

DAULAT RAM COLLEGE, UNIVERSITY OF DELHI

TENDER DOCUMENT

**SELECTION OF CONTRACTOR
FOR
NON-DESTRUCTIVE TESTING OF COLLEGE BLOCK WESTERN
WING & LIBRARY**

ISSUED TO

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Last Date for Submission of Tender: 11th Dec., 2018 by 2 pm.

DAULAT RAM COLLEGE, UNIVERSITY OF DELHI

Issued to M/s. :

Last date for submission : 11th Dec., 2018 by 2 pm.

Application to be addressed to : Principal,
4, Patel Marg,
Maurice Nagar.
Daulat Ram College,
Delhi University,
Delhi-110007.

I/We have read and understood the instructions and the terms and conditions contained in the application form. I/We do hereby declare that the information furnished in the application and in the supplementary sheets including Annexures from pages _____ to _____ are correct to the best of my/our knowledge and belief.

Signature: _____

Name : _____

Designation: _____

Address : _____

Place:

Date:

Seal of applicant:

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Instructions to the applicants

Daulat Ram College (DRC) invites applications under “Two Bid System” on prescribed forms for the aforesaid work in order to empanel reputed Companies engaged in conducting structural audit, Non-destructive testing of structures & allied works of multi-storied building in Delhi. Details of the building to be assessed are mentioned in the Annexure I.

Filled in applications as Technical Bid (Part-I) and Price Bid(Part-II) shall be submitted separately in two sealed envelopes, duly furnishing all the required information. The sealed envelope for technical bid with the superscription “Technical Bid for Selection Of Contractors For Non-Destructive Testing Of sealed envelope for price bid with the superscription “Price Bid for Selection Of Contractors For Non-Destructive Testing and should be addressed to Principal.

Technical bid will be opened on 11th Dec., 2018 at 4 pm. The price bid will be opened only for the technically qualified bidders. The date of opening of the price bid will be communicated to the bidders after the scrutiny of the Technical Bid.

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Instructions to the applicants:

1. Intending applicants are required to submit their profile giving details in the enclosed proforma about their organisation, experience, technical personnel in their organisation, spare capacity, competence, etc.
2. In deciding the selection of a Consultant, great emphasis will be given on the ability and competence of applicants to render required services within the specified time frame.
3. Should have successfully completed in last 5 Financial Years, at least three work-orders in the field of conducting NDT for reputed organisations. It is desirable that the firm should have completed one or two similar works and work order inclusive of NDT work and completion certificate issued by clients. Copies should be included.
4. Should submit audited balance sheets / P&L account and Income Tax clearance certificates for the last 3 financial years
5. The application shall be signed by the person/persons on behalf of the organisation having necessary Authorisation/Power of Attorney to do so. Each page of the application shall be signed. (Copy of Power of Attorney/Memorandum of Association shall be furnished along with application).
6. If the space in the proforma & Statement, is insufficient for furnishing full details, such information shall be supplemented on separate sheets of paper stating therein the part of the proforma and serial number. Separate sheets shall be used for each part of application.
7. Applications containing false and/or incomplete information are liable for rejection.
8. While filling up the application with regard to the list of important projects completed or on hand, the applicants shall only include major works.
9. The applicant must have qualified and experienced Engineers in the respective discipline.
10. The applicant must have successfully assessed the condition through NDTs for major Residential/Official/Commercial RCC buildings.
11. Decision of the College in regard to determining the qualification of the Contractors shall be final. The College is not bound to assign any reasons therefor.

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12. Price bids of only those contractors qualified in the Technical bid will be opened for selection of contractors.
13. The Earnest Money Deposit of Rs...../- (Rupees Only) submitted along with the tender will be refunded after successful completion of the work.
14. Please furnish a copy of PAN Card, AADHAR Card, Bank account details like Cancelled cheque (including Account number, IFS code, account type etc.)
15. The Bids shall not contain any conditions and in case any conditions are specified, the same shall not be taken into consideration for evaluation and the bid is liable to be rejected.
16. Validity of the offer shall be 90 days from the date of opening of the price bid. (Part -2)
17. DRC reserves the right to accept or reject any or all tenders, without assigning any reasons whatsoever. The work may be divided and awarded separately among the tenderers either in part or whole, at the sole discretion of DRC.

All the above conditions are acceptable to me/us.

Signature of the Applicant with full address and office seal

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SPECIAL CONDITIONS AND STANDARD SPECIFICATION:

General

1. The rates quoted by the Contractor shall be all inclusive rates. 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 contractor within the rates quoted prepare working plan for NDT and get the same approved from DRC/ Consultants before execution. This will determine the final scope of work at the site.
3. The contractor will remove all surplus and released material from the site of work after NDT. The consultant will also, at the direction of the site in-charge, rehandle his material in use to avoid any inconvenience without any extra cost. In case of default, DRC may get the work done at the cost of the contractor.
4. In case of any dispute regarding interpretation of any of the Special Condition of Contract, decision of the Principal Daulat Ram College will be final and binding on the contractor.
5. The contractor shall take insurance covers (i.e.All Risk Policy) as specified elsewhere in the contract at his own cost. The policy shall be taken in joint names of the contractor and Employer.
6. The whole of work included in the contract shall be executed by the contractor 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 Employer 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.
7. Request for extension of time, to be eligible for consideration, shall be made by the contractor in writing of the happening of the event causing delay. The Contractor may indicate in such a request the period for which extension is desired.
8. 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

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- 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's, 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.

Test to be undertaken:

a. Rebound Hammer Test :

Rebound Hammer test is conducted to assess the relative strength and elasticity of concrete onsite 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.

b. 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), 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

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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 and 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 be inspected is carried out. It works on single homogenous material.

c. 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.

d. 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

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moisture, reacts with hydrated cement minerals to produce carbonates, e.g. calcium carbonate. The carbonation process is also called depassivation. 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.

e. Concrete Core Extraction and Testing

In most structural investigations, diagnosis 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 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.

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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.

All the above special condition and standardization are acceptable to me/us.

Signature of the Applicant with full address and office seal

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Terms and Conditions

- 1) Completion Period: 10 days for conducting the Tests as per the scope and submission of detailed report of observations and recommendations
- 2) Mode of Payment:

100% - After submission of NDT analysis report and recommendation.
- 3) All the Audit reports to be provided in triplicate in hard as well as soft copy.
- 4) All the necessary tools, tackles, instruments, material required for completion of audit shall be in the scope of work.
- 5) The decision of M/s DRC in awarding the work shall be final and cannot be subjected to arbitration.
- 6) The rates will be inclusive of all taxes and duties. Only Service tax on applicable rates shall be paid extra.

PLEASE REFER THE PRICE BID DOCUMENT FOR FURTHER TERMS & CONDITONS.

I/we accept all the above Terms and Conditions in all respects without any reservation.

Place

Signature

Date

Name & Address (Seal)

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Performa 1: Information to be furnished by the Contractors/ Agencies/ Engineering Research Institutions:

1)	Name and registered address		
2)	Organisational set up of the firm including names, qualifications and experience of partners/ Associates and staff	:	Details to be furnished in the prescribed proforma (Statement I)
3)	Whether Registered as a fellow or a member of any of the Institutions like Institution of Engineers, Indian Council of Architecture.		
4)	Experience as practicing consultant/ Designer (give number of years)	:	
5)	Important major structures where NDT conducted during last 5 years by the firm. The full postal address of the clients (including their contact telephone numbers) for whom the works have been executed shall also be given	:	Details to be furnished in the prescribed proforma (Statement II)
6)	Important major buildings on which the firm is engaged at present The full address of the clients and their contact telephone numbers shall be indicated against each project	:	Details to be furnished in the prescribed proforma (Statement III)
7)	Turnover of the firm during last 5 years (year wise). Copy of IT return for the last 3 years may be furnished.		
8)	PAN No.		

Signature of the applicant with full address and office seal

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Note: Statements I & II are enclosed.

STATEMENT – I

List of technical personnel, giving the technical qualification, experience, including that in the present organization*

Sr. No.	Name	Age	Qualification	Consultancy experience	Nature of works handled	Name of the projects handled	Date from which employed in the present organization	Indicate special experience, if any
1	2	3	4	5	6	7	8	9

* Use separate/additional sheets as per the requirement

Signature of the applicant with full address and office seal

Note: Indicate other points (including clients' certificates), if any, relating to your technical and managerial competency which you would like to bring to our notice.

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STATEMENT - II

List of important Projects (structural condition assessment) executed by the Organisation during the last five years*

Sr. No.	Name of the Project and location.	Nature of work involved in the contract (e.g. residential office, etc.).	Name of the owner and indicate whether it is a State Govt./ Govt. of India undertaking or Pvt. body with full address and telephone numbers.	Completion Period		Any other relevant information
				Stipulated	Actual	
1	2	3	4	5	6	7

* Use separate /additional sheets as per the requirement

Signature of the applicant with full address and office seal

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Tentative details for the number of test to be carried out

Sr. No.	Description	Qty	Unit	Rate (Rs.)	Amount (Rs.)
1	Site Mobilization		LS		
2	Rebound Hammer test to assess the hardness of concrete and correlation with core compressive strength.	80	Nos		
3	Ultrasonic Pulse Velocity (UPV) as per IS-13311 Part -I, measurements on the RCC elements. To find out the quality of concrete.	80	Nos		
4	Core cutting: - Take out the sample of cylindrical concrete core.				
	Compressive strength: - To check the compressive strength of cylindrical concrete core sample.	18	Nos		
5	Ferro Scanning / Rebar Scan : To locate the RCC element in wall and also check the steel bars & its details i.e. spacing, cover & its estimation of diameter.	22	Nos		
6	Carbonation :- To check the corrosion in concrete.	10	Nos		
7	Half-cell Potential Test to confirm the corrosion possibility in RCC members.	15	Nos		
8	Preparation of NDT Test Report and Remedial Suggestion		LS		
	Total Amount Rs.				