

TENDER DOCUMENT FOR TOPOGRAPHICAL SURVEY AND SOIL INVESTIGATION FOR 15MW PV SOLAR PROJECT AT ORDNANCE FACTORY PREMISES, YEDDUMAILARAM, MEDAK DISTRICT, TELANGANA

Bharat Heavy Electricals Ltd
Electronics Division , Mysore Road, Bangalore – 560026

TENDER DOCUMENT

**TOPOGRAPHICAL SURVEY AND SOIL INVESTIGATION
FOR 15MW PV SOLAR PROJECT AT ORDNANCE
FACTORY PREMISES, YEDDUMAILARAM, MEDAK
DISTRICT, TELANGANA**

Nearest Urban Area	Medak/ Shankarpally
Nearest Highway	SH55/SH65
Nearest Railway Station	Medak/ Shankarpally
Nearest Domestic Airport	Hyderabad

DATE OF INTIMATION: 23.05.2016

Part-I OF THIS TENDER DOCUMENTS CONTAIN:

1. Notice Inviting Tender.
2. Technical-cum-commercial bid (to be filled-up by tenderer).
3. Instructions to Tenderer.
4. Condition of Contract.
5. Technical Specification
6. Safety Declaration letter on bidders letter head.
7. Other relevant documents like acceptance for condition of contract/specification, Form of Tender.

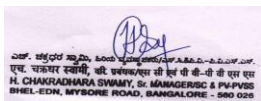
Part – II Price Bid:

1. Bill of quantities (BOQ) for total scope of work (to be filled up by tenderer).

Note:

1. Part I: To be submitted in a separate sealed cover.
2. Part II: To be submitted in a separate sealed cover.
3. Earnest Money Deposit: Not Applicable
4. Part-I, Part-II sealed covers should be put in outer envelope and super scribing the Name of work, RFQ number, BHEL address and Name & Address of the Tenderer.

AGM /SC&PV (PVSS)
NEB 5TH FLOOR
Bharat Heavy Electricals Ltd
Electronics Division
Mysore Road, Bangalore – 560026



BHEL

CONTACTOR (SIGN & SEAL)

TENDER DOCUMENT FOR TOPOGRAPHICAL SURVEY AND SOIL INVESTIGATION FOR 15MW PV SOLAR PROJECT AT ORDNANCE FACTORY PREMISES, YEDDUMAILARAM, MEDAK DISTRICT, TELANGANA

NOTICE INVITING TENDER

1. TENDER No./RFQ No.:EDN/SCPV/PVSS/15MW/BEL-SECI/Topo & Soil Investigation/01, 23.05.2016

2. NAME OF WORK : TOPOGRAPHICAL SURVEY AND SOIL INVESTIGATION FOR 15MW PV SOLAR PROJECT AT ORDNANCE FACTORY PREMISES, YEDDUMAILARAM, MEDAK DISTRICT, TELANGANA

3. EARNEST MONEY DEPOSIT : NOT APPLICABLE

4. SECURITY DEPOSIT : NOT APPLICABLE

5. COMPLETION TIME : 04 WEEKS FROM THE DATE OF ISSUE OF LOA or HANDING OVER OF SITE/ WORK ORDER FOR ALL ACTIVITIES PUT TOGETHER.

6. LAST DATE AND TIME FOR THE SUBMISSION OF DULY FILLED IN TENDER DOCUMENT : **ON 08.06.2016 BEFORE 01:00 P.M.**

7. PLACE OF SUBMISSION/

ADDRESS TO BE SUPERSCRIBED ON TENDER ENVELOPE : AGM /SC&PV (PVSS) 5TH FLOOR, N.E.B. BUILDING, BHEL-ELECTRONICS DIVISION, MYSORE ROAD, BANGALORE-560026
Ph No: 080-26998656, 26998332, 9449869851

8. DATE AND TIME OF TECHNICAL BID OPENING : **ON 08-06-2016 AT 01:30 P.M.**

9. DATE AND TIME OF PRICE BID OPENING : **WILL BE INTIMATED SEPARATELY**


10. PENALTY OF 0.5% PER WEEK OF DELAY ON THE CONTRACT VALUE OF WORK SUBJECT TO CEILING OF 10% OF CONTRACT VALUE.

NOTE:

A. Tenderer shall return the duly filled in Tender document after affixing Signatures and seal on **all pages** of tender document and submit.

B. Bidders desiring to be present for the opening shall depute their representatives with due letter of authorization presented well in advance.

C. Separate intimation regarding availability of site to commence the Topographical survey and Soil testing & investigation will be given to successful bidder.


H. CHAKRAVARTHI, Sr. Manager SC & PV-PVSS
BHEL-EDN, MYSORE ROAD, BANGALORE - 560 026

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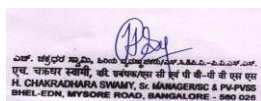
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SOLAR PROJECT AT ORDNANCE FACTORY PREMISES, YEDDUMAILARAM, MEDAK DISTRICT,
TELANGANA**

TECHNICAL-CUM-COMMERCIAL BID

(To be furnished by the Bidders)

01. NAME OF THE WORK : TOPOGRAPHICAL SURVEY AND SOIL INVESTIGATION FOR
15MW PV SOLAR PROJECT AT ORDNANCE FACTORY
PREMISES, YEDDUMAILARAM, MEDAK DISTRICT, TELANGANA
02. COMPLETION PERIOD : **04 WEEKS** (FROM DATE OF LOA/ W.O ISSUED/HANDING OVER OF SITE,
TOPOGRAPHICAL SURVEY AND SOIL INVESTIGATION REPORT
03. NAME OF THE CONTRACTOR :
04. ADDRESS
- (A) OFFICE :
- E-mail :
- TEL. PH. NO. :
- (B) RESIDENCE :
- TEL.PH NO :
05. QUALIFICATION :
06. STAFF STRENGTH :
- (A) TECHNICAL :
- (B) GENERAL :
07. PLANT/EQUIPMENTS/LABORATORY DETAILS : To be enclosed
8. EXPERIENCE CERTIFICATE SUCESSFULLY COMPLETED : To be enclosed
SIMILAR CONSULTANCY WORKS :
9. BHEL'S PAYMENT TERMS (as per following details) :
- a. No Advance payment
- b. Payment will be made 45 days after submission of Report and accepted by BHEL
Engineer.
- c. Price variation clause not applicable.



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SOLAR PROJECT AT ORDNANCE FACTORY PREMISES, YEDDUMAILARAM, MEDAK DISTRICT,
TELANGANA**

10. Bidder shall be agreeable to make necessary Statutory payments as per BHEL EDN terms

11. Constitution of Firm : Individual / Sole Proprietorship Concern /
Partnership Firm / Public Ltd. Company/
Private Ltd. Company

12. Service Tax NO : Certificate : ----- (To be enclosed)

13. Pan Card NO: : ----- (To be enclosed)

14. PRE QUALIFICATION CRITERIA: (MANDATORY REQUIREMENTS FOR PRE-QUALIFICATION)

a): Bidder to submit the similar work experience certificates

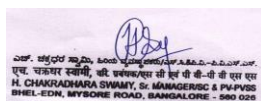
b): Bidder should have approved by Govt Dept or Having NABL accreditation for the same works.

15. BHEL Payment terms acceptance. Yes/no

Note: Offers of the Tenderers not meeting the above requirements are liable to be rejected.

Documents required to be submitted

1. Copy of PAN/GIR No. Registration Certificate issued by Income Tax Authority
2. Certificate of TIN Number
3. Service Tax Registration Certificate
4. Registration Certificate with ESI and PF Authority
5. Income Tax Returns for last Three years
6. Balance Sheet and Profit & Loss Account for the last Three years
7. Annual Turnover for the last Three years duly certified by auditor
8. Work on hand (required for bid capacity also)
9. Availability of Technical personnel.
10. Registration with BHEL/CPWD/NABL/other Govt. organization if any.
11. Any other statutory requirement as per the local government body if applicable.



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
CONTACTOR (SIGN & SEAL)

Bharat Heavy Electricals Limited
ELECTRONICS DIVISION
MYSORE ROAD- BANGALORE-26

1. All entries in tender documents should be in one ink (preferably blue ink). Erasing and overwriting is not permitted. All corrections should be duly signed by tenderer concerned.
2. Tenderers shall fill in all the required particulars in the blank space provided for this purpose in the tender documents and also sign in each and every page of the tender documents attached before submitting tender.
3. In Price bid unit rate should be quoted in figures as well as in words in Indian Currency only i.e. Rupees and Paisa with reference to each item and for the items and tax to be indicated separately shown in the attached schedule.
4. In case the rate quoted in figures differs from those quoted in words, the lower of the rates quoted will be taken as the tendered rate and shall be binding on the tenderer.
5. The tenderer shall note that, NO Claim for variation of rates, on the ground that existing statutory levies have been increased / decreased or those new statutory levies have come into effect after tender, or on any other ground, will be entertained.
6. (a) The rate quoted in the tender shall remain valid for a period of 'THREE MONTHS' from the date of opening tender.
(b) Tenderer shall not increase quoted rates, once the tenderer has submitted offers/quotation/price and during execution of contract in case tender is accepted.
(c) Successful bidder should execute the work strictly in accordance with Tender schedule quoted rates as accepted by BHEL.
(d) The rates quoted should be exclusive of all taxes arising on the transaction. Tax shall be indicated separately as applicable.
7. Before tendering, the tenderer are advised to inspect the site of work and its environments and be well acquainted with the actual working and other prevailing conditions, position of material and labor. They should be well versed with BHEL Conditions of Contract, instruction to the tenderers, technical specification, schedule of works and all other documents which form part of the agreement to be entered into subsequent to award of work. The tenderer should be specially note that it is tenderers responsibility to provide any items which is not specifically mentioned in the specifications and scope, but which is necessary to complete the work and tenderers shall make his own arrangements for the transport of personnel and equipment to the site and for the stay and boarding facilities of their team at site during the course of work. Vendor shall ensure safety of the operating team and personnel at site during the execution of work.

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 एच. चक्रधर स्वामी, सी. मॅनेजर/एस सी एल पी सी-पी टी एस एस
 H. CHAKRADHARA SWAMY, Sr. MANAGER/SC & PV-PVSS
 BHIL-EDN, MYSORE ROAD, BANGALORE - 560 026

CONTACTOR (SIGN & SEAL)

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18. Any action brought in by anybody on BHEL regarding patent, right etc., used by Contractor in execution of work shall be defended by the Contractor and / or reimburse BHEL the cost of the same.

19. Contractor shall produce necessary records, documents; explanation whenever he is called upon to do by any Government Agencies.

20. EXTRA ITEMS

No extra items of work shall be carried out by the contractor other than those authorized to do so in writing by the Engineer-in-charge. For any such items of work executed as per instructions of Engineer-in-charge, the rates will be fixed on the basis BHEL terms and condition.

21. In case, work is not completed as per the BHEL scope due to any unforeseen reasons, contractor has to complete the job at later stage without any extra charge. No overturn charges shall be paid in case of extension of work schedule.

ಎಚ್. ಚಕ್ರಾಧರ ಸ್ವಾಮಿ, 5008 ಬೆಂಗಳೂರು ಮಾರ್ಕೆಟ್ - 560 026.
 H. CHAKRADHARA SWAMY, Sr. MANAGER/SC & PV-PVSS
 BHIL-EDN, MYSORE ROAD, BANGALORE - 560 026

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CONDITONS OF CONTRACT

1. The conditions of contract and other tender documents are complimentary to each other and shall be read in conjunction with each other.

2. SCOPE OF WORK

The scope of work includes for the full, final and entire completion of all Soil Investigation and Topographical survey works as detailed in specifications and bill of quantity, which forms part of this Contract. The scope of work also includes cleaning/removing all debris, refilling of holes etc as per direction of the Engineer-in-charge.

The scope of work under this contract shall cover supply of all materials, labour, tools, and plants etc.,

3. SITE FACILITES

A. **LAND:** The contractor must maintain the areas allotted to him in a neat and clean conditions as required by the Employer. On completion of work, the site shall be cleaned by the contractor of all materials, temporary debris, rubbish plants and equipment's, belonging to the contractor at no extra cost. The site and surroundings shall be handed over in a neat and clean condition. In case of any failure by the contractor, the employer will get inside cleared at risk and cost of the Contractor.

B. **POWER AND WATER SUPPLY:** Power and water shall be arranged by the vendor

4. **MACHINERY:** The Contractor shall at his own expense, supply all tools, plant and equipment (hereinafter referred to as T & P) required for execution of contract, as specified in the tender documents. No P.O.L. can be supplied by the Employer. Hydraulic type rig to be deployed for speedy extraction (rock/soil).

a) The whole of the works shall be executed in perfect conformity with the specifications and schedule of works. If contractor perform any works in a manner contrary to the specifications and schedule of works and without reference to the Engineer-in-charge, he shall bear all the costs arising or ensuring there from.

b) All technical documents regarding the works are given in the metric system and work should be carried out according to metric system.


5. SAFETY PRECAUTIONS

The contractor shall at times observe the safety code and make necessary action as required in the tender. In default thereof, the employer may get this done departmentally or through other agencies and recover the cost from the contractor.

6. COMPLETION OF WORK AND MEASUREMENT

a) All work shall be carried out and measured according to scope of work mentioned in Bill of quantity

b) On completion of the work, the Contractor must submit to the Engineer the test reports, topographical drawing etc. as per bill of quantity/ scope of work


ಎಂ. ಚಾರಾದ್ರಾಜಾ ದಿವಾನ್, ಸಿ. ಮನಗೇರಿ & ಪಿ.ಎಸ್
ए. चारदारजा दियान, सी. मनगेरी & पी.एस
H. CHARADRAJADA DIVANI, S. MANAGERI & P. PWS
BHEL-EDN, HYDRABAD ROAD, BANGALORE - 560 025

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TECHNICAL SPECIFICATION

TOPOGRAPHICAL SURVEY

Bidder shall conduct the Topographical Survey for the allocated plot in proposed solar project Medak dist,Telangana. The scope of work and technical specification for the same is as below:

Scope of Work


The Contractor shall carry out the Topographical Survey and preparation of Plans (Maps) and report of the assigned entire area/areas indicated for locating the Solar PV Power plant and its other systems. Carrying out the Bench Mark (GTS) to site/sites under survey by parallel levelling, establishing and constructing bench mark, grid and reference pillars in the field, and spot level survey of the entire area/areas at specified intervals and development of the contours. Carrying out cross-section of river/canal as specified in the schedule of items taking spot levels at on an average 10 meters intervals or less depending upon the site conditions. Furnishing all field data & drawings in soft copy (on CDs) apart from hard copies.

Furnishing of the survey report as described in details in the succeeding paragraphs is also included in the scope of this work

The work shall be executed according to the specifications and good standard practice necessary to fulfill the objective of the survey work, strictly in accordance with the instructions and satisfaction of the Owner. The Contractor shall carry out Bench Mark by fly-levelling from nearest GTS Bench Mark or available source as approved by the Owner and establish the same two permanent Bench Mark at site. All subsequent transfer of levels shall be carried out with respect to these Bench Mark. The work shall also include constructing permanent reference pillars at suitably locations as approved by the Owner. These reference pillars shall be labelled permanently with their respective coordinates and reduced levels for future use. The Bench Marks and reference pillars shall be shown on the survey drawings. While carrying bench mark to the project site, levels shall be established on the permanent objects like culverts etc. at least on one object in every one km. if available along with route with adequate description about the objects and levels shall be maintained & mentioned in the survey report to facilitate locating these objects later on. Latitude and Longitude: The work shall be carried out in UTM grids system. The contractor shall also establish the latitudes and longitudes of the corners of the project site. At least 50m width of the adjoining plots shall also be covered in the survey for correlation with adjoining plots.

Topographical Survey and Mapping

Positions, both in plan and elevation, of all natural and artificial features of the area like waterways, railway tracks, trees, cultivation, houses, fences, pucca and kutcha roads including culverts and crossings, foot tracks, other permanent objects like telephone posts and transmission towers etc. are to be established and subsequently shown on survey maps by means of conventional symbols (preferably, symbols of survey of India Maps), all hills and valleys within the area/areas are to be surveyed and plotted on maps by contours. Necessary levelling work of the entire area/areas are to be surveyed and plotted on maps by establishing horizontal location so that location and sketching of contours for the area/areas can be done at specified intervals and in specified scales on maps. Method of survey, contour intervals etc. shall be decided by owner on site in case of steep slopes and dense jungle etc. where gridding is not possible. Any unusual condition or


ಎಸ್. ಶಂಕರ್ ಸ್ವಾಮಿ, ಕೂಟ ಪದಾಧಿಕಾರಿಗಳ ಮಹಾಲಯ-೨, ೭೦೧೩೦೪, ಬೆಂ.
ಇ. ಚಕ್ರಾಧರ ಸ್ವಾಮಿ, ಜಿ. ಡ್ರೆಸ್ಟ್/ಐಸಿ ಪಿ ಹೆಚ್-ಪಿ ವಿ ಎಸ್ ಇಸ್
H. CHAKRADHARA SWAMY, Sr. MANAGER/SC & PV-PVSS
BHEL-EDN, MYSORE ROAD, BANGALORE - 560 026

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TELANGANA**

formations on the ground, locations of rock outcrops (if visible on the surface) and spring/falls, possible aggregate deposits etc. shall also be noted and plotted on the maps.

The field work shall be done with Total Station Equipment in the following steps:

Establishing horizontal and vertical controls and locating reference grids and bench mark in the area. Surveying for establishing spot levels and plotting contours. Surveying for locating the natural and manmade details as described earlier. The grids for the survey work shall be established in N-S & E-W direction (Corresponding to Magnetic North) or the Plant North as directed by the Owner.

Contouring

Contractor shall carry out spot level surveying at an interval of on an average 25 meters for contouring the area. Levels shall also be taken on all traverse stations and on salient points located at random over the area (ground points). Contours are to be interpolated at 0.5 M intervals after the above points are plotted. The contours shall not be just interpolated but properly surveyed on the ground so that features falling between the two successive levels are also picked up. Sufficient points properly distributed over the entire area shall be located and levels taken so that accurate contouring can be done at places of sharp curvature or abrupt change in direction and elevation, points selected shall be close to each other. Salient points on ridge lines and valley lines shall also be measured. Transfer of levels shall always start from Main/Subsidiary stations whose levels are based on bench mark established in the survey area.

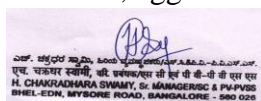
Preparation & Submission of Survey Maps and Documents

The Contractor shall submit survey maps of the site in 1:10,000 scale indicating grid lines and contour lines, demarcating all permanent features like roads, railways, waterways, buildings, power lines, natural streams, trees etc. The topography drawing shall also cover at least 50m wide area of the adjacent solar plot (beyond the assigned plot area) and match the grids of the adjacent solar plot.

All the maps should be prepared in digitized forms using computer software like AutoCAD Release 2005 or as directed by Owner. The block of name plate of all the drawings should be as per BHEL approved standard. Contractor shall submit all data pertaining to the survey in original to the Owner including all levels & co-ordinates in X-Y-Z format for the entire area on CD. Presence of any well and/or tube well in the site or adjoining areas and water level in them shall be marked in the documents. Details of earlier uses of the site i.e. mining, quarrying, agriculture etc. Existing drainage pattern of the site, possibility of water logging and high flood level of the area shall also be captures in the documents.

GEOTECHNICAL INVESTIGATION SCHEME

Geotechnical investigation for the scope of work shall be done by the bidder. The Bidder shall carry out geotechnical investigation for establishing the sub-surface conditions and to decide type of foundations for the structures envisaged, construction methods, any special requirements/treatment called for remedial measures for sub-soil/ foundations etc. in view of soft sub-soils, aggressive sub-soils and water, expansive/swelling soils etc. prior to commencement of



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detailed design/drawings. The Bidder shall obtain the approval for the field and laboratory testing scheme proposed by him from the Owner before undertaking the geotechnical investigation work. Field test shall include but not be limited to the following: Boreholes, Standard Penetration Test (SPT), collection of disturbed and undisturbed soil samples (UDS), Trial Pits (TP), collection of Water samples, Electrical Resistivity Test (ERT) etc.

Scheme of Geotechnical Investigation


Minimum 1No. of borehole of 5m to 10m depth shall be carried out in every 10 acres of land. Few ERT & TPs shall be carried out as per layout and Engineer instructions.

The depth of boreholes shall be 5.0m to 10m . SPT shall be carried out in all types of soil deposits and in all rock formations with core recovery upto 20%, met within a borehole. This test shall be conducted at every 1.5 m interval or at change of strata. The starting depth of SPT shall be 0.5m from ground level. UDS shall be collected at every 1.5 m interval or at change of strata.

The laboratory tests shall be conducted on soil, rock & water samples collected during field investigations in sufficient numbers as approved by Employer. Laboratory tests shall be carried out on disturbed and undisturbed soil samples for Grain Size Analysis, Hydrometer Analysis, Atterberg Limits, Triaxial Shear Tests (UU), Natural Moisture Content, Specific Gravity and Bulk Unit Weight, Consolidation Tests, Unconfined Compression Test, Free Swell Index, Shrinkage Limit, Swell Pressure Test, Chemical Analysis test on soil and water samples to determine the carbonates, sulphates, chlorides, nitrates, pH, organic matter and any other chemicals harmful to concrete and reinforcement/ steel. Laboratory tests on rock samples shall be carried out for Hardness, Specific Gravity, Unit Weight, Uniaxial Compressive Strength (in-situ & saturated), Slake Durability etc.

On completion of all field and laboratory work, the Bidder shall submit a Geotechnical investigation report for Owner's approval. The Geotechnical investigation report shall contain field and laboratory observations/ data/ records, analysis of results and recommendations on type of foundation for different type of structures envisaged for all the areas of work. Recommendations on treatment for soil, foundation, based on subsoil characteristics, soft soils, aggressive chemicals, expansive soils, etc.

All corrigenda, addendum, amendments, time extension, clarification, etc. (if any) to above will be intimated to Bidders by email/on BHEL EDN website.


H. CHAKRADHARA SWAMY, Sr. MANAGER SC & PM-PVSS
BHEL-EDN, HYDROGEN ROAD, BANGALORE - 560 025

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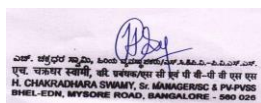
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Declaration in Vendors Letter head

Subject: Certification of Work safety by Testing Agency during Topographical Survey and Soil Investigation work for Solar Power Plant at site mentioned below

This is to certify that, during the execution of the work of Topographical Survey and Soil testing at 15 MW Solar Power Plant site at Ordnance factory premises, Yeddumailaram, Medak District, Telangana. undertaken by us, we shall be solely responsible for the Safety and health of our team consisting of site engineers, technicians and labour working at the site. Required statutory provisions governing Workmen safety and protection and accident compensation shall be our sole responsibility and entirely covered by us during the course of mobilization and execution of works.

For and on behalf of
M/s



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TELANGANA**

EDN/SCPV/PVSS/15MW/BEL-SECI/Topo & Soil
Investigation/01, 23.05.2016 DUE ON : 08.06.2016

PRICE BID

TOPOGRAPHICAL SURVEY AND SOIL TESING &
INVESTIGATION FOR 15MW PV SOLAR PROJECT AT
ORDNANCE FACTORY PREMISES, YEDDUMAILARAM,
MEDAK DISTRICT, TELANGANA .

NAME OF BIDDER:
(AFFIX SEAL & SIGNATURE ON ALL PAGES OF PRICE BID)


ಎಂ. ಕೆ. ಸುಬ್ರಹ್ಮಣ್ಯಂ, ಕೆ.ಎಂ. ಸುಬ್ರಹ್ಮಣ್ಯಂ, ಕೆ.ಎಂ. ಸುಬ್ರಹ್ಮಣ್ಯಂ
एच. चक्रधरा स्वामी, के.एम. सुब्रह्मण्यं, के.एम. सुब्रह्मण्यं
H. CHAKRADHARA SWAMY, K. MANAGERSC & PV-PVSS
BHEL-EDN, BYESONE ROAD, BANGALORE - 560 028

BHEL

CONTACTOR (SIGN & SEAL)

**BOQ of Topographical Survey& Soil Investigation for 15MW BEL-SECI Solar PV power plant in the Premises of
Ordnance Factory Medak,Yeddumailaram (Telangana)**

PRICE-BID

SL NO	DESCRIPTION OF THE WORK	UNIT	QTY	RATE	AMOUNT
1	Topographical survey shall have to be done of the proposed site at suitable grid interval(10M×10M) by total station equipment.The Contractor shall carry the Bench Mark from nearest GTS Bench Mark, or any other establish source like Railway station etc. as approved bythe Employer, by fly-levelling and establish two permanent bench marks (PBM) at site.All subsequent transfer of levels shall be carried out with respect to these PBMs. Thework shall also include constructing permanent reference pillars at suitable locations as approved by the Employer. These reference pillars shall be labelled permanently with their respective coordinates and reduced levels for future use. The Permanent Bench Marks and reference pillars shall be shown on the survey drawings. All necessary levels as entered in the field book have to be submitted along with precontour layout of the total site. Based on the above survey work a general layout drawing with clear demarcation showing boundary pillars, location of control room, array yard,approach road drainage, existing electrical Tower/ poles, and other structures detailing with elevation along with Bore hole detailing with Co ordinates, Establishing(Setting out) the TBM points (min 15 pillars as per IRC025 page no 03 with painting) on plant area / periphery.Two sets of drawings and survey reports along with all relevant documents to be submitted in hard copy. Soft copy of the drawings in ACAD latest version, Survey details also shall be made available in CDs with GPS points of the key points as instructed by BHEL	Acres	85.00		
2	Mobilisation of necessary equipment,men & materials to the project site for carrying out the geotechnical investigation and demobilisation of the same after completion of all the field works etc.	(LS)	1.00		
3(a)	Location and making 150mm nominal diameter bore hole at various location upto required depth as per site condition maximum of 10 meter below ground level in all type of the soil including laterite/weathered soft rock using suitable approved method of boring including chesiling,cleaing,providing casing pipes as required or as directed; perfoming standard penetration test at every 1.5m interval down to required depth below ground level and at change of strata and at the depth however undisturbed soil samples could not be collected; Bore hole location shall be identified and shown by BHEL prior to commencement	Running Meter (4 No's of holes 5 mtr depth and 4 No's of holes 10 mtr depth)	60.00		
3(b)	Perfoming standard penetration test and collecting of disturbed samples at every 1.5m interval down to 10 meter/as required depth below ground level and at change of strata at depths wherever undisturbed soil samples could not be collected; and back filling of bore holes with sand on completion of the same etc.,all complete as per specification.	No's	40.00		
3©	Core drilling (N×size) in rock upto a required depth of maximum of 6 meter to required depth below ground level using hydraulic feed rotary drill and double tube core barrel with diamond bit including collection of core samples.	Running Meter (if required only)	30.00		
3(d)	performing SPT at locations where core recovery is less than 20%, maintaining continous record of core recovery and RQD, keeping the cores in wooden core boxes, transporting the cores to laboratory.Location shall be identified and shown by BHEL prior to commencement.	Each (if required only)	20.00		
4(a)	Collection of undisturbed samples from bore holes are required	Each	40.00		

BOQ of Topographical Survey& Soil Investigation for 15MW BEL-SECI Solar PV power plant in the Premises of Ordnance Factory Medak,Yeddumailaram (Telangana) <u>PRICE-BID</u>					
SL NO	DESCRIPTION OF THE WORK	UNIT	QTY	RATE	AMOUNT
4(b)	Collection of disturbed samples from bore holes are required	Each	40.00		
5	Conducting electrical Resistivity Test(ERT) at various locations complete as per specification,drawings and as directed by the engineer- In-charge.	Each	18.00		
6	Conducting Laboratory test on soil samples at an approved laboratory including preparation of soil samples to determine the following properties etc.all complete as per specification.				
a	Atterberg limits	Each	200.00		
b	Dry and Bulk Density	Each	200.00		
c	Moisture Content	Each	200.00		
d	Sieve analysis	Each	200.00		
e	Specific Gravity and Void ratio	Each	200.00		
f	Direct Shear Test or Triaxial Test as applicable	Each	200.00		
g	CBR Test & consolidation	Each	200.00		
h	Shrinkage Limit Test	Each	200.00		
i	Swell pressure test	Each	200.00		
j	Unconfined Compressive strength	Each	200.00		
7	Conducting Laboratory test on rock samples(if rock encountered including preparation of samples to determine the following properties etc.all complete as per specification.		200.00		
a	Determination of RQD / Slake durability test	Each	200.00		
b	UCC test (in-situ & saturated)	Each	200.00		
c	Specific gravity test & Hardness	Each	200.00		
d	Water absorbtion test & Unit Weight	Each	200.00		
8	Preparation and submission of draft report in two copies and final report in five hard copies and two soft copies in CD's after the approval of draft report including all field records,laboratory test results,graphs,analysis of test results and suitable recommendation regarding type of foundation etc all complete as per specification etc.	LS	1.00		
9	Chemical analysis of water as per IS-456-Scope to cover organic, Inorganic,sulphates,Chlorides,PHvalues,suspended matter,acids,alkalies etc. to be done for two samples in the area as decided with BHEL site engineer	LS	2.00		
10	Chemical Analysis -Soil As per relevant standard.Scope to cover content of sulphates,chlorides and PH value to be done for two samples in the area as decided with BHEL site engineer	LS	4.00		
TOTAL AMOUNT					
Taxes on the above (14.5%)					
Total Amount in Rs /-					
IN WORDS: Rupees					