Notice Inviting Tenders

HSCC (I) LTD on behalf of Ministry of Health and Family Welfare, invites sealed tenders from Soil/ Survey Investigation Agencies for the proposed AIIMS new Master plan of the following-

(1) Tender No. AIIMS/Soil-1: Expansion of OPD
(2) Tender No. AIIMS/ Soil-2: Emergency Wing
(3) Tender No. AIIMS/ Soil-3: Centre for Mother & Child Health
(4) Tender No. AIIMS/ Soil-4: PC & Teaching Block

Tender documents may be downloaded from HSCC website http://www.hsccltd.co.in and submitted on or before 3 P.M on 29th December 2008 in HSCC's office at Plot No. 6(A), Block E, Sector-1, Noida-201301(U.P)

Sr. Manager(Civil)

CONSTRUCTION OF CENTRE FOR MOTHER & CHILD HEALTH
AT AIIMS, NEW DELHI

TENDER FOR
TOPOGRAPHICAL, GEOTECHNICAL & HYDRO-GEOLOGICAL SURVEY WORK

December, 2008

Consultant: HSCC (I) Ltd. E-6(A), Sector-1, NOIDA, U.P.-201301

Tel: (0120) 2542436, 2542437, 2542439
Fax: (0120) 2542447
Web Site: www.hsccltd.co.in

Name of Work: Topographical, Geotechnical & Hydro-geological Survey work

CONTENTS:

Tender for Topographical, Geotechnical and Hydro geological Survey Works for "Construction of Centre for Mother & Child Health at AIIMS, New Delhi"

Offers are hereby invited by HSCC(India) Ltd. for and on behalf of the Ministry of Health & Family Welfare (owner) from competent * Survey/Soil Investigation Agencies. The agency shall carry out the Topographical Survey, Geotechnical Investigations and Hydro geological Survey for the above site as per enclosed scope of work, general terms and conditions, time period and mode of payments etc.

The offer shall be submitted in sealed covers marked **"Tender for Topographical Survey, Geotechnical and Hydro geological Survey for "Construction of Centre for Mother & Child Health at AIIMS, New Delhi" as detailed below: -**

ENVELOPE MARKED NO.1

Shall contain cost of tender of Rs.500/- (non-refundable) and an Earnest money of Rs.5,000/- (refundable) in the form of either demand draft or pay order in favour of HSCC (India) Ltd, payable at New Delhi.

ENVELOPE MARKED NO. 2
Shall contain all documents supplied with the tender **excluding Price bid** duly signed and filled.

ENVELOPE MARKED NO. 3
Shall contain all Price bid duly filled signed & stamped.

All the three envelopes marked above to be sealed in a separate envelope and submitted within due date & time at the following address:

HSCC (India) Ltd.
E - 6(A), Sector -1, NOIDA, Uttar Pradesh.
Pin- 201301.

The last date of submission of tender is 29.12.2008 up to 1500 Hrs.

Bids shall be opened in the office of HSCC (India) Ltd, Plot No. 6(A), Block-E, Sector 1, Noida, Distt.Gautam Budh Nagar, Uttar Pradesh, Pin - 201301, half an hour after the prescribed time for tender submission in presence of the bidders representatives who may wish to be present.

Envelope No.1: Shall be opened first. If the bid Security is not found as prescribed the bid shall be summarily rejected.
Envelope No.2: Shall then be opened. Bids of parties who do not accept the conditions laid down in the bid documents may be rejected.
Envelope No. 3 : Shall contain the sealed price bid. Whose bids is found to be generally in order and substantially responsive shall be opened either at the bid opening or at a subsequent date to be intimated in advance to such eligible bidders.

Offers not complete in all respects and/or received without the cost of tender, earnest money, and conditional or not in accordance with our terms and conditions, will be summarily rejected. The decision of HSCC shall be final and binding in this regard. HSCC reserves the right to accept or reject any or all quotations without assigning any reason thereof and also take no responsibility for delay, loss or non-receipt of quotations sent by post either way.

Kindly note that offers shall be valid for three months from date of submission of your bid.

Thanking you.

Yours faithfully,

-----sd------

Senior Manager (Civil)

* as per Pre Qualifying Criteria

Brief Description of Project:

The Centre for Mother & Child Health is proposed to construct in vicinity of the existing hospital in the East Ansari Nagar Campus of AIIMS. The total covered area of proposed block is about 30000 square metre with 4500 square metre ground coverage area.

Pre Qualifying Criteria

Following is the pre qualification criteria for the tenderers:

Contractors working with CPWD, Railways, MES, P & T Deptt., State PWD's, Semi govt. Organizations and Institutes or in reputed private Sector Firms who have:

1. Average Annual financial turnover during the last three years, ending 31st March of the previous financial year, i.e. for FYs 2005-06, 2006-07 & 2007-08, should be at least 30% of the estimated cost.
2. Experience of having successfully completed similar works during last seven years ending last day of month previous to the one in which applications are invited should be either of the following;
    a) Three similar completed works consisting not less than the amount equal to 40% of the estimated cost.
    or
    b) Two similar completed works consisting not less than the amount equal to 50% of the estimated cost.
    or
    c) One similar completed works consisting not less than the amount equal to 80% of the estimated cost.

3. Similar works here mean works mentioned in "Scope of Work".

All tenderers should submit the proof of works executed as above & "Satisfactory Performance Certificates". Absence of submitting the same along with the tender will disqualify the tenderer.

The estimated cost of the work is Rs.2,80,000/- (Rupees Two Lakh Eighty Thousand only)

The competent authority to pre-qualify shall have the powers to relax any condition/criteria for pre-qualification if it considers expedient to do so.

SCOPE OF WORK

A. TOPOGRAPHICAL SURVEY & COLLECTION OF FIELD DATA AND REPORT SUBMISSION

The Scope of work is detailed as under: -

1. Carrying out topographical survey including transferring the level from nearest available permanent G.T.S. benchmark
2. Establishment and construction of 2 nos. bench mark/grid pillars & providing fencing around them including all labour and materials for excavation, foundation, brick work and concreting work and 12 mm thick M.S. plate of size 200 mm x 200 mm with 500 mm long M.S. flat 40 mm x 3 mm, 2 nos. welded with each plate grouting and marking centre points etc.). The reduced level with respect to M.S.L. shall be engraved on each plate of the bench mark pillars as well as corresponding reference be given on the Survey Plan. The drawing for the construction of Bench Mark is attached along with it and same to be used for the construction of Bench Mark.
3. Spot leveling of total area of land/plot by taking spot levels at 5 m center to center grid and contour intervals at 0.5 m.
4. To locate on the survey plan in A1/A0 sheet to the scale of 1:200 with all permanent & temporary structures along with existing storm, sewer & water line, power (HT & LT) & telecommunication lines/poles, trees of various girths, roads, water supply, sewer, drainage line and also any other important features etc. adjacent and within the total area of plot, if any.
5. Following field data shall be collected and supplied in the form of report and drawings by the agency: -
   a) Direction of North.
   b) Prevailing wind direction and speed.
   c) Maximum, minimum, average, hourly, daily, monthly and annual rainfall for the last 10 years.

d) Daily maximum, minimum and average temperature for last ten years.

e) High Flood level near site

6. Existing water supply source data shall be collected and supplied as under:-

i) Location and alignment of potable water source with reference to area under survey along with size and residual pressure available in and around the project site boundary.

ii) Total water storage capacity in existing tanks & details of consumption per day.

iii) Feasibility to connect proposed water supply from existing main ring.

7. Existing Fire fighting system data shall be collected and supplied for areas in and around the project site boundary as under : -

i) Location and capacity of existing fire storage tank & fire pumps.

ii) Existing fire ring main – location, alignment, diameter, material of pipe, location of hydrants etc.

iii) Feasibility to connect fire line nearest to the proposed site.

iv) Local Bye-laws of the area.

8. Details about Sewer and storm water drain / nallah passing through/near the complex indicating the following details:-

i) Location and alignment of drain / nallah

ii) Invert level / L-Section of the drain / nallah indicating slope .

iii) Cross-section of the nallah / drain at suitable locations.

9. Location of the road near the site indicating its layout with reference to site. The crown levels (L-section) of road/railway at 20 m. interval along the alignment are to be indicated.

10. Details of Municipal/Public sewer line:

i) Location, material, diameter and alignment of the existing sewer lines running in and around the project site. Location for suggested outfall point for sewerage of the proposed Complex.

ii) Location of manholes with size, ground level and invert levels of sewer line running around/near the project site.

iii) Feasibility to connect proposed sewer with existing sewer line.

11. Details of the proposed approach road connecting main road to project site to be supplied as under: -

i) Alignment of the road

ii) L-Section of the road indicating ground levels at 10 m centre to centre between main road and entrance of project site.

iii) Cross-section of the road extending up to 10 m distance on both sides of centre of road with levels at 5m. c/c.

iv) Crown level of the main road at the junctions with the proposed approach road.

v) Details - such as L.S. & C.S., Bed level, H.F.L. etc. of the cross drainage, if any.

12. Details of the existing boundary wall, temporary and permanent structures, if any, inside the site including the following shall be collected and supplied: -

i) Cross section of the wall

ii) Part elevations and cross-section of the buildings also showing. foundation.

iii) Length, width, height, area and no of stories of each building including details of materials used in construction.

iv) Location of existing trees (along with height and girth of the trees) and other permanent/ temporary structures.

v) Electric overhead lines (LT/ HT), telephone lines.

vi) The agency shall submit colored photographs (about 25) showing the major features of the site and its surroundings.

13. All survey, grid levels shall be done by Total Station and contour plan shall be prepared on computer through digitization process and the soft copy shall be provided for the same immediately.

14 On completion of all fieldwork, collection of pertinent field data and preparation of drawings the agency shall submit a formal draft report containing all the information/field observations and drawings, in triplicate for review of Supervising Agency. Thereafter the agency shall visit to Supervising Agency's office for detail discussions on Supervising Agency's comments if any. After discussion with the Supervising Agency, the agency shall incorporate the agreed modifications in the draft report at their own cost and submit six copies of the detailed final report (plastic coated with spiral binding) and 6 sets of drawings (the drawings shall bear the logo of HSCC and the format of the same can be obtained from HSCC) along with a set of reproducible drawings and related floppy diskette/ CD. The agency shall also submit along with report a copy of field book in original or an authenticated copy of the same duly certified by Engineer.

15 Description and photos of general surrounding and plot and of the team while carrying out the work awarded.

16 Plot has to be cleared of all vegetation including shrubs, bushes, etc. whatsoever before start of the work and all removed vegetation to be thrown as per HSCC directives.

B. GEOTECHNICAL INVESTIGATION AND REPORT SUBMISSION

1.01 Detailed Geo-technical Investigation is to be carried out of the area of plot and submission of a detailed Geo-technical report which shall be the basis for the design and detailing of foundations for buildings and structures.

1.02 Item wise list of investigations to be conducted along with approximate estimated quantities are given at Schedule of Quantities against which the agency shall quote the rates in figures as well as in words. However, payment shall be made as per quantities actually executed.

1.03 The work shall include mobilisation of all necessary equipments, providing necessary engineering supervision and technical personnel, skilled and unskilled labour etc. as required to carry out the entire field as well as laboratory investigation, analysis and interpretation of data collected and preparation of a Geo-technical report.

1.04 The Agency shall make their own arrangements for locating the coordinates and positions of bore holes, trial pits, dynamic cone penetration tests and other field tests as per the drawings/sketches supplied to him and for determining the reduced levels (R.L's) at these locations with respect to the single bench mark indicated by the Engineer. Two established reference lines will be indicated to him.

1.05 All the field and laboratory data shall be recorded in the proforma recommended in Indian Standards codes. The Agency shall submit to the HSCC one copy of field borelogs and all the field records (countersigned by the Engineer) soon after the completion of each borehole/test.

1.06 The Agency shall interact with HSCC and get acquainted with the broad guidelines about the different types of structures envisaged and in assessing the load intensities on the foundations for the various structures of the project in order to enable him to make specific recommendations for the depth, founding stratum, type of foundation and the allowable bearing pressure.

1.07 The Agency shall carry out all work meant within Para 1.01 of this specification even if not explicitly mentioned under the scope. All work shall be executed to the satisfaction of the Engineer.

1.08 FIELD INVESTIGATIONS - SOIL

1.08.1 BORING

a) Bore holes shall be taken at specified locations to obtain information about the subsoil profile, its nature and strength and to collect soil samples for strata identification and conducting laboratory tests. The sequence of boring shall be fixed with the approval of the Engineer and on ascertaining preliminary nature of subsoil profile, the Engineer shall reserve the right to increase or decrease the number of proposed Bore holes by any limit. However, as per Clause 1.02, payment shall be made as per actual quantities executed. The minimum diameter of the bore holes shall be 150 mm and boring shall be carried out in accordance with the provisions of IS : 1892.

b) All boreholes shall extend up to 15.0 to 30.0 Mtr. depths or depths shown on the construction drawings or as directed by the Engineer. The refusal criteria shall be strictly as per IS: 1892. When the boreholes are to be terminated in soil strata an additional Standard Penetration Test shall be carried out at the termination depth. No extra payment shall be made for carrying out Standard Penetration Tests. **The site data shall be made available to HSCC as and when each bore is completed either by fax/ courier/speed post/ hand delivery showing location of the borehole on the plan and the soil data along with visual description. The comments regarding the strata and the nature of variations shall also be included.**

c) On completion of the boreholes, the Agency shall backfill all the bore holes as directed by the Engineer. The boreholes shall not be back filled till verified by the Engineer. Arrangements shall be made by the agency to preserve the boreholes so that the depth can be verified.

1.08.2 PLATE LOAD TEST

Plate load test shall be conducted to determine the allowable bearing pressure. A pit of size 2.0m square shall be excavated up to a depth of 2.0m deep from virgin soil. The size of plate should be of 0.75mX0.75m. It should be made of mild steel and 25 mm thick. Load shall be applied on this plate by means of hydraulic jack. The reaction to the jack shall be provided by means of loaded platform (kentledge). A seating load of 7 kN/m2 shall be first applied which shall be released after some time. The load shall then be applied in increments of 20% of the estimated safe load or one-tenth of the ultimate load. The settlement shall be recorded at 1, 2.25, 4, 6.25,9,16 and 25 minutes and thereafter at hourly intervals to nearest 0.02mm. The test shall be conducted until failure or at least until the settlement of about 25mm has occurred. The specifications for the equipment and accessories required for performing this test, test procedure, field observation and reporting of results shall conform to IS: 1888-1982

1.08.3 SAMPLING

1.08.3.1 General

All the accessories required for sampling and the method of sampling shall conform to IS: 2132. All the disturbed and undisturbed samples collected in the field shall be classified at the site as per IS: 1498.

1.08.3.2 Disturbed Sample

Disturbed soil samples shall be collected from bore holes at regular intervals. Jar samples weighing approximately 1 Kg. shall be collected in bore holes at 0.5 m below ground level and at every identifiable change of strata to supplement the

boring records. Samples shall be immediately stored in air tight jars and shall fill the jar as far as possible.

Sufficient number of soil samples shall be collected. Disturbed soil samples shall be collected for field identification and conducting tests such as sieve analysis, index properties, specific gravity, chemical analysis,(chemical tests on undisturbed samples to be done so that representative chemical state of the total depth of the soil is obtained) etc. Undisturbed samples shall be collected to estimate the physical strength and settlement properties of the soil.

1.08.3.3 Undisturbed Sample

In each borehole undisturbed sample shall be collected at every change of strata and depths of 1.0 m, 4.0 m, 7.0 m, 10.0 m, 13.0 m, 15.0 m and as directed by the Engineer. Undisturbed samples shall be of 100 mm dia and 450 mm length. Samples shall be collected in such a manner that the structure of the soils and its moisture content do not get altered.

The specifications for the accessories required for sampling and the sampling procedure shall conform to IS: 1892 and IS: 2132. Undisturbed sampling in sand shall be done using compressed air technique mentioned in IS: 8763.

1.08.3.4 One of the methods shall be adopted for determining the ground water table in bore holes as per IS: 6935 and as per the instructions of the Engineer.

1.08.3.5 a) Sub-soil water samples

Sub-soil water samples shall be collected for carrying out chemical analysis thereon. Representative samples of ground water shall be collected when it is first encountered in boreholes before the addition of water to aid boring or drilling.

b) Chemical analysis of water samples shall include determination of PH value; turbidity; sulphate; carbonate; nitrate and chloride contents; presence of organic matter and suspended

c) Standard Penetration Test

This test shall be conducted in all types of soil deposits met within a bore hole to find the variation in the soil stratification by co-relating with the number of blows required for unit penetration of a standard penetrometer. This test shall be conducted at 1.50 m interval and every change of strata and as per the direction of the Engineer. The depth interval between the top levels of standard penetration test and next undisturbed sampling shall not be less than 1.0 m.

d) Dynamic Cone Penetration Test

Dynamic cone penetration test shall be conducted to predict stratification, density, bearing capacity etc. of soils. The test shall be conducted by driving a standard size cone attached to the bottom of a string of drill rods. The test shall be conducted up to the specified depth or refusal whichever is earlier. Refusal shall be considered when the blow count exceeds 150 for 300 mm penetration. The specifications for the equipment and accessories required for performing this test, test procedure, field observation and reporting of results shall conform to IS : 4968, Part - II.

1.08.4 Earth Resistivity of soil

Resistivity of soil /earth shall be measured at 2 locations as per instructions of the Engineer. Measurements shall be carried out as per IS-3043.

1.9 LABORATORY TESTING

1.9.1 Essential Requirements

a) Tests indicated in the schedule of items shall be performed on soil, water and rock samples as per relevant IS codes.

b) Laboratory tests shall be conducted using approved apparatus complying with the requirements of Indian Standards or other approved standards for this class of work. The tests shall be conducted at an approved laboratory.

1.9.2 Tests

Tests as indicated in this specification and as called for by the Engineer shall be conducted. These tests shall include but not be limited to the following: -

a) Tests on Disturbed and Undisturbed samples: -

- Visual and Engineering Classification
- Sieve analysis and Hydrometer analysis
- Liquid, Plastic and Shrinkage limits
- Specific Gravity
- Chemical Analysis
- Swell pressure and free swell index determination (applicable only for black cotton soil)
- Proctor Compaction Test

b) Tests on undisturbed samples

- Bulk density and moisture content
- Relative density (for sand)
- Unconfined compression test
- Box shear test (in case of sand)
- Tri-axial shear tests: (depending on the type of soil and field conditions on undisturbed or re-moulded samples).

c) Unconsolidated undrained

d) Consolidated undrained test with the measurement of Pore Water Pressure.

e) Consolidated drained.

f) Consolidation Test (In case of cohesive soil)

1.9.3 Salient Test Requirement

a) Chemical analysis of sub-soil shall include determination of pH value, carbonate, sulphate (both SO3 and SO4), chloride and nitrate contents; organic matter; salinity and any other chemical harmful to the foundation material. The contents in soil shall be indicated as percentage (%).

b) Chemical analysis of sub-soil water sample include the determination of the properties such as colour, odour, turbidity, pH value and specific conductivity both at 25^0 C and chemical contents such as Carbonates, Sulphates (both SO_3 and SO_4), Chlorides, Nitrates, Organic matter and any other chemical harmful to the

foundation material. **The contents such as Sulphates, Saltpetre, etc. shall be indicated as ppm by weight.**

1.10 REPORT

1.10.1 General

a) On completion of all the field and laboratory work, the Agency shall submit a formal report containing Geological information of the region, procedure adopted for investigation, field observations, summarised test data, conclusion and recommendations. The report shall include detailed bore-logs, subsoil sections, field test results, laboratory observations and test results both in tabular as well as graphical form, practical results both in tabular as well as graphical form, practical and theoretical considerations for the interpretation of test results, the supporting calculations for the conclusions drawn, etc. Initially the Agency shall submit three copies of the report in draft form for the Supervising Agency's review. The format of the cover page of the reports shall be got approved by the Engineer.

b) The Agency's qualified Geotechnical Engineer shall visit Supervising Agency's office for a detailed discussion on Supervising Agency's comments on his draft report. During the discussions, Supervising Agency shall decide as to the modifications that need to be done in the draft report. Thereafter the Agency shall incorporate in his report the agreed modifications and after getting the amended draft report approved, six copies of the detailed final report (in A4 size and spiral binding with plastic covers) shall be submitted along with one set of reproducible of the graphs, tables, etc.

c) The detailed final report based on field observation, in-situ and laboratory tests shall encompass theoretical as well as practical considerations for foundations for different types of structures envisaged in the area under investigation. The Agency shall acquaint himself about the type of structures, foundation loads and other information required from the Engineer.

1.10.2 Data to be furnished

The report (in soft as well as hard copy) shall also include but not be limited to the following: -

a) A plot plan in A1/A0 sheet showing the locations and reduced levels of all field tests e.g. boreholes, trial pits, static cone penetration tests, dynamic cone penetration tests, plate load tests, etc., properly drawn to scale and dimensioned with reference to the established grid lines.

b) A true cross section of **all individual boreholes and trial pits** with reduced levels and coordinates showing the classification and thickness of individual stratum, position of ground water table, various in-situ tests conducted and samples collected at different depths and the rock stratum, if met with.

c) A set of longitudinal and transverse soil profiles connecting various boreholes in order to give a clear picture of the variation of the subsoil strata as per IS: 6065. (each soil profile to be submitted in separate sheets).

d) Past observations and historical data, if available, for the area or for other areas with similar soil profile or with similar structures in the surrounding areas.

e) Plot of Standard Penetration Test (N values both uncorrected and corrected) with depth for identified areas.

f) Results of all laboratory tests summarised (i) for each sample and for each layer alongwith all the relevant charts, tables, graphs, figures, supporting calculations, conclusions and photographs of representative `rock cores'.

g) For all tri-axial shear tests stress vs strain diagrams as well as Mohr's circle envelops shall be furnished. If back pressure is applied for saturation, the magnitude of the same shall be indicated. The value of modulus of elasticity, E shall be furnished for all tests alongwith relevant calculations.

h) Soil resistivity Test results

i) For all consolidation tests, the following curves shall be furnished :-

e vs log p

or e vs p and as per applicability

Compression vs log t or

Compression vs square root of t (depending upon the shape of the plot for proper determination of co-efficient of consolidation).

The point showing the initial condition of the soil shall be marked on curves.

The procedure adopted for calculating the compression index from the field curve and settlement of soil strata shall be clearly specified. The time required for 50% and 90% primary consolidation alongwith secondary settlements, if significant, shall also be calculated.

1.10.3 Recommendations

Recommendations shall be given area wise duly considering the type of soil, structure and foundation in the area. The recommendations shall include but not be limited to the following:-

1.10.3.1 For shallow foundations

The following shall be indicated with comprehensive supporting calculations.

a. Net safe allowable bearing pressure for isolated footings and continuous strip footings of suitable sizes (Varying from 1 to 4m) at suitable foundation depth as per site condition below ground level considering both shear failure and settlement

criteria, giving reasons for type of shear failure adopted in the calculations. Such Footings to be suggested for single storeyed buildings are proposed.

b. Net safe allowable bearing pressure for Raft Foundation at suitable foundation depth as per site condition below ground level considering both shear failure and settlement criteria, giving reasons for type of shear failure adopted in the calculations. Such Footings to be suggested for Raft Foundation giving data for modulus of Subgrade Reaction

c. Rate and magnitude of settlement expected of the structure.

1.10.3.2 For Pile foundations

Since piling is envisaged at the existing site, the following shall be indicated with comprehensive supporting calculations:-

a) Type of pile and reasons for recommending the same duly considering the soil characteristics.

b) Suitable founding strata for the pile and the pile depth at respective locations.

c) Estimated length of pile for 300 mm dia, 350 mm, 400 mm dia and 450 mm dia and any other diameter to be suggested by the investigating agencies.

d) Type of pile- End bearing and/or Frictional resistance and whether bored cast-in-situ or Pre cast driven pile shall be indicated separately. The estimated pile capacity clearly identifying the end bearing and treated resistance capacities contributes in the total capacity.

e) Magnitude of negative skin friction, if any, to be considered in pile design.

C. GROUND WATER / RAIN WATER HARVESTING

The scope of work includes conducting Geo-physical and Geo-hydrological survey of the entire area and a study of the environmental conditions that may affect the fitness of the underground water source for domestic and non-domestic purpose. The total water requirement for the proposed site is approximately 2 lakh liters per day. The alternative sources of ground water i.e tube well and rain water-harvesting scheme be assessed scientifically. This also includes the assessment of the capacity and dependability of the different sources to meet water for project.

The detailed scope of work will be as below:

1. With the objective to meet total water requirement at least 4 points shall be subjected to vertical electrical sounding to ascertain suitability for locating tube wells with a depth range upto 150 meters or whatever suitable in and around project site. A/C or D/C (digital type) resistivity meter will be used for the study. The resistivity data so procured shall be analysed, computed and plotted on log-log graph paper with modules of 62.5 mm, smooth curves shall be drawn for each vertical electrical sounding. Geophysical interpretations of the curves drawn by computer and using auxiliary charts shall reveal the following information.

2. Full details of the existing underground sources of water, nature and extent aquifers, their depth and yield expected from tube well or open dug wells in entire campus.

3. Best point selection on the field for the tube well drilling. The same to be marked on overall plot plan with co-ordinate. The exact bench markings for individual wells suggested will be got done by your representative at site as directed by Engineer.

4. Apparent resistivity of existing sub-Geoelectrical layers and corresponding geology of the layer. Correlation of data with CGWB data.

5. Detailed design and specification for tube wells.

6. Recommended drilling depth and drilling techniques of each tube well.

7. Expected yield of tube well in (litre /hr) and rate of withdrawal.

8. Suggest number of tube wells required to meet total water requirement.

9. Recommended capacity (discharge, head) of submersible pump, pumping hrs for individual bore well, type of material and dia. of pipe for tube well.

10. Recommended spacing between the tube wells to avoid minimum interference.

11. Recommendations for functional utility of the bore wells/ dug wells.

12. Suggest method for improvement of bore well yield and quality of water.

13. Suggest scheme for piping network for interconnection of different tube wells.

14. Suggest rainwater harvesting scheme / ground water recharge method and maximum percolation rate through recharge pit.

15. Water quality Assessment

The quality of surface as well as Ground water is to be tested as per IS: 10500, (23 parameters) standards. The scope of water analysis is not limited to ascertaining potability or being semisalty or salty. It should also include chemical and bacteriological tests. A range regarding percentage salt content shall be given which should be close to 90% of salt content once water is actually pumped out.
The study report shall also include the required Geoelectrical sections for the area, as well as samples of the curves used for matching.

16. Contents of the report.

i) The Geohydrological investigation report should have the following contents:

a) Introduction
b) Location of the Study Area
c) Objectives of Ground Water studies
d) Applied Methodologies
e) Available basic Data
i) Ground Water level
ii) Geology of the area
iii) Information and details of existing ground water sources.
iv) Delineation of potential ground water bearing zones
v) Assessment of hydraulic parameters of aquifers

vi) Water producing capabilities of aquifers likely to be tapped for construction of tube wells/ Dug wells in liters/hour

vii) Correlation of the data obtained from site with data from CGWB etc.

viii) Number of tube wells/ dug wells to meet the water requirement of the project.

ix) Spacing between tube wells/ dug wells.

x) Specification of tube wells/ dug wells and type of pump set, type of material and dia of pipe for tube well.

xi) Details of rain water harvesting scheme.

xii) Recommendations.

General Conditions of Contract

The General Conditions of Contract are as under.

1.0 Security Deposit

Security deposit at the rate of 5% of the amount of each running bill shall be retained and the same shall be released after six months of the successful completion of the work at site. However no interest shall be payable to the Agency for the amount of security deposit for the period retained by HSCC.

1.1 Delay and extension

If the work is delayed by force majure or any other cause in the absolute discretion of Employer is beyond the Agency's control, they shall immediately upon the happening of such event contributing to delays give notice thereof in writing to Employer but shall nevertheless use constantly their best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of HSCC to proceed with the work.

Request for extension of time shall be made by the Agency in writing within seven days of the happening of the event causing delay. The survey Agency shall also indicate with any such request, the period for which extension is required. In any such case HSCC may give a fair and reasonable extension of time for completion of individual items or group of items of work for which separate period of completion is specified in the contract as a whole, but it shall be the sole discretion of the Employer to grant or refuse such extension.

The decision of HSCC in regard to the extension will be communicated to the Agency in writing within a reasonable time but no compensation or any extra amount shall be paid for such extension granted by HSCC.

1.2 Compensation payable for delay in completion and risk prejudice clause

The Agency shall be liable to pay compensation to HSCC in case of delay in fulfilling obligation under this agreement for causes solely attributable to the survey Agency at 1% (One percent) of contract amount per week of delay subject to maximum of 5%(five percent only) of the total contract price towards their contract.

1.3 Risk Prejudice Clause

In case progress of any part of Agency's work is found to be unsatisfactory by HSCC at any time during the execution vis-a-vis, the terms of contract, HSCC shall give the Agency a fortnight's notice in writing asking for their plans for remedying the situation and to complete the job within the time mutually agreed, subject however to the conditions that the entire work falling within their scope of work shall be completed within the stipulated time. On the failure to remedy the situation as per agreed time with HSCC, HSCC shall have the right to withhold that portion of the work and get the same done at the risk and cost of the Agency after giving one weeks notice.

1.4 Arbitration

If at any time any doubt, question, dispute or difference whatsoever, shall arise between the Agency and HSCC upon or relating to or in connection with this contract, either of the parties may give the other notice in writing of the existence of such doubt, question, dispute or difference and the same shall be referred to the Chairman - cum - Managing Director, HSCC or his nominee as Sole Arbitrator. The decision of the sole arbitrator thereon shall be final, conclusive and binding upon the parties to dispute. The party invoking arbitration shall specify the dispute or disputes to be referred to the arbitration under the clause together with the amount or amounts claimed in respect of each of dispute.

1.5 Jurisdiction of Court

All disputes arising out of the contract shall have the jurisdiction of courts of the Union Territory of Delhi only.

1.6 Termination of Contract

HSCC reserves the right to terminate, or postpone the work on account of unfulfillment of contractual obligation(s) or any sufficient cause, HSCC being sole judge of the same. The Agency shall be paid for the useful work done upto the date of termination. HSCC shall determine the credit to be given to the detailer for the value of the work executed by the Agency. The Agency shall give HSCC all the data, compiled report, drawings etc. prepared by them till the date of termination before the final dues are paid to the Agency. Even after the termination of agreement, the Agency shall continue to cooperate with HSCC to such a reasonable extent as may be necessary to clarify or explain any reports or recommendations in documents or detailing made by them.

1.7 Breach of Trust

Unless otherwise directed by HSCC specifically, the Agency shall not contact directly or indirectly the client or any other authorities connected with the project. Non compliance of this clause shall be treated as breach of trust resulting in the termination of contract

between HSCC and the Agency for with without any prior notice to him. In such event, no job will be entrusted to him in future by HSCC.

1.8 Discussions with HSCC and Approvals

The Agency shall make themselves available at reasonable notice to be present for discussions with HSCC. The Agency shall also provide assistance, advice and information to HSCC as may be required from time to time for discussions with other agencies or HSCC officials connected with the work.

The Agency shall get approved the work done by him at every stage throughout the period from HSCC. However, such approval by HSCC shall not be deemed to absolve the Agency of the total responsibility of the correctness and soundness of the work and other obligations under this contract.

1.9 Guarantee and liability of the Agency

The Agency shall be liable for all consequence of errors and omissions arising from errors solely attributable to Agency or on the part of their employees to the extent and with the limitation specified by HSCC.

2.0 Periodical Progress Report

The Agency shall prepare and submit periodical progress reports and status of works being performed by them. Such submissions of reports and review and approvals, if any, thereof by HSCC shall not be deemed to absolve the responsibilities of the Detailer for timely completion of the assignment.

2.1 Unit Rates

The Lump sum / Unit rates quoted shall remain firm throughout the validity of the contract. The rate shall include cost of materials, labor, tools and equipments, transport charges, taxes, royalties, octroi, service tax etc. payable on all transactions for the due performance of work under this contract. The rates shall be given in the schedule, as specified herein before. No escalation shall be paid on whatever account it may be.

2.2 Variation in scope of work and schedule of quantity

The scope of work & schedule of quantities may vary to any extent. The rates quoted by the Agency shall remain firm for the complete job as directed by the Engineer.

2.3 Mobilization advance

No Mobilization advance shall be paid.

2.4 Income tax

Income tax shall be deducted from Agency's bill as per rules.

2.4 Only computerized output

The Agency shall prepare a CD of the complete work assigned to them including drawings, report work, data, and other documents & the same shall be submitted to HSCC after completion of job. All drawings shall be on AUTOCAD and in A1 & A4 sizes only.

2.5 Water for construction purposes

The Agency shall make his/ their own arrangements for unfiltered water required for the work and nothing will be paid for the same.

2.6 Power

The Agency shall make his own arrangements for obtaining electrical connections if required and make necessary payments directly to the departments concerned.

COMPLETION TIME SCHEDULE AND MODE OF PAYMENT

Completion Time

Total time period for completion of job will be as per following from the date of issue of letter of award. The work is to be done in phases in order of priority as given below:-

Table-1

S.N.	Particulars (a)	Completion Time	Submission of Draft Report (b)	Submission of Final Report (c)
A.	Topographical plan with Contours (as per Scope of Work)	2 weeks from date of award of work	3 weeks from date of award of work	1 week from the date of receipt of comments on Draft report from HSCC
B.	Geotechnical Investigations (as per Scope of Work)	2 weeks from date of award of work	3 weeks from date of award of work	1 week from the date of receipt of comments on Draft report from HSCC
C.	Hydro Geological Survey (as per Scope of Work)	2 weeks from date of award of work	3 weeks from date of award of work	1 week from the date of receipt of comments on Draft report from HSCC)

MODE OF PAYMENT

Table-2

S.No.	Stage of Work	Percentage of Total fees payable
1.	For submission of draft Reports of all items from S.N. 1 to 3 in Table -1(a)	30
2.	For submission of final Reports of all items from S.N. 1 to 3 in Table -1(c) after receiving approval from HSCC	30
3.	On submission of field information along with all reports as required/as per scope of work	20
4.	On submission of all drawings and technical report including photographs, basic calculation sheets, complete in all respects, in a CD.	20

Price Bid for Topographical, Geotechnical and Hydro geological Survey for Construction of Centre for Mother & Child Health at AIIMS, New Delhi

S.No.	Description	Unit	Quantity	Rate	Amount
1	Topographical Survey, Collection of field and report Submission:				
	(a) Site Survey and Collection of Field Data as per defined scope of work of the area ear marked in enclosed layout drawing .	Sqm	4500		
	(b) Construction of Bench Mark and providing fencing around them as per drg supplied.	No	1		
2	**Soil boring, sampling, chemical analysis and report submission**				
	Boring of holes of 150mm dia. In all types of soil excluding soft and hard rock but including boulders, gravels etc. upto the depth of 30m below the existig G.L. or refusal whichever is met earlier complete in all respects. (The quoted rate shall take care of following subheads.)				
	(a) Conducting standard penetration test in all bore holes at intervals of 1.5 m and also at change of strata as per IS codes of practices				
	(b) Collecting disturbed and undisturbed samples of soil at 1.5m interval and also at change of strata from the bore-holes.				
	(c) Recording of water table in bore hole after completion of boring as per scope of work.				
	(d) Conducting necessary tests on samples collected from each hole. The laboratory tests include chemical analysis of soil and water as per scope.				
	(e) Collection of water samples from bore holes for chemical test and analysis.	RM	100		
3	**Plate Load Test**				
	Conducting plate load tests using 750mm x 750mm square plate. Test should be continued till 25mm settlement in normal circumstances and 50mm in special cases such dense gravel, gravel and sand mixture is obtained or failure of the soil whichever is earlier as per IS:1888 or refusal whichever is earlier	Each	1		
4	**Rock Sampling**	Metre	10		

Price Bid for Topographical, Geotechnical and Hydro geological Survey for Construction of Centre for Mother & Child Health at AIIMS, New Delhi

S.No.	Description	Unit	Quantity	Rate	Amount
	Boring of holes of 150mm dia. Into hard rocks in case hard rock is met at a depth lesser than 30 meter below the existing G.L. or refusal whichever is met earlier complete in all respects				
5	**Other penetration tests:**				
	Conducting static cone penetration test as specified and in locations indicated and depth upto 10.0 m or refusal whichever is earlier	Each	5		
	Conducting Dynamic cone penetration test as specified and in locations indicated and depth upto 10.0m or refusal whichever is earlier.	Each	5		
	Conducting field density test as specified at 1.5m, 2.5m and 3.5m depth at each locations.	Each	5		
6	**Ground water investigation**				
	Ground water investigation by Geo-physical equipments for assessment of availability of ground water at site as per scope of work specified including the followings:				
	(a) Collection of geophysical field data at 4 no of required locations to suggest 2-3 no of tube wells/dug wells.				
	(b) Collection of data from existing underground water sources,.				
	(c) Collection of water samples from 2 no locations of existing underground sources and getting them tested (Physical, Chemical & Bacteriological) at every location. Suggesting design of tube wells/dug wells				
	(d) Suggested design for Rain water Harvesting System	Lumpsum	1		
7	Conducting soil resistivity test as per IS 3043 and submission of test results as part of draft and final report.	Each	2		
	Total				