



# The Institute of Cost Accountants of India

(Statutory Bodt under an Act of Parliament)

**Headquarters:** CMA BHAWAN, 12, Sudder Street, Kolkata – 700016

**New Delhi Office:** CMA BHAWAN, 3, Institutional Area, Lodhi Road, New Delhi – 110003.

Phone No.:033-2252 1031/1034/1035 & 011-24666100/24622156/57/58

Website: www.icmai.in



## Tender Document

### For

**SELECTION FOR CONSULTANCY FIRMS/ CIVIL ENGINEERING FIRM/COMPANIES/ AGENCIES FOR CONDUCTING OF STRUCTURAL AUDIT/ ASSESSMENT OF REMEDIAL MEASURES, NDT & ALLIED WORKS OF INSTITUTE BUILDING AT PLOT NO. 97, SECTOR 15, CBD BELAPUR, NAVI MUMBAI.**

Name of the Tenderer: - \_\_\_\_\_

**Last Date of Submission** : 16.00 hours on 08.02.2024.

**Date of Opening of Technical bid** : 14.00 hours on 09.02.2024.

**Earnest Money Deposit** : Rs. 10,000/- in Demand Draft Drawn in favour of “The Institute of Cost Accountants of India”, Payable at Kolkata. EMD to be submitted along with the documents of Technical bid.  
EMD will be refunded on submission of the report.

**EMD is exempted at the time of submission of the tender for the bidders who are having MSME registration. Successful bidder on award of the contract need to deposit EMD amount of Rs. 10,000/-**



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### BID NOTICE

The Institute invites applications under “Two Bid System” on prescribed forms for the under noted works from reputed Consultancy Firms/Companies engaged in conducting structural audit, Non- destructive testing of structures & allied works of multi- storied building.

The Institute of Cost Accounts of India, having its Headquarters at CMA Bhawan, 12, Sudder Street, Kolkata – 700 016 invites applications on prescribed forms for the undernoted works from reputed Consultancy Firms/ Civil Engineering Firm/Companies/Agencies engaged in conducting Structural audit and Non-destructive testing of structures & allied works of building at Plot No. 97, Sector 15, CBD Belapur, Navi Mumbai.

Name of work	<b>Consultancy and conducting of Structural Audit and NDT of Institute Buildings at Plot no. 97, Sector 15, CBD Belapur, Navi Mumbai.</b>
Last date and time of submission of bids	<b>Up to 16.00 Hours on 08.02.2024 at <i>The Institute of Cost Accountants of India</i>, CMA Bhawan, Headquarters, 12, Sudder Street, Kolkata – 700 016.</b> <b>(Technical Bid would be opened on 09.02.2024 at 14.00 Hrs)</b>
Availability of Bid document	Bid document could be downloaded from the web site of the Institute: <a href="http://www.icmai.in">www.icmai.in</a> under “Tender Section”.

### **Minimum Eligibility Criteria:**

Consultancy Firms/ Civil Engineering Firm/Companies/Agencies

1. Should have at least 5 years of experience in the field of Consultancy and conducting of Structural Audit and NDT of various Buildings. Should have services of Licensed Structural Engineers registered with appropriate authorities authorized for the Structural Audit/NDT works.
2. Experience of Structural Audit as per the guidelines of the Indian Society of Structural Engineers is essential.
3. Should have successfully completed in last 3 Financial Years, at least three work-orders in the field of Consultancy for Structural Audit/Space Audit of various Buildings including conducting NDT, preparation of BOQ with estimates, drawings/specifications based on NDT for reputed organisations. Each consultancy work order inclusive of NDT work should be above **Rs. 3.00 lakh (without GST)**.
4. Should submit audited balance sheets / P&L account and Income Tax clearance certificates for the last 3 financial years Interested applicants should submit their application as per enclosed Proforma & Annexure giving requisite details. All documents should be duly signed and stamped by an authorized signatory of the firm/company and all facts/figures should be supported by appropriate documentary evidence /certificates.



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**NOTE:** The Pre-Qualifying (Technical) bid and Financial Bid should be put in separate envelopes superscribed as Technical bid and Financial bid respectively and sealed. The said two sealed envelopes shall be put in a third sealed envelope superscribing "Consultancy and conducting of Structural Audit of Institutes Buildings at Plot no. 97, Sector 15, CBD Belapur, Navi Mumbai" and be submitted at *The Institute of Cost Accountants of India, CMA Bhawan, Headquarters, 12, Sudder Street, Kolkata – 700 016* through speed post/courier within the prescribed date and time. The Financial Bid of only those who qualify in terms of eligibility criteria will be opened and the date of opening of financial bid shall be intimated to the bidders in due course. Bids through email/fax will not be admitted.

### **BROAD SCOPE OF CONSULTANCY WORK**

#### **STRUCTURAL AUDIT:**

1. The existing building is a half done building with structural frame work up to third floor level and kept abandon for the last 8 years. It is also proposed for vertical expansion for another three floors. The said building is having approximately (321.00 Sq. Mt. Usable area + 100.00 Sq. Mt. Stair case area) i.e. 421.00 Sq. Mt. of area in each floor. The said premises will be used for office and Institutional Activities. The report shall include feasibility of accommodating the load of the racks for records and strengthening of the floor if required.
2. Structural audit shall be carried out as a qualitative assessment in accordance with latest guidelines of Indian Society of structural engineers. Visual health inspection of buildings covering internal, external and common areas using light tapping hammer, marking in floor plans all the visible defects, deterioration and quantification.
3. Assessment of damages of RCC members through NDT (Non-Destructive Testing) with calibration chart for the site. Initially digital rebound hammer test and if necessary Ultrasonic Pulse Velocity test, Half Cell Potential test, carbonation depth test, core test, chemical test etc. Necessity of which will be decided after inspection.
4. Finding the probable causes of damages, seepage / leakages and status of external surfaces and other installations, if any.
5. Preparation of detailed report based on visual inspection, NDT, suggesting/ phasing out priority wise repair/ remedial and retrofitting measures supported by photographs wherever necessary.
6. Preparation of detailed estimate for proposed structural repairs/ restoration, rectification work of specialized nature with BOQ (Bill of Quantities).
7. Preparation of as Built Drawings including Site Plan, Floor Plans, Sections, Elevations to a suitable scale and submitting three Sets of Hard Copies and corresponding Soft Copies.
8. Preparation of tender documents, drawings (main & working) etc., for proposed structural repairs/ restoration, rectification work and assisting The Institute, in respect of publishing of notice, inviting



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Tender from the experienced contractors registered with the Government/Semi Government organizations.

9. Attending meetings with The Institute Officials, wherever required, in respect to above work.
10. Final report on the restoration work to be executed.

### 11. Preliminary Work (Part of Report)

Collection of preliminary data.

Pre-repair survey (field work}

Submission of survey report, general defects and damages, general recommendations, budgetary estimate in the descending order of preference, generalized bill of quantities

### B. Pre-repair Planning.

Evaluation of methodology and repair strategy.

Detailed estimation of quantities.

Estimated value of project and Bill of quantities (BOQ)

The offer shall include the professional charges for all the consultancy services mentioned above and submitted as financial bid in separate sealed cover. The other details such as registration etc. with appropriate authority, qualification, work done details, etc. shall be submitted in a separate cover.

Sd/-

The Convener,

Tender Committee,

The Institute of Cost Accountants of India,

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### **INSTRUCTIONS TO THE BIDDER**

1. All Pre- Qualification (PQ) bid papers annexed along with the **Technical Bid** document should be **serially numbered on the top right hand corner** of every page.
2. All pages of the technical bid document should be duly signed and stamped by the authorized signatory of the applicant. The PQ bid document should be submitted in original. Technical bid document not submitted in original will be rejected.
3. Tenders should be on the specified form (Non-transferable) which may be downloaded from our website [www.icmai.in](http://www.icmai.in) under “Tender section till 16.00 hrs of 08.02.2024 and submit the completed document along with necessary papers in prescribed pro-forma **on or before 08.02.2024 by 16.00 hrs.** to **The Institute of Cost Accountants of India, CMA Bhawan, Headquarters, 12, Sudder Street, Kolkata – 700 016.** Tenders should be submitted super-scribed with the name of the work, date and time of opening on the envelope.
4. The Institute (The Institute) does not bind itself to accept the lowest or any TENDER, and The Institute reserves its right of accepting the whole or any part of the TENDER and the Bidder shall be bound to perform the same at the rate quoted.
5. Technical/PQ bid and the Financial bid should be enclosed in separate sealed envelope, super scribing Technical/PQ bid and Financial bid respectively thereon, the above said two sealed envelopes shall be put in a third sealed envelope super scribing “Bids for Structural Auditing work” and deposited in the tender box allotted for the purpose.
6. The Bidder will not be permitted to quote for works in The Institute where a relative is posted.
7. TENDER submitted shall remain valid for 180 days from the date of opening of Technical Bid for the purpose of acceptance and award of work, validity beyond 180 days from the date of opening of Technical Bid shall be by mutual consent.
8. The Bidder shall quote rates both in figures and words. On check if there are differences between the rates quoted by the Bidder in words and in figures, the rates in words will be considered as final.
9. Before quoting, the Bidder shall inspect the site, to fully acquaint himself about the condition in regard to accessibility of the site, working condition of site and locality etc., conditions affecting movement of personnel etc. required for the satisfactory execution of the work contract. No claim whatsoever on such account shall be entertained by the Institute in any circumstances.
10. Except writing rates and amounts, the Bidder should not write any conditions or make any changes, additions, alterations and modifications in the printed form of Tenders. No conditional rebate will be accepted.
11. Bidder should attach required proofs (Photocopies) for the eligibility in support of works of similar nature, for a minimum value as indicated in Technical Bid should also be submitted.



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12. All tender paper annexed along with the “Bid” should be serially numbered on the top right hand corner of every page. All pages of the tender document should be duly signed and stamped by the authorized signatory of the applicant. The tender document should be submitted in original. Tender document not submitted in original will be treated as invalid and rejected. The applicant should submit complete set of documents in support of information furnished in the Bid document.
13. **“Consortiums/ MOUs shall not be considered.”**
14. Canvassing in connection with the Tenders is prohibited and the Tenders submitted by the consultant who resorts to canvassing are liable for rejection.
15. The signed Audit reports in hard copy should be submitted in triplicate as well as soft form.
16. As all the building is old. The Institute may not be able to provide required DATA, Drawings & Documents related to the buildings to the bidders. However, the DATA; Drawings & documents available with the Institute shall be made available to the Successful bidder only. All the necessary works related to the Job component shall be under the scope of the Successful bidder.

The applicant should submit all requisite documents in support of information furnished in the Technical/PQ Bid document and should be attested by an authority competent to attest the documents. Failure to attach attested copies may lead to disqualification of the bidder.

The Institute (The Institute) does not bind itself to accept the lowest or any TENDER, and The Institute, reserves its right of accepting the whole or any part of the TENDER and the Bidder shall be bound to perform the same at the rate quoted. **The Institute, also reserves its right sub-divide the work among different consultants and the offer has to be submitted as per BOQ, enclosed in the tender booklet.**

Pre-Qualifying Bid i.e. Technical bid and the Financial bid should be enclosed in separate sealed envelope, superscribing **“Technical bid” and “Financial bid respectively”** thereon. The above said two sealed envelopes shall be put in a third sealed envelope superscribing **“Consultancy and conducting of Structural Audit of the Institute Building, at Plot no. 97, Sector 15, CBD Belapur, Navi Mumbai and** deposited in the office of the **“The Convener, The Institute of Cost Accountants of India, CMA Bhawan, 12, Sudder Street, Kolkata – 700016”**. by the date and time specified above.

Any bid sent through e-mail/ordinary post etc., should be avoided and shall be considered as invalid and will be rejected. The envelopes should clearly reflect the applicant’s name, address, contact details and name of the work.

TENDER submitted shall remain valid for 180 days from the date of opening of Technical bid for the purpose of acceptance and award of work. Validity beyond 180 days from the date of opening of Technical Bid shall be by mutual consent.



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## GENERAL CONDITIONS OF CONTRACT

### Definitions:

“The Contract” means the documents forming the tender and acceptance thereof and the formal agreement executed between The Institute and the Consultant, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from by the Institute / Consultant from time to time and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.

In the contract the following expressions shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them.

- 1.1 The Institute / Institute – The Institute of Cost Accountants of India, having its Headquarters at CMA Bhawan, 12 Sydder Street, Kolkata – 700 016 and includes its representatives, successors and assigns.
- 1.2 “Sanctioning Authority” means authority nominated to exercise power of approval, sanction and Acceptance concerning administrative, financial and technical aspects of transactions done on behalf of The Institute.
- 1.3 “Site Engineer” or “Engineer” means an Engineer appointed by the Institute as their representative to give instructions and supervise the work of the consultant/consultant at site.
- 1.4 “The Consultant or Consultants” means the firm or agency or individual engaged by the Institute to execute the work. It shall also include their legal representative(s), successors or assigns.
- 1.5 “Contract value” means the value of the entire work as stipulated in the work order.
- 1.6 Conveying acceptance of the tender subject to such additions thereto or deductions there from as may be made under the provision herein after contained.
- 1.7 “Tendered value” means the value of the entire work as stipulated in the work order.
- 1.8 “Works” or “work” means the permanent or temporary work(s) or testing or consultancy work described in the “Scope of Work” and/or to be executed in accordance with the contract and includes materials, apparatus, equipment, temporary supports, fittings and things of all kinds to be provided, the obligations of the consultant hereunder and work to be done by the consultant under the contract.
- 1.9 “The Site” means the premises, into or through which work is to be executed under the contract or any adjacent premises, which may be allotted or used for the purpose of carrying out the contract.
- 1.11 “Specifications” means the specifications referred to in the tender and any modifications thereof as may be furnished or approved by the Institute from time to time.





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- 1.12 **“Market Rate”** means the rate as decided by the Institute on the recommendations of their engineer based on the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned elsewhere to cover, all overheads and profits.
- 1.13 **“Schedule(s)”** referred to in these conditions mean the relevant schedule(s) annexed to the tender papers.
- 1.14 **“Local Controlling Authority”** means the Local Municipal Authority or any other appropriate statutory authority viz. Town Planning Department, Town Development Authority, Town/City Improvement Trust, Electricity Board, Water and Sewerage Department, Civil Aviation Authority, High-rise Building Committee, Lift Inspectorate, Telephone Department, Pollution Control Board, Fire Board and any other authorities as the case may be according to whose rules and regulations a building within its jurisdiction is to be, designed and approval of the drawings to be obtained.
- 1.15 **“Month”** means calendar month.
- 1.16 **“Week”** means seven consecutive days beginning Monday.
- 1.17 **“Day”** means a calendar day beginning and ending at 00 Hrs and 24 hrs respectively.

## 2.0 **Scope and performance**

Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.

## 3.0 **Work to be carried out**

The work to be carried out under the contract shall, except as otherwise provided in these conditions, include all Labour, Materials, Tools, Plants, Tackles, Equipment and Transport which may be required in preparation of and for and in the full and entire execution and completion of the work. The descriptions given in the Schedule of Quantities shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.

## 4.0 **Sufficiency of Tender**

The Consultant shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.



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## 4.1 Scope of Work

The consultant shall carry out complete work and maintain the said work in every respect strictly in accordance with this contract and with the directions of and to the satisfaction of the Institute to be communicated through The Institute of Cost accountants of India, Mumbai Chapter.

### 1. LOCATION / ADDRESS OF SITE

The Institute of Cost Accountants of India, Plot no. 97, Sector 15, CBD Belapur, Navi Mumbai.

### 2. RATES FOR PAYMENT

The rates given in the BOQ tendered by the consultant/agency and as accepted by the Institute will form the basis of payment for such items under this contract.

1. No material price variation or wages escalation on any account whatsoever, the compensation for force majeure etc. shall be payable under the contract.
2. The rates for any item of work not included in the Schedule of items, and which the consultant may be called upon to do by Institute shall be fixed by the supplementary written agreement between the consultant and Institute before the particular item or items of work is /are executed in the event of such agreement not being entered into and executed Institute may also execute these works by making alternative arrangements. Institute will not be responsible for any loss or damages on this account.
3. It should be specifically noted by the tenderer that no separate loading, unloading and lead Charges for materials and site visits shall not be paid for by Institute and the rates quoted by the tenderer/s shall be inclusive of all these charges.
4. Should there arise any items which may be necessary for the smooth completion of work but which does not appear in the Schedule of items, rates and Quantities attached with Tender, items rate will be fixed by analysis of actual inputs of all types including labour and material or derived from the labour and material rates given in the latest CPWD Standard Schedule of Rates. The rates for such non-scheduled items occurring during the course of construction shall be payable subject to the approval of the competent authority of the Institute.

### 3. Work Order

Within the validity period of the tender, the Institute shall issue a work order by registered post or otherwise dispatching at the address of the consultant as given in the tender to enter into a contract for execution of the work as per the terms of the tender. The work order shall constitute a binding contract between the Institute and the Consultant.



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### 4. Contract document

On receipt of work order from the Institute, the successful tenderer shall be bound to implement the contract and within seven days thereof, he shall sign an agreement on a non-judicial stamp paper of appropriate value. The consultant shall be furnished, one certified copy of the contract documents together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.

### 5. Language

The language in which the contract documents shall be drawn shall be English.

### 12. Detailed drawings and instructions

The Institute shall furnish with reasonable promptness additional instructions by means of drawings or otherwise necessary for proper execution of the work at site. All such drawings and instructions shall be consistent with the contract documents, true developments thereof and reasonably inferable therefrom. The work shall be executed in conformity therewith and the consultant shall on receipt of the work order prepare and submit a detailed programme schedule indicating therein the date of start and completion of various activities to the Institute. **In case structural drawings or any other drawings like plans, elevation are not readily available with the Institute the consultant/bidder are required to prepare all necessary drawings at the site on their own for completing the structural audit report etc.**

### 13. Ownership of drawings

All drawings, specifications and copies thereof furnished by the Institute if any are the properties of the Institute. They are not to be used on any other work.

### 14. Setting out Work

The consultant shall set out the work and shall be responsible for the true and perfect setting out of the same including correctness of the positions, levels, dimensions, and alignment of all parts thereof. The consultant shall get it approved from the Engineer before commencing and proceeding with the work.

### 15. Materials, Appliances and Employees

The consultant shall, at his own expense, provide all materials required for the works and no material required for carrying out the work shall be supplied by the Institute.

### 19. Consultant/Agency to supply tools & plants etc.

The consultant shall provide at his own cost all materials, plant, tools, appliances, implements, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specification or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of



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satisfying or complying with the requirements of the Institute / Consultant as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work.

### **20. Protection of works and property**

The consultant shall continuously maintain adequate protection of all his work from damage and shall protect the Institute's properties from injury or loss arising in connection with contract. He shall make good any such damage, injury, loss resulting due to his fault or negligence except due to causes beyond his control. He shall take adequate care and steps for protection of the other floors and adjacent properties. The consultant shall take all precautions for safety and protection of his employees on the works and shall comply with all applicable provisions of Government and local bodies on safety laws and building codes to prevent accidents, or injuries to persons or property in or adjacent to his place of work. The consultant shall take insurance covers (i . e. Contractor's All Risk Policy) at his own cost. The policy shall be taken in joint names of the consultants and Institute.

In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained notwithstanding any other provisions elsewhere in the contract agreement. Also, the Consultant shall make good, at his own cost, the damages caused, if any.

### **21. Assignment and subletting**

The whole of work included in the contract shall be executed by the consultant and he shall not directly entrust and engage or indirectly transfer assign or underlet the contract or any part or share thereof or interest therein without the written consent of the Institute through the Engineer and no undertaking shall relieve the consultant from the responsibility of the consultant from active superintendence of the work during its progress.

The contract shall not be assigned or sublet without the written approval of the Institute / Consultant. And if the consultant shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the consultant, or any of his servants or agent to any public officer or person in the employment of Institute / Consultant or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Institute shall have power to adopt any of the courses specified under clause of "when contract can be determined" hereof as the Institute may deem best suited to the interest of Institute and in the event of any of these courses being adopted the consequences specified in the said Clause of shall ensure.



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### 22. Consultant's superintendence

The consultant shall give necessary personal superintendence during the execution of the works and as long, thereafter, as the Institute/Consultant may consider necessary until the expiry of the defects liability period, stated hereto. The consultant shall depute necessary technical staff for supervision of work.

### 23. Quantities

The rates quoted for various items shall remain valid for variation of quantity against individual item to any extent. The payment to the consultant shall be made as per the actual work executed based on the joint measurement and quoted unit rates for individual items. The quantities in the BOQ are only indicative and may increase or decrease, however the rate quoted shall remain firm for the respective item.

### 24. Works to be measured

The Bank shall, except as otherwise provided, ascertain and determine by measurement the value in accordance with the contract of work done. All measurement of all items having financial value shall be entered in Measurement Book and / or field level book so that a complete record is obtained of all works performed under the contract.

If for any reason, the consultant or his authorized representative is not available and the work of recording measurements is suspended by the Engineer, the Institute shall not entertain any claim from consultant for any loss or damages on this account.

If the consultant or his authorized representative does not remain present at the time of such measurements after the consultant or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Site Engineer shall be deemed to be accepted by the Consultant. All authorized extra work, omissions and all variations made shall be included in such measurements.

The consultant shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels.

The Institute / Consultant may cause either themselves or through other representative of Institute / Consultant to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated hereinabove shall be applicable to such checking of measurements or levels.

It is also a term of this contract that recording of measurements of any item of work in the measurement book and / or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the consultant from liabilities from any over measurement or defects noticed till completion of the defects liability period.



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### 25. Certificate of payment

The consultant shall submit bill on completion of work. Institute shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. The amount admissible shall be paid by 30th working day after the day of certification of the bill by the Engineer subject to the bill is found to be in order by the Institute with no discrepancies. The Institute shall recover the statutory recoveries, other dues including the retention amount from the certificate of payment.

The Engineer shall have power to withhold the certificate if the work or any part thereof is not carried out to Institute's satisfaction.

The Institute shall deduct the IT/turn over tax or any other tax from the consultant's bill at the rate as applicable as per rules framed by concerned Govt./local bodies from time to time and remit it to concerned department and shall issue a certificate regarding tax/duties/levies so deducted on demand by the consultant.

### 28. Work by other agencies

The Institute reserves the rights to use premises and any portion of the site for execution of any work not included in the scope of this contract which it may desire to have carried out by other persons simultaneously and the consultant shall not only allow but also extend all reasonable facilities for the execution of such work(s). Such work(s) shall be carried out in such manners not to impede the progress of the works included in the contract.

### 29. Work in shifts and holidays

For completing the work in time, the Consultant might be required to work in two or more shifts (including night shifts) or on Holidays. No claim whatsoever shall be entertained on this account, notwithstanding the fact that the Consultant may have to pay extra amounts for any reason, to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour and other statutory bodies regulations and the agreement entered upon by the Consultant with them.

### 30. Dismantled material Institute's property

The consultant shall treat all useful materials obtained during dismantling/testing of the building/premises as Institute's property and such materials shall be disposed of to the best advantage of the Institute according to the instructions in writing issued by the Institute.

### 31. Maintenance of Registers

The consultant shall maintain the following registers at site of work and should produce the same for inspection of the Institute / Consultant whenever desired by them. The consultant shall also maintain the records/registers as required by the local authorities/Government from time to time.

- i) Daily progress register/ Test Register
- ii) Site order book



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### 32. Permits, Laws and Regulations

Permits and licenses required for execution of the work shall be obtained by the consultant at his own expenses. The consultant shall give necessary notices and comply with the local regulations, laws, and ordinances rules, applicable for execution of work. If the consultant performs any act, which is against the local law, rules and regulations, he shall meet all the costs and consequences arising there from and shall indemnify the Institute against any legal actions arising there from. The consultant shall arrange to obtain completion certificate from the relevant local authority after completion of work. The rates quoted by the consultant are inclusive of obtaining such approval(s) and nothing extra beyond quoted rates shall be paid to the consultant on this account.

### 33. Local Laws, Acts, Regulations

The consultant shall strictly adhere to all prevailing labour laws inclusive of contract labour (regulation and abolition act of 1970) and other safety regulations. The consultant shall comply with the provision of all labour legislation including the latest requirements of all the Acts, laws, and any other regulations that are applicable to the execution of the project.

1. Minimum Wages Act, 1948 (Amended)
2. Payment of Wages Act 1936 (Amended)
3. Workmen's Compensation Act 1923 (Amended)
4. Contract Labour Regulation and Abolition Act 1970 and Central
5. Apprentice Act 1961 (Amended)
6. Industrial Employment (Standing Order) Act 1946 (Amended)
7. Personal Injuries (Compensation Insurance) Act 1963 and any other modifications
8. Employees' Provident Fund and Miscellaneous Provisions Act 1952 and amendment thereof
9. Shop and Establishment Act
10. Any other Act or enactment relating thereto and rules framed there under from time to time.

### 34. Commencement of Works

The date of commencement of the work will be reckoned as Tenth Day from the date of issue of work order by the Institute or the first day when the consultant is handed over the site for taking up execution of the work whichever is earlier.

### 35. Time for completion

Time is the essence of the contract and shall be strictly observed by the consultant. The entire work shall be completed within a period of 60 days from the date of commencement of work. If required in the contract or as directed by the Institute, the consultant shall complete certain portions of work before



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completion of the entire work. However, the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract.

### 36. Rate of progress

Should the rate of progress of the work or any part thereof at any time in the opinion of the Institute / Consultant is slow, to ensure the completion of the whole of the work by the prescribed time or extended time for completion, the Institute / Consultant shall thereupon take such steps as considered necessary by the Institute / Consultant to expedite progress of work so as to complete the work by the prescribed time or extended time. Such communications from the Institute / Consultant neither shall relieve the consultant from fulfilling obligations under the contract nor will he be entitled to raise any claims arising out of such directions.

### 37. Extension of Time

**37.1** If the work(s) are delayed by: Force Majeure or abnormally bad weather or serious loss or damage by fire or Civil Commotion. Location commotion of workmen, strike or lockout, affecting any of the trades employed on the work or

- Delay on the part of other consultants or tradesmen engaged by Institute in executing work not forming part of the contract or
- Any other causes which in the absolute discretion of the Institute is beyond the Consultant's Control.

Then upon the happening of any such event causing delay, the consultant shall immediately give notice thereof in writing to the Institute but shall nevertheless use constantly his best endeavours to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Institute to proceed with the works.

**37.2** Request for extension of time, to be eligible for consideration, shall be made by the consultant in writing within two days of the happening of the event causing delay. The Consultant may indicate in such a request the period for which extension is desired.

**37.3** In any such cases the Institute on the basis of recommendations of Engineer will give a fair and reasonable extension of time for completion of work. Such extension shall be communicated to the Consultant by the Institute in writing, within 3 days of the date of receipt of such request. Non application by the consultant for extension of time shall not be a bar for giving a fair and reasonable extension by the Institute and this shall be binding on the consultant.

### 39. When Contract can be determined

Subject to other provisions contained in this clause, the Institute may, without prejudice to his any other rights or remedy against the consultant 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 cases.





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### 40. Suspension of work

i) The consultant shall, on receipt of the order in writing from the Institute (whose decision shall be final and binding on the consultant) suspend the progress of works or any part thereof for such time and in such manner as the Institute / Consultant may consider necessary so as not cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons:

- a) On account any default on the part of the consultant, or
- b) For proper execution of the works or part thereof for reasons other than the default of the consultant, or
- c) For safety of the works or part thereof.

The consultant shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Institute / Engineer.

ii) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above.

The consultant shall be entitled to an extension of time equal to the period of every such suspension. No compensation whatsoever shall be paid on this account. If the works or part thereof is suspended on the orders of the Institute for more than three months at a time, except when suspension is ordered for reason (a) in sub-para (i) above, the consultant may after receipt of such order serve a written notice on the Institute requiring permission within fifteen days from receipt by the Institute of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the consultant, if he intends to treat the suspension, where it affects only a part of the works as an omission of such part by the Institute or where it affects whole of the works, as an abandonment of the works by the Institute, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Institute. In the event of the consultant treating the suspension as an abandonment of the contract by the Institute, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not Derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Institute on the recommendations of the Engineer may consider reasonable, in respect of salaries and / or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the consultant provided, the consultant submits his claim supported by details to the Institute within 30 days of the expiry of the period of 3 months.

### 41. Foreclosure of contract due to abandonment or reduction in scope of work

If at any time after acceptance of the tender, the Institute decides to abandon or reduce the scope of the work for any reason whatsoever and does not require the whole or any part of the works to be carried out, the Institute shall give notice in writing to that effect to the consultant and the consultant shall act accordingly in the matter. The consultant shall have no claim to any payment of compensation or



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otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

### 42. Cancellation of contract in full or part

If consultant:

1. at any time makes default in proceeding with the works or any part of the work with the due diligence and continues to do so after a notice in writing of 7 days from the Institute / Consultant;

or

2. commits default to complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Institute / Consultant;

or

3. fails to complete the work, on or before the stipulated date of completion, and does not complete them within the period specified in a notice given in writing in that behalf by the Institute/ Consultant; or the Institute may, without prejudice to any other right or remedy which shall have accrued or shall accrue hereafter to Institute, by a notice in writing, cancel the contract as a whole or only such items of work in default from the Contract. The Consultant / Site Engineer shall on such cancellation by the Institute have powers to take possession of the site and any materials, constructional plant, implements, stores, etc. thereon; and / or carry out the incomplete work by any means at the risk and cost of the consultant.

On cancellation of the contract in full or in part, the Institute through Engineer shall determine the amount, if any, is recoverable from the consultant for completion of the works or part of the works or in case the works or part of the works is not to be completed, the loss or damage suffered by Institute. In determining the amount, credit shall be given to the consultant for the value of the work executed by him up to the time of cancellation, the value of consultant's materials taken over and incorporated in the work and use of plant and machinery belonging to the consultant. Any excess expenditure incurred or to be incurred by Institute in completing the works or part of the works or the excess loss or damages suffered or may be suffered by Institute as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to Institute in law be recovered from any moneys due to the consultant on any account, and if such moneys are not sufficient the consultant shall be called upon in writing and shall be liable to pay the same within 30 days. If the consultant shall fail to pay the required sum within the aforesaid period of 30 days, the Institute shall have the right to sell any or all of the consultants' unused materials, constructional plant, implements, temporary buildings, etc. and apply the proceeds of sale thereof towards the satisfaction of any sums due from the consultant under the contract and if thereafter there be any



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balance outstanding from the consultant, it shall be recovered in accordance with the provisions of the contract.

Any sums in excess of the amounts due to Institute and unsold materials, constructional plant, etc., shall be returned to the consultant, provided always that if cost or anticipated cost of completion by the Institute of the works or part of the works is less than the amount which the contractor would have been paid had he completed the works or part of the works, such benefit shall not accrue to the consultant.

### **43. Settlement of Disputes and Arbitration**

**43.1** Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of the or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completing or abandonment thereof shall be dealt with as mentioned hereinafter:

**43.2** If the consultant considers any work demanded of him to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Site Engineer any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 7 days request the Engineer in writing for written instruction or decision. Thereupon, the Engineer shall give his written instruction or decision within a period of one week from the receipt of the consultant's letter.

If the Engineer fails to give his instructions or decision in writing within the aforesaid period or if the consultant is dissatisfied with the instructions or decision of the Engineer, the consultant may within 7 days of the receipt of the Institute/Engineer's decision, appeal to the Institute who shall afford an opportunity to the consultant to be heard, if the latter so desires, and to offer evidence in support of his appeal. The Institute shall give his decision within 15 days of receipt of consultant's appeal. If the consultant is dissatisfied with this decision, the consultant shall within a period of 30 days from receipt of the decision, give notice to the Institute for appointment of a sole arbitrator failing which the said decision shall be final binding and conclusive and not referable to adjudication by the arbitrator.

**43.3** For the purpose of appointing the sole arbitrator referred to above, the Institute will send within thirty days of receipt by him the written notice aforesaid to the consultant a panel of three names of persons who shall be presently unconnected with the organization for which the work is executed.

**43.4** The consultant shall, on receipt by him of the names as aforesaid, select any one of the persons named to be appointed as a sole arbitrator and communicate his/her name to the Institute within thirty days of receipt by him of the names. The Institute shall thereupon without any delay appoint the said person as the sole arbitrator. If the consultant fails to communicate such selection as provided above



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within the period specified, the Institute shall make the selection and appoint the selected person as the sole arbitrator. If the Institute fails to send to the consultant the panel of three names as aforesaid within the period specified, the Consultant shall send to Institute a panel of three names of three persons who shall be unconnected with either party. The Institute shall on receipt by him of the names as aforesaid select any one of the persons named to be appointed as a sole arbitrator and communicate his / her name to the consultant within thirty days of receipt by him of the names.

**43.5** If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever, another sole arbitrator shall be appointed as aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

**43.6** The work under the contract shall however continue during the arbitration proceedings and no payment payable to the consultant relating to the disputed items shall be withheld on account of such proceedings.

**43.8** The arbitrator from time to time with the consent of the parties enlarges the time for making and publishing the award.

**43.9** The arbitrator shall give a separate award in respect of each dispute or difference referred to him. The arbitrator shall decide each dispute in accordance with terms of the contract and give a reasoned award.

**43.10** It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the rejection by the Institute of the appeal.

**43.11** It is also a term of this contract that no person other than a person appointed by such Institute, as aforesaid should act as arbitrator and if for any reason that is not possible, the matter shall not be referred to arbitration at all.

**43.12** It is also a term of this contract that if the consultant does not make any demand for appointment of arbitrator in respect of any claims in writing as aforesaid within 60 days of receiving the intimation from the Institute that the final bill is ready for payment, the claim of the consultant shall be deemed to have been waived and absolutely barred and the Institute shall be discharged and released of all liabilities under the contract in respect of these claims. Further it is agreed that for the purpose of this clause such notice is deemed to have been received by the consultant within two days of posting of the letter by the Institute or delivered by hand immediately after receipt thereof by the consultant whichever is earlier. Further a letter signed by the officials of the Institute that the letter was posted to the consultant shall be conclusive.

**43.13** The arbitration shall be conducted in accordance with the provisions of the Arbitration and conciliation Act, 1996 (26 of 1996) or any statutory modifications or re-enactment thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceeding under this clause.

**43.14** It is also a term of this contract that the arbitrator shall adjudicate on only such disputes as are referred to him by the appointing authority and give separate award against each dispute and claim



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referred to him and in all cases where the total amount of the claims by any party exceeds Rs. 50,000/-, the arbitrator shall give reasons for the award.

**43.15** It is also a term of the contract that if any fees are payable to the arbitrator, these shall be paid equally by both the parties.

**43.16** It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statements of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any, of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid.

**43.17** The award of the arbitrator shall be final and binding on both parties.

### **44. Force Majeure**

**44.1** Neither consultant nor BANK shall be considered in default in performance of their obligations if such performance is prevented or delayed by events such as war, hostilities, revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of god or for any other cause beyond the reasonable control of the party affected or prevented or delayed. However, a notice is required to be given within 30 days from the happening of the event with complete details, to the other party to the contract, if it is not possible to serve a notice, within the shortest possible period without delay.

**44.2** As soon as the cause of force majeure has been removed, the party whose ability to perform its obligations has been affected, shall notify the other of such cessation and the actual delay incurred in such affected activity adducing necessary evidence in support thereof.

**44.3** From the date of occurrence of a case of force majeure, obligations of the party affected shall be suspended during the continuance of any inability so caused. With the cause itself and inability resulting therefrom having been removed, the agreed time of completion of the respective obligations under this agreement shall stand extended by a period equal to the period of delay occasioned by such events.

**44.4** Should one or both parties be prevented from fulfilling the contractual obligations by a state of force majeure lasting to a period of 6 months or more, the two parties shall mutually decide regarding the future execution of this contract.



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### 45. Peaceful handing over of the premises

It shall be the responsibility of the consultant to see that the premises under test is not occupied by anybody unauthorized during execution of work and is handed over to the Institute with vacant possession of complete furnishing.

### 46. Consultant liable for damages, defects during ~~defects liability period~~ during execution

If the consultant or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, enclosure, water pipe, cables, drains, electric or telephone post or wires, contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within the stipulated time frame.

### 47. Accidents

The consultant shall immediately on occurrence of any accident at or about the site or in connection with the execution of the work report such accident to the Institute / Consultant. The consultant shall also report such accident immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate actions thereof.

Signature of the Tenderer/s:

Address:



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## Details scope of the work

Conducting Space Audit and Structural audit including detailed visual inspection and non- destructive test using digital rebound hammer in the Institute’s buildings at Plot no. 97, Sector 15, CBD Belapur, Navi Mumbai.

### To carry out following additional non-destructive tests.

Sr. No.	Additional ND Tests	Approximate Nos. of Location	Remarks
1	Ultrasonic Pulse Velocity Test	As per details given in financial bid	The Types of tests numbers and the test locations will be decided in consultation worth the respective department on visual inspection and rebound hammer test results.
2	Half Cell Potential Test for Corrosion mapping	As per details given in financial bid	
3	Carbonation Depth Test	As per details given in financial bid	
4	Core Test	As per details given in financial bid	

### 2. Submission of detailed report, which includes

- A. The findings from detailed visual inspection with photographs.
- B. Non- destructive test results with details of procedure followed.
- C. Suggested remedial measures to strengthening the existing building.
- D. Examination of the existing structure for vertical expansion and maximum limit of extension.
- E. Bill of quantities with detailed specification and cost estimate for the remedial measures to be taken for strengthening the existing building and to complete the pending works to put the building in use for institutional purposes.

### 3. Intermittent site visits during the execution of the repair works by the contractor.

### 4. Site visit after completion of repair works and issue of structural fitness certificate.

The consultancy and incidental charges for carrying out the above works shall be as per following format, which is to be filled and submitted in a separate cover: **Consultant/Firm’s Services:**

Sr. No.	Description
1	To carry out detailed visual inspection and digital rebound hammer test (i) Consultancy charges (ii) Including Incidental charges* (Maximum no. of visits)
2	To carry out additional Non Destructive Tests, if necessary <b>a. Ultrasonic Pulse Velocity Test</b> <b>b. Half Cell Potential Test</b>



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	<b>c. Carbonation Depth test d. Core Test</b>
3	Consultancy charges for preparation of report which includes a. The findings from detailed visual inspection b. Non-destructive test results c. Suggested remedial measures and Bill of Quantities
4	BOQ for the repairs, renovations; additions; alterations for restoration works to be proposed as remedial work with detailed technical specification of the respective items .
5	Structural analysis of the existing structure.

\* Incidental charges include charges towards hiring a vehicle for transportation, hiring labours and tools/tackles/equipment's required for testing, visit charges of engineers and supporting staff, contingencies, etc.

### **The Consultant firm will have services of:**

1. Licensed Structural Engineers (highest category) registered with appropriate authority.
2. Personnel who is Member of a Special Repair Panel formed by Municipal Corporation or/and other professional bodies
3. Trained and experienced surveyors.
4. Engineer to conduct Structural Audit as per the guidelines of the Indian Society of Structural Engineers  
Consultant will have

Methodology supported by exhaustive checklists and software.

Detailed report along with documentation of floor wise observations for Space and Structural Audit.

### **SPECIAL CONDITIONS AND STANDARD SPECIFICATION:**

#### **1. GENERAL.**

The rates quoted by the Consultant/s shall be all inclusive through rates. The consultant within the rates quoted prepare working plan for NDT and get the same approved from Engineer before execution. This will determine the final scope of work at the site. No leads/lifts, loading/unloading, handling, re-handling, stacking at site, toll tax, octroi, sales tax, and royalty or any other charges levied or liveable by the State Government or Local Bodies shall be paid by Institute.

The rates quoted shall be inclusive of all scaffolding, hoists, hoisting equipment, tools, equipment's, testing equipment's etc., required for the smooth execution and completion of the work.

**2.1** The consultant will remove all surplus and released material from the site of work after NDT to avoid any hindrance/inconvenience to other agencies working in the adjoining area, and to the travelling public or to the train operation. The consultant will also, at the direction of the site in charge, re-handle his





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material in use or likely to be used in future to relocate the same to avoid any inconvenience to other agencies working in the adjoining area or to the travelling public or to the train operation without any extra cost.

In case of default, the Institute may get the work done at the cost of the consultant by giving him 48 hours' notice in normal case or without any notice in case of an emergency, which is causing complaints from flat/apartment occupant surrounded by the said plot, and recover such costs from any payment due to the Consultants.

**2.3** In case of any dispute regarding interpretation of any of the Special Condition of Contract, decision of the Institute will be final and binding on the consultant/s.

### **Situations where NDT is an option to consider for investigation of *in-situ* concrete:**

to investigate the homogeneity of concrete mixing lack of grout in post tensioning ducts to determine the density and strength of concrete in a structure.

to determine the location of reinforcing bars and the cover over the bars to determine the number and size/diameter of reinforcing bars.

to determine the extent of defects such as corrosion

to determine the location of in-built wiring, piping, ducting, etc.

to determine whether internal defects such as voids, cracks, delamination, honeycombing, lack of bonding with reinforcing bars, etc. exist in concrete

to determine if there is a bond between epoxy bonded steel plates and concrete members.

### **Permeability of Concrete**

Permeability of Concrete is important when dealing with durability of Concrete (Concrete durability depends largely on the ease (or difficulty) with which fluids (water, carbon dioxide, oxygen) in the form of liquid or gas can migrate through the hardened concrete mass, particularly in those used for water retaining structures or watertight sub-structures. Structures exposed to harsh environmental conditions also require low porosity as well as permeability. Such adverse elements can result in degradation of reinforced concrete. Permeability test measures the ease with which liquids, ions and gasses movement can occur by **flow, diffusion, and absorption**. Generally, the overall potential for moisture and ion ingress in concrete by these three modes is referred to as its **permeability**.

### **Rebound Hammer Test:**

Rebound Hammer test is conducted to assess the relative strength and elasticity of concrete on site based on the hardness at or near its exposed surface. Depending on the age of the concrete structure and carbonation effect some specialized investigation is suggested before conducting the test. It consists essentially of a metal plunger, one end of which is held against the concrete surface while the free end is struck by a spring-loaded mass, which rebounds to a point on a graduated scale. The point is indicated by



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Website: [www.icmai.in](http://www.icmai.in)

an index rider. The amount of rebound increases with increase in concrete strength for a particular concrete mix. It measures the surface hardness of concrete and provides an estimation of surface compressive strength, uniformity and quality of concrete. User expertise is low and can be readily operated by field personnel.

It gives accurate assessment of the strength of the surface layer of material. The entire structure can be tested in its 'as-built' condition. It can be very costly and time consuming as instrumentation is required to measure response. It requires careful planning and can damage structure. The member must be isolated from the rest of the structure prior to the test.

### **Ultrasonic Pulse Velocity (UPV) Test:**

Ultrasonic Pulse Velocity Test is conducted as per IS 13111 – 1992 to assess the quality of concrete, which is suspected to have low compaction, voids (porosity), and delamination or damaged material in concrete under test. Ultrasonic Pulse Velocity Test can also be used for the following applications:

- Estimation of Strength of Concrete
- Establishing Homogeneity of Concrete
- Studies on Durability of Concrete
- Analysis of Surface Crack Depth
- Determination of Dynamic Modulus of Elasticity

Voltage pulses are generated and transformed into wave bursts of mechanical energy by the transmitting transducer (which must be coupled to the specimen surface through a suitable medium). A receiving transducer is coupled to the specimen at a known distance to measure the interval between the transmission and reception of a pulse. There are three practical arrangements for measuring pulse velocity, namely direct, diagonal and surface techniques. The direct approach provides the greatest sensitivity and is therefore superior to the other arrangements. Determination of the variability and quality of concrete by measuring pulse velocity. Using transmission method, the extent of such defects such as voids, honeycombing, cracks and segregation may be determined. This technique is also useful when examining fire damaged concrete. Low level is required to make measurements. However, expertise is needed to interpret the results. Excellent for determining the quality and uniformity of concrete. It can rapidly survey large areas and thick members. Path lengths of 10m to 15m can be inspected with suitable equipment.

Proper surface preparation is required. The work is very time consuming as it takes only point measurements. Skill is required in the analysis of results as moisture variations and presence of metal reinforcement can affect results. The interpretation of ultrasonic test results based on published graphs and tables can be misleading. It is therefore necessary that correlation with the concrete to be inspected is carried out. It works on single homogenous material.



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### **Electrochemical Half-cell Potentiometer Test:**

Electrochemical Half-cell Potentiometer test provides a relatively quick method of assessing reinforcement corrosion over a wide area without the need of wholesale removal of the concrete cover. The method of half-cell potential measurements normally involves measuring the potential of an embedded reinforcing bar relative to a reference half-cell placed on the concrete surface. The half-cell is usually a copper/copper sulphate or silver/silver chloride cell but other combinations are used. The concrete functions as an electrolyte and the risk of corrosion of the reinforcement in the immediate region of the test location may be related empirically to the measured potential difference. In some circumstances, useful measurements can be obtained between two half-cells on the concrete surface. ASTM C876 - 91 gives a Standard Test Method for Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete. Quantitative measurements are made so that a structure can be monitored over a period of time and deterioration can be noted. Areas of usage include marine structures, bridge decks, abutments and so on. Used in conjunction with other tests, it has been found helpful when investigating concrete contaminated by salts.

### **Carbonation Test:**

The method of testing consists of determining the depth of the carbonated layer on the surface of hardened concrete by means of an indicator. Carbonation of concrete occurs when the carbon dioxide, in the atmosphere in the presence of moisture, reacts with hydrated cement minerals to produce carbonates, e.g. calcium carbonate. The carbonation process is also called DE passivation. Carbonation penetrates below the exposed surface of concrete extremely slowly. The significance of carbonation is that the usual protection of the reinforcing steel generally present in the concrete due to the alkaline conditions caused by the hydrated cement paste is neutralized by carbonation. Thus, if the entire concrete covering the reinforcing steel is carbonated, corrosion of the steel would occur if moisture and oxygen could reach the steel. The time required for carbonation can be estimated knowing the concrete grade and using the equation.

### **Concrete Core Extraction and Testing:**

In most structural investigations or diagnoses extraction of core samples is unavoidable and often essential. Cores are usually extracted by drilling using a diamond tipped core cutter cooled with water. Broken samples, for example, due to popping, spalling and delamination, are also commonly retrieved for further analysis as these samples may provide additional evidence as to the cause of distress. The selection of the locations for extraction of core samples is made after non-destructive testing which can give guidance on the most suitable sampling areas.

For instance, a cover meter can be used to ensure there are no reinforcing bars where the core is to be taken; or the ultrasonic pulse velocity test can be used to establish the areas of maximum and minimum pulse velocity that could indicate the highest and lowest compressive strength areas in the structure.



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Moreover, using non-destructive tests, the number of cores that need to be taken can be reduced or minimized. This is often an advantage since coring is frequently viewed as being destructive. Also the cost of extracting cores is quite high and the damage to the concrete is severe. The extracted cores can be subjected to a series of tests and serve multiple functions such as: confirming the findings of the non-destructive test

identifying the presence of deleterious matter in the concrete ascertaining the strength of the concrete for design purposes predicting the potential durability of the concrete.

confirming the mix composition of the concrete for dispute resolution.

determining specific properties of the concrete not attainable by non-destructive methods such as intrinsic permeability.

This test is used to determine the compressive strength of a concrete core, which has usually been extracted from an existing structure. The value of compressive strength can then be used in conjunction with other measured properties to assess the condition of the concrete.

Using a masonry saw, the core is first trimmed to the correct test length, which varies upon the standard being adopted. Following trimming, the core will have its ends either ground perfectly flat, or be capped in a material to produce a smooth bearing surface.

After the prescribed curing has taken place, the specimen is then crushed to failure noting the maximum load achieved. From the values of load and dimensions, the compressive strength of the core can be calculated.

### ADDITIONAL TERMS AND CONDITIONS

#### 1. Completion Period

60 days for conducting the Structural audit as per the scope and submission of detailed report of observations and recommendations along with submission of detailed tender documents.

#### 2. Payment

The payments for the Consultancy and NDT will be made after completion of testing and submission of report along with BOQ for the repairs, maintenance and restoration works to be proposed as remedial work and as per relevant clauses elsewhere in the Bid document.

3. All the Audit reports will have to be provided in triplicate in hard as well as soft copy.

4. Since this is an old building, the Institute may not be able to provide complete Data, Drawings & Documents related to the buildings. However, the available DATA & Drawings with us may be shared to the successful bidder only. All the necessary work related for job completion shall be in the scope of the Consultants.



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5. All the necessary tools, tackles, instruments, material required for completion of audit shall be part of the scope of work.
6. THE ENTIRE JOB SHALL BE CARRIED OUT AS PER THE TERMS AND CONDITIONS STIPULATED IN THE TENDER AND INSTRUCTIONS OF INSTITUTES ENGINEER IN-CHARGE.

### SAFETY CODE

1. There shall be maintained in a readily accessible place first aid appliances including adequate supply of sterilized dressings and cotton wool.
2. An injured person shall be taken to a public hospital without loss of time, in case where they injury necessitates hospitalization.
3. Suitable and strong scaffolds should be provided for workmen for all works that cannot safely be done from ground.
4. No portable single ladder shall be over 8 meters in length. The width between the said rails shall not be less than 30 cm (clear) and the distance between two adjacent rungs shall not be more than 30 cm. When a ladder is used an extra mazdoor shall be engaged for holding the ladder.
5. The excavated material shall not be placed within 1.5 meters of the edge of the trench or half of the depth of trench whichever is more. All trenches and excavations shall be provided with necessary fencing and lighting.
6. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one meter.
7. No floor, roof or other part of the structure shall be so overloaded with debris or materials as to render it unsafe.
8. Workers employed on mixing and handling material such as asphalt, cement, mortar or concrete and lime mortar shall be provided with protective footwear and rubber hand-gloves.
9. Those engaged in welding works shall be provided with welder's protective eye-shields and gloves.
10. (i)  
No paint containing lead or lead products shall be used except in the form of paste or readymade paint.  
(ii) Suitable face masks be supplied for use by the workers when paint is applied in the forms of spray or surface having lead paint is being dry rubbed and scraped. 33
11. Overalls shall be supplied by the Contractor to the painters and adequate facilities shall be provided to enable the working painters to wash during the periods of cessation of work.
12. Hoisting machines and Tackle used in the works, including their attachments anchorage and supports shall be in perfect condition.



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**The ropes used in hoisting or lowering material or as a means of suspension shall be of durable quality and adequate strength and free from defects.**

Signed as token of acceptance

Signature of consultant with seal

Date:

Place:



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### UNDERTAKING

TO  
The Convener,  
Tender Committee,  
The Institute of Cost Accountants of India,

\_\_\_\_\_  
\_\_\_\_\_

I/We-----

have read the various conditions to technical bid attached here to and hereby agree to abide by the said conditions. I/We offer to do this work of **“Consultancy and conducting of Space Audit, Structural Audit, and NDT of Buildings at Plot no. 97, Sector 15, CBD Belaur, Navi Mumbai”**. As detailed under scope of work in the event we are Pre-qualified for the purpose and hereby bind myself/ourselves to complete the work in all respects. We agree to the condition that our Financial Bid will be opened only if we qualify as per the stipulations in the Technical bid document.

I/We also hereby agree to abide by the General Condition of Contract and to carry out the consultancy work according to the Special Conditions of Contract and specifications for material and testing works as laid down by the Institute.

Signature of the bidder/s

Bidder/s Address with telephone Nos.  
(complete postal address to be given)



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## TECHNO-COMMERCIAL EVALUATION

### WEIGHTAGE- TECHNICAL PARAMETERS –70%, PRICE BID –30%

#### TECHNICAL EVALUATION

#### I. BRIEF TECHNICAL PARAMETER FOR EVALUATION BASED ON THE PARAMETERS REQUIRED FOR ELIGIBLE CRITERIA

(TOTAL MARKS- 70)

Sl. No.	Broad criteria/technical parameter	Maximum Marks
1	Number of technical staff (Architects and Engineers) in main office: ----- Up to 10 =5 marks, More than 10 and up to 20 = 10 marks, more than 20 =15 marks.	15
2	Experience of the firm, up to 5 yrs =5 marks, more than 5 yrs and up to 15 yrs=10 marks, more than 15 yrs = 15 marks	15
3	Maximum value (Project Cost without taxes) of any single project handled, up to Rs 30.00 crores=10 marks, More than 30.00 crores and up to 50.00 Crores =15 marks, More than 50.00 crores and up to 100.00 Crores =20 marks, More than 100.00 crores=25 marks in the last 5 years as on <b>31.12.2023</b> for Public Sector Organization / Public Sector Institute / Government Department / Multinational Corporate Houses of repute. <i>Each project should be of Multi-storeyed office &amp; Instructional building.</i> (This parameter is linked with annual turnover to be submitted)	25
4	Certification level in green / energy saving building in IGBC / LEED / GRIHA rating system in multi-storeyed residential building (having project cost of Rs. 100.00 Cr or above) completed in the last 5 years as on <b>31.12.2023</b> . Green Building Certified=1 marks, Silver=2 marks, Gold=3 marks, Platinum=5 marks. No Green Certification = 0	5
5	Having Local Office at Mumbai/Navi Mumbai. Full Fledged Office =10 marks, Branch Office at Mumbai/Navi Mumbai. =5 marks, No Office or Branch Office at Mumbai/Navi Mumbai.=0 marks	10
	<b>TOTAL</b>	<b>70</b>

#### **Qualifying marks:**

**40 marks out of 70 marks. Financial bids will be opened for those who have qualified in the Technical bid through the above mentioned evaluation process.**

#### APPLICATION FORM

I / We ..... am / are desirous of participating in the PQ bid for the work of Consultancy and conducting of Structural Audit, NDT, Space Audit and Allied Works of the said building of the Institute, at Plot no. 97, Sector 15, CBD Belapur, Navi Mumbai, as detailed under scope of work, and hereby apply for the same. I/we give the following details for your consideration:





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## TECHNICAL BID

### PRE-QUALIFICATION OF ARCHITECTURAL/CONSULTANCY FIRM--- FIRM PROFILE

1. Name of the Firm :
2. Address :
3. Name, Telephone Nos. including Mobile of contact person :
4. E-mail ID and address and Fax No. :
5. Constitution of the Firm :
6. Year of Establishment :
7. Name of Partners / Associates :
8. Bio-data of Partners / Associates,  
Details may be given in the enclosed format (Annexure – I) :
- 9a. Registration Number with Council of  
Consultant / Indian Institute of Architects.  
(Copy of valid registration to be enclosed) :
- 9b. Details of GST registration  
(Copy of valid registration to be enclosed) :
- 9c. Amount of GST paid year-wise  
During last 3 financial years ending on 31.03.2023 :
10. Name and value of major Building  
Construction works completed during the  
Last 5 years. Details may be given in the Enclosed  
format (Annexure – II) :
11. Name & value of the major Building  
Construction work on hand. Details may be  
Given in the enclosed format (Annexure -III) :
12. Name & value of other major works  
(Other than building) in hand. Details may be  
Given in the enclosed format (Annexure – IV). :
13. Details of features of green building provided in the buildings:
14. Details of modern amenities provided in the building :
15. List of Technical Personnel employed :
16. List of other Personnel employed :



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15. List of consultants engaged by the Firm :
18. List of office equipment owned by the company :
19. **Details of Bank account of the firm**
- i. Account name (exactly as it appears on statement of account)
- ii. Account number
- iii. Name of the Bank with Branch name; branch code & IFSC Code
20. Income Tax Clearance Certificate for last three years to be enclosed :
21. (a) List of registration with other Organizations :
- (b) List of completion certificate etc. from the clients for completed/ ongoing projects
- (c) Certified copies of the letter of intent for award of the work from Listed Corporate bodies having CIN/Nationalized Institutes/ multinational organizations/PSUS etc.
22. Particulars of participation in competitions and awards if any received :
23. If the firm is not having its office at Noida/New Delhi:

Please indicate the time by which it is likely to open an office Mumbai with documentary evidence.

**(Mandatory)**

24.	Turnover of the firm during last 3 years (amount in lacs) <b>(Certificate from Reputed Chartered Accountant is to be enclosed)</b>	Year ended on	Turnover	
			Fees Received without GST	GST Amount (GST Clearance Certificate must be enclosed for the respective years)
		31.03.2021		
		31.03.2022		
		31.03.2023		

- Note: 1. Please enclose separate sheets for additional information, photographs, and documents.
2. Please enclose all the Annexes with relevant supporting documents duly self-attested.

Date:

Signature of the Consultant with seal

Place:



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## Annexure - I

### BIO-DATA OF THE ASSOCIATES

**Use separate form for each associate.**

1. Name :
- With Contact Number & E-mail Id :
2. Associates with the firm since :
3. Date of Birth :
4. Professional Qualifications :
5. Professional Experience :
6. Professional Affiliation :
7. Membership in :
8. Details of Published papers in Magazine :
9. Details of cost-effective methods/designs adopted in the projects :
10. Exposure to new materials/ Techniques :
11. Details of Features of green buildings provided in the buildings :
12. Details of modern amenities provided in the buildings :

**Note:** Please enclose all the Annexes with relevant supporting documents duly self-attested.

Signature of the Consultant with seal

Date:

Place:

**Use separate form for each executive/partner/director**

1	Name	
2	Designation/position	
3	Associated with the firm since	
5	Professional Qualification	
6	Professional Experience	
7	Field of expertise	
8	Contact number	
9	e-mail Id	
10	Annexure number of document evidencing employment with the firm like EPF contribution etc.	

Signature of the Consultant with seal

Date:

Place:



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## Annexure - II

### LIST OF MAJOR BUILDING CONSTRUCTION WORKS COMPLETED DURING THE LAST FIVE YEARS ENDING AS ON 31.07.2023

Sl. No.	Name of the Client	Nature of work	Features green building and modern amenities provided	Location of the building/municipal limits	Estimated value	Built up Area in Sq.mt.	Height of the building	Date of start	Period of completion	Actual date of completion	Final value of the project (Without GST)	Reasons for the variation/delay, if any
1	2	3	4	5	6	7	8	9	10	11	12	13

**Note: Please enclose all the Annexes with relevant supporting documents duly self-attested.**

Please Note:

- The credentials issued by the Clients shall be enclosed including letter of award of the work.
- The work should have been executed by the firm under the name in which they are submitting the applications.

Signature of the Consultant with seal

Date:

Place:

## Annexure - III

### LIST OF MAJOR BUILDING CONSTRUCTION WORKS ON HAND AS ON 31.07.2023

Sr. No.	Name of the client	Nature of work	Features green building and modern amenities provided	Location the building / municipal limits	Estimated Value	Area in Sq.mt.	Height the building	Present position	Scheduled of completion	Remarks
1	2	3	4	5	6	7	8	9	10	11

**Note: Please enclose all the Annexes with relevant supporting documents duly self-attested.**

Signature of the Consultant with seal

Date:

Place:



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## Annexure - IV

### LIST OF OTHER WORKS (OTHER THAN BUILDING WORKS) ON HAND AS ON 31.07.2023

Sr. No	Name of the client	Nature of work	Estimated Value	Present position	Scheduled date of completion	Remarks

**Note:** Please enclose all the Annexes with relevant supporting documents duly self-attested.

Signature of the Consultant with seal

Date:

Place:

#### List of Annexures (Use additional sheets if necessary)

Annexure Number	Particulars of document

**NOTE:** To enable us to process your application, please ensure that complete present Postal Address including Pin Code and latest Telephone Numbers / Fax Numbers / E-mail Address etc. are furnished under Column Nos. 3 & 4 above and "Completion Certificate/Work Orders" from client / owner for each work listed above has been enclosed, bearing above details.

### DECLARATION

I/We agree to notify **The Institute of Cost Accountants of India, having its Headquarters at CMA Bhawan, 12 Sudder Street, Kolkata – 700 016**, accepting this application, of any changes in the foregoing particulars as and when they occur and to verify and confirm these.

I / We understand and agree that the competent authority of **The Institute, Infrastructure Department of the Headquarters, Kolkata** has the right as he may decide, not to issue PQ/Technical bid form in any particular case and also to suspend, remove or blacklist my / our name from **The Institute of Cost Accountants of India** list of Consultants in the event of my / our submitting non bonafide PQ/Technical bids, or for technical or other delinquency in regard to which the decision of competent authority of The Institute, General Administration Department, Central Office, Mumbai, shall be final and conclusive.

I / We certify that the particulars furnished in the enrolment forms are correct and that should it be found that I/We have given a false certificate or that if I / We fail to notify the fact of my/ our subsequent amalgamation with another Consultant or firm, **The Institute of Cost Accountants of India** may remove my / our name from the list of Consultants and any contract that I/We may be holding at the time may be rescinded.

Place:

Date:

**SIGNATURE & SEAL OF APPLICANT**



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## Volume - II

(TO BE SUBMITTED IN SEPRATE SEALED ENVELOPE)

### PRICE BID

#### PROFORMA FOR SUB MISSION OF THE PRICE BID

**SELECTION FOR CONSULTANCY FIRMS/ CIVIL ENGINEERING FIRM/COMPANIES/ AGENCIES FOR CONDUCTING OF STRUCTURAL AUDIT/ ASSESSMENT OF REMEDIAL MEASURES AND NDT & ALLIED WORKS OF INSTITUTE BUILDING AT PLOT NO.97, SECTOR 15, CBD BELAPUR, NAVI MUMBAI.**

We have understood the prequalification criteria, scope of the services to be offered, the terms and conditions for the appointment to be rendered by the Architectural Consultant specified by ICMAI in their technical bid as well from their standard agreement for the captioned purpose and we will abide by the same in case our proposal is accepted.

#### (Financial Bid) – For Structural Audit & Allied Works

**Name of the Work:** Consultancy for Conducting of Structural Audit/ Assessment of Remedial Measures and NDT & Allied Works of Institute Building at Plot No.97, Sector 15, CBD Belapur, Navi Mumbai.

Sl. No.	Description	Quantity	Unit	Rate (Rs.)	Amount (Rs.)
<b>PART – A ( Investigations &amp; Report)</b>					
1	Conducting detailed visual survey of each building (internally and externally) by visual inspection to record observation of distressed part of the building, level of deterioration) and submitting the report with photographs for each spot etc. complete.	1	JOB		
2	NDT				
	The final total nos. of test points would be decided after inspection of the property in consultation with Engineer In charge.				
a	Rebound Hammer Test: Preparing the Surface of RCC Structural Members such as beams, columns, slabs etc. by chipping the plastered surface/finishing/cladding to expose the concrete, smoothening the area using carborandum stone all in terms of relevant IS Code and conducting rebound hammer test all as per IS 13311-1992 (Part 2) or as directed by the Engineer In charge including analysis of the test result and preparation of separate report for each building with observations and recommendations for remedial measures if any.	80.00	No.		
b	UPV (Ultra sonic Pulse Velocity) Test: Preparing				



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Sl. No.	Description	Quantity	Unit	Rate (Rs.)	Amount (Rs.)
	the surface of RCC Structural Members such as beams, columns, slabs etc. by chipping the plastered surface/finishing/cladding to expose the concrete, smoothing the area using carborandum stone all in terms of relevant IS Code and conducting rebound hammer test all as per IS 13311-1992(part1) or as directed by Engineer in charge including analysis of the test result and preparation of separate report for each building with observations and recommendations for remedial measures if any.	80.00	No.		
c	Half Cell Potential Test for Corrosion mapping. Preparing the structural members as directed to expose the Reinforcement steel, cleaning the area with blower/wire brush and carrying out half-cell potentiometer test for measuring the level of corrosion of reinforcement steel in the RCC member including analysis of the test result and preparation of separate report for each building with observations and recommendations for remedial measures if any.	35.00	Nos.		
d	Carbonation Depth Test :Preparing the surface of RCC structural member such as beams, columns, slabs, water tank walls and slab etc. by chipping the plastered surface/finishing/cladding to expose the concrete, cutting etc. as per relevant code and conducting carbonation test at various depth as directed Engineer In charge using phenolphthalein of specified concentration to assess depth of carbonation including separate report for each building with analysis of the test result and preparation of remedial measures if any observations and recommendations.	35.00	Nos.		
3	Consultancy charges for preparation of structural audit report which includes:	1	JOB		
a	The findings from detailed visual inspection as in item 1				
b	Tabulation of Non Destructive Test Results				
c	Suggested remedial measures				



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Sl. No.	Description	Quantity	Unit	Rate (Rs.)	Amount (Rs.)
d	Bill of quantities item wise and detailed specification with cost estimate for each floor of the building separately.				
e	Classification of severity				
f	Photos of Distressed Location				
4	Cleaning of Bushes of the entire area to provide facility to carry out the Structural audit work works smoothly and to provide safety and security of the workers.	1	JOB		
<b>PART – B (Structural Analysis for Stability report)</b>					
1	Detailed structural Analysis of the existing building including technical analysis for the stability of the existing structure.	1	JOB		
				<b>SUB – TOTAL X = Part A + Part B</b>	
				<b>GST @ _____% of (X)</b>	
				<b>TOTAL</b>	

**Amount in Words:**

**Signature & Seal of the Tenderer**

**Place:**

**Date:**

**L1 party (lowest bidder) will be selected based on the price quoted as per the Table above [Refer page No.40: Grant Total including GST]**





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## SAMPLE DEED OF AGREEMENT

THIS AGREEMENT made this .....day of ..... Two thousand .....between Institute of Cost Accountants of India, Statutory Body under an Act of Parliament, and having its Headquarters at 12, Sudder Street, Kolkata – 700016 and Delhi Office at 3, Institutional Area, Lodhi Road, New Delhi 110003 (herein after called 'the Employer or Institute or ICMAI' which expression shall include the successors and assigns) of the one part and M/S..... having its office at ..... (hereinafter called 'the Architect' which expression shall include the partners and also the partners from time to time as also their respective heirs, legal representatives, administrators and assigns) of the other part.

Whereas the Employer intends to construct it's .....at..... and whereas the firm as Architects for the said ..... (Hereinafter called the 'said works') and whereas the Employer is desirous of appointing the said Consultant/Firm as Structural Auditor for the said work by their letter No. ....dated ..... (Hereinafter called the 'said works') and whereas the Architects have accepted the said appointment by their letter No. ....dated .....Now, therefore, this agreement witnessed that the said M/S. ....are hereby appointed Architects for ..... above referred to on the following terms and conditions:

### 1. Consultant/Firm's Services:

Sr. No.	Description
1	To carry out detailed visual inspection and digital rebound hammer test (i) Consultancy charges (ii) Including Incidental charges* (Maximum no. of visits)
2	To carry out additional Non Destructive Tests, if necessary <b>a. Ultrasonic Pulse Velocity Test</b> <b>b. Half Cell Potential Test</b> <b>c. Carbonation Depth test d. Core Test</b>
3	Consultancy charges for preparation of report which includes a. The findings from detailed visual inspection b. Non-destructive test results c. Suggested remedial measures and Bill of Quantities
4	BOQ for the repairs, renovations; additions; alterations for restoration works to be proposed as remedial work with detailed technical specification of the respective items .
5	Structural analysis of the existing structure.



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- \* Incidental charges include charges towards hiring a vehicle for transportation, hiring labours and tools/tackles/equipment's required for testing, visit charges of engineers and supporting staff, contingencies, etc.

The Consultant Firm/Consultant will have services of:

1. Licensed Structural Engineers (highest category) registered with appropriate authority.
2. Personnel who is Member of a Special Repair Panel formed by Municipal Corporation or/and other professional bodies
3. Trained and experienced surveyors.
4. Engineer to conduct Structural Audit as per the guidelines of the Indian Society of Structural Engineers Consultant will have

Methodology supported by exhaustive checklists and software.

Detailed report along with documentation of floor wise observations for Space and Structural Audit.

### **SPECIAL CONDITIONS AND STANDARD SPECIFICATION:**

#### **1. GENERAL.**

The rates quoted by the Consultant/s shall be all inclusive through rates. The consultant within the rates quoted prepare working plan for NDT and get the same approved from Engineer before execution. This will determine the final scope of work at the site. No leads/lifts, loading/unloading, handling, re-handling, stacking at site, toll tax, octroi, sales tax, and royalty or any other charges levied or liveable by the State Government or Local Bodies shall be paid by Institute.

The rates quoted shall be inclusive of all scaffolding, hoists, hoisting equipment, tools, equipment's, testing equipment's etc., required for the smooth execution and completion of the work.

**2.1** The consultant will remove all surplus and released material from the site of work after NDT to avoid any hindrance/inconvenience to other agencies working in the adjoining area, and to the travelling public or to the train operation. The consultant will also, at the direction of the site in charge, re-handle his material in use or likely to be used in future to relocate the same to avoid any inconvenience to other agencies working in the adjoining area or to the travelling public or to the train operation without any extra cost.

In case of default, the Institute may get the work done at the cost of the consultant by giving him 48 hours' notice in normal case or without any notice in case of an emergency, which is causing complaints from flat/apartment occupant surrounded by the said plot, and recover such costs from any payment due to the Consultants.

**2.3** In case of any dispute regarding interpretation of any of the Special Condition of Contract, decision of the Institute will be final and binding on the consultant/s.



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### **Situations where NDT is an option to consider for investigation of *in-situ* concrete:**

to investigate the homogeneity of concrete mixing lack of grout in post tensioning ducts to determine the density and strength of concrete in a structure.

to determine the location of reinforcing bars and the cover over the bars to determine the number and size/diameter of reinforcing bars.

to determine the extent of defects such as corrosion

to determine the location of in-built wiring, piping, ducting, etc.

to determine whether internal defects such as voids, cracks, delamination, honeycombing, lack of bonding with reinforcing bars, etc. exist in concrete

to determine if there is a bond between epoxy bonded steel plates and concrete members.

### **Permeability of Concrete**

Permeability of Concrete is important when dealing with durability of Concrete (Concrete durability depends largely on the ease (or difficulty) with which fluids (water, carbon dioxide, oxygen) in the form of liquid or gas can migrate through the hardened concrete mass, particularly in those used for water retaining structures or watertight sub-structures. Structures exposed to harsh environmental conditions also require low porosity as well as permeability. Such adverse elements can result in degradation of reinforced concrete. Permeability test measures the ease with which liquids, ions and gasses movement can occur by **flow, diffusion, and absorption**. Generally, the overall potential for moisture and ion ingress in concrete by these three modes is referred to as its **permeability**.

### **Rebound Hammer Test:**

Rebound Hammer test is conducted to assess the relative strength and elasticity of concrete on site based on the hardness at or near its exposed surface. Depending on the age of the concrete structure and carbonation effect some specialized investigation is suggested before conducting the test. It consists essentially of a metal plunger, one end of which is held against the concrete surface while the free end is struck by a spring-loaded mass, which rebounds to a point on a graduated scale. The point is indicated by an index rider. The amount of rebound increases with increase in concrete strength for a particular concrete mix. It measures the surface hardness of concrete and provides an estimation of surface compressive strength, uniformity and quality of concrete. User expertise is low and can be readily operated by field personnel.

It gives accurate assessment of the strength of the surface layer of material. The entire structure can be tested in its 'as-built' condition. It can be very costly and time consuming as instrumentation is required to measure response. It requires careful planning and can damage structure. The member must be isolated from the rest of the structure prior to the test.



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### **Ultrasonic Pulse Velocity (UPV) Test:**

Ultrasonic Pulse Velocity Test is conducted as per IS 13111 – 1992 to assess the quality of concrete, which is suspected to have low compaction, voids (porosity), and delamination or damaged material in concrete under test. Ultrasonic Pulse Velocity Test can also be used for the following applications:

- Estimation of Strength of Concrete
- Establishing Homogeneity of Concrete
- Studies on Durability of Concrete
- Analysis of Surface Crack Depth
- Determination of Dynamic Modulus of Elasticity

Voltage pulses are generated and transformed into wave bursts of mechanical energy by the transmitting transducer (which must be coupled to the specimen surface through a suitable medium). A receiving transducer is coupled to the specimen at a known distance to measure the interval between the transmission and reception of a pulse. There are three practical arrangements for measuring pulse velocity, namely direct, diagonal and surface techniques. The direct approach provides the greatest sensitivity and is therefore superior to the other arrangements. Determination of the variability and quality of concrete by measuring pulse velocity. Using transmission method, the extent of such defects such as voids, honeycombing, cracks and segregation may be determined. This technique is also useful when examining fire damaged concrete. Low level is required to make measurements. However, expertise is needed to interpret the results. Excellent for determining the quality and uniformity of concrete. It can rapidly survey large areas and thick members. Path lengths of 10m to 15m can be inspected with suitable equipment.

Proper surface preparation is required. The work is very time consuming as it takes only point measurements. Skill is required in the analysis of results as moisture variations and presence of metal reinforcement can affect results. The interpretation of ultrasonic test results based on published graphs and tables can be misleading. It is therefore necessary that correlation with the concrete to be inspected is carried out. It works on single homogenous material.

### **Electrochemical Half-cell Potentiometer Test:**

Electrochemical Half-cell Potentiometer test provides a relatively quick method of assessing reinforcement corrosion over a wide area without the need of wholesale removal of the concrete cover. The method of half-cell potential measurements normally involves measuring the potential of an embedded reinforcing bar relative to a reference half-cell placed on the concrete surface. The half-cell is usually a copper/copper sulphate or silver/silver chloride cell but other combinations are used. The concrete functions as an electrolyte and the risk of corrosion of the reinforcement in the immediate region of the test location may be related empirically to the measured potential difference. In some circumstances, useful measurements can be obtained between two half-cells on the concrete surface. ASTM C876 - 91 gives a Standard Test



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Method for Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete. Quantitative measurements are made so that a structure can be monitored over a period of time and deterioration can be noted. Areas of usage include marine structures, bridge decks, abutments and so on. Used in conjunction with other tests, it has been found helpful when investigating concrete contaminated by salts.

### **Carbonation Test:**

The method of testing consists of determining the depth of the carbonated layer on the surface of hardened concrete by means of an indicator. Carbonation of concrete occurs when the carbon dioxide, in the atmosphere in the presence of moisture, reacts with hydrated cement minerals to produce carbonates, e.g. calcium carbonate. The carbonation process is also called DE passivation. Carbonation penetrates below the exposed surface of concrete extremely slowly. The significance of carbonation is that the usual protection of the reinforcing steel generally present in the concrete due to the alkaline conditions caused by the hydrated cement paste is neutralized by carbonation. Thus, if the entire concrete covering the reinforcing steel is carbonated, corrosion of the steel would occur if moisture and oxygen could reach the steel. The time required for carbonation can be estimated knowing the concrete grade and using the equation.

### **Concrete Core Extraction and Testing:**

In most structural investigations or diagnoses extraction of core samples is unavoidable and often essential. Cores are usually extracted by drilling using a diamond tipped core cutter cooled with water. Broken samples, for example, due to popping, spalling and delamination, are also commonly retrieved for further analysis as these samples may provide additional evidence as to the cause of distress. The selection of the locations for extraction of core samples is made after non-destructive testing which can give guidance on the most suitable sampling areas.

For instance, a cover meter can be used to ensure there are no reinforcing bars where the core is to be taken; or the ultrasonic pulse velocity test can be used to establish the areas of maximum and minimum pulse velocity that could indicate the highest and lowest compressive strength areas in the structure.

Moreover, using non-destructive tests, the number of cores that need to be taken can be reduced or minimized. This is often an advantage since coring is frequently viewed as being destructive. Also the cost of extracting cores is quite high and the damage to the concrete is severe. The extracted cores can be subjected to a series of tests and serve multiple functions such as: confirming the findings of the non-destructive test

identifying the presence of deleterious matter in the concrete ascertaining the strength of the concrete for design purposes predicting the potential durability of the concrete.

confirming the mix composition of the concrete for dispute resolution.

determining specific properties of the concrete not attainable by non-destructive methods such as intrinsic permeability.



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This test is used to determine the compressive strength of a concrete core, which has usually been extracted from an existing structure. The value of compressive strength can then be used in conjunction with other measured properties to assess the condition of the concrete.

Using a masonry saw, the core is first trimmed to the correct test length, which varies upon the standard being adopted. Following trimming, the core will have its ends either ground perfectly flat, or be capped in a material to produce a smooth bearing surface.

After the prescribed curing has taken place, the specimen is then crushed to failure noting the maximum load achieved. From the values of load and dimensions, the compressive strength of the core can be calculated.

### **ADDITIONAL TERMS AND CONDITIONS**

#### **1. Completion Period**

30 days for conducting the Structural audit as per the scope and submission of detailed report of observations and recommendations along with submission of detailed tender documents.

#### **2. Payment**

The payments for the Consultancy and NDT will be made after completion of testing and submission of report along with BOQ for the repairs, maintenance and restoration works as per relevant clauses elsewhere in the Bid document.

**3.** All the Audit reports will have to be provided in triplicate in hard as well as soft copy.

**4.** Since this is an old building, the Institute may not be able to provide any Data, Drawings & Documents related to the buildings. However, the available DATA & Drawings with us may be shared to the successful bidder only. All the necessary work related for job completion shall be in the scope of the Consultants.

**5.** All the necessary tools, tackles, instruments, material required for completion of audit shall be part of the scope of work.

**6.** THE ENTIRE JOB SHALL BE CARRIED OUT AS PER THE TERMS AND CONDITIONS STIPULATED IN THE TENDER AND INSTRUCTIONS OF INSTITUTES ENGINEER IN-CHARGE.

### **SAFETY CODE**

**1.** There shall be maintained in a readily accessible place first aid appliances including adequate supply of sterilized dressings and cotton wool.

**2.** An injured person shall be taken to a public hospital without loss of time, in case where they injury necessitates hospitalization.

**3.** Suitable and strong scaffolds should be provided for workmen for all works that cannot safely be done from ground.



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4. No portable single ladder shall be over 8 meters in length. The width between the said rails shall not be less than 30 cm (clear) and the distance between two adjacent rungs shall not be more than 30 cm. When a ladder is used an extra mazdoor shall be engaged for holding the ladder.
5. The excavated material shall not be placed within 1.5 meters of the edge of the trench or half of the depth of trench whichever is more. All trenches and excavations shall be provided with necessary fencing and lighting.
6. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one meter.
7. No floor, roof or other part of the structure shall be so overloaded with debris or materials as to render it unsafe.
8. Workers employed on mixing and handling material such as asphalt, cement, mortar or concrete and lime mortar shall be provided with protective footwear and rubber hand-gloves.
9. Those engaged in welding works shall be provided with welder's protective eye-shields and gloves.
10. (i)  
No paint containing lead or lead products shall be used except in the form of paste or readymade paint.  
(ii) Suitable face masks be supplied for use by the workers when paint is applied in the forms of spray or surface having lead paint is being dry rubbed and scraped. 33
11. Overalls shall be supplied by the Contractor to the painters and adequate facilities shall be provided to enable the working painters to wash during the periods of cessation of work.
12. Hoisting machines and Tackle used in the works, including their attachments anchorage and supports shall be in perfect condition.

### 2. Conditions of Engagement:

- a) The Consultant Firm/Consultant shall submit to the Employer the sketch plans, detailed plans, cost estimates, tender documents etc. within the period stipulated including project details in the schedule hereto annexed.

The following shall constitute the joint Project Committee (hereinafter referred to as JPC) for assessing and reviewing the progress of the work on the project and to issue instructions or directions from time to time for being observed and followed by the Consultant Firm/Consultant in the execution of the project.

- i. Institute's Engineers (Civil /Electrical) and other officials of the Institute.
- iii. The Secretary of the Committee may, convene the meetings of the ICMAI, concerned Consultant Firm/Consultant at such regular intervals or frequently as may be instructed by the Chairman of the JPC and shall record and circulate to all concerned the decisions of the JPC for implementation/information as may be applicable. It is clarified that day to day supervision, programming of the works and coordination of various activities, quality control, measuring and recording the actual quantity of work,



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their correctness, ensuring that the work is being executed as per tender specifications and drawings, pointing out of any discrepancy therein

- e) During the progress of work, the Consultant Firm/Consultant's representative at site shall remain in daily touch with the concerned representatives of the Institute and ascertain in from them whether any excesses over sanctioned cost is anticipated and/or has already occurred. The Architects shall immediately report the same to the Employer with adequate justification for the same and obtain Employer's approval thereto.
- i) Due to fault or delay caused by the Consultant Firm/Consultant or their staff, on which question the decision of ICMAI, is final and binding, will have to be made good by the architects, subject to the total liability of the firm on this account being limited to an amount equal to 10% of the total payable fees.

ICMAI may require the firm to go out for discharge of any of Consultant Firm/Consultant's duties enumerated in this agreement without any extra fees. In such case, the firm shall, except in case of visit to site/laboratories / quarries / shops within the Maharashtra state, be entitled to traveling and daily allowance permissible as under:

- i. Senior Directors / Partners and Senior Consultants:

Actual traveling charge (permitted by Air/Two tire A/C Sleeper class for train journey), lodging plus boarding together not exceeding @ Rs. 2500.00, plus taxes per day per person after producing necessary bills/receipts in support of their claims.

- ii. Other Engineers/ Architects/ Employees:

Actual traveling charges (permitted by First Class train fare), lodging & boarding charges together not exceed @ Rs. 1500.00 plus taxes-per-day per person after producing necessary bills / receipts in support of their claims.

- l) The Consultant Firm/Consultant shall, on the completion of the work, supply to the Employer free of cost three copies report, drawings of not less than 1:100 scale (one of which shall be in both AUTOCAD and PDF format on a pen drive), three complete sets of structural drawings and three sets of drawings sufficiently showing the main lines of water and drainage pipes, electrical installation and other essential services and also an inventory of all fittings and fixtures in the building. The Consultant Firm/Consultant shall, if so required by the Employer, supply extra copies of all such drawings and the cost of such extra copies shall be reimbursed by the Employer to the Architects.

### 3. Termination of Agreement

- a) The agreement herein may be terminated at any time by either party by giving a written notice of two months to the other party. Even after the termination of their employment, the Architects shall remain liable and shall be responsible for the certification / approval of any bills submitted by the contractors at any time in respect of the work executed before the termination of the Architects appointment and consequences thereof on account of any excess / wrong payment, if any, certified / recommended by the Architects for payments to the contractors.





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- b) If the Consultant Firm/Consultant shall close their business or the company, partnership firm stands dissolved due to provisions, if any, in partnership agreement of the firm in the event of death of one or more partners or become incapacitated from acting as such Architects, then the Agreement shall stand terminated.
- c) (i) If the Architects fail to adhere to the time schedule stipulated in the schedule hereto annexure or the extended time which may be granted by the Employer in his sole discretion.

*Or*

- (ii) In case there is any change in the constitution of the firm of the architects for any reason whatsoever, the employer shall be entitled to terminate this agreement without giving notice and entrust the work to some other Architects.
- d) In case of termination under sub-clause (a), (b) or (c) above, the Architects shall not be entitled to fees or compensation except the fees payable to them for the work actually done and as per the provisions in this agreement. In such cases the decision of the Employer as to what is the work actually done and what is the amount of the fees due to the Architects on the basis of actual work and as per the provisions in this agreement shall be final and binding on the Architects.
- e) In case of the termination under sub-clause (a), (b) or (c) above, the Employer may make use of all or any drawings, estimates or other documents prepared by the Architects.

#### 4. Transfer of Interests:

- (i) The Architects shall not assign, sublet or transfer their interest in this agreement, without the prior written consent of the employer.
- (ii) Whether the firm is partnership firm or a company, no change in the constitution of such partnership or no change in the constitution of Board of Directors of the Company shall be made without the prior approval of ICMAI.

#### 5. Scale of Charges:

- a) The Employer shall pay to the Architects as remuneration for the services rendered by the Architects in relation to the said works, and in particular for the services herein before mentioned, \_\_\_\_\_ as indicated in sub-clause (a) of this clause. No deduction shall be made from the Consultant Firm/Consultant's bill/fees on account of any delay in the work due to reasons not attributable to the Consultant Firm/Consultant.
- b) The Consultant Firm/Consultant shall be paid fees referred to above in the manner laid down in clause 6 below, in respect of the said work.

#### 6. Methods of Payment:

**Payment schedule – Structural Audit & Submission of Report with BOQ & Cost Estimate: Payment shall be made in stages as per the following schedule:**

- 50% of the gross amount of the work amount after submission of report in triplicate.
- 100% of the gross amount of the work less amount already paid after submission of detailed BOQ of rectification / restoration work to be suggested and submission of stability certificate.



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### 7. Visit to the Site:

In addition to the stationed qualified Resident Engineer and one or two of his assistants as they may consider necessary to support them, the senior Consultant/Engineer as stipulated by the Employer or their representatives shall visit the site.

### 8. Delays, Responsibility & Recoveries from fees:

- a) In the event the Consultant Firm/Consultant fail to discharge their duties diligently and delays are caused due to their negligence or if they do not cooperate, due to which the work is not completed within the time frame, they shall be liable to make good suffered by the Institute without prejudice to the Institute's right to terminate the agreement and pay such fees, which is at discretion of the Institute, required to be paid at the time of termination.
- c) It is agreed by the Employer and the Consultant Firm/Consultant that the total recoveries /payments on account of delays / mistakes except in case of structural failure at architects' end and any other account from the Consultant's fees shall not exceed 15% of their total fees for the entire project.

### 9. Arbitration:

- i. Any dispute and items of disagreement arising between the Architects shall be referred to the Secretary of the Institute or in his absence the Consultant Engineer of the Institute and his decision on those matters will be final and binding on the Consultant Firm/Consultant.
- ii. If any dispute, difference, or question shall at any time arise between the Consultant Firm/Consultant's and the Employer as to the interpretation of this agreement or concerning anything herein contained or arising out of this agreement except that stated in (i) above or as to the rights, liabilities and duties of the said parties hereunder, or as to the execution of the said works except in respect of the matters for which it is provided herein, that the decision of the Employer is final and binding, the same shall be referred to the Arbitration and arbitrator is to be appointed by the employer.
- iii. The work under the contract shall, however, continue during the Arbitration proceedings. No payment due or payable to the Architects shall be with-held on account of such proceedings except the disputed payment of fees on account of other provisions in this agreement.
- iv. The Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the date of the first hearing. The Arbitrator may from time to time, with the consent of the parties, enlarge the time for making and publishing the award.
- v. The Arbitrator shall give a separate award in respect of each dispute or difference referred to him. The Arbitrator shall decide each dispute in accordance with the terms of the contract and give a reasoned award. The venue of Arbitration shall be such place as may be fixed by the Arbitrator in his sole discretion.
- vi. The fees, if any, of the Arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The costs of the reference and of the award including the fees, if any of the Arbitrator, who may direct to and by whom and in what manner, such costs or any part thereof shall be paid may fix or settle the amount of costs to be paid.
- vii. The award of the Arbitrator shall be final and binding on both the parties.



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Website: www.icmai.in

viii. Subject to aforesaid, the provisions of the Arbitrator Act 1940 or any statutory, modification or re-enactment thereof and the rules made there under, and for the time being to force, shall apply to the arbitration proceedings under this clause.

This agreement executed the day and year first written above.

In witness of this agreement, the parties hereto have subscribed their respective hands hereto and/ or a duplicate hereof on the day and the year herein above first mentioned.

Signed and delivered by within named M/s-----by the hand of its Partners for and on behalf of the Architects in the presence of

1.                      2.

Signed and delivered for and on behalf of the Institute of Cost Accountants of India by

1.                      2.

For any clarification please contact: -

**CMA Bhawan, Headquarters, 12, Sudder Street, Kolkata – 700016**

Landline No.: 033 22521031/1034/1035 (extn. 207)