampling system and boring techniques used in our country it might not be possible to extract undisturbed sample at 3 m intervals from all of 500 locations as per IS code. Not all undisturbed samples are really undisturbed. There is every possibility that proper extraction of the sample for cyclic tri-axial test may fail. Under so many uncertainties, only few samples may be possible to be tested in cyclic tri-axial system. Therefore, exact no. of laboratory test will be decided after eliminating all errors encountered in the process.

II. Generate **geophysical parameters** by conducting Micro-Tremor, DHT . Down-hole Test and MASW . Multi-channel Analysis of Surface Waves (accelerated hammer type) to obtain base rock/soil profile and Shear wave velocity of subsoil. Salient features of some of the important geophysical tests are given below:

- i. Down-hole surveys (**DHT**) can be performed using only one cased borehole. Here, S-waves are propagated down to the geophone from a stationary surface point. No inclinometer survey is needed as the vertical path distance (R) is calculated strongly on depth. In the DHT, a horizontal plank at the surface is statically loaded by a vehicle wheel (to increase normal stress) and struck lengthwise to provide an excellent shear wave source. The orientation of the axis of the down-hole geophone must be parallel with the horizontal plank (because shear waves are polarized and directional). The results are paired for successive events (generally at 1 m depth intervals) and the corresponding shear wave at mid-interval is calculated as $V_s = R/ t$, where R = the hypotenuse distance from plank to geophone and t = arrival time of the shear wave. A recent version of the down-hole method is the Seismic Cone Penetration Test (SCPT) with an accelerometer located within the cone of penetrometer. In this manner, no borehole is needed beforehand.
- ii. The Multi-channel Analysis of Surface Waves (**MASW**) method is a non-destructive seismic method to evaluate linear elastic modulus of underground materials. It analyses dispersion properties of certain types of seismic surface waves (fundamental-mode Rayleigh waves) propagating horizontally along the surface of measurement directly from impact point to receivers. It gives this shear-wave velocity (V_s) (or stiffness) information in either 1D (depth) or 2D (depth and surface location) format in a cost-effective and time-efficient manner. The main advantage with the MASW method is to take a full account of the complicated nature of seismic waves that always contain harmful noise waves such as higher modes of surface waves, body waves, scattered waves, traffic waves etc. These noise waves may result in a significant portion of the recorded data being dubious if not properly accounted for. The fundamental framework of the MASW method is based on the multi-channel recording and analysis approach long used in seismic exploration surveys. These techniques can discriminate useful signal against all other types of noise by utilizing pattern-recognition techniques. Due to multi-channel recording and processing schemes employed, results (V_s information) of the survey are highly reliable even under the presence of higher modes of surface waves and various types of cultural noise. For the same reason, the processing steps can be fully automated. Therefore, the method is extremely easy and fast to implement.
- iii. Microtremor Survey is a geophysical method to obtain underground structure consisting of S-wave velocity by means of the surface wave transmitting ground surface. Both of body wave (Primary wave and Secondary wave) and surface wave (Rayleigh wave and Love wave) becomes generating and transmitting as elastic wave, which is called

microtremor due to their very weak vibration. The surface wave has dispersibility, of which velocity reflects underground S-wave structure from the deep crust up to the ground surface. Underground S wave structure can be obtained by the dispersion property of the surface wave that was extracted from observed microtremor. Microtremor Survey, although it is easy-to-apply and non-explosive way, enables to prospect from several meters up to thousands of meters. S wave velocity structure can be obtained as a result of Microtremor Survey, which offers very fundamental factor to evaluate geotechnical properties for the earthquake motion assessment. At least one measurement will be done in every grid in each city.

Note: Not all tests will be performed at same location. However, No. & type of tests and their strategic locations will be decided after or during field investigations. Some of these tests would be required to check SPT-N data and some will be performed at locations other than those of SPT boreholes. The reason for conducting several tests at specific locations; is to obtain complete mapping of sub-soil profile of different cities. There are several correlations in literatures, which help obtaining one parameter from different tests and vice-versa.

LETTER OF TRANSMITTAL

To
The Project Head,
Seismic Hazard and Risk Assessment (SHRA) Division,
National Centre for Seismology
Ministry of Earth Sciences, Lodi Road
New Delhi 110 003
Subject: Geotechnical and Geophysical Investigations under Seismic Microzonation of
30 cities in India

Sir

I / We have read and examined the complete document including the Letter of Invitation, terms of reference and general conditions of the contract for execution of the above named work. I/We hereby submit our application on prescribed formats for undertaking the work referred to in the aforesaid documents upon the terms and conditions contained referred to therein. I/We agree to abide by and fulfil all the terms, conditions and provisions of the aforesaid documents. I/We undertake to commence the work within 30 (thirty) days of issue of the work order and to complete the work in the total period at 12/24 months.

The offer is submitted in separate sealed covers marked as +Technical Bid+ (Three copies), %Financial Bid+ (One copy) and all these envelopes are then sealed in another single envelope with name of work super scribed on each envelope.

The %Technical Bid+ contains the details as per the formats given in **Annexure-A** and %Financial Bid+ contains details as per **Annexure-B** duly filled in and duly signed by authorized representative.

By virtue of my/our signature below, I/We confirm that to be the best of my/our knowledge and belief the information contained in the specified formats, sections thereof and any annexure thereto and all supporting and explanatory information is truthful and exact.

**Name and signature of the Head of Institution/Organisation
with official Seal**

Witness

Date:

Address:

LETTER OF TRANSMITTAL OF FINANCIAL PROPOSAL

To
The Program Head,
Seismic Hazard and Risk Assessment (SHRA) Division,
National Center for Seismology
Ministry of Earth Sciences, Lodi Road
New Delhi 110 003

Subject: Geotechnical and Geophysical Investigations under Seismic Microzonation of
30 cities in India

Sir,

Having examined the details given in Press Notice Inviting Bids and BID document for
the above work, I/We hereby submit the Financial Proposal.

1. I/We hereby certify that all the statements made in the financial proposal
and information supplied in the enclosed Performa (Financial bid) and
accompanying statement are true and correct.
2. I/We have furnished all information and details necessary for Bid evaluation purpose
and have no further pertinent information to supply as per requirement.

Enclosures:

Date of submission

**Name and signature of the Head of
Institution/Organisation
with official Seal**

INTEGRITY PACT

General

This contract Agreement (hereinafter called the Integrity Pact) is made on _____, between, on one hand, the President of India acting through

_____, Ministry / Department, Government of India (hereinafter called the "BUYER"[referred to as National Centre of Seismology (NCS) . Ministry of Earth Sciences (MoES)], which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and _____ represe

nted by _____ (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure *GEOTECHNICAL AND GEOPHYSICAL INVESTIGATIONS UNDER THE PROJECT "SEISMIC MICROZONATION OF 30-CITIES IN INDIA* _____ (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and WHEREAS the BIDDER is a private company/public company / Government undertaking / partnership / registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry / Department of the Government of India / PSU performing its functions on behalf of the President of India.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

1. Commitments of the BUYER

1.1 The BUYER [referred to as National Centre of Seismology (NCS) . Ministry of Earth Sciences (MoES)] undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favor or any material or immaterial benefit or any other advantage

from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

- 1.2 The BUYER will, during the pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.
 - 1.3 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

3. Commitments of Prime Bidder

The PRIME BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:

- 3.1 The PRIME BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.
- 3.2 The PRIME BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favor, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the Government
- 3.3 PRIME BIDDERS shall disclose the name and address of agents and representatives and Indian PRIME BIDDERS shall disclose their foreign principals or associates.

- 3.4 PRIME BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
- 3.5 The PRIME BIDDER further confirms and declares to the BUYER that the PRIME BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the PRIME BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
- 3.6 The PRIME BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
- 3.7 The PRIME BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.
- 3.8 The PRIME BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 3.9 The PRIME BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The PRIME BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.
- 3.10 The PRIME BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- 3.11 The PRIME BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
- 3.12 If the PRIME BIDDER or any employee of the PRIME BIDDER or any person acting on behalf of the PRIME BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the PRIME BIDDER's firm, the same shall be disclosed by the PRIME BIDDER at the time of filing of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The PRIME BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. Previous Transgression

4.1 The PRIME BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify PRIME BIDDER's exclusion from the tender process.

4.2 The PRIME BIDDER agrees that if it makes incorrect statement on this subject, PRIME BIDDER can be disqualified from the limited tender process or the contract, if already awarded, can be terminated for such reason.

5. Sanctions for Violations

5.1 Any breach of the aforesaid provisions by the PRIME BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the PRIME BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:

- (i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the PRIME BIDDER. However, the proceedings with the other PRIME BIDDER(s) would continue.
- (ii) To immediately cancel the contract, if already signed, without giving any compensation to the PRIME BIDDER.
- (iii) To recover all sums already paid by the BUYER, and in case of an Indian PRIME BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a PRIME BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the PRIME BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.
- (iv) To cancel all or any other Contracts with the PRIME BIDDER. The PRIME BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the PRIME BIDDER.
- (v) To debar the PRIME BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.
- (vi) To recover all sums paid in violation of this Pact by PRIME BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(vii) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the PRIME BIDDER, the same shall not be opened.

(viii) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.2 The BUYER will be entitled to take all or any of the actions mentioned at Para (6) of this Pact also on the Commission by the PRIME BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the PRIME BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

5.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the PRIME BIDDER shall be final and conclusive on the PRIME BIDDER. However, the PRIME BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

6. Fall Clause

6.1 The PRIME BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems/services at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the PRIME BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the PRIME BIDDER to the BUYER, if the contract has already been concluded.

6.2 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission.

6.3 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

6.4 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

6.5 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

6.6 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

6.7 The PRIME BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the PRIME BIDDER. The PRIME BIDDER will also grant the

Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Partners of Prime Bidder. The Monitor shall be under contractual obligation to treat the information and documents of the PRIME BIDDER/Partner(s) with confidentiality.

6.8 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

6.9 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department / within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / PRIME BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

7. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the PRIME BIDDER and the PRIME BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

8. Independent Monitors

MoES has approved the following officers as Independent External Monitors (IEM) vide order No. MoES/20/06/2016-(VIG.) dated 06/12/2016.

- (i) Shri Arun Kumar, Ex Secretary, Oil Industry Development Board (OIDB);
Address: B-38, Virandavan Apartment, Plot No -1, Sector-6, Dwarka New Delhi-110075
Email: kumararun_53@rediffmail.com
Mobile: 9810621113
- (ii) Shri Sushil Gupta, Ex-Chairman, Central Ground Water Board (CGWB) & Central Ground Water Authority (CGWA),
Address: B-702, Arravali Heights, Sector 21 C, Faridabad, Haryana-121001
Email: sushilanitagupta@yahoo.com
Mobile: 9999744061

8.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors to be given).

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

- 8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.
- 8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.
- 8.6 The PRIME BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the PRIME BIDDER. The PRIME BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Partners of Prime bidder. The Monitor shall be under contractual obligation to treat the information and documents of the PRIME BIDDER/Partner(s) with confidentiality.
- 8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.
- 8.8 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department / within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / PRIME BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the PRIME BIDDER and the PRIME BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

11. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. Validity

- 12.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the PRIME BIDDER/Seller, including warranty period, whichever is later. In case PRIME BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at _____ on _____

BUYER

PRIME BIDDER

Name of the Officer : _____

Designation : _____

Dept./Ministry/PSU: _____

Witness:

Witness:

1. _____

1. _____

2. _____

2. _____

Contract Agreement

for

Geotechnical and Geophysical Investigations for

**_____ city under Project “Seismic Microzonation of
30-cities in India”**

between

National Centre for Seismology

(Ministry of Earth Sciences)

New Delhi

and

Name of Research Organization/Institute/University

Date: _____

Contract Agreement

This Agreement is made and entered in to on the.....day of.....,2018.

Between

**National Centre for Seismology (NCS) –
Ministry of Earth Sciences (MoES), New Delhi-110003**

President of India, acting through Director, National Centre for Seismology (NCS), Ministry of Earth Sciences (MoES) Lodi Road, New Delhi-110003; hereinafter referred to as NCS - MoES, (which expression shall, unless excluded by or repugnant to the context be deemed to include his successors in office and assigns) of the First Part.

And

..... Name & Address of the Qualified Institute / Organisation / University .., hereinafter referred to as "The Prime Bidder", (which expression shall unless excluded by or repugnant to the context, be deemed to include its administrators, executors, liquidators, successors in interest and permitted assigns) of the Second Part.

NCS is the National Centre attached to MoES engaged in monitoring earthquakes of the country and Seismic Hazard Risk Assessment of Indian sub-continent /region.

And whereas NCS - SHRA is desirous for Geotechnical and Geophysical Investigations for the Seismic Microzonation of 30 . cities in India and monitoring earthquake and earthquake / Seismic risk assessment of Indian sub-continent / region And whereas SHRA desires that the work be carried out as per the Bid document No.

And whereas the Prime Bidder is willing and has accepted to render the services to carry out Geotechnical and Geophysical investigations for the seismic Microzonation of _____ City, in India. And whereas the Prime Bidder has submitted an offer and NCS-MoES has accepted the same for the Geotechnical and Geophysical Investigations for the Seismic Microzonation of _____ City in India.

NOW, THEREFORE, THESE PRESENT WITNESS and it is hereby agreed and declared by between the parties here to as follows:

1. In this Agreement the words and expressions shall have the same meanings as are respectively assigned to them in the General Conditions of Contract for Geotechnical and Geophysical investigations in **Part-D of the Bid Document**.

2. The following documents shall be deemed to form and be read and construed & consisted as part of the Agreement viz:

- i. The letter No. _____ of NCS-MoES inviting technical and financial offers:
- ii. The Bid Documents dated _____ issued to the Prime Bidder by NCS-MoES;
- iii. The Technical and Financial Offer of the Prime Bidder to carry out the works;
- iv. The Letter of Acceptance from NCS-MoES : _____
- v. The General Conditions of Contract for geotechnical and Geophysical Investigations included in the Bid Documents.
- vi. Copy of Bank Guarantee taken by the qualified Prime Bidder from its associates / partners of private agencies involved in conducting joint investigations for the qualified city / Cities

3. In consideration of payments to be made by the Client to the Prime Bidder as hereinafter mentioned, the Prime Bidder hereby covenants with the Client to perform the Services in conformity in all respects with the provisions of this Agreement.

4. The Prime Bidder Agrees to execute the whole work namely geotechnical and geophysical investigation for Seismic Microzonation of _____ **City** in India for an amount of Rs. _____ and NCS - MoES agrees to pay for the same in accordance with conditions specified in the Bid document.

IN WITNESS where of the parties here to have hereunder set their respective hands and seals on the day , month and year first above written.

**Scientist & Head, SHRA and
Project Director (Seismic Microzonation)**

(for and on behalf of the President of India)

1. Name of Witness with signature and address

2. Name of Witness with signature and address

Name and signature of the Head of Institution/Organisation

with official Seal

1. Name of Witness with signature and address

2. Name of Witness with signature and address

Appendix 'A'

The contract made between _____ hereinafter called the Prime Bidder which expression shall include their legal representative on the one part and Director, National Centre for Seismology, Ministry of Earth Sciences Lodhi Road, New Delhi 110003 on behalf of the President of India hereinafter called the Job allotter on the other.

Custody of Data and Records

The Prime Bidder shall perform the contract in all respects in accordance with the terms and conditions as mentioned in the Bid Document / Job Order. All Data and Records pertaining to Geotechnical and Geophysical Investigations for the Seismic Microzonation of _____ City in India shall remain in every respect at the safe custody of the Prime Bidder until completion of the soil investigation and report making as mentioned in the Job Order and until their delivery to the NCS-MoES, New Delhi. The Prime Bidder shall be held responsible for all loss, destruction, damage or deterioration or perforation of data / information during the complete period of the fulfilment of the job. The qualified Prime Bidders and their associates who executed the job of seismic microzonation of city / cities have no right or authority to publish or sale or share any part of the required data, records or reports on it to any other institutes / firms or within self. The sole custodian of data will be NCS - MoES, Govt. of India.

Rights of Rejection of data / Report

- (a) Notwithstanding any approval which the Purchaser may have given in contract of the letter of award or any part thereof which shall be lawful for the Government on behalf of the job allotter to reject the whole or any part of the work within 18-weeks from the submission of the completion report if not found in conformity with the specifications and terms and conditions of the contract on account of accuracy, omission of details etc. as referred in the **Part B** of the Bid Document.
- (b) That if the Prime Bidder fails to observe or perform any condition of this contract or be come in solvent or he or his representative tries to unduly influence any official or offers any bribe in connection with contract then, notwithstanding any previous waiver of such default or action, the NCS-MoES will have the power on behalf of the Government to terminate the contract forth with and without prejudice to other rights and remedies of the Government to blacklist the institute of the qualified Prime bidders from getting any projects from the Government in future and charge the amount paid so far with interest of 18%, which must be paid to NCS - MoES having declaration with the Head of the Institute of the Prime Bidders along with a forfeit the said Security Deposit of the associates / partners submitted to the NCS-MoES through Prime Bidders **Rs.** in the form of Bank Guarantee at its discretion and also recover from the

Prime Bidder any loss suffered by the Government on account of the Contract being so terminated prematurely.

(c) Time and date of completion of the work essence of the contract

The time and date stipulated in the letter of award for the completion of the allotted work shall be deemed to be the essence of the contract. In case of delay the Prime Bidder shall in agreement to other liabilities mentioned in the General conditions of Contract be liable for losses of inspection which may be incurred after the date on which the work ought to have been completed and in the event of the Prime Bidder's failure to complete the work within the period prescribed for such completion, the NCS-MoES shall be entitled to withhold any payments until the whole of the work has been completed and take action under clause 7.6 of General condition of contract in part-D of the Bid document. The NCS-MoES will allow such additional time, as he may prefer to have been required by the circumstances of the case.

(d) That in case of any dispute or difference, that may arise in connection with contract the settlement of which is not herein before provided for, the same shall be referred for the Arbitration in accordance with clause 15 of General Conditions of Contract. The stipulated time of completion of the work is strictly in accordance to the approved RFP and as per Lol. The submitted performance Bank guarantee will also be corroborative and complied with the completion of the work by the firm.

(Head / Director for the Prime Bidder)

1. Name of Witness with signature

2. Name of Witness with signature

**Scientist & Head, SHRA and
Project Director (Seismic Microzonation)**
(For and on behalf of President of India)

1. Name of Witness with signature

2. Name of Witness with signature

Name and signature of the Head of
Institution/Organisation
with official Seal

INTEGRITY PACT

General

This contract Agreement (hereinafter called the Integrity Pact) is made on _____, between, on one hand, the President of India acting through _____, Ministry / Department, Government of India (hereinafter called the "BUYER", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and _____ represented by _____ (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure *GEOTECHNICAL AND GEOPHYSICAL INVESTIGATIONS UNDER THE PROJECT "SEISMIC MICROZONATION OF 30-CITIES IN INDIA"* _____ (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and WHEREAS the BIDDER is a private company/public company / Government undertaking / partnership / registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry / Department of the Government of India / PSU performing its functions on behalf of the President of India.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

2. Commitments of the BUYER

- 1.4 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favor or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.
 - 1.5 The BUYER will, during the pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.
 - 1.6 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
3. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

3. Commitments of Prime Bidder

The PRIME BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:

- 3.14 The PRIME BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.
- 3.15 The PRIME BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favor, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the Government
- 3.16 PRIME BIDDERS shall disclose the name and address of agents and representatives and Indian PRIME BIDDERS shall disclose their foreign principals or associates.
- 3.17 PRIME BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
- 3.18 The PRIME BIDDER further confirms and declares to the BUYER that the PRIME BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the PRIME BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
- 3.19 The PRIME BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
- 3.20 The PRIME BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.
- 3.21 The PRIME BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 3.22 The PRIME BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The PRIME BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.
- 3.23 The PRIME BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- 3.24 The PRIME BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.25 If the PRIME BIDDER or any employee of the PRIME BIDDER or any person acting on behalf of the PRIME BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the PRIME BIDDER's firm, the same shall be disclosed by the PRIME BIDDER at the time of filing of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.26 The PRIME BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. Previous Transgression

4.3 The PRIME BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify PRIME BIDDER's exclusion from the tender process.

4.4 The PRIME BIDDER agrees that if it makes incorrect statement on this subject, PRIME BIDDER can be disqualified from the limited tender process or the contract, if already awarded, can be terminated for such reason.

14. Sanctions for Violations

14.1 Any breach of the aforesaid provisions by the PRIME BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the PRIME BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:

(ix) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the PRIME BIDDER. However, the proceedings with the other PRIME BIDDER(s) would continue.

(x) To immediately cancel the contract, if already signed, without giving any compensation to the PRIME BIDDER.

(xi) To recover all sums already paid by the BUYER, and in case of an Indian PRIME BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a PRIME BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the PRIME BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(xii) To cancel all or any other Contracts with the PRIME BIDDER. The PRIME BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the PRIME BIDDER.

(xiii) To debar the PRIME BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.

(xiv) To recover all sums paid in violation of this Pact by PRIME BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(xv) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the PRIME BIDDER, the same shall not be opened.

(xvi) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

14.2 The BUYER (NCS-MoES) will be entitled to take all or any of the actions mentioned at Para (6) of this Pact also on the Commission by the PRIME BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the PRIME BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

14.3 The decision of the BUYER (NCS-MoES) to the effect that a breach of the provisions of this Pact has been committed by the PRIME BIDDER shall be final and conclusive on the PRIME BIDDER. However, the PRIME BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

15. Fall Clause

15.1 The PRIME BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems/services at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the PRIME BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the PRIME BIDDER to the BUYER (NCS-MoES), if the contract has already been concluded.

15.2 The BUYER (NCS - MoES) has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission.

15.3 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

15.4 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

15.5 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

15.6 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER (NCS - MoES).

15.7 The PRIME BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER (NCS - MoES) including that provided by the PRIME BIDDER. The PRIME BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Partners of Prime Bidder. The Monitor shall be under contractual obligation to treat the information and documents of the PRIME BIDDER/Partner(s) with confidentiality.

15.8 The BUYER (NCS-MoES) will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

15.9 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department / within 8 to 10 weeks from the date of reference or intimation to him by the BUYER (NCS-MoES) / PRIME BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

16. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER (NCS - MoES) or its agencies shall be entitled to examine all the documents including the Books of Accounts of the PRIME BIDDER and the PRIME BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

17. Independent Monitors

MoES has approved the following officers as Independent External Monitors (IEM) vide order No. MoES/20/06/2016-(VIG.) dated 06/12/2016.

- (iii) ShriArun Kumar, Ex Secretary, Oil Industry Development Board (OIDB);
Address: B-38, Virandavan Apartment, Plot No -1, Sector-6, Dwarka New Delhi-110075
Email: kumararun_53@rediffmail.com
Mobile: 9810621113
- (iv) ShriSushil Gupta, Ex-Chairman, Central Ground Water Board (CGWB) & Central Ground Water Authority (CGWA),
Address: B-702, Arravali Heights, Sector 21 C, Faridabad, Haryana-121001
Email: sushilanitagupta@yahoo.com
Mobile: 9999744061

- 17.1 The BUYER (NCS-MoES) has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors to be given).
- 17.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.
- 17.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
- 17.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.
- 17.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER (NCS-MoES).
- 17.6 The PRIME BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER (NCS-MoES) including that provided by the PRIME BIDDER. The PRIME BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Partners of Prime bidder. The Monitor shall be under contractual obligation to treat the information and documents of the PRIME BIDDER/Partner(s) with confidentiality.
- 17.7 The BUYER (NCS-MoES) will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.
- 17.8 The Monitor will submit a written report to the designated Authority of BUYER (NCS-MoES)/Secretary in the Department / within 8 to 10 weeks from the date of reference or intimation to him by the BUYER (NCS-MoES) / PRIME BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

18. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER (NCS-MoES) or its agencies shall be entitled to examine all the documents including the Books of Accounts of the PRIME BIDDER and the PRIME BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

19. Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER (NCS-MoES).

20. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

21. Validity

21.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER (NCS-MoES) and the PRIME BIDDER/Seller, including warranty period, whichever is later. In case PRIME BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

21.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

22. The parties hereby sign this Integrity Pact at _____ on _____

BUYER (NCS-MoES)

PRIME BIDDER

Name of the Officer : _____

Designation : _____

Deptt./Ministry/PSU: _____

Witness:

Witness:

1. _____

1. _____

2. _____

2. _____

PART-D

General Conditions of Contract and Contract Forms

GEOTECHNICAL AND GEOPHYSICAL INVESTIGATIONS FOR SEISMIC MICROZONATION OF CITIES IN INDIA

General Conditions of Contract (GCC)
& Contract Forms

General Conditions of Contract (GCC)

General Conditions

1. General Provisions

1.1 Definitions The following definitions shall carry the meaning assigned to them hereunder for the purpose of this contract:

A. "Contract" means the Contract Agreement, the Letter of Acceptance, the Letter of Bid, General Conditions, the Specifications, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.

B. "Letter of Acceptance" means the letter of formal acceptance, signed by the NCS-MoES, including any annexure comprising agreements between and signed by both Parties.

C. "NCS-MoES" means the National Centre for Seismology, Ministry of Earth Sciences, and the successors in the office.

D. "Prime Bidder" means the person(s) named as Prime Bidder in the Letter of Bid accepted by the NCS-MoES and the legal successors in title to this person(s).

E. "Designated Scientist" means the Program Head, SHRA, NCS, MoES /person appointed by the NCS-MoES to act as his representative for the purpose of the Contract.

F. "Performance Security" means the security under Sub-Clause 4.2 [Performance Security].

G. "Force Majeure" means an exceptional event or circumstance:

- (i) Which is beyond a Party's control.
- (ii) Which such Party could not reasonably have provided against before entering into the Contract,
- (iii) Which, having arisen, such Party could not reasonably have avoided or overcome, and
- (iv) Which is not substantially attributable to the other Party.

1.2 Priority of Documents

1.2.1 The documents forming the Contract are to be taken as mutually explanatory of one another. However, in case of any discrepancy between any two or more documents, for the purpose of interpretation, the following order of preference shall be observed:

- (a) The Work Component.
- (b) The specification and special conditions, if any.
- (c) These General Conditions.
- (d) Indian Standard Specifications of BIS

1.2.2 If there are varying or conflicting provisions made in any one document forming part of the contract, the Program Head, Seismic Hazard and Risk Analysis, National Centre for Seismology, Ministry of Earth Sciences shall be the deciding authority with regard to the intention of the document whose decision shall be binding on the Prime Bidder.

1.2.3 Any error in description, quantity or rate in Schedule of Quantities or any omission there from shall not vitiate the contract or release the Prime Bidder from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.

1.3 Delayed Instructions

If the Prime Bidder feels that the Work is likely to be delayed or disrupted due to non-issue of some or any instruction within a particular reasonable time, he shall give notice to the Designated Scientist specifying details of the necessary instruction, details of its necessity when it should be issued. He shall also give details of the nature and amount of the delay or disruption likely to be suffered if it is late.

If the Prime Bidder suffers delay and/or incurs Cost as a result of Designated Scientist failing to issue the notified instruction within the said reasonable time specified in the notice, the Prime Bidder shall give a further notice to the Designated Scientist and shall be entitled:

- (a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 7.4 [Extension of Time for Completion], and
- (b) Payment of any such Cost plus profit, which shall be determined by the Director, National Center for Seismology, MoES and shall be final and binding on the Prime Bidder.

However, if and to the extent that the Designated Scientist's failure was caused by any error or delay by the Prime Bidder, including an error in, or delay in the submission of, any of the Prime Bidder's Documents, the Prime Bidder shall not be entitled to such extension of time, Cost or profit

2. The NCS-MoES

2.1 Right of Access to the Site

The NCS-MoES shall provide the Prime Bidder right of access to a particular site within 5 days of Prime Bidders notice of his intension to execute work at that site. However, the NCS-MoES may withhold any such right until the Performance Security has been received. If Prime Bidder suffers delay and/or incurs cost as a result of late permission of access to any site, he shall be suitably compensated following a procedure similar to that mentioned in **clause 1.3** for delayed instructions.

2.2 Permits, Licenses or Approvals

The NCS-MoES shall, to the extent possible, provide reasonable assistance to the Prime Bidder at the request of the Prime Bidder such as assistance in Prime Bidder's applications for any permits, licenses or approvals required by the Laws of the Country, which the Prime Bidder is required to obtain for the delivery of Goods, carrying out investigations.

2.3 NCS/MOES Claims

If the NCS-MoES considers itself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Notification Period, the NCS-MoES shall give notice to the Prime Bidder specifying the Clause or other basis of the claim, and shall include substantiation of the amount and/or extension to which the NCS-MoES considers himself to be entitled

This amount may be included as a deduction in the Contract Price and Payment Certificates. The NCS-MoES shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Prime Bidder, in accordance with this Sub-Clause.

3. The Designated Scientist/Officer

3.1 Designated Scientist's Duties and Authority

The NCS-MoES shall appoint the Designated Scientist who shall carry out the duties assigned to him in the Contract. Whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Designated Scientist shall be deemed to act for the NCS-MoES.

The Designated Scientist shall obtain the specific approval of the NCS-MoES while acting under the-following Sub-Clauses of these Conditions:

- (a) **Sub-Clause 7.4:** Extension of time and/or additional cost.

(b) Sub-Clause 9.1: Instructing a Variation, except; (i) in an emergency situation as determined by the Designated Scientist, or (ii) if such a Variation would result in increases the Contract Amount.

3.2 Instructions of the Designated Scientist

The Prime Bidder shall abide by the instructions of the Designated Scientist given to him or to his authorized representative on any matter related to the contract. The Prime Bidder shall only take instructions from the NCS-MoES, Designated Scientist, or from an assistant to whom the authority has been delegated. Whenever practicable, such instructions shall be given in writing. If the Prime Bidder has any objection in carrying out the instruction, he shall give it to the Designated Scientist in writing within two working days of receiving the instruction. If the Designated Scientist rejects the objection or does not reply within two working days of receiving the objection, the instruction shall be deemed to be confirmed and the Prime Bidder would be under obligation to carry out the same.

4. The Prime Bidder

4.1 Prime Bidder's General Obligations

The Prime Bidder shall execute and complete the Works in accordance with the Contract and with the Designated Scientist's instructions, and shall remedy any defects in the Works. The Prime Bidder shall provide the Plant and machinery, Personnel, Goods, consumables and other things and services as required at site for the execution of the work. The Prime Bidder shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of execution. Except where stated otherwise, the Prime Bidder shall be responsible for all Prime Bidder's Documents, Temporary Works, and such design of each item of Plant and Materials as is required for the item to be in accordance with the Contract. Whenever required by the Designated Scientist, the Prime Bidder shall submit details of the arrangements and methods which the Prime Bidder proposes to adopt for the execution of the Works. Any change in these arrangements and methods shall be made only with the prior approval of the Designated Scientist.

4.2 Prime Bidder's Representative

The Prime Bidder shall appoint the Prime Bidder's Representative(s) and shall give him all authority necessary to act on the Prime Bidder's behalf under the Contract. The Prime Bidder's representative(s) shall, at all times, be available at the site to supervise the work and to receive instructions from The NCS-MoES, the Designated Scientist or his authorized subordinate. If the Prime Bidder's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed with the prior approval of the NCS-MoES or the Designated Scientist.

4.3 Prime Bidders Associates/partners

The Prime Bidder shall not subcontract the whole or any part of the Works. Any part of the work shall be assigned or sublet to the subcontractor with the prior approval of the NCS-MoES. The Prime Bidder shall be responsible for the acts or defaults of any subcontractor, his agents or employees, as if they were the acts or defaults of the Prime Bidder.

4.4 Co-operation

The Prime Bidder shall, as specified in the Contract or as instructed by the Designated Scientist, allow appropriate opportunities for carrying out work to:

- (a) The NCS-MoES's Personnel,
- (b) Any other Prime Bidders employed by the NCS-MoES, and
- (c) The personnel of any legally constituted public authorities, who may be employed in the execution on or near the Site of any work not included in the Contract.

4.5 Performance Guaranty

Performance Guaranty must be submitted by the Prime Bidders' Associates or Partners to their Principle Prime Bidder with whom they are associated. A copy of the Performance Guaranty submitted by the associates/partners of the Prime Bidder must also be submitted to NCS-MoES before signing the MoU between NCS-MoES and Head of the Prime Bidder's Institute.

4.5 Safety Procedures

The Prime Bidder shall:

- (a) Comply with all applicable safety regulations,
- (b) Take care for the safety of all persons entitled to be on the Site,
- (c) Use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons,
- (d) Provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.
- (e) All the boreholes drilled for investigations need to be properly closed/ capped using adequate and environmentally friendly measure to avoid human hazards. In absence of this compliance the entire responsibility shall be of bidders and will be dealt accordingly.

4.7 Quality Assurance

The Prime Bidder shall institute a quality assurance in accordance with the details stated in the Contract. The Designated Scientist shall be entitled to audit any aspect of the system. Details of all procedures and compliance documents shall be submitted to the Designated Scientist for information before each execution stage is commenced. Compliance with the quality assurance system shall not relieve the Prime Bidder of any of his duties, obligations or responsibilities under the Contract.

4.8 Avoidance of Interference

The Prime Bidder shall not interfere unnecessarily or improperly with the convenience of the public; or the access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the NCS-MoES or of others. The Prime Bidder shall indemnify the NCS-MoES against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference. The Prime Bidder shall use reasonable efforts to prevent any road or bridge from being damaged by the Prime Bidder's traffic or by the Prime Bidder's Personnel. He shall be responsible for any maintenance which may be required for his use of access routes;

4.9 Prime Bidder's Equipment

The Prime Bidder shall be responsible for all his Equipment, which shall be brought on to the Site exclusively for the execution of the Works. The Prime Bidder shall not remove from the Site any major items of his Equipment without the consent of the Designated Scientist except the vehicles transporting goods or Prime Bidder's personnel.

4.10 Protection of the Environment

The Prime Bidder shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations. The Prime Bidder shall ensure that emissions, surface discharges and effluent from the Prime Bidder's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.

4.11 Electricity, Water and Gas

The Prime Bidder shall make his own arrangements for power, water and other services he may require.

4.12 Progress Reports

Monthly progress reports in prescribed pro forma shall be prepared by the Prime Bidder and submitted to the Designated Scientist in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates. Reporting shall continue until the Prime Bidder has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the

Works.

4.13 Security of the Site

Unless otherwise stated in the Contract Conditions, the Prime Bidder shall make arrangement for keeping unauthorized persons off the Site. For the purpose of this sub-clause any person other than the Prime Bidder's Personnel or the NCS-MoES's Personnel or other personnel notified to the Prime Bidder by the NCS-MoES /Designated Scientist as authorized personnel of the NCS-MoES's other Prime Bidders on the Site, shall be treated as unauthorized person.

4.14 Prime Bidder's Operations on Site

During the execution of the Work, the Prime Bidder shall keep the Site free from all unnecessary obstruction. The Prime Bidder shall either properly keep in store or dispose off any Prime Bidder's Equipment, surplus materials, wreckage, rubbish and Temporary Works that are no longer required on the work.

On completion of operations on a particular site, which may form a part of the total work, the Prime Bidder shall clear away and remove, from that Site or part of site, all his Equipment, surplus material, wreckage, rubbish and Temporary Works, if any. The Prime Bidder shall leave that part of the Site in a clean and safe condition. However, the Prime Bidder may retain on Site, during the Defects Notification Period, such Goods as are required for the Prime Bidder to fulfill obligations under the Contract.

4.15 Fossils

All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be the government property and shall be placed under the care and authority of the NCS-MoES. The Prime Bidder shall prevent Prime Bidder's Personnel or other persons from removing or damaging any of these findings. Upon discovery of any such finding, the Prime Bidder shall, promptly give notice to the Designated Scientist, and shall abide by his instructions for dealing with it.

5. Staff and Labour

5.1 Engagement of Staff and Labour

Except as otherwise stated in the Specification, the Prime Bidder shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, housing, feeding and transport.

5.2 Labour Laws

The Prime Bidder shall comply with all the relevant labour Laws such as the Contract Labour (R&A) Act 1970, the Contract Labour (Regulation and Abolition) Central Rules 1971, and Child Labour (Prohibition and Regulation) Act, 1986. No labour below the age of 14 years shall be employed on the work.

Any failure to fulfil these requirements shall attract the penal provisions of this contract arising out of the resultant non-execution of the work.

5.3 Rates of Wages and Conditions of Labour

The Prime Bidder shall pay to laborers employed by him either directly or through sub-Prime Bidder, wages not less than fair wages as per provisions of the Contract Labour (Regulation and Abolition) Act 1970 Contract Labour (Regulation and Abolition) Central Rules 1971, wherever applicable.

The Prime Bidder shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act 1948, Employees liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, and the Contract Labour (Regulation and Abolition) Act 1970, as amended from time to time and any other laws relating thereto and the rules made thereafter from time to time.

The NCS-MoES shall have the right to deduct from the amount due to the Prime Bidder any sum required or

estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.

The Prime Bidder shall indemnify and keep indemnified the NCS-MoES against payments to be made under and for the observance of the laws aforesaid without prejudice to his right to claim indemnity from his sub-Prime Bidders.

5.4 Facilities for Staff and Labour

Except as otherwise stated in the Specification, the Prime Bidder shall provide and maintain all necessary accommodation and welfare facilities for the Prime Bidder's Personnel. The Prime Bidder shall also provide facilities for the NCS-MoES's Personnel as stated in the Specification.

5.5 Health and Safety

The Prime Bidder shall at all times take all reasonable precautions to maintain the health and safety of the Prime Bidder's Personnel. In collaboration with local health authorities, the Prime Bidder shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Prime Bidder's and NCS-MoES's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements including adequate supply of drinking and other water, and for the prevention of epidemics.

The Prime Bidder shall send, to the Designated Scientist, details of any accident as soon as practicable after its occurrence. The Prime Bidder shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Designated Scientist may reasonably require.

5.6 Prime Bidder's Personnel

The Designated Scientist or the NCS-MoES may require the Prime Bidder to dismiss or remove from the site of the work any person or persons in the Prime Bidder's employ who may be incompetent, misconduct himself, lacks in care or persists in any conduct which is prejudicial to safety, health, or the protection of the environment. The Prime Bidder shall have to forthwith comply with such requirement.

5.7 Disorderly Conduct

The Prime Bidder shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Prime Bidder's Personnel, and to preserve peace and protection of persons and property on and near the Site.

6. Plant, Materials and Workmanship

6.1 Inspection

The NCS - MoES's Personnel or any person authorised by him shall at all reasonable times have full access to all parts of the Site and be entitled to examine, inspect, measure and test the materials, procedures and workmanship. The Prime Bidder shall give the NCS-MoES's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Prime Bidder from any obligation or responsibility. The Prime Bidder shall give notice to the Designated Scientist whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport so that the Designated Scientist may carry out the examination, inspection, measurement or testing within a reasonable time, or promptly intimate the Prime Bidder that the Designated Scientist does not require to do so.

6.2 Remedial Work

Notwithstanding any previous test or certification, the Designated Scientist may instruct the Prime Bidder to remove from the Site and replace any Plant or Materials which is not in accordance with the Contract or re-execute any work which is not in accordance with the Contract. The Prime Bidder shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction. If the Prime Bidder fails to comply with the instruction, the NCS-MoES shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Prime Bidder would have been entitled to payment for the work, the Prime Bidder shall be subject to Sub-Clause 2.3 [NCS-MoES ø Claims] pay to the NCS-MoES all costs arising from this failure.

7. Commencement, Delays and Suspension

7.1 Commencement of Works

Unless otherwise stated in the Contract Conditions, the Commencement Date shall be as mentioned in the letter of award of contract or if no date is mentioned then 10 (Ten) days after the date of issue of the Letter of Award of Contract. The execution of work shall commence from such time period or from the date of handing over the site whichever is later. If the Prime Bidder fails to commence the work as aforesaid, the NCS-MoES shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money and performance guarantee absolutely.

7.2 Time for Completion

The Prime Bidder shall complete the whole of the Works within the 12/24 months and maintain proportionate progress at all times. Failure to complete the work (if any) may attract the provisions for compensation for delays.

7.3 Work Schedule

The Prime Bidder shall submit a detailed work schedule to the NCS-MoES within 15 days of the award of the contract. The Prime Bidder shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Prime Bidder's obligations.

7.4 Extension of Time for Completion

If the work(s) be delayed by any of the following:

- (a) A variation or other substantial change in the quantity of an item of work included in the Contract,
- (b) A cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,
- (c) Exceptionally adverse climatic conditions,
- (d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions, or
- (e) Any delay, impediment or prevention caused by or attributable to the NCS-MoES, the NCS-MoES's Personnel, or the NCS-MoES's other Prime Bidders,
- (f) Any other cause which, in the absolute discretion of the NCS-MoES, is beyond the control of the Prime Bidder,

then the Prime Bidder shall be entitled to an extension of the Time for Completion if and to the extent that completion for the purposes of Sub-Clause 7.2 will likely to be delayed. Upon happening of any of such event causing delay, the Prime Bidder shall immediately give notice thereof in writing to the Designated Scientist but nevertheless use constantly his best endeavor to prevent or make good the delay. In any such case the NCS-MoES may give a fair and reasonable extension of time and reschedule various stages of the work for completion of the work. Such extension of time shall be communicated to the Prime Bidder by the NCS-MoES in writing within two months of the receipt of request from the Prime Bidder. Non application by the Prime Bidder for extension of time shall not be a bar for giving a fair and reasonable extension by the NCS-MoES and this shall be binding on the Prime Bidder.

7.5 Rate of Progress

If, at any time (a) actual progress is too slow to complete the work within the Time for Completion, and/or (b) progress has fallen (or will fall) behind the current programme under Sub-Clause 7.3 [Work Schedule], other than as a result of a cause listed in Sub-Clause 7.4 [Extension of Time for Completion], then the Designated Scientist may instruct the Prime Bidder to submit, under Sub-Clause 7.3 [Work Schedule], a revised programme and supporting report describing the revised methods which the Prime Bidder proposes to adopt in order to expedite progress and complete within the Time for Completion. Unless the Designated Scientist notifies otherwise, the Prime Bidder shall adopt these revised methods, which may require increases in the working hours and/or in the numbers of Prime Bidder's Personnel and/or Goods, at the risk and cost of the Prime Bidder. If these revised methods cause the NCS-MoES to incur additional costs, the Prime Bidder shall subject to Sub-Clause 2.3 [NCS-MoES's Claims] pay these costs to the NCS-MoES, in addition to delay damages (if any) under Sub-Clause 7.6 below.

7.6 Compensation for Delay

If the Prime Bidder fails to comply with Sub-Clause 7.2 [Time for Completion], he / she shall be liable, subject to Sub-Clause 2.3 [NCS-MoES's Claims] to pay compensation to the NCS-MoES for this default. The compensation shall be paid as below:

1% of the contract value for every week the work remains incomplete beyond specified time of completion, subject to a maximum of 10% of the contract value. The compensation shall not relieve the Prime Bidder of his obligation to complete the Work or from any other duties, obligations or responsibilities which he may have under the contract.

7.7 Completion Certificate

Immediate on completion of the work at particular site the Prime Bidder shall give notice to the Designated Scientist of such completion and after inspection and satisfaction Designated Scientist shall issue the Completion Certificate if he finds that the work has been completed satisfactorily in all respects. If the work is not to the satisfaction of the Designated Scientist, he shall indicate in writing to the Prime Bidder the defects/shortcomings in the work and ask the Prime Bidder to remove them. Upon removal of such defects/shortcomings alone the Designated Scientist shall issue the completion certificate. Performance of the Prime Bidder's obligations shall not be considered to have been completed until the Designated Scientist has issued the Completion Certificate to the Prime Bidder, stating the date on which the Prime Bidder completed his obligations under the Contract.)

7.8 Unfulfilled Obligations

After the Performance Certificate has been issued, each Party shall remain liable for the fulfilment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.

7.9 Clearance of Site

The Prime Bidder shall remove any remaining Prime Bidder's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site immediately. The Prime Bidder shall also close all the boreholes properly drilled for geotechnical investigations and geophysical investigations. If all these items have not been removed within 48 hours after the NCS-MoES receives a copy of the Performance Certificate, the NCS-MoES may sell or otherwise dispose of any remaining items. The NCS-MoES shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site. Any balance of the amount from the sale shall be paid to the Prime Bidder. If these amounts are less than the NCS-MoES's costs, the Prime Bidder shall pay the outstanding balance to the NCS-MoES.)

8. Measurement and Evaluation

The Works shall be measured and valued for payment.

9. Variations and adjustments

9.1 Right to Vary

The NCS-MoES /Designated Scientist may at any time prior to issuing the Completion Certificate for the works require variation in the quantity or method of any item of work to the extent of 25% either by an instruction or by a request for the Prime Bidder to submit a proposal, which shall be binding on the Prime Bidder. The Prime Bidder may, however, promptly give notice to the Designated Scientist stating (with supporting particulars) his difficulty, if any, in carrying out the variation. Upon receiving this notice, the Designated Scientist shall cancel, confirm or vary the instruction.

9.2 Adjustments for Changes in Legislation

All rates quoted by the Prime Bidder shall be inclusive of all taxes and levies payable under respective statutes. However, pursuant to the Constitution (46th Amendment) Act, 1982, if any further tax or levy is imposed by Statute after the last stipulated date for the receipt of bids including extensions, if any, and thereupon necessarily and properly pays such taxes/ levies, the Prime Bidder shall be reimbursed the amount so paid, provided such payment is not, in the opinion of the NCS-MoES (whose decision shall be final and binding on the Prime Bidder) attributable to delay in execution of the work within the control of the Prime Bidder. The Prime Bidder shall, within a period of 30 days of the imposition of any such tax or levy, pursuant to the Constitution (46th Amendment) Act 1982, give a written notice to the Designated Scientist along with all necessary information related thereto.

10. Contract Price and Payment

10.1 Mobilization Advance

The NCS-MoES may give a mobilization advance not exceeding 10% of the contract amount, if requested by the Prime bidder in writing within one month of the order to commence the work. The Mobilization Advance will not be paid in less than two installments. The total advance payment, the number and timing of installments (if more than one) shall be decided by NCS-MoES. The first installment shall be released on receiving a request from the Prime Bidder and the second and subsequent installments, if any, shall be released only after the Prime Bidder furnishes a proof of the satisfactory utilization of the earlier installments to the entire satisfaction of the NCS-MoES. The mobilization advance as above shall bear a simple interest at the rate of 18 percent per annum calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced shall be made by deduction from Prime Bidder's bills commencing after the first ten percent of the gross value of the work is executed and paid, on pro rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time eighty percent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

10.2 Payment of Interim or Running Account Bills

The Prime Bidder shall submit the interim or running account bills for the work executed on the basis of recorded measurements in triplicate on or before the 10th day of every quarter. The Prime bidder shall not be entitled to be paid interim or running account bill if the gross work done together with net payment adjustment of advances, if any. The amount admissible to the Prime Bidder shall be paid by NCS-MoES after due verification of the measurements. In the event of failure of the Prime Bidder to submit the bill, no claim of the Prime Bidder whatsoever due to delay in payment including that of interest shall be payable to the Prime Bidder. All interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskillful work to be rejected, removed, replaced or redone. The progress of the work should be to the satisfaction of NCS-MoES.

In nutshell the payment will be made to qualified Prime Bidder as follows:

Mobilization advance: 10% of the total contract value will be given as advance to commence the work by the Prime Bidder.

Payment during and after completion of project: On adjustment of given advance after submission of utilization certificate by the Prime Bidder, the rest payment of 90% of total contract value will be made in four equal installments (22.5%) for the project duration of 1 year/2years only after satisfaction to NCS-MoES and after submission of utilization certificate of the previous paid value, out of which the last installment will be released after submission of the final report in every aspect on investigation for the city to NCS-MoES by the Prime Bidder. This may be noted that issuance of the completion certificate to Prime Bidder by NCS-MoES (mentioned in sub clause (10.3) given below) will be made well in advance date so that completion of the report on the city containing all required GIS based information, data, report, maps in both hard and soft copy to be prepared by the prime bidder for submission to NCS-MoES.

10.3 Final Payment

The Prime Bidder shall present the final bill within 60-days of issuance of the Completion ~ Certificate by the NCS-MoES. The NCS-MoES shall pay to the Prime Bidder the final payment within 90-days of receiving the final bill from the Prime Bidder.

11. Termination by NCS-MoES

11.1 Termination

11.1.1 Subject to other provisions contained in this clause, the designated Scientist may, without prejudice to his any other rights or remedy against the Prime Bidder in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

- i. If the Prime Bidder having been given by the designated scientist a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.
- ii. If the Prime Bidder being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.
- iii. If the Prime Bidder has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the designated scientist (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the designated scientist.
- iv. If the Prime Bidder fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the designated scientist.
- v. If the Prime Bidder persistently neglects to carry out his obligations under the contract and /or commits default in complying with any of terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7days after a notice in writing is given to him in that behalf by the designated scientist.
- vi. If the work is not started by the Prime Bidder within 2 months of the stipulated time.

when the Prime Bidder has made himself liable for action under any of the cases aforesaid the designated scientist on behalf of the President of India shall have powers:

- a) To determine or rescind the contract as aforesaid (of which termination or rescission notice in writing to the Prime Bidder under the hand of the designated Scientist shall be conclusive evidence). Upon such determination or rescission, the Earnest Money Deposit, Security Deposit already recovered and performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Government.
- b) After giving notice to the Prime Bidder to measure up the work of the Prime Bidder and to take such whole, or the balance or part thereof, shall be un-executed out of his hands and to give it to another Prime Bidder to complete the work. The Prime Bidder, whose contract is determined or rescinded as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above courses being adopted by the designated Scientist, the Prime Bidder shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the Prime Bidder shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the designated Scientist has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

11.1.2 In case, the work cannot be started due to reasons not within the control of the Prime Bidder within 2-months of the allocation of work, either party may close the contract. In such eventuality, the Earnest Money Deposit and the Performance Guarantee of the Prime Bidder shall be refunded, but no payment on account of interest, loss of profit or damages etc. shall be payable at all.

11.2 Valuation at Date of Termination

As soon as practicable after a notice of termination under Sub-Clause 11.1 [Termination] has taken effect, the Designated Scientist shall proceed to agree or determine the value of the Works, Goods and Prime Bidder's Documents, and any other sums due to the Prime Bidder for work executed in accordance with the Contract.

11.3 Payment after Termination

After a notice of termination under Sub-Clause 11.1 [Termination] has taken effect, the NCS-MoES may:

(a) withhold further payments to the Prime Bidder until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the NCS-MoES, have been established, and/or

(b) recover from the Prime Bidder any losses and damages incurred by the NCS-MoES and any extra costs of completing the Works, after allowing for any sum due to the Prime Bidder under Sub-Clause 11.2 [Valuation at Date of Termination]. After recovering any such losses, damages and extra costs, the NCS-MoES shall pay any balance to the Prime Bidder.

11.4 Foreclosure of contract by NCS-MoES

The NCS /MOES shall be entitled to terminate the Contract at any time for the NCS-MoES's convenience, by giving a 30 days' notice to the Prime Bidder. The NCS/SHRA shall, however, not terminate the Contract under this Sub-Clause in order to execute the Works itself or to arrange for the Works to be executed by another Prime Bidder or to avoid a termination of the Contract by the Prime Bidder under Clause 12.1 [Termination by Prime Bidder]. In the event of such termination, the NCS-MoES shall promptly return the Performance Security to the Prime Bidder. The termination shall take effect 30 days after the later of the dates on which the Prime Bidder receives this notice or the NCS-MoES returns the Performance Security. After this termination, the Prime Bidder shall proceed in accordance with Sub-Clause 12.2 [Cessation of Work and Removal of Prime Bidder's Equipment].

12. Termination by Prime Bidder

12.1 Termination by Prime Bidder

The Prime Bidder shall be entitled to terminate the Contract if:

(a) The Prime Bidder does not receive the amount due under an interim bill within 60 days of submitting the bill.

(b) In the event of Prime Bidder not receiving the sums due to him upon expiration of the 60 days as above for payments under interim bill, the Prime Bidder may, without prejudice to the Prime Bidder's entitlement to interest on delayed payments under Sub-Clause 10.4, immediately take one or both of the following actions, namely (i) suspend work or reduce the rate of work, and (ii) terminate the Contract by giving notice to the NCS-MoES. Such termination shall take effect 14 days after the giving of the notice. The Prime Bidder's election to terminate the Contract shall not prejudice any other rights of the Prime Bidder, under the Contract or otherwise.

12.2 Cessation of Work and Removal of Prime Bidder's Equipment

After a notice of termination or foreclosure under Sub-Clause 11.1 or 11.4 [NCS - MoES's Entitlement to Termination] or Sub-Clause 12.1 [Termination by Prime Bidder] has taken effect, the Prime Bidder shall promptly:

- (a) Cease all further work, except for such work as may have been instructed by the Designated Scientist for the protection of life or property or for the safety of the Works,
- (b) Hand over Prime Bidder's Documents, geotechnical and geophysical data (raw and Digital format) for which the Prime Bidder has received payment, and
- (c) Remove all other Goods from the Site, except as necessary for safety, and leave the Site.

12.3 Payment on Termination

After a notice of termination under Sub-Clause 12.1 [Termination by Prime Bidder] has taken effect, the NCS-MoES shall promptly:

- (a) Return the Performance Security to the Prime Bidder,
- (b) Pay the Prime Bidder in accordance with Sub-Clause 11.3

13. Risk and Responsibility

Indemnities

The Prime Bidder shall indemnify and hold harmless the NCS-MoES, the NCS-MoES 's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of the following:

- (a) Bodily injury, sickness, disease or death, of any person whatsoever arising out of or in the course of the execution and completion of the Works unless attributable to any negligence, willful act or breach of the Contract by the NCS-MoES, the NCS-MoES 's Personnel, or any of their respective agents, and
- (b) Damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of the execution and completion of the Works unless and to the extent that any such damage or loss is attributable to any negligence, willful act or breach of the Contract by the NCS-MoES, the NCS-MoES 's Personnel, their respective agents. The NCS-MoES shall indemnify and hold harmless the Prime Bidder, the Prime Bidder's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of bodily injury, sickness, disease or death, which is attributable to any negligence, willful act or breach of the Contract by the NCS-MoES, the NCS-MoES 's Personnel, or any of their respective agents.

14. Force Majeure

14.1 Definition of Force Majeure

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) mentioned in the Definitions are satisfied:

- (i) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (ii) rebellion, terrorism, sabotage by persons other than the Prime Bidder's Personnel, revolution, insurrection, military or usurped power, or civil war,
- (iii) riot, commotion, disorder, strike or lockout by persons other than the Prime Bidder's Personnel,
- (iv) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Prime Bidder's use of such munitions, explosives, radiation or radio-activity, and
- (v) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

14.2 Notice of Force Majeure

If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure. The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them. Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the

other Party under the Contract.

14.3 Consequences of Force Majeure

If the Prime Bidder is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 14.2 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Prime Bidder shall be entitled to an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 7.4 [Extension of Time for Completion].

15. Claims, Disputes and Arbitration

If any dispute or difference arises between the parties hereto as to the construction, interpretation, effect and implication of any provision of this contract, including the rights or liabilities or any claim or demand of any party (or its extent) against the other party or its sub-Prime Bidder or in regard to any matter under these presents but excluding any matters, decisions or determination of which is expressly provided in this contract, such disputes or differences shall be referred to an arbitrator to be appointed by the mutual consent of both parties. If the parties cannot agree on the appointment of the arbitrator within a period of one month from the notification by one party to the other of existence of such dispute, then the arbitrator shall be nominated by the Secretary to the Government of India, Department of Legal Affairs, Ministry of Law & Justice (Law Secretary). A reference to the arbitration under this clause shall be deemed to be submission with the meaning of the Arbitration and Conciliation Act 1996 and any modification or re-enactment thereof and the rules framed there under for the time being in force.

Any dispute arising out of the contract should be within the jurisdiction of New Delhi only. Minor cases of redressal, if any, can be referred to the NCS-MoES, New Delhi. It is to be mentioned that any disputes between the qualified prime bidders and their associates or partners would be dealt by themselves, and NCS-MoES would not be responsible to deal with their disputes, however, delay in completing the assigned jobs of NCS-MoES by the Prime Bidder should not be happened on ground of any sort of disputes between the qualified Prime Bidders and their associates, for which the Prime Bidders need to submit a declaration from their Head of institutions concerned to NCS ó MoES stating that the assigned job will be completed on time, whatsoever the reasons are with the Prime Bidders, except delays due to natural disasters in the area of the field investigations for seismic microzonation of the city.

16.0 Intellectual Property Rights

All the field, laboratory test data and their hard/soft copy, interpretations/illustrations, recommendations would be the intellectual properties of NCS-MoES under Intellectual Property Right Act, 2005. Even a copy of these data set in any form will not be allowed to keep either with Prime bidders or with their associates / partners to avoid the use of data for any other purposes.

In addition to above, each and every clause as mentioned in the approved RFP uploaded to CPP would be accepted by both the parties, will be strictly followed and complied.

Scientist & Head, SHRA and
Project Director (Seismic Microzonation)

Name and signature of the Head of
Institution/Organisation
with official Seal