ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

PHONE : 080 - 26998377
Fax : 080 -26989217
E-MAIL pragadeeshtg@bhel.in

Bharat Heavy Electricals Limited

(A Government of India Undertaking)

ELECTRONICS DIVISION

P.O. Box No. 2606, Mysuru Road, Bengaluru - 560 026

An ISO 9001, ISO 14001, OHSAS 18001 & ISO/IEC 27001:2005 Company

E-Tender

The Quotations are invited under two part bid system for Design, Supply and Installation and Commissioning of floating platform for electrical equipment for 100 MW Floating Solar Power Plant at NTPC Ramagundam (Telangana), India

RFQ NO and date	TGPBOS0050 dated 10.12.2019 (e-tender)
RFQ due date & time	23.12.2019 up to 13.00 hrs (IST)
Date, Time & Venue of Part-I Bid Opening	23.12.2019 after 13.30 hrs (IST)
Date, Time & Venue of Price Bid opening	Will be intimated later for technically accepted vendors
Address for Commercial Communication & Contact Person in BHEL (MM dept)	Mr. T.G.Pragadeesh (09742576787) Manager Mr. Ramachandra (09980958476), SDGM SC&PV MM Department, BHEL Electronics Division, PB NO 2606, Mysuru road, Bengaluru-560 026. INDIA Email: pragadeeshtg@bhel.in ramachandra@bhel.in Telephone number: +91 80 26998377, +91 80 26998476
Address for Technical Communication & Contact Person in BHEL with CC to MM dept	Mr. VIJAY KUMAR CHOUDHARY (9415041583) Dy.Manager Mr. PUNAM MISHRA (9448987217), Sr. Manager SC&PV ENGINEERING Department, BHEL Electronics Division, PB NO 2606, Mysuru road, Bengaluru-560 026. INDIA Email: vijayk.choudhary@bhel.in punammishra@bhel.in Telephone number: +91 80 26998046, +91 80 26998991

ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
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Bharat Heavy Electricals Limited
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P.O. Box No. 2606, Mysuru Road, Bengaluru - 560 026
An ISO 9001, ISO 14001, OHSAS 18001 & ISO/IEC 27001:2005 Company

Name and address of the Independent External Monitor for this tender	1. Shri Arun Chandra Verma, IPS (Retd.) Flat No. C -1204, C Tower, Amrapali,Platinum Complex,Sector 119, Noida (U.P.) acverma1@gmail.com 2. Shri Virendra Bahadur Singh, IPS (Retd.) H. No. B-5/64, Vineet Khand, Gomti Nagar,Lucknow – 226010 vbsinghips@gmail.com .

Any Deviations from or additions to the "General Conditions of Contract" or "Special Conditions of Contract" require BHEL's express written consent. The General Terms of Business or Sale of the Bidder shall not apply to this tender.

PREQUALIFICATION CRITERIA

1. Technical Assessment:

Bidder should have successfully supplied floating barges/pontoons/platforms/buildings etc. made of steel/HDPE/FRP /precast or cast in-situ concrete/Ferrocement of a minimum base area of 100 sqm (Single Platform) during last five years from the date of tender opening.

As evidence to this, copy of such purchase orders along with relevant drawings/specifications and their performance report/completion certificate issued by customer for successful execution of the order is to be submitted.

Note:

Bidders who have Joint Ventures (JV), consortium or Technology Tie-up with manufacturer of Floating barges/pontoons/platforms/buildings etc. made of steel/HDPE/FRP /precast or cast in-situ concrete/ Ferrocement can also participate in the tender.

In above case purchase orders of original manufacturer and their performance report/completion certificate issued by their customer for successful execution of the order is to be submitted.

2. Financial Assessment:

Bidder should have successfully executed orders of cumulative value of Rs. 3 Crores in last 3 years. As evidence to this, copy of such purchase orders along with their performance report/completion certificate/ Dispatch Documents/ Invoice Copies/ Other equivalent documents for successful execution of the order is to be submitted.

Or

Average annual financial turn over during the last 3 years should be 3 Crores. Audited Profit & loss account and balance sheet to be submitted for last three financial years.

BHEL reserves the right to verify the documents submitted by the bidder. During verification, if it is found fake/forged/manipulated, suitable penal action shall be taken against bidder as per extent guidelines of BHEL for suspension of business dealing.

REQUEST FOR QUOTATION

MMI:PU:RF:003

BHARAT HEAVY ELECTRICALS LIMITED
Electronics Division
PB No. 2606, Mysore Road Bangalore - 560026
INDIA

RFQ NUMBER:
TGPBOS0050

RFQ DATE :
10.12.2019

Due Date/Day: 23.12.2019 MON
Time : 13:00 HRS
Tender Box : Reception Area
Opening Venue:
NEW ENGG. BLDG

(address for communication) :

(for all correspondence)
Purchase Executive : TG Pragadeesh
Phone : 080 26998377
Fax :
E-mail: pragadeeshtg@bhel.in

Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	PS0679083448 Inverter floater platform (IFP) * HSN/SAC : 8907 Test Certificate Design and supply of complete Inverter floater platform (IFP) along with accessories as per specification PS-439-1319	36	NO	36	18.08.2020
2	PS0679083456 Local pooling S/G Floater Platform * HSN/SAC : 8907 Test Certificate Design and supply of complete Local pooling switchgear Floater Platform (LPSFP) along with accessories PS-439-1319	4	NO	4	18.08.2020
3	PS0679083464 Anchoring and Mooring system * HSN/SAC : 8907 Test Certificate Design and supply of Anchoring and Mooring system for the platforms as per specification PS-439-1319	40	ST	40	18.08.2020
4	PS0679083472 I & C for Floating Platform IFP/LPSFP * HSN/SAC : 7308 Installation and commissioning of floating platform in water body including underwater Anchoring and Mooring (1 AU for 1 Set of Platform and their anchoring & mooring)	40	AU	40	13.10.2020
5	PS0679083480 Spares for IFP/LPSFP * HSN/SAC : 8907 Test Certificate Supply of spares and other maintenance material for above platforms (As per manufacture#s recommendation for a life cycle of 25 years) as per specification PS-439-1319	40	ST	40	18.08.2020
6	PS0679083499 AMC : For IFP/LPSFP * HSN/SAC : 9954 AMC of IFP/LPSFP as per specification (1 AU for 1 Year)As	10	AU	10	13.10.2020

TWO PART BID - SUBMIT TECHNICAL AND PRICE BID IN SEPARATE SEALED COVERS

NOTES:
1. This RFQ is governed by:
a) INSTRUCTIONS TO BIDDERS/SELLERS and GENERAL CONDITIONS OF CONTRACT FOR PURCHASE available at **http://edn.bhel.com (RFQ-PO Terms & Conditions)**
b) Any other specific Terms and Conditions mentioned.
2. Bidders / Representatives who would like to be present during opening of offers are required to furnish authorization letter for the same.
* The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

TG Pragadeesh
Semiconductors & Pho

REQUEST FOR QUOTATION

MMI:PU:RF:003

BHARAT HEAVY ELECTRICALS LIMITED
Electronics Division
PB No. 2606, Mysore Road Bangalore - 560026
INDIA

RFQ NUMBER:
TGPBOS0050

RFQ DATE :
10.12.2019

Due Date/Day: 23.12.2019 MON
Time : 13:00 HRS
Tender Box : Reception Area
Opening Venue:
NEW ENGG. BLDG

(address for communication) :

(for all correspondence)
Purchase Executive : TG Pragadeesh
Phone : 080 26998377
Fax :
E-mail: pragadeeshtg@bhel.in

Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
	per spec BHEL Spec PS-439-1319				
7	PS0679083502 Supervision of mounting on IFP/LPSFP * HSN/SAC : 7308 Supervision during mounting of electrical equipment on IFP/LPSFP by BHEL (Lumpsum Basis) as per specification PS-439-1319.	1	AU	1	13.10.2020

Total Number of Items - 7

1.
2.

TWO PART BID - SUBMIT TECHNICAL AND PRICE BID IN SEPARATE SEALED COVERS

NOTES:
1. This RFQ is governed by:
a) INSTRUCTIONS TO BIDDERS/SELLERS and GENERAL CONDITIONS OF CONTRACT FOR PURCHASE available at **http://edn.bhel.com (RFQ-PO Terms & Conditions)**
b) Any other specific Terms and Conditions mentioned.
2. Bidders / Representatives who would like to be present during opening of offers are required to furnish authorization letter for the same.
* The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

TG Pragadeesh
Semiconductors & Pho

NOTES:–

1. THE DETAILS SHOWN IN DRAWING ARE TENTATIVE AND FOR TENDER PURPOSE ONLY.
2. THE AREA DEMARCATION ARE TENTATIVE AND ARE SUBJECT TO CHANGE DURING EXECUTION.
3. CMCS BUILDING, & ASSOCIATED EQUIPMENTS FOR POWER EVACUATION IS IN BIDDERS SCOPE.
4. EVACUATION ROUTE SHOWN IS INDICATIVE. BIDDER MAY HOWEVER FINALIZE THE LOCATION OF ISUB–POOLING SWITCHGEAR & ROUTE BASED ON THEIR LAYOUT

LEGEND:–

1. RESERVOIR BOUNDARY
2. POWER EVACUATION ROUTE

FOR TENDER PURPOSE ONLY

एन टी पी सी NTPC

एन टी पी सी लिमिटेड
NTPC Limited
(A GOVERNMENT OF INDIA ENTERPRISE)
(ENGINEERING DIVISION)

PROJECT: DEVELOPMENT OF 100MW RAMAGUNDAM FLOATING SOLAR PV PROJECT

TITLE: VICINITY MAP

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	GEOTECH	REDG	ELEC.	APPD.	DATE
A	TENDER DRAWING	RAVI	RKP	AKS					21.11.18
			CLEARED BY						

SIZE	SCALE	DRG. NO.	REV.NO.
A1		5747-004-POC-A-001	A

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CLIENT

Bharat Heavy Electricals Limited

Report for Bathymetric survey works of the water body for proposed Project site of Floating Solar power plant of 100MW at NTPC Ramagundam (Telangana)

2nd October 2019

Investigated & Prepared By:

SWAYIN & ASSOCIATES.

77, SATYANAGAR, BHUBANESWAR - 751 007

Ph. # (0674) 2570015, 2572971, 2570458. Fax: 2570329, 2570985

Email: kbs@swayinassociates.com / sns@swayinassociates.com

Website: www.swayinassociates.com

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SECTION – 1
INTRODUCTION

1.0 GENERAL

Bharat Heavy Electricals Limited, Electronics Division Mysore road, Bangalore had invited tenders for execution of Conducting Geotechnical Investigation and bathymetric survey works of the water body for proposed Project site of Floating Solar power plant of 100MW at NTPC Ramagundam (Telangana) In response, a tender was submitted by M/S. Swayin & Associates (S&A), Bhubaneswar, Odisha. The BHEL has approved the tender of S&A and were pleased to award contract to carry out the Bathymetric survey of the water body in accordance with the Technical Specification and guidelines. The assignment was attended by Swayin & Associates, and completed in time. Periodical reports & drawing were submitted to the client indicating the progress of bathymetric survey work.

The bathymetric survey work was completed in accordance with the proposal as Vide WO No. EDN: SCPV:100MWNTPCR:01/WO Dtd.30.08.2019.

The site Handover for bathymetric survey work on dt.04.09.2019

The Present report explains about the bathymetric Survey of Floating Solar power plant of 100MW at NTPC Ramagundam (Telangana).

1.2 SCOPE OF WORK

The Bathymetric survey of the water body & prepare drawings as per the following:

1. The total Bathymetric survey is carried out 20m x20m of proposed location.
2. Permanent structures located within this corridor to be marked in the report.
3. The layout (to scale) to be superimposed on the map of the location along with permanent benchmarks
4. Demarcate any existing obstructions, rock outcrops, any large size sunken object etc. along with the contour as per directions of site engineer.
5. Transfer of bench Mark/datum w.r.t MSL.
6. Establishing horizontal control and marking selected points on the shore at suitable intervals (accuracy +1m)
7. Interval of contours at 0.5m interval

SECTION –2
EXECUTIVE SUMMARY

2.0 General

BHARAT HEAVY ELECTRICALS LIMITED has awarded the Geotechnical investigation and Bathymetric survey of the water body for Floating Solar power plant of 100MW at NTPC Ramagundam (Telangana). The total area present of the water body including Land is about 703.95 acres. Present report explains about the bathymetric Survey of Floating Solar power plant of 100MW at NTPC Ramagundam (Telangana) which is about 564.34acres of water body.

2.1 Location

The project area is located at near Ramagundam city, Peddapelli District of State Telangana.

The location area is situated at Latitude 18°44'18.82", Longitude 79°27'24.44". A Key Plan showing the location is presented key plan.

Key Plan

2.2 Technical Personnel Deployed

(1) Senior Surveyor -1

(2) Assistant surveyors -1

2.3Equipment Deployed

Following equipments were deployed at site is represented in table

Equipment Deployed List

Sl. No.	Description of Equipments/Machines	Model Name	Quantity(Nos.)
1	Echo sounder	Garmin GPS map 420s	1
2	Hand GPS	Garmin-etrex	2

2.4Deliverables – In soft copy & Hard copy

1) Bathymetric survey report
2) Bathymetric survey drawing.
3) Topo sheet map.

SECTION -3

APPROACH, METHODOLOGY AND DESCRIPTION OF THE AREA

3.0 Introduction

A preliminary desktop study has been carried out for identifying the area based on the detailed Bathymetric survey report. Based on this study, a methodology for carrying out the detailed field survey was developed for development works for water body for Floating Solar power plant of 100MW at NTPC Ramagundam (Telangana).

3.1 General Description of the Area

The total area present of the water body including Land is about 703.95 acres

Present report explains about the bathymetric Survey of Floating Solar power plant of 100MW at NTPC Ramagundam (Telangana) which is about 564.34acres of water body

The Bathymetric survey is carried out from Echo-sounder of model Garmin GPS map 420s having depth recording accuracy of 0.10m for ascertaining the depth.

3.2 CO-ORDINATES OF BORE HOLES & BENCH MARK PILLAR:

SL.NO	NAME	UTM COORDINATE (ZONE-44Q)		ELEVATION IN MTR
		EASTING	NORTHING	
1	BM-1	336436.1	2072463.62	168.93
2	BM-2	336449.59	2072454.65	168.11
3	BM-3	336915.17	2072289.9	166.92
4	BM-4	336932.91	2072275.94	167.42

*BM- Permanent Bench mark Pillar

SL.NO	NAME	UTM COORDINATE (ZONE-44Q)		ELEVATION IN MTR
		EASTING	NORTHING	
1	BH-1	33674.00	2072625.00	165.125
2	BH-2	337297.00	2072514.00	160.137
3	BH-3	337550.00	2072115.00	161.737
4	BH-4	338454.00	2071854.00	151.758
5	BH-5	337775.00	2071226.00	161.396

*BH- Bore holes

Echo Sounder:

Echo sounding is a type of sonar used to determine the depth of water by transmitting sound waves into water. The time interval between emission and return of a pulse is recorded, which is used to determine the depth of water along with the speed of sound in water at the time. The word *sounding* is used for all types of depth measurements, including those that don't use sound, and is unrelated in origin to the word *sound* in the sense of noise or tones. Echo sounding is a more rapid method of measuring depth than the previous technique of lowering a sounding line until it touched bottom.

Distance is measured by multiplying half the time from the signal's outgoing pulse to its return by the speed of sound in the water, which is approximately 1.5 kilometers per second [T÷2×(4700 feet per second or 1.5 kil per second For precise applications of echo sounding, such as hydrography, the speed of sound must also be measured typically by deploying a sound velocity probe into the water. Echo sounding is effectively a special purpose application of sonar used to locate the bottom.

INSTRUMENTS

The following instruments were used for carrying out Bathymetric Survey

Instrument type : Echo sounder

Model : GPS map 420s

Manufacturer : Garmin

HAND GPS:

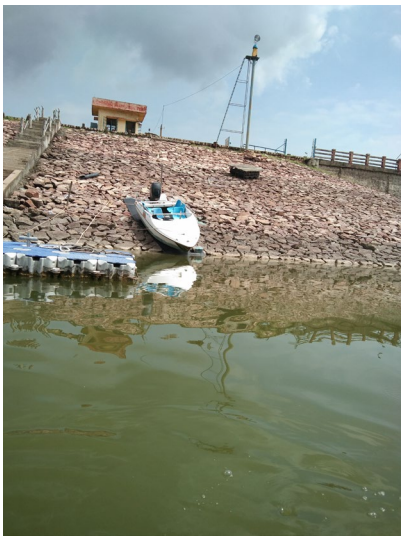
The GPS was originally developed for use by the United States military, but in the 1980s, the United States government allowed the system to be used for civilian purposes. Though the GPS satellite data is free and works anywhere in the world, the GPS device and the associated software must be bought or rented.

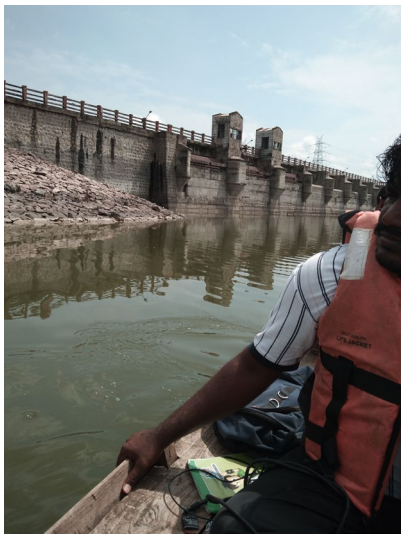
A GPS device can retrieve from the GPS system location and time information in all weather conditions, anywhere on or near the Earth. A GPS reception requires an unobstructed line of sight to four or more GPS satellites,[2]and is subject to poor satellite signal conditions. In exceptionally poor signal conditions, for example in urban areas, satellite signals may exhibit multipath propagation where signals skip off structures, or are weakened by meteorological conditions. Obstructed lines of sight may arise from a tree canopy or inside a structure, such as in a building, garage or tunnel. Today, most standalone GPS receivers are used in automobiles. The GPS capability of smart phones may use assisted GPS (A-GPS) technology, which can use the base station or cell towers to provide the device location tracking capability, especially when GPS signals are poor or unavailable. However, the mobile network part of the A-GPS technology would not be available when the Smartphone is outside the range of the mobile reception network

SECTION-4

PHOTOGRAPHS OF BENCH MARK PILLAR

PHOTOGRAPHS OF BATHYMETRIC SURVEY





SECTION-5

ACKNOWLEDGEMENT

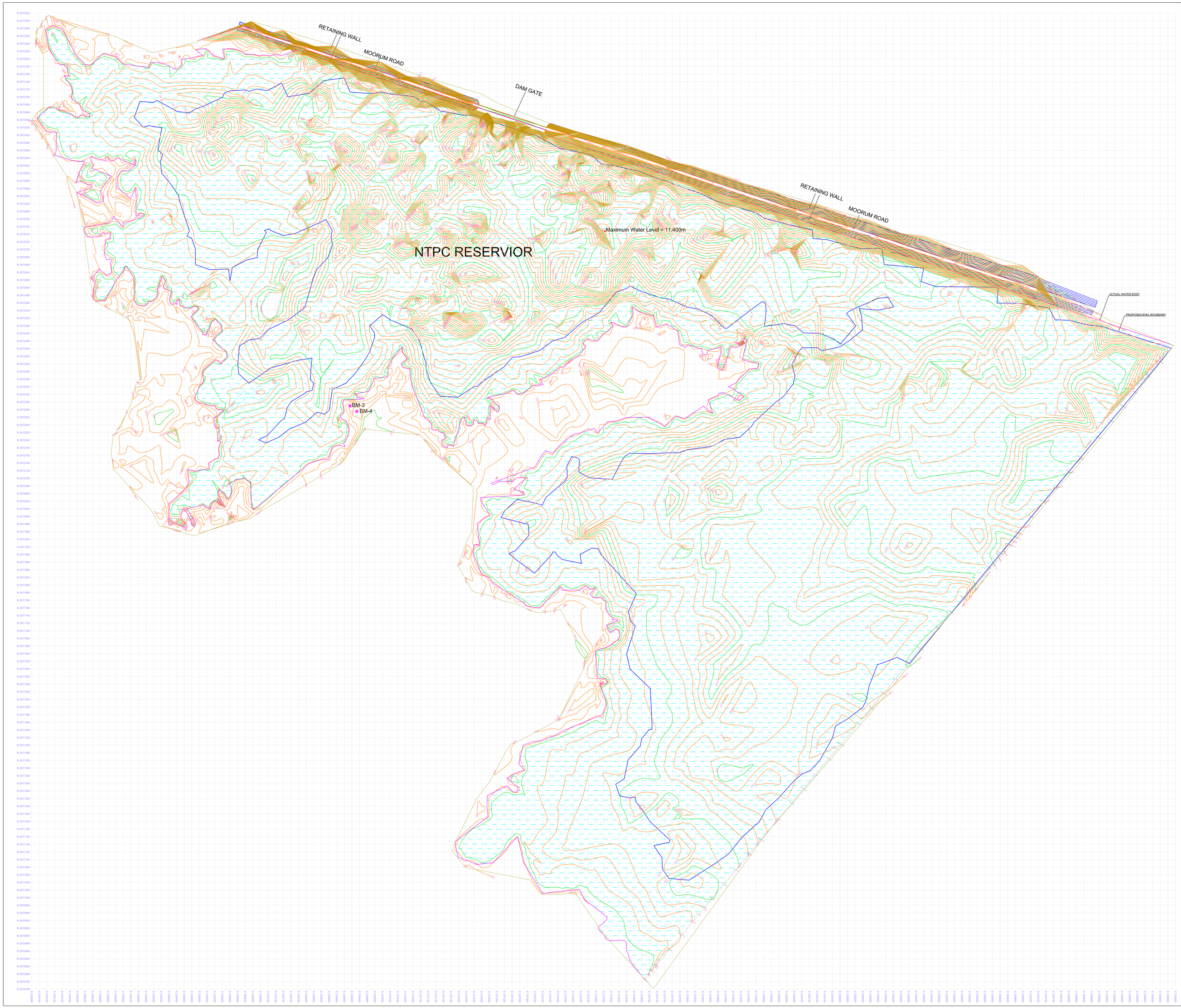
We regard our sincere thanks to all the officers of (Bharat Heavy Electricals Limited) for their excellent guidance, co-operation and support extended during field activity and in preparation of this report.

SWAYIN & ASSOCIATES BBSR

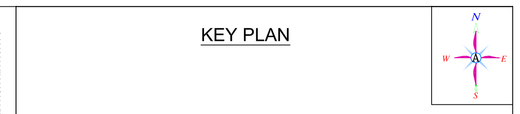
SWAYIN & ASSOCIATES

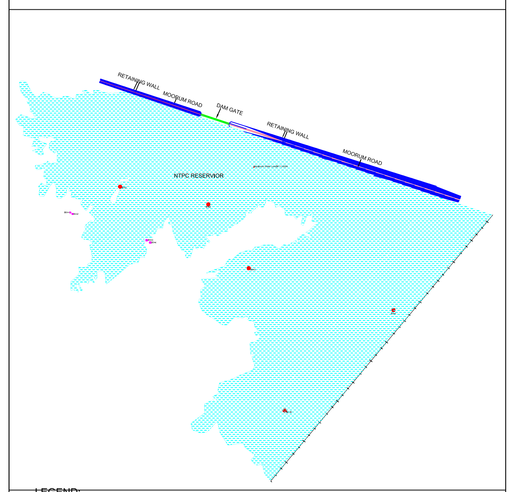
PLOT NO. 77, SATYANAGAR

BHUBANESAWAR.



KEY PLAN





LEGEND:

PARTICULAR	SYMBOL
MOORUM ROAD	
RETAINING WALL	
DAM GATE	
BENCHMARK	
BORE HOLE	
WATER LOGGED AREA	
CONTOUR LINE-MAJOR/MINOR	
GRID LINE	
PROPOSED BHEL BOUNDARY	
ACTUAL WATER BODY	

TOTAL SURVEY AREA : 703.95ACRES
WATER BODY : 564.34ACRES
LAND : 139.61ACRES

VILLAGE : RAMAGUNDAM
DISTRICT : PEDDAPELLI
STATE : TELANGANA

COORDINATES OF BH

NAME	EASTING	NORTHING	RL IN 'M'
BH-1	336746.00	2072625.00	165.125
BH-2	337297.00	2072514.00	160.137
BH-3	337550.00	2072115.00	161.737
BH-4	338454.00	2071854.00	157.758
BH-5	337775.00	2071226.00	161.396

COORDINATES OF BM

NAME	EASTING	NORTHING	RL IN 'M'
BM-1	336436.10	2072463.62	168.93
BM-2	336449.59	2072454.65	168.11
BM-3	336915.17	2072289.90	166.92
BM-4	336932.91	2072275.94	167.42

NOTE :-

(1) All dimensions and levels are in meters Unless Otherwise Mention.
(2) The Spot Level as marked on the drawing is 5mt.
(3) Grid Interval is - 20mt x 20mt.
(4) Boundary markings including levels are jointly verified at site.

Rev.	DATE	DRN.BY	CHKD.BY	APPRD. BY	DESCRIPTION
00	30.09.2019	PRAHALLAD	TEJA	SNS	DRAFT SUBMISSION

CLIENT: BHARAT HEAVY ELECTRICALS LIMITED

SURVEYED BY:
SWAYIN & ASSOCIATES
77, SATYANAGAR,
PH - (91-0674)2570015/2572971/2570458

TITLE: CONTOUR SURVEY DWG OF WATER BODY FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM

PROJECT: CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM

SCALE	DATE	DRAWING NO.	REV.
1:1000	02.10.19	B/SA/BHEL/CONTOUR SURVEY DWG	00

CLIENT

BHARAT HEAVY ELECTRICALS LIMITED

NAME OF PROJECT:-CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMERIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100 MW AT NTPC RAMAGUNDAM

GEO-TECHNICAL INVESTIGATION REPORT OF WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT

OCT-2019 (R01)

INVESTIGATED & PREPARED BY:

M/s. SWAYIN & ASSOCIATES

77, SATYANAGAR, BHUBANESWAR - 751 007
Ph. # (0674) 2570015, 2572971, 2570458. Fax: 2570329, 2570985
Email: kbs@swayinassociates.com / sns@swayinassociates.com
Website: www.swayinassociates.com

Name of Project	**"CONDUCTING GEOTECHNICAL INVESTIGATION & BATHYMERIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM (TELANGANA)"**
WO No. & Date	**WO No. EDN: SCPV:100MWNTPCR:01/WO Dtd.30.08.2019**
Job No.	**SA-1028**
Client	**BHARAT HEAVY ELERCTRICALS LIMITED.**
Investigated & Prepared by	**Swayin & Associates** **77, Satya Nagar, Bhuabaneswar-751007**
Technical Consultant	**Shri. K.B Swayin** **(F.I.E)** **Shri. S.N Swayin** **(F.I.E)**
Technical Assistant	**Mr. Dharma Teja Annam** **B.Tech (Civil)**
Reports Prepared By	**Bibhu Ranjan Baliarsingh** **Diploma (Civil)**
Date of Commencement (Field Work	**- 12.09.2019**
Date of Completion (Field Work)	**- 20.09.2019**
Date of Commencement (Laboratory)	**- 17.09.2019**
Date of Completion (Laboratory)	**- 27.09.2019**

Report Submitted by
Swayin & Associates

Report Submitted to
Bharat Heavy Electricals Limited

PREFACE

We have the pleasure to again collaborate ourselves with Bharat Heavy Electricals Limited for rendering our service conducting geotechnical investigation and bathymetric survey works of the water body for proposed project site of floating solar power plant of 100MW at NTPC Ramagundam (Telangana). Our sincere thanks to the esteemed officials of Bharat Heavy Electricals Limited including Project Engineer (PE) Executive Engineer(EE), (Asst.EE) and Site-Engineer for their endeavour and collective interest in providing adequate support for execution of above work. We will be proud enough to associate ourselves for this kind of civil engineering activities with BHEL in future days.

SWAYIN & ASSOCIATES

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INTRODUCTION

Bharat Heavy Electricals Limited, Electronics division Mysoreroad Bangalore had invited tenders for execution of Conducting Geotechnical Investigation and Bathymeric survey works of the water body for proposed Project site of Floating Solar power plant of 100MW at NTPC Ramagundam (Telangana) In response, a tender was submitted by M/S. Swayin & Associates (S&A), Bhubaneswar, Odisha. The BHEL has approved the tender of S&A and were pleased to award contract to carry out the specified Geo-technical work in accordance with the Technical Specification and guidelines. The assignment was attended by Swayin & Associates, and completed in time. Periodical reports were submitted to the client indicating the progress of Geo-technical work.

The Geo-Technical Investigation was completed in accordance with the proposal as Vide WO No. EDN: SCPV:100MWNTPCR:01/WO Dtd.30.08.2019.

Through correspondence with Bharat Heavy Electricals Limited, the investigation was intended to assist in determining the design soil parameters, for the foundation of proposed Solar power plant at Ramagundam, Peddapelli, Telangana. It was endeavored to study in detail the soil conditions at the project site.

SCOPE OF WORK

The Geo-Technical Investigation consists of advancement of five boreholes for proposed site. The boreholes were drilled upto a depth 5.0m based on the level of the founding in which the foundations and other sub-structures for the proposed projects leading to their economical and safe design for proposed area at NTPC Ramagundam, Telangana.

The Scope of work for the Field Investigation was as follows:

1. Advancement of boreholes at the specified locations as per the direction of EIC.
2. Record the soil conditions encountered in the boreholes.
3. Conducting Standard Penetration test (SPT), collection of undisturbed (UDS) &disturbed (DS) soil samples from boreholes.
4. Conducting laboratory test on collected soil and rock samples as per schedule of rates.
5. Analysis of Field and laboratory tests data and provide geotechnical characterization of the soils/rock encountered.
7. Preparation & Submission of the Geotechnical Investigation report, with appropriate descriptions of the existing Soil/Rock encountered in the boreholes advanced for the investigation and provide recommendations with respect to the implications for construction of Buildings, Structures and Boundary Walls etc.

EXPLORATION TECHNIQUE

i. Soil exploration was conducted with 150mm dia boreholes. The bore were done with Rotary calyx technique as per IS 1892-1962. The top of the bore hole is taken from the actual bed level at the time of boring. Standard Penetration tests were conducted at every required interval using Standard split spoon sampler driven by a 63.5 kg hammer with free fall height of 750 mm as per IS 2131-1963. The results are recorded and represented graphically in logs of bore holes. Undisturbed & disturbed sample were collected in plastic bags for visual inspection and classification of strata from all the layers as recorded in log sheets of bore holes.

ii. Collection representative undisturbed/disturbed soil samples from the exploratory bore holes for carrying out detailed laboratory analysis which would help finalization of design soil parameters and foundation type.

iii. Carrying out standard penetration tests as per the provisions laid down in IS:2131-1981 in the holes and subsequently maintaining penetration chart depth-wise upto the test depth in each of the 1 nos. Exploratory bore holes at locations.

SCOPE OF INVESTIGATION

In an attempt for optimization in the design of foundation for the proposed structures to come up at various sites, geo-technical investigations were envisaged. The entire geo-technical investigation program had been divided into three parts:-

(i) Field Investigation

(ii) Laboratory Test.

(iii) Preparation of technical report

As mentioned in the framework of B.O.Q., the field works comprised of the following:

Sinking of exploratory bore holes 150 mm in diameter, 05 (Five) nos., prefixed at the site as per the provisions laid down in IS: 1892-1962.

FIELD OPERATION

Levels & Co-ordinates of Test Location					
LOCATION	DESCRIPTION	CO-ORDINATES		REDUCED LEVEL (M)	SUBMERGED IN WATER (M)
		EASTING	NORTHING		
NTPC, RAMAGUNDAM	BH-01	336746.00	2072625.00	165.125	3.30
	BH-02	337297.00	2072514.00	160.137	3.80
	BH-03	337550.00	2072115.00	161.737	1.90
	BH-04	338454.00	2071854.00	157.758	8.80
	BH-05	337775.00	2071226.00	161.396	3.60

LABORATORY TEST RESULTS (AS PER IS)

The soil samples collected from the boreholes were tested in the laboratory and the field tests conducted at the site. The following tests were conducted.

a. Moisture content (IS - 2720 Pt. II)

Natural Moisture contents were obtained by oven drying method and the results are tabulated.

b. Bulk and dry density (IS - 2720 pt. III)

The bulk and dry density with saturated and buoyant density of samples are tabulated.

c. Grain Size Distribution (IS - 2720 Pt. IV)

Both sieve size analysis and hydrometer analysis were conducted on different samples and the findings are tabulated. Grain size classification scale confirms Indian Bureau of Standards.

d. Specific Gravity (IS-2720 Pt.III-2)

Specific gravity was obtained by pycnometer method and the result is tabulated.

e. Atterberg's Limits (IS - 2720 Pt. V)

The consistency limits are the water contents at which the soil mass passes from one state to the next. The soil mass interaction has four states of constancy limits. The Atterberg's limits useful for engineering purposes are liquid limit & plastic limit which are tabulated along with other index properties.

f. Free Swell Index Tests - IS 2720 (Pt - L)

To determine the free swell index of soil as per IS: 2720 (Part L) Free swell or differential free swell, also termed as free swell index, is the increase in volume of soil without any external constraint when subjected to submergence in water.

g. Swelling Pressure - IS 2720 (Pt – L1)

The Swelling Pressure measured in the Laboratory by the used of a conventional one – dimensional consolidation. Vertical expansion of the sample was measured under different imposed vertical pressures after being flooded with water and recorded as percentage of initial height, which was the percent of swell under certain pressure.

h. Direct Shear Tests - IS 2720 (Part 13)

These tests were done on identical sandy samples by shear box apparatus which was an undrained test. Shearing force was applied by increasing the successive load until the failure takes place. The plane of shear failure was determined & the graph is attached.

i. Laboratory California Bearing Ratio – IS 2720 (pt –XVI)

The California bearing ratio test is penetration test meant for the evaluation of sub grade strength of roads and pavements. The results obtained by these tests are used with the empirical curves to determine the thickness of pavement and its component layers. This is the most widely used method for

the design of flexible pavement. California bearing ratio is the ratio of force per unit area required to penetrate in to a soil mass with a circular plunger of 50mm diameter at the rate of 1.25mm / min.

j. Standard Proctor Test (IS – 2720 Pt-VIII)

Standard Proctor Compaction Test was done in the Laboratory tests, and the results are tabulated.

TEST PROCEDURE

1. DETERMINATION OF WATER CONTENT BY OVEN-DRYING METHOD

Clean the container and weight it with lid. Put the required quantity of the moist soil sample in the container and replace the lid. We have noted down the weight. The required quantity of soil sample is collected.

The container is placed in the oven with lid open and maintains the temperature of the oven between 105^0C to 110^0 C, for about 16 to 24 hours. Take out the container, replace the lid and cool it in the desiccators. Found the weight of the container with lid and dried soil sample.

2. DETERMINATION OF SPECIFIC GRAVITY BY PYCNOMETER

Clean the pycnometer and dry it. Found the weight of the pycnometer, brass cap and washer, accurate to 1g. Taken about 200 to 400 g of oven dried soil and placed it in the pycnometer. Weighed the pycnometer plus soil etc. Filled the pycnometer to half its height with distilled water and mixed it thoroughly with glass rod. By adding more water thorough mixture is done. Replace the screw top and fill the pycnometer flush with hole in the conical cap. Taken the weight of dry pycnometer from outside, and weighed it. Now empty the pycnometer and cleaned it thoroughly and fill it with distilled water, up to the hole of the conical cap and weighed it. By repeating the above procedure for two more times the specific gravity is determined.

3. DETERMINATION OF DRY DENSITY BY WATER DISPLACEMENT METHOD

With the help of knife, we have trimmed the sample to a more or less regular shape, by avoiding re-entrant angles. Weighted the sample with the help of the brush, applied one coat of melted wax. When the coat was hardened, apply the second coat. Weighted the coated sample. Filled fresh water into the container until it overflows through the tubing. When the overflow stopped, clamp the clip of the tubing. By immersing the wax coated sample slowly into the container, until it was sunk completely. Put the beaker below the rubber tubing and open the clip. Collected all the over flown water. Found the weight of water so collected, accurate to 1g. We have taken out the wax coated sample, dried it outside and

remove the paraffin wax skin. Cutted the sample into two pieces and kept a representative sample for water content determination.

4. DETERMINATION OF GRAIN SIZE DISTRIBUTION BY SIEVING

By using a riffle, taken a representative sample of soil received from the field and dried it in the oven. Weighed the required quantity of dried soil, and was placed it in a tray and soaked it with water. The maximum size of material presents in substantial quantities in the soil, the weight of soil sample taken for analysis.

Paddle the sample thoroughly in water and passed the slurry through 4.75mm sieve, which divides the gravel fraction from the sand fraction. Washed the slurry with jet of water and collect the materials that are retained on 4.75 mm sieve and the material passed through it in separate containers. Kept the material retained on 4.75 mm sieve in the oven. We washed the material passing through the 4.75 mm sieve, through the following set of sieves: 63mm, 20mm, 10mm and 4.75mm by hand sieving. While sieving through each sieve, the sieve should be agitated so that the sample rolled in irregular motion over the sieve. The material from the sieve is rubbed, with the rubber pestle in the mortar; care is taken that individual soil particles were not broken and re-sieve it to make sure that only individual particles are retained. The weight of material retained on each sieve is recorded. We sieved the dried material, retained on 75micron sieve through the following set of sieves: 2 mm, 1 mm, 600 micron, 425 micron, 300 micron, 150 micron and 75 micron size. The set of sieves should be arranged one above the other and fitted to a mechanical sieve shaker such that the 2mm sieve is at the top and the 75 micron sieve is at the bottom. A cover is placed on the top of the 2mm sieve, and receiver is placed below the 75 micron sieve. A minimum of 10 minutes sieving is done. The soil fraction retained on each sieve is carefully collected in containers and the weight of each fraction is noted and recorded. Alternatively, the material retained on 75micron sieve is dried, but is washed through a set of sieves, setted in order from the finer to the finest (75 micron) at the bottom. Washing is continued until the water passing through each sieve was substantially cleaned. The fraction retained on each sieve is emptied carefully without loss of material in separate container and oven dried. The oven dried fraction is weighed separately and their weight is recorded. The material passing through 75 micron sieve is used for the sedimentation analysis.

5. DETERMINATION OF GRAIN SIZE DISTRIBUTION BY HYDROMETER

Calibration of hydrometer

To determine the volume of the hydrometer bulb (V_h), we have poured about 800 ml of water in the 1000ml measuring cylinder and noted the reading at the water level. By immersing the hydrometer in

water, noted down the water reading. The difference between the two readings was recorded as the volume of the hydrometer bulb plus the volume of that part of the stem, which was submerged.

Alternatively, we weighed the hydrometer to nearest 2g. This weight in grams was recorded as the volume of the hydrometer in ml. This includes the volume of the bulb plus the volume of the stem.

In order to find the area of cross section (A) of the measuring cylinder in which the hydrometer is to be used, measured the distance in cm, between two graduations of the cylinder. The cross sectional area (A) was then equal to volume included between the two graduations divided by the distance between them.

The distance (h) is measured from the neck to the bottom of the bulb, and recorded it as the height of the bulb.

With the help of an accurate scale, the height H is measured between the neck of the hydrometer to each of the other major calibration marks (R_h).

To calculate the effective depth (H6) corresponding to each of the major calibration marks (or hydrometer readings, Rh) we used the expression:

$$H6 = H + \frac{1}{2}\left(h - \frac{Vh}{A}\right)$$

The readings is recorded

We have drawed a calibration curve between H6 and Rh which is used for finding the effective depth (H6) corresponding to hydrometer readings (Rh) which are obtained during the test.

Meniscus correction: By Inserting the hydrometer in the measuring cylinder containing 700ml of water. We have taken the reading of the hydrometer at the top and bottom of the meniscus. The difference between two readings was taken as the meniscus correction (cm), which was a constant for a hydrometer.

DISPERSION OF SOIL

To the oven-dried soil in the evaporating dish added 100 ml of sodium hexametaphosphate solution and warmed the mixture gently for about 10 minutes. Transferred the mixture to the cup of the mechanical mixer used a jet of distilled water, and stirred it well for about 15 minutes. The sodium hexametaphosphate solution was prepared by dissolving 33g of sodium hexametaphosphate and seven grams of sodium carbonate in distilled water to made one liter of solution. This solution was unstable and should be freshly prepared approximately once in a month.

Transferred the soil suspension to the 75 micron IS sieve placed on a receiver and washed the soil on this sieve used jet of distilled water from a wash bottle. The amount of distilled water used during this

operation might be about 500ml.

Transferred the soil suspension passing the 75 micron IS sieve to the 1000 ml. Measuring cylinder, and added more distilled water to made the volume to exactly 100ml in the cylinder.

Collected the material retained on 75 micron sieve and put it in the oven for drying. Determined the dried weight of soil retained on 75 micron sieve.

SEDIMENTATION TEST WITH HYDROMETER

Insert a rubber bung or any other suitable cover on the top of the 1000ml measuring cylinder contained the soil suspension and shake it vigorously end over end. Stopped shaking and allowed it to stand. Immediately, started the stopwatch, and removed the top cover from the cylinder.

Immersed the hydrometer gently to a depth slightly below its floating position and then allowed it to float freely. Taken the hydrometer readings after periods of ½, 1,2 and 4 minutes. Taken out the hydrometer, rinsed it with distilled water and allowed it to stand in a jar containing distilled water at the same temperature as that of the test cylinder.

The hydrometer is reinserted in the suspension and readings are taken after periods of 8, 15 and 30 minutes; 1, 2 and 4 hours after shaking. The hydrometer should be removed, rinsed and placed in the distilled water after each reading. After the end of 4 hours, readings should be taken once or twice within 24 hours.

Composite correction. In order to determine the composite correction, put 100ml of dispersing agent solution in another 1000 ml measuring cylinder and made it to 1000 ml by added distilled water. The cylinder should be maintained at the same temperature as that of the test cylinder contained soil specimen. Insert the hydrometer in this comparison cylinder contained distilled water and the dispersed agent and taken the reading corresponding to the top of the meniscus. The negative of the hydrometer reading so obtained given the composite correction (C). The composite correction was found before the starter of the test, and also at every time intervals of 30 minutes, 1 hour, 2 hours and 4 hours after the beginning of the test, and afterwards, just after each hydrometer reading was taken in test cylinder.

The temperature of the suspension should be observed and recorded once during the first 15 minutes and then after every subsequent reading.

6. DETERMINATION OF LIQUID LIMIT OF SOIL

By means of the gauge on the handle of the grooving tool and the adjustment plate, adjusted the height

through which the cup was lifted and dropped so that the point on the cup which comes in contact with the base falls through exactly one centimeter when the handle was rotated by one revolution. When the adjustment was complete, secure the adjustment plate by tightening its screws.

Taken about 120g of the specimen, passing through the 425 micron sieve, and mixed it thoroughly with distilled water in the evaporating dish or on the marble plate so that uniform paste was formed. Left the soil for sufficient time so that water per maturing time might be up to 25 hours. Taken a portion of the paste with the spatula and placed it in the centre of the cup so that it was almost half filled. Level off the top of the wet soil symmetrically with the spatula, so that it was parallel to the rubber base and the maximum depth of the soil was 1 cm.

With the help of grooving ‘a’ the paste in the cup was divided along the cup diameter (through the center line of the cam follower), by holed the tool normal to the surface of the cup and drawn it firmly across. Thus a V shaped gap, 2 mm wide at the bottom and 11mm at the top and 8mm deep would be formed. Turn the handle of the apparatus at the rate of 2 revolutions per second, until the two parts of the soil came in contact with the bottom of the groove along a distance of 10 mm. Recorded the number of blows required to cause the groove close for length of 10 mm.

Collected a representative slice of soil by moved the spatula widthwise from one edge to the other edge of the soil cake at right angles to the groove, included the portion of the groove in which the soil flowed together, and put it in an airtight container. Its water content was later determined by Oven drying method.

Removed the remaining soil from the cup and mixed it with the soil left earlier on the marble plate (or evaporating dish). Changed the consistency of the mix by either added more water or left the soil paste to dried. Noted the number of revolutions to close the groove and kept the soil for water content determination. These operations are repeated for 3 or 4 more additional trials. The soil paste in these operations should be of such consistency that the number of revolutions or drops to closed the groove is 25 -10. The test should always proceed from the dryer (more blows) to wetter (less blows) condition of the soil.

7. DETERMINATION OF PLASTIC LIMIT OF SOIL

Taken about 20g of air-dried soil from the thoroughly mixed portion of the material passed 420 micron IS sieve. Mixed it on the marble plate with sufficient distilled water to made it plastic enough to be shaped into a ball. Left the plastic soil mass for some time to mature.

Taken about 8g of the plastic soil, made a ball of it, and rolled it on the marble (or glass) plate with the hand with just sufficient pressure to roll the mass into a thread of uniform diameter throughout its length. When the diameter of the thread had decreased to 3 mm the specimen was kneaded together and rolled out again. Continued the process until the thread just crumbles at 3mm diameter. Collected the crumbled soil thread in the airtight container and kept it for water content determination. The test was repeated twice more. Thus, three readings were obtained for the determination.

8. DETERMINATION OF SWELLING PRESSURE.

The swelling pressure measured in the laboratory by the used of a conventional one-dimensional consolidometer. A soil sample of 1.5 to 2.5 cm thickness was enclosed between two porous plates and confined in a metal ring of 5 to 10 cm diameter. Vertical expansion of the sample was measured under different imposed vertical pressures after being flooded with water and recorded as percentage of initial height, which was the percent of swell under certain pressure. This means one sample was required to be tested for one vertical pressure and all the tests with the same initial conditions. 3 to 4 samples might be required with the same initial conditions for the test. The Curves obtained from the values given the relation between swelling and the vertical pressure. The point where the extrapolated curve meets the abscissa gives the swelling pressure under zero swelling, and the point where the curve meets the vertical axis gives the free swelling under zero vertical pressure.

9. DIFFERENTIAL FREE SWELL

Procedure:

Dried about 50 g of soil in an oven at 100 – 110^{0}C, sieve the soil through 425-micron IS sieve. Taken two specimen of this soil each weighing 10 g. Filled one cycling with Kerosene oil and the other with distilled water each up to about 80-90 ml. Capacity. Pour gently one soil specimen in the first cylinder containing Kerosene and the other specimen in the second cylinder containing distilled water. Removed the entrapped air by gentle shaking or by stirring with clean glass rods. Left the soils in both the cylinders to settle for 24 hours or more. Read the final (constant) volume of soil specimen in both the cylinders. Kerosene was a non-polar liquid causing no swelling of the soil. The level of the soil specimen in the graduated cylinder containing Kerosene oil. Therefore, was read as the original volume of the soil sample. The level of the soil specimen in the second cylinder containing distilled water was taken as the free swell level.

10. DETERMINATION OF SHEAR PARAMETERS BY DIRECT SHEAR TEST

Collect the soil specimen which is either undisturbed or remolded. The sample should be taken using sampler and Rammer. If cohesion less soil is taking then sampler and rammer are not required.

The inner dimensions of sampler should be 60 mm x 60 mm in plan which are also the inner dimensions of shear box. The Thickness of box is about 50 mm while the thickness of sample should be 25mm.

Now attach the two halves of the shear box with locking pins and place the base plate at the bottom.

Above the bottom plate, Place the porous stone and above it place the grid plate. Plain grid plates are used for undrained conditions while perforated grid plates are used for drained conditions.

Now we have base plate, porous stone and grid plate in the shear box. Weigh the box at this stage and note down.

After that place the soil specimen above the grid plate. Undisturbed sample is directly transferred to shear box. If sandy soil is using, place it layers wise and tamper the each layer to get the required density.

Note down the weight of shear box with soil specimen.

Above the soil specimen, place the upper grid plate, porous stone and loading pad one above the other.

Now the whole box is placed in a container and mounted on the loading frame.

Proving ring is arranged in such a way that it should contact the upper half of the shear box.

Loading yoke is placed on the steel ball of loading pad of shear box.

Two dial gauges are fitted one to the container for measuring shear displacement and other one is to the loading yoke for measuring vertical displacement.

Now locking pins are removed from the shear box and spacing screws are placed in their respective positions of the box.

The upper half of the box is raised slightly with the help of spacing screws. The spacing is decided depending upon the maximum size of particle.

Now apply the normal stress which is generally 25 kN/m2. Also apply the shear load at a constant rate of strain.

Now the box starts reacting to loads applied and for every 30 seconds note down the readings of proving ring and dial gauges.

If the proving ring reaches maximum and suddenly drops it, means the specimen is failed. Note down the maximum value which is nothing but failure stress.

For some soils, failure point is taken at 20% of shear strain.

Finally remove the box and measure the water content of the specimen.

Repeat the same procedure for different normal stresses of 50, 100, 150,200,250,300,400 kN/m2.

11. CALIFORNIA BEARING RATIO

It is the ratio of force per unit area required to penetrate a soil mass with standard circular piston at the rate of 1.25 mm/min. to that required for the corresponding penetration of a standard material.

Tests are carried out on natural or compacted soils in water soaked or un-soaked conditions and the results so obtained are compared with the curves of standard test to have an idea of the soil strength of the subgrade soil.

PROCEDURE

Normally 3 specimens each of about 7 kg must be compacted so that their compacted densities range from 95% to 100% generally with 10, 30 and 65 blows.

- Weigh of empty mould
- Add water to the first specimen (compact it in five layer by giving 10 blows per layer)
- After compaction, remove the collar and level the surface.
- Take sample for determination of moisture content.
- Weight of mould along with compacted specimen.
- Place the mold in the soaking tank for four days (ignore this step in case of unsoaked CBR.
- Take other samples and apply different blows and repeat the whole process.
- After four days, measure the swell reading and find %age swell.
- Remove the mould from the tank and allow water to drain.
- Then place the specimen under the penetration piston and place surcharge load of 10lb.
- Apply the load and note the penetration load values.
- Draw the graphs between the penetration (in) and penetration load (in) and find the value of CBR.
- Draw the graph between the %age CBR and Dry Density, and find CBR at required degree of compaction.

12. PROCTOR COMPACTION TEST

- Take about 20kg of air-dried soil. Sieve it through 20mm and 4.7mm sieve.
- Calculate the percentage retained on 20mm sieve and 4.75mm sieve, and the percentage passing 4.75mm sieve.
- If the percentage retained on 4.75mm sieve is greater than 20, use the large mould of 150mm diameter. If it is less than 20%, the standard mould of 100mm diameter can be used. The following procedure is for the standard mould.
- Mix the soil retained on 4.75mm sieve and that passing 4.75mm sieve in proportions determined in step (2) to obtain about 16 to 18 kg of soil specimen.
- Clean and dry the mould and the base plate. Grease them lightly.
- Weigh the mould with the base plate to the nearest 1 gram.
- Take about 16 – 18 kg of soil specimen. Add water to it to bring the water content to about 4% if the soil is sandy and to about 8% if the soil is clayey.
- Keep the soil in an air-tight container for about 18 to 20 hours for maturing. Mix the soil thoroughly. Divide the processed soil into 5 parts.
- Attach the collar to the mould. Place the mould on a solid base.
- Take about 2.5kg of the processed soil, and hence place it in the mould in 5 equal layers. Take about one-third the quantity first, and compact it by giving 25 blows of the rammer. The blows should be uniformly distributed over the surface of each layer.
- The top surface of the first layer be scratched with spatula before placing the second layer. The second layer should also be compacted by 25 blows of rammer. Likewise, place the third layer and compact it.
- The amount of the soil used should be just sufficient to fill the mould ad leaving about 5 mm above the top of the mould to be struck off when the collar is removed.
- Remove the collar and trim off the excess soil projecting above the mould using a straight edge.
- Clean the base plate and the mould from outside. Weigh it to the nearest gram.
- Remove the soil from the mould. The soil may also be ejected out.
- Take the soil samples for the water content determination from the top, middle and bottom portions. Determine the water content.

Add about 3% of the water to a fresh portion of the processed soil, and repeat the steps 10 to 14

13. CHEMICAL ANALYSIS OF WATER

Measurement of pH

50 ml of water sample is taken and it is allowed to stand for 1 hour with occasional Stirring. It is stirred again, immediately before testing.

The pH meter is calibrated with standard buffer and the pH of the water is measured.

Chloride

5 to 6 drops of potassium chromate indicator is added to 10 ml of the water sample get yellow color and then titrated against Silver nitrate solution (0.01N).

End point: yellow Brick Red colour.

Chloride Content, ppm = 3.545 x (VxN (10000)/S)

Where,

V= Volume of Silver nitrate Solution (ml)

S = Sample weight in gm.

N= Normality of Silver Nitrate Solution

Sulphate

10 ml of the sodium chloride- Hydrochloric acid mixture, 10 ml of glycerol-Ethanol mixture and 0.15 g of Barium Chloride is added to 50ml of water sample. This is stirred for about an hour and the absorbance is measured against distilled water blank using a colorimeter. The sulphate content of the sample is deduced from the standard curve.

Carbonate

The Carbonate content test was done as per IS Code 3025-51 and results are tabulated.

Salinity

Water salinity is measured by passing an electric current between the two electrodes of a salinity meter in a sample of water. The electrical conductivity or EC of a soil or water sample is influenced by the concentration and composition of dissolved salts. Salts increase the ability of a solution to conduct an electrical current, so a high EC value indicates a high salinity level.

Electrical conductivity (EC) is also a term used to describe a measurement unit of salinity.

Organic Matter

The Organic content test was done as per IS Code 3025-58 and results are tabulated.

ANALYSIS OF STRATUM

LOCATION – (NTPC, RAMAGUNDAM)

BH No: 01

Bore hole-01 was sunk upto an average depth of 8.50m. (Including water depth). The sub-soil of the Bore hole is summarized as follows.

The depth of water is 3.30m from the bed level.

Stratum – I

The strata below an average depth of 3.30m to 6.60m consist of Soft sandy stone. The 'N' value is greater than 100.The stratum is Very dense.

Stratum-II

The strata below an average depth of 6.60m to 8.50m consist of Medium to hard sandy stone. The Stratum is Very dense.

BH No: 02

Bore hole-02 was sunk upto an average depth of 8.80m. (Including water depth). The sub-soil of the Bore hole is summarized as follows.

The depth of water is 3.80m from the bed level.

Stratum – I

The strata below an average depth of 3.80m to 6.80m consist of Soft sandy stone. The 'N' value is greater than 100.The stratum is Very dense.

Stratum-II

The strata below an average depth of 6.80m to 8.80m consist of Soft to medium sandy stone. The Stratum is Very dense.

BH No: 03

Bore hole-03 was sunk upto an average depth of 7.00m. (Including water depth). The sub-soil of the Bore hole is summarized as follows.

The depth of water is 1.90m from the bed level.

Stratum – I

The strata below an average depth of 1.90m to 5.80m consist of Soft sandy stone. The 'N' value is greater than 100.The stratum is Very dense.

Stratum-II

The strata below an average depth of 5.80m to 7.00m consist of Medium to hard sandy stone. The Stratum is Very dense.

BH No: 04

Bore hole-04 was sunk upto an average depth of 14.00m. (Including water depth). The sub-soil of the Bore hole is summarized as follows.

The depth of water is 8.80m from the bed level.

Stratum – I

The strata below an average depth of 8.80m to 9.30m consist of Medium to coarse sand.

Stratum-II

The strata below an average depth of 9.30m to11.00m consist of Soft sandy stone. The 'N' value is greater than 100.The stratum is Very dense.

Stratum-III

The strata below an average depth of 11.00m to 14.00m consist of Medium to hard sandy stone. The Stratum is Very dense.

BH No: 05

Bore hole-05 was sunk upto an average depth of 8.80m. (Including water depth). The sub-soil of the Bore hole is summarized as follows.

The depth of water is 3.60m from the bed level.

Stratum – I

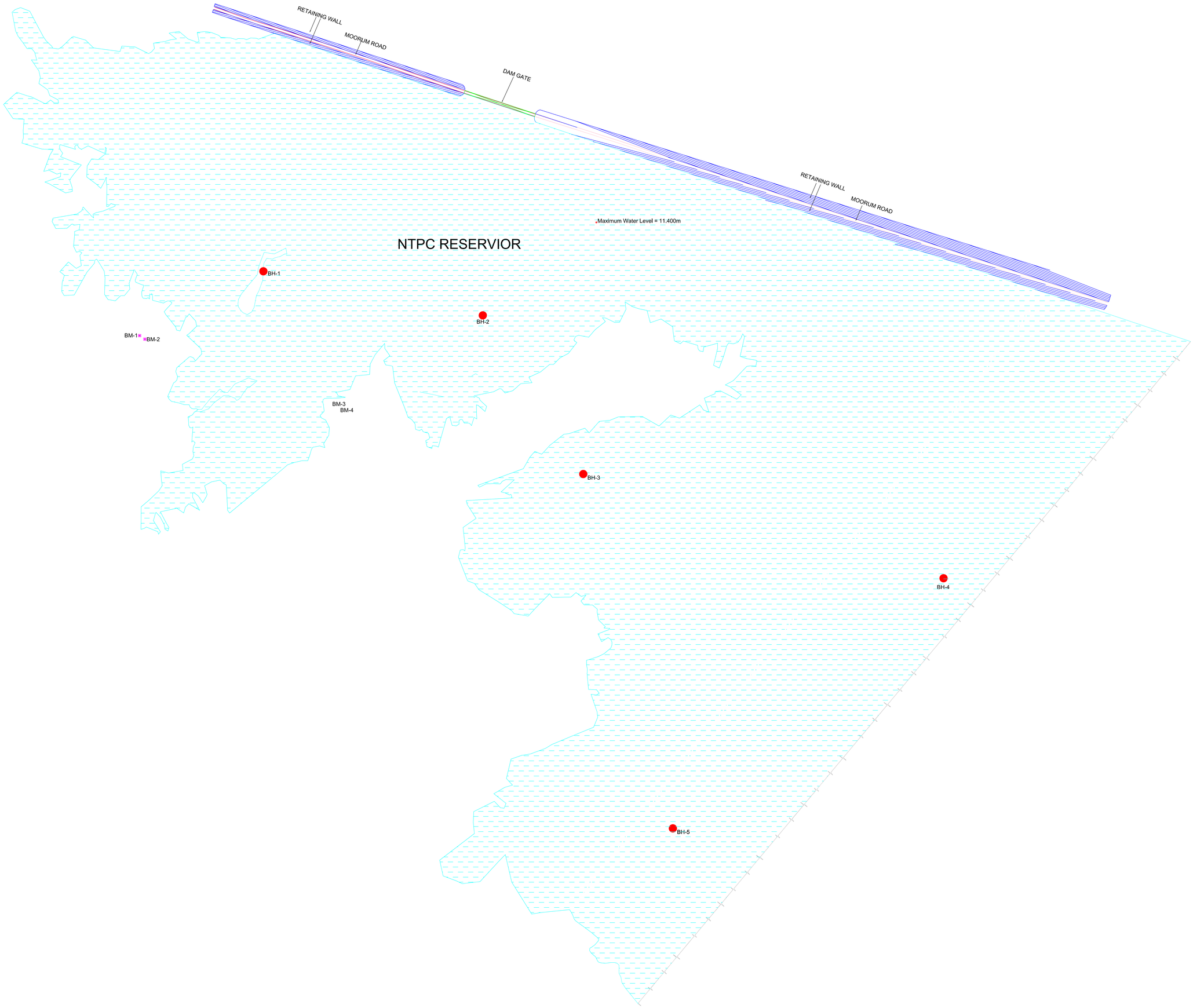
The strata below an average depth of 3.60m to 4.10m consist of Medium to coarse sand.

Stratum-II

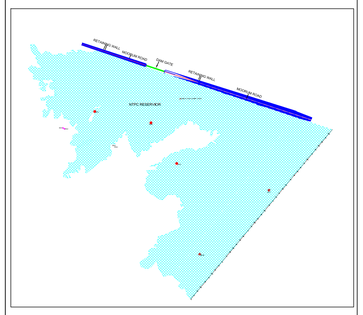
The strata below an average depth of 4.10m to7.00m consist of Soft sandy stone. The 'N' value is greater than 100.The stratum is Very dense.

Stratum-III

The strata below an average depth of 7.00m to 8.80m consist of Soft to medium sandy stone. The Stratum is Very dense.



KEY PLAN



LEGEND:

PARTICULAR	SYMBOL
MOORUM ROAD	
RETAINING WALL	
DAM GATE	
BENCHMARK	
BORE HOLE	
WATER LOGGED AREA	

TOTAL SURVEY AREA : 703.95ACRES
WATER BODY : 564.34ACRES
LAND : 139.61ACRES

VILLAGE : RAMAGUNDAM
DISTRICT : PEDDAPELLI
STATE : TELANGANA

COORDINATES OF BH

NAME	EASTING	NORTHING	RL IN 'M'
BH-1	336746.00	2072625.00	165.125
BH-2	337297.00	2072514.00	160.137
BH-3	337550.00	2072115.00	161.737
BH-4	338454.00	2071854.00	157.758
BH-5	337775.00	2071226.00	161.396

COORDINATES OF BM

NAME	EASTING	NORTHING	RL IN 'M'
BM-1	336436.10	2072463.62	168.93
BM-2	336449.59	2072454.65	168.11
BM-3	336915.17	2072289.90	166.92
BM-4	336932.91	2072275.94	167.42

NOTE :-

(1) All dimensions and levels are in meters Unless Otherwise Mention.
(2) The Spot Level as marked on the drawing is 5mt.
(3) Grid Interval is - 20mt x 20mt.
(4) Boundary markings including levels are jointly verified at site.

Rev.	DATE	DRN.BY	CHKD.BY	APPRD. BY	DESCRIPTION
00	30.09.2019	PRAHALLAD	TEJA	SNS	DRAFT SUBMISSION

CLIENT: BHARAT HEAVY ELECTRICALS LIMITED

SURVEYED BY:
SWAYIN & ASSOCIATES
77, SATYANAGAR,
PH - (91-0674)2570015/2572971/2570458

TITLE: LAYOUT PLAN DWG OF WATER BODY FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM

PROJECT: CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM

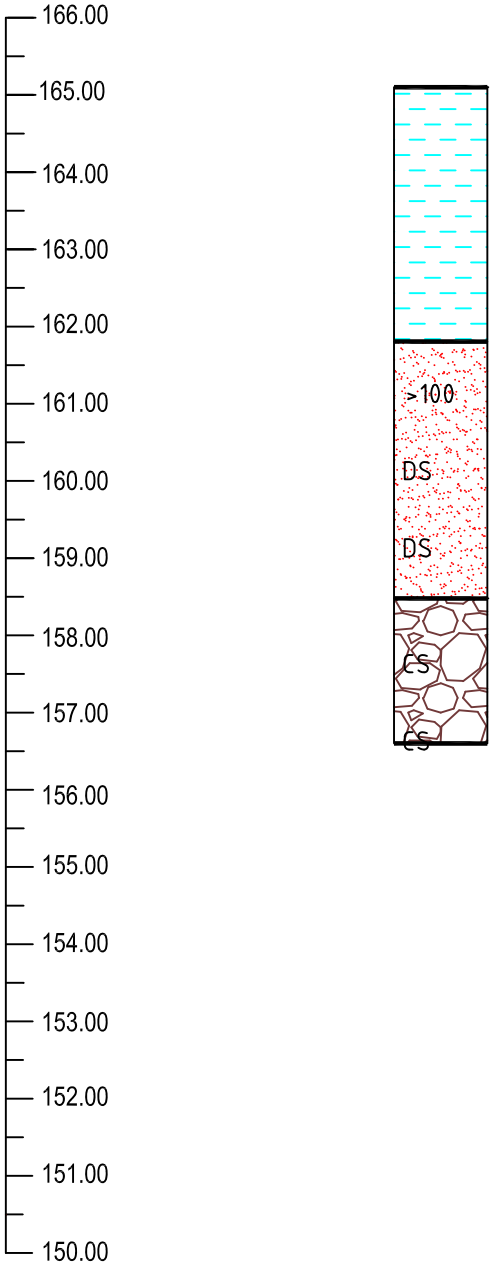
SCALE	DATE	DRAWING NO.	REV.
1:1000	02.10.19	B/SA/BHEL/LAYOUT PLAN DWG	00

SUB-SOIL PROFILE

CO-ORDINATE-: E-336746.00 , N-2072625.00

BORE HOLE- 01

RL IN 'M'



LEGEND:

1	WATER	
2	SOFT SAND STONE	
3	MEDIUM TO HARD SANDY STONE	

NOTE : ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

PROJECT : CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA).

CLIENT : BHARAT HEAVY ELECTRICALS LIMITED

INVESTIGATED AND PREPARED BY :-

SWAYIN & ASSOCIATES
77, SATYA NAGAR, BHUBANESWAR
PH-(O674) 2570015,2572971

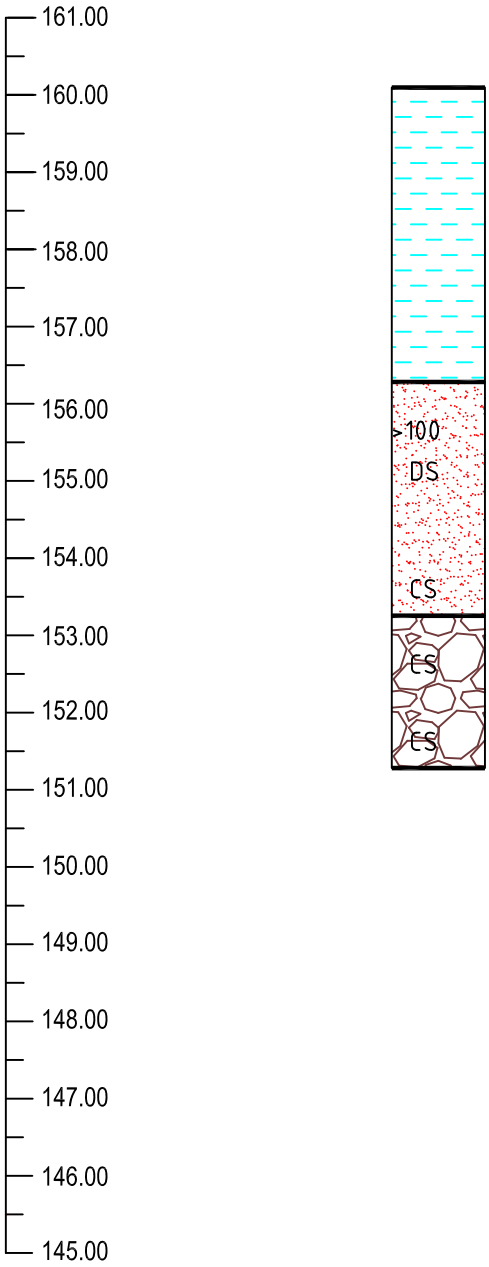
LOCATION	NTPC,RAMAGUNDAM
TITLE	SUB SOIL PROFILE

SUB-SOIL PROFILE

CO-ORDINATE-: E-337297.00 , N-2072514.00

BORE HOLE- 02

RL IN 'M'



LEGEND:

1	WATER	
2	SOFT SAND STONE	
3	SOFT TO MEDIUM SANDY STONE	

NOTE : ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

PROJECT : CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA).

CLIENT : BHARAT HEAVY ELECTRICALS LIMITED

INVESTIGATED AND PREPARED BY :-

SWAYIN & ASSOCIATES
77, SATYA NAGAR, BHUBANESWAR
PH-(O674) 2570015,2572971

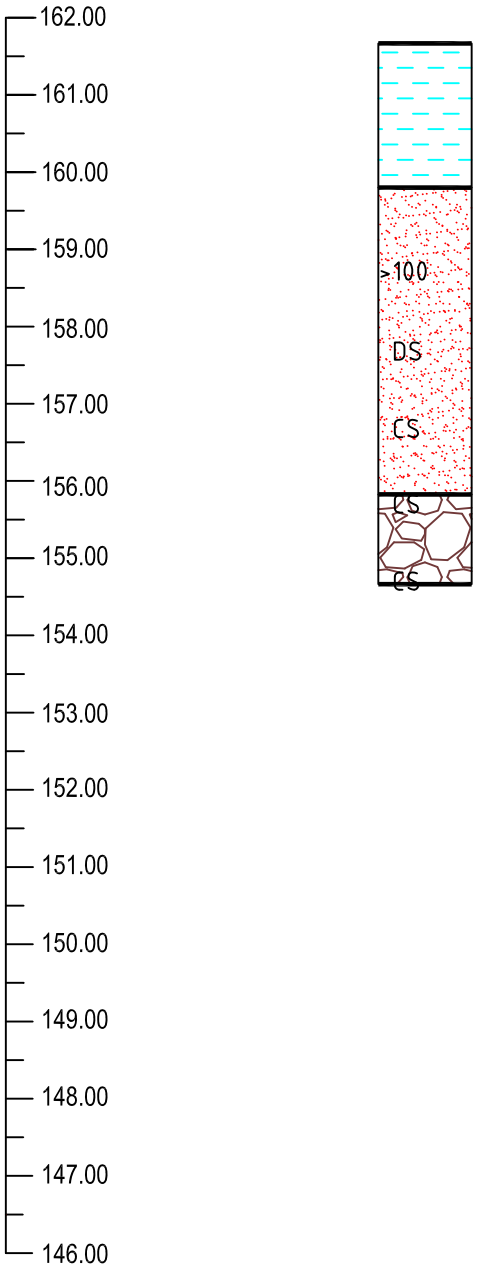
LOCATION	NTPC,RAMAGUNDAM
TITLE	SUB SOIL PROFILE

SUB-SOIL PROFILE

CO-ORDINATE-: E-337550.00 , N-2072115.00

BORE HOLE- 03

RL IN 'M'



LEGEND:

1	WATER	
2	SOFT SAND STONE	
3	MEDIUM TO HARD SANDY STONE	

NOTE : ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

PROJECT : CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA).

CLIENT : BHARAT HEAVY ELECTRICALS LIMITED

INVESTIGATED AND PREPARED BY :-

SWAYIN & ASSOCIATES
77, SATYA NAGAR, BHUBANESWAR
PH-(O674) 2570015,2572971

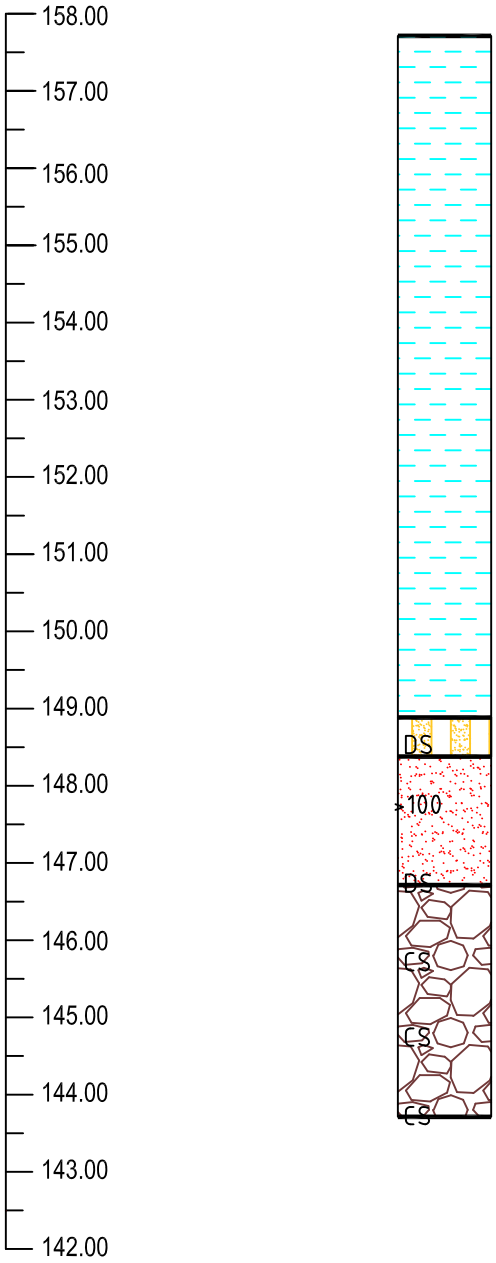
LOCATION	NTPC,RAMAGUNDAM
TITLE	SUB SOIL PROFILE

SUB-SOIL PROFILE

CO-ORDINATE-: E-338454.00 , N-2071854.00

BORE HOLE- 04

RL IN 'M'



LEGEND:

1	WATER	
2	SOFT SAND STONE	
3	MEDIUM TO COARSE SAND	
4	MEDIUM TO HARD SANDY STONE	

NOTE : ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

PROJECT : CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA).

CLIENT : BHARAT HEAVY ELECTRICALS LIMITED

INVESTIGATED AND PREPARED BY :-

SWAYIN & ASSOCIATES
77, SATYA NAGAR, BHUBANESWAR
PH-(O674) 2570015,2572971

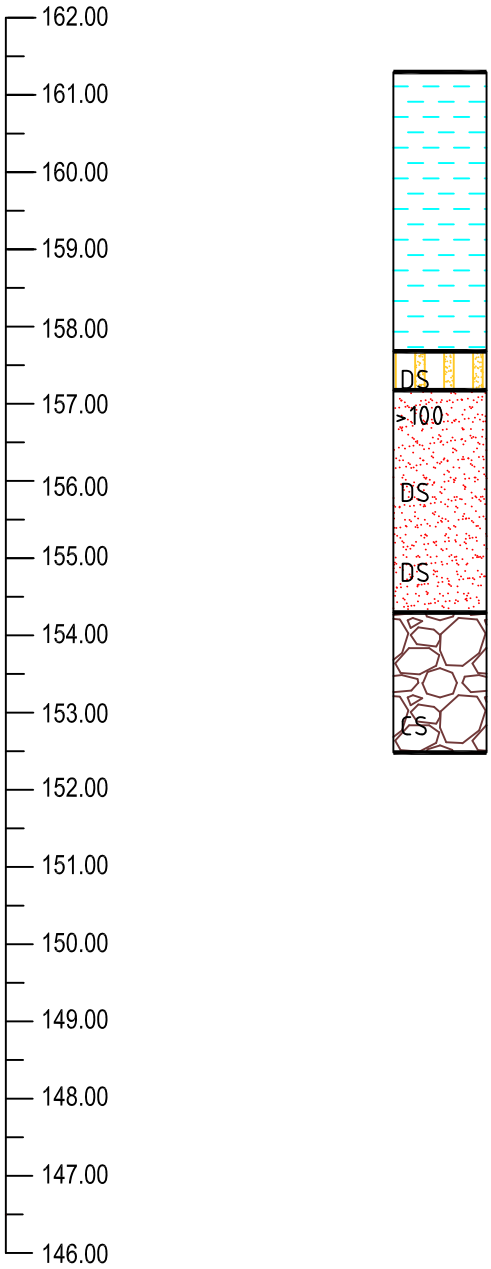
LOCATION	NTPC,RAMAGUNDAM
TITLE	SUB SOIL PROFILE

SUB-SOIL PROFILE

CO-ORDINATE-: E-337775.00 , N-2071226.00

BORE HOLE- 05

RL IN 'M'



LEGEND:

1	WATER	
2	SOFT SAND STONE	
3	MEDIUM TO COARSE SAND	
4	SOFT TO MEDIUM SANDY STONE	

NOTE : ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

PROJECT : CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA).

CLIENT : BHARAT HEAVY ELECTRICALS LIMITED

INVESTIGATED AND PREPARED BY :-

SWAYIN & ASSOCIATES
77, SATYA NAGAR, BHUBANESWAR
PH-(O674) 2570015,2572971

LOCATION	NTPC,RAMAGUNDAM
TITLE	SUB SOIL PROFILE

SWAYIN & ASSOCIATES

77,SATYANAGAR, BHUBANESWAR
Web Site : www.swayinassociates.com

BORELOG DATA SHEET

NAME OF PROJECT :- CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA)

TYPE OF BORING-	ROTARY DRILLING
DIA OF HOLE -	150MM/NX
DEPTH -	8.50M
COMMENCED ON :-12.09.2018	COMPLETED ON :-13.09.2018
SUBMERGED IN WATER 3.30M	

CLIENT :- BHARAT HEAVY ELECTRICALS LIMITED

JOB NO :- SA-1028 | BORE HOLE NO:-01 | SHEET NO:-01

LOCATION :- NTPC,RAMAGUNDAM | CO-ORDINATES: E:-336746.00 N:-2072625.00 | RL:-165.125M

DESCRIPTION OF STRATA	IS CLASSIFICATION	CHANGE OF STRATA IN MTRS.	DEPTH IN MTRS.	SYMBOL	SAMPLE DEPTH IN MTRS.	GRAPHICAL REPRESENTATION OF 'N' VALUES (20 40 60 80 100)	'N' VALUES	SAMPLE TYPE	SAMPLE REFNO.	CORE RECOVERY%	RQD%	G.W.L OBSER
		0.00	0.00									
			1.00									
WATER			2.00									
			3.00									
		3.30										
			4.00		4.00		>100	SPT	01			
SOFT SAND STONE	SP		5.00		5.00			DS	01			
			6.00		6.00			DS	02			
		6.60								12%	NIL	
			7.00									
MEDIUM TO HARD SANDY STONE					7.50			CS	01			
			8.00							15%	NIL	
BH TERMINATED AT THE 8.50M INCLUDE WATER DEPTH 3.30M		8.50			8.50			CS	02			
			9.00									
			10.00									
			11.00									
			12.00									
			13.00									
			14.00									
			15.00									

LEGEND:-

UDS-UNDISTURBED SAMPLE, DS- DISTURBED SAMPLE, SPT-STANDARD PENETRATION TEST W- WATER SAMPLE,

▽-WATER LEVEL P-PENETROMETRE TEST, V- VANE SHEAR TEST, C-CORE RECOVERY

No. of disturbed sample :- 02	No. of Undisturbed sample:-00	No. of Vane Shear Test :- NIL
No. of Large diameter sample :- NIL	No. of CORE :- 02	No. of Water Sample :-NIL
	No. of S.P.T. :- 01	

SWAYIN & ASSOCIATES

77,SATYANAGAR, BHUBANESWAR
Web Site : www.swayinassociates.com

BORELOG DATA SHEET

NAME OF PROJECT :- CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA)

TYPE OF BORING-	ROTARY DRILLING
DIA OF HOLE -	150MM/NX
DEPTH -	8.80M
COMMENCED ON :-14.09.2019	COMPLETED ON :-15.09.2019
SUBMERGED IN WATER 3.80M	

CLIENT :- BHARAT HEAVY ELECTRICALS LIMITED

JOB NO :- SA-1028 | BORE HOLE NO:-02 | SHEET NO:-01

LOCATION :- NTPC,RAMAGUNDAM | CO-ORDINATES: E:-337297.00 N:-2072514.00 | RL:-160.137M

DESCRIPTION OF STRATA	IS CLASSIFICATION	CHANGE OF STRATA IN MTRS.	DEPTH IN MTRS.	SYMBOL	SAMPLE DEPTH IN MTRS.	GRAPHICAL REPRESENTATION OF 'N' VALUES (20 40 60 80 100)	'N' VALUES	SAMPLE TYPE	SAMPLE REFNO.	CORE RECOVERY%	RQD%	G.W.L OBSER
		0.00	0.00									
			1.00									
WATER			2.00									
			3.00									
		3.80	4.00									
					4.50		>100	SPT	01			
SOFT SAND STONE		SP	5.00		5.00			DS	01			
			6.00									
					6.50			CS	01			
		6.80	7.00							10%	NIL	
SOFT TO MEDIUM SANDY STONE					7.50			CS	02			
			8.00							14%	NIL	
					8.50			CS	03			
BH TERMINATED AT 8.80M INCLUDE WATER DEPTH 3.80M		8.80	9.00									
			10.00									
			11.00									
			12.00									
			13.00									
			14.00									
			15.00									

LEGEND:-

UDS-UNDISTURBED SAMPLE, DS- DISTURBED SAMPLE, SPT-STANDARD PENETRATION TEST W- WATER SAMPLE,

▽-WATER LEVEL P-PENETROMETRE TEST, V- VANE SHEAR TEST, C-CORE RECOVERY

No. of disturbed sample :- 01	No. of Undisturbed sample:-00	No. of Vane Shear Test :- NIL
No. of Large diameter sample :- NIL	No. of CORE :- 03	No. of Water Sample :-NIL
	No. of S.P.T. :- 01	

SWAYIN & ASSOCIATES

77,SATYANAGAR, BHUBANESWAR
Web Site : www.swayinassociates.com

BORELOG DATA SHEET

NAME OF PROJECT :- CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA)

TYPE OF BORING-	ROTARY DRILLING
DIA OF HOLE -	150MM/NX
DEPTH -	7.00M
COMMENCED ON :-15.09.2019	COMPLETED ON :-16.09.2019
SUBMERGED IN WATER 1.90M	

CLIENT :- BHARAT HEAVY ELECTRICALS LIMITED

JOB NO :- SA-1028 | BORE HOLE NO:-03 | SHEET NO:-01

LOCATION :- NTPC,RAMAGUNDAM | CO-ORDINATES: E:-337550.00 N:-2072115.00 | RL:-161.737M

DESCRIPTION OF STRATA	IS CLASSIFICATION	CHANGE OF STRATA IN MTRS.	DEPTH IN MTRS.	SYMBOL	SAMPLE DEPTH IN MTRS.	GRAPHICAL REPRESENTATION OF 'N' VALUES (20 40 60 80 100)	'N' VALUES	SAMPLE TYPE	SAMPLE REFNO.	CORE RECOVERY%	RQD%	G.W.L OBSER
WATER		0.00	0.00									
			1.00									
		1.90	2.00									
			3.00		3.00		>100	SPT	01			
SOFT SAND STONE		SP										
			4.00		4.00			DS	01			
			5.00		5.00			CS	01	NIL	NIL	
		5.80	6.00		6.00			CS	02	NIL	NIL	
MEDIUM TO HARD SANDY STONE										14%	NIL	
BH TERMINATED AT 7.00M INCLUDE WATER DEPTH 1.90M		7.00	7.00		7.00			CS	03			
			8.00									
			9.00									
			10.00									
			11.00									
			12.00									
			13.00									
			14.00									
			15.00									

LEGEND:-

UDS-UNDISTURBED SAMPLE, DS- DISTURBED SAMPLE, SPT-STANDARD PENETRATION TEST W- WATER SAMPLE,

▽-WATER LEVEL P-PENETROMETRE TEST, V- VANE SHEAR TEST, C-CORE RECOVERY

No. of disturbed sample :- 02	No. of Undisturbed sample:-00	No. of Vane Shear Test :- NIL
No. of Large diameter sample :- NIL	No. of CORE :- 03	No. of Water Sample :-NIL
	No. of S.P.T. :- 01	

SWAYIN & ASSOCIATES

77,SATYANAGAR, BHUBANESWAR
Web Site : www.swayinassociates.com

BORELOG DATA SHEET

NAME OF PROJECT :- CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA)

TYPE OF BORING-	ROTARY DRILLING
DIA OF HOLE -	150MM/NX
DEPTH -	14.00M
COMMENCED ON :-17.09.2019	COMPLETED ON :-18.09.2019
SUBMERGED IN WATER 8.80M	

CLIENT :- BHARAT HEAVY ELECTRICALS LIMITED

JOB NO :- SA-1028 | BORE HOLE NO:-04 | SHEET NO:-01

LOCATION :- NTPC,RAMAGUNDAM | CO-ORDINATES: E:-338454.00 N:-2071854.00 | RL:-157.758M

DESCRIPTION OF STRATA	IS CLASSIFICATION	CHANGE OF STRATA IN MTRS.	DEPTH IN MTRS.	SYMBOL	SAMPLE DEPTH IN MTRS.	GRAPHICAL REPRESENTATION OF 'N' VALUES (20 40 60 80 100)	'N' VALUES	SAMPLE TYPE	SAMPLE REFNO.	CORE RECOVERY%	RQD%	G.W.L OBSER
		0.00	0.00									
			1.00									
			2.00									
			3.00		3.00							
			4.00		4.00							
WATER			5.00		5.00							
			6.00		6.00							
			7.00		7.00							
			8.00									
MEDIUM TO COARSE SAND		8.80	9.00					DS	01			
		9.30										
SOFT SAND STONE	SP		10.00				>100	SPT	01			
		11.00	11.00					DS	02			
MEDIUM TO HARD STONE			12.00					CS	01	10%	NIL	
			13.00					CS	02	15%	NIL	
BH TERMINATED AT 14.00M INCLUDE WATER DEPTH 8.80M		14.00	14.00					CS	03	18%	NIL	
			15.00									

LEGEND:-

UDS-UNDISTURBED SAMPLE, DS- DISTURBED SAMPLE, SPT-STANDARD PENETRATION TEST W- WATER SAMPLE,

▽-WATER LEVEL P-PENETROMETRE TEST, V- VANE SHEAR TEST, C-CORE RECOVERY

No. of disturbed sample :- 02	No. of Undisturbed sample:-00	No. of Vane Shear Test :- NIL
No. of Large diameter sample :- NIL	No. of CORE :- 03	No. of Water Sample :-NIL
	No. of S.P.T. :- 01	

SWAYIN & ASSOCIATES

77,SATYANAGAR, BHUBANESWAR
Web Site : www.swayinassociates.com

BORELOG DATA SHEET

NAME OF PROJECT :- CONDUCTING GEOTECHNICAL INVESTIGATION AND BATHYMETRIC SURVEY WORKS OF THE WATER BODY FOR PROPOSED PROJECT SITE OF FLOATING SOLAR POWER PLANT OF 100MW AT NTPC RAMAGUNDAM(TELANGANA)

TYPE OF BORING-	ROTARY DRILLING
DIA OF HOLE -	150MM/NX
DEPTH -	8.80M
COMMENCED ON :-18.09.2019	COMPLETED ON :-20.09.2019
SUBMERGED IN WATER 3.60M	

CLIENT :- BHARAT HEAVY ELECTRICALS LIMITED

JOB NO :- SA-1028 | BORE HOLE NO:-05 | SHEET NO:-01

LOCATION :- NTPC,RAMAGUNDAM | CO-ORDINATES: E:-337775.00 N:-2071226.00 | RL:-161.396M

DESCRIPTION OF STRATA	IS CLASSIFICATION	CHANGE OF STRATA IN MTRS.	DEPTH IN MTRS.	SYMBOL	SAMPLE DEPTH IN MTRS.	GRAPHICAL REPRESENTATION OF 'N' VALUES (20 40 60 80 100)	'N' VALUES	SAMPLE TYPE	SAMPLE REFNO.	CORE RECOVERY%	RQD%	G.W.L OBSER
WATER		0.00	0.00									
			1.00									
			2.00									
			3.00									
MEDIUM TO COARSE SAND		3.60										
		4.10	4.00		4.00			DS	01			
					4.50		>100	SPT	01			
			5.00									
SOFT SAND STONE	SP				5.50			DS	02			
			6.00									
					6.50			DS	03			
		7.00	7.00									
SOFT TO MEDIUM SANDY STONE			8.00									
					8.50			CS	01	12%	NIL	
BH TERMINATED AT 8.80M INCLUDE WATER DEPTH 3.60M		8.80	9.00									
			10.00									
			11.00									
			12.00									
			13.00									
			14.00									
			15.00									

LEGEND:-

UDS-UNDISTURBED SAMPLE, DS- DISTURBED SAMPLE, SPT-STANDARD PENETRATION TEST W- WATER SAMPLE,

▽-WATER LEVEL P-PENETROMETRE TEST, V- VANE SHEAR TEST, C-CORE RECOVERY

No. of disturbed sample :- 03	No. of Undisturbed sample:-00	No. of Vane Shear Test :- NIL
No. of Large diameter sample :- NIL	No. of CORE :- 01	No. of Water Sample :-NIL
	No. of S.P.T. :- 01	

ASIAN GEOTECH RESEARCH SERVICES

(Civil Engineering Consultant & Testing Laboratory)
NABL Accredited Laboratory Based on ISO/IEC 17025:2005
An ISO 9001 : 2008 Certified & MSME Regd. Company
Approved by the Govt. of Odisha
Sub-Soil Exploration Regd. No. - 7/2004-2005 &
Testing Laboratory Regd. No.-8/2004-2005

NABL
Certificate No.TC-6270

Geo-Technical Investigation, All types of Physical & Chemical testing, Pile Load & Plate Load testing, All types of field testing, Non Destructive testing, ERT testing, Topographic & Hydrographic Survey, DGPS Survey, Architectural & Structural Design, Quality Control Supervision, Project Management Consultancy, Preparation of DPR, Plan & Estimates

LABORATORY TEST RESULT OF SOIL

Bore hole No.	Depth in Mtrs	Type os Sample	Bulk Density in gm/cc	Water Content in %	Dry Density (gm/cc)	Particle Distribution (%)				Atterberg's Limit (%)			Specific Gravity	Direct Shear test		Swelling Pressure (Kpa)	Free Swell Index (%)	Standard Proctor		CBR in %
						Gravel	Sand	Silt	Clay	LL	PL	PI		C in kg/cm2	ϕ in degree			MDD in gm/cc	OMC in %	
BH-01	5	DS	1.980	20.00	1.65	0	94	6	0	18.0	NP	-	2.65	0.00	28.0	-	-	1.900	11.250	15.20
	6	DS	2.010	22.00	1.65	0	95	5	0	20.0	NP	-	2.66	-	-	-	-	-	-	-
BH-02	5	DS	1.960	19.00	1.65	0	93	7	0	17.0	NP	-	2.68	0.00	25.0	-	-	1.908	10.960	17.28
BH-03	4	DS	1.980	21.00	1.64	0	94	6	0	19.0	NP	-	2.66	0.00	27.0	-	-	1.914	10.680	15.90
BH-04	9.2	DS	2.040	23.00	1.66	0	92	8	0	18.0	NP	-	2.69	0.00	28.0	-	-	1.910	11.160	17.64
	11	DS	2.000	20.00	1.67	0	93	7	0	21.0	NP	-	2.67	-	-	-	-	-	-	-
BH-05	4	DS	1.980	19.00	1.66	0	93	7	0	19.0	NP	-	2.68	0.00	26.0	-	-	1.922	10.420	16.35
	6.5	DS	2.020	22.00	1.66	0	91	9	0	20.0	NP	-	2.67	-	-	-	-	-	-	-

ASIAN GEOTECH RESEARCH SERVICES
BHUBANESWAR

CHEMICAL ANALYSIS OF WATER

BH-01

Parameters	Results
Ph value	7.32
Sulphate (ppm)	15.62
Chloride (ppm)	34.25
Carbonate (mg/ltr)	75
Salinity	54
Organic Matter	1.8

BH-02

Parameters	Results
Ph value	7.56
Sulphate (ppm)	14.30
Chloride (ppm)	38.25
Carbonate (mg/ltr)	72
Salinity	49
Organic Matter	1.5

BH-03

Parameters	Results
Ph value	7.45
Sulphate (ppm)	15.15
Chloride (ppm)	35.62
Carbonate (mg/ltr)	78
Salinity	55
Organic Matter	1.6

BH-04

Parameters	Results
Ph value	7.65
Sulphate (ppm)	14.60
Chloride (ppm)	36.84
Carbonate (mg/ltr)	77
Salinity	46
Organic Matter	1.3

BH-05

Parameters	Results
Ph value	7.50
Sulphate (ppm)	14.85
Chloride (ppm)	40.10
Carbonate (mg/ltr)	71
Salinity	50
Organic Matter	1.5

CHEMICAL ANALYSIS OF SOIL

BH-01 (Depth:- 5.00m)

Parameters	Results
Ph value	6.24
Sulphate (%)	0.038
Chloride (%)	0.45
Carbonate (%)	12.00
Organic Matter	1.25

BH-02 (Depth:- 5.00m)

Parameters	Results
Ph value	6.18
Sulphate (%)	0.48
Chloride (%)	34.25
Carbonate (%)	10.50
Organic Matter	1.32

BH-03 (Depth:- 4.00m)

Parameters	Results
Ph value	6.36
Sulphate (%)	0.035
Chloride (%)	0.40
Carbonate (%)	11.20
Organic Matter	1.28

BH-04 (Depth:- 9.20m)

Parameters	Results
Ph value	6.25
Sulphate (%)	0.040
Chloride (%)	0.46
Carbonate (%)	13.10
Organic Matter	1.30

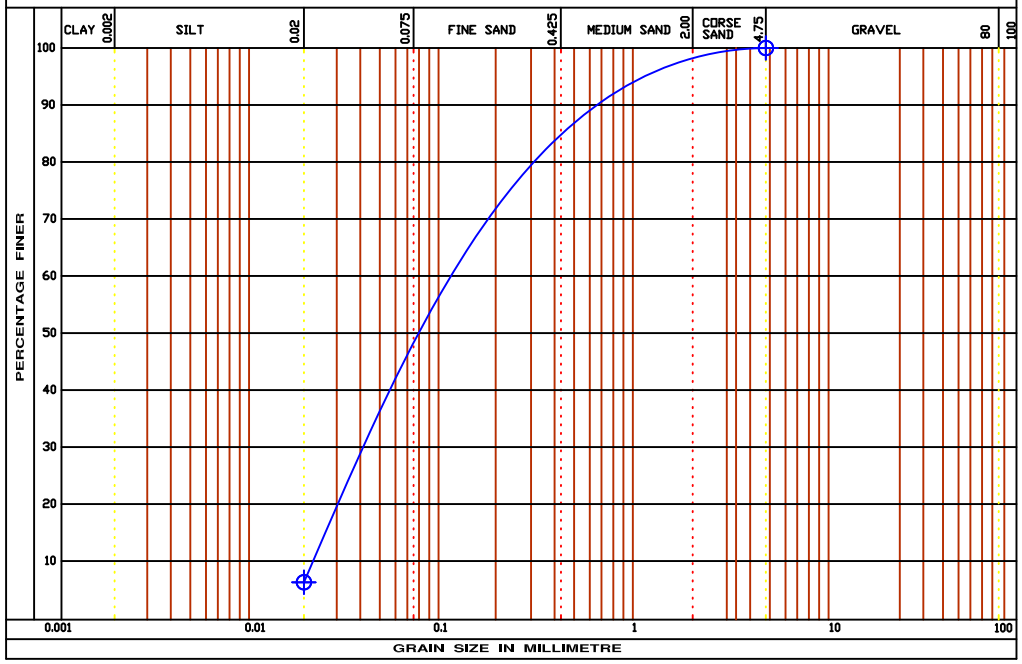
BH-05 (Depth:- 5.50m)

Parameters	Results
Ph value	6.40
Sulphate (%)	0.036
Chloride (%)	0.42
Carbonate (%)	11.80
Organic Matter	1.27

LOCATION: NTPC RAMAGUNDAM
DEPTH:5.00m

GRAIN SIZE DISTRIBUTION CURVE

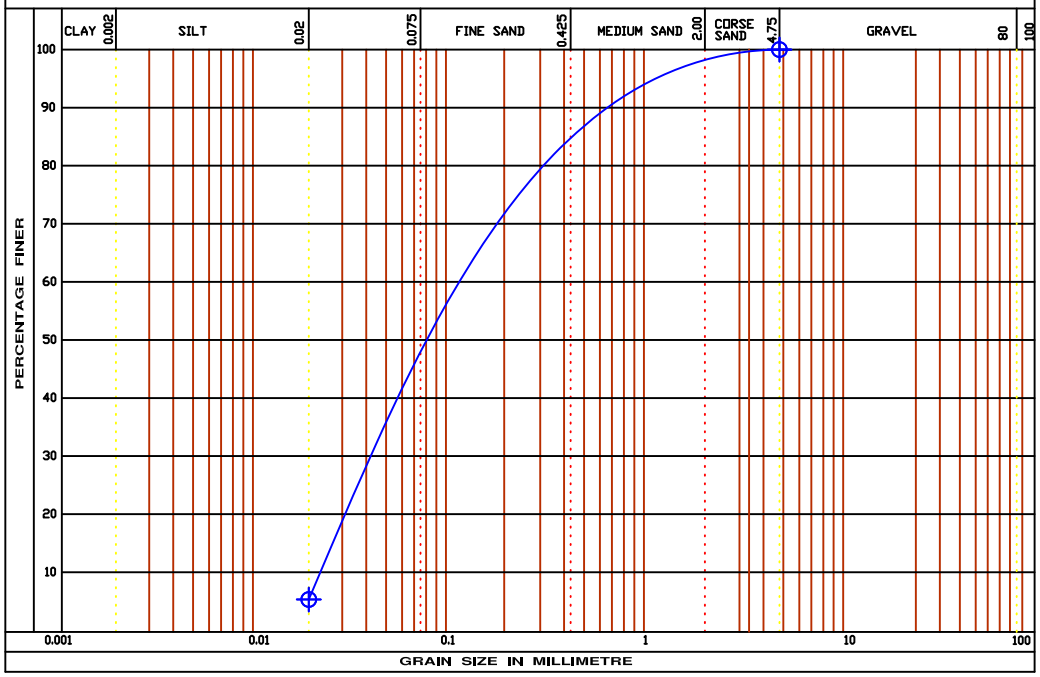
B.H NO:- 01



LOCATION: NTPC RAMAGUNDAM
DEPTH:6.00m

GRAIN SIZE DISTRIBUTION CURVE

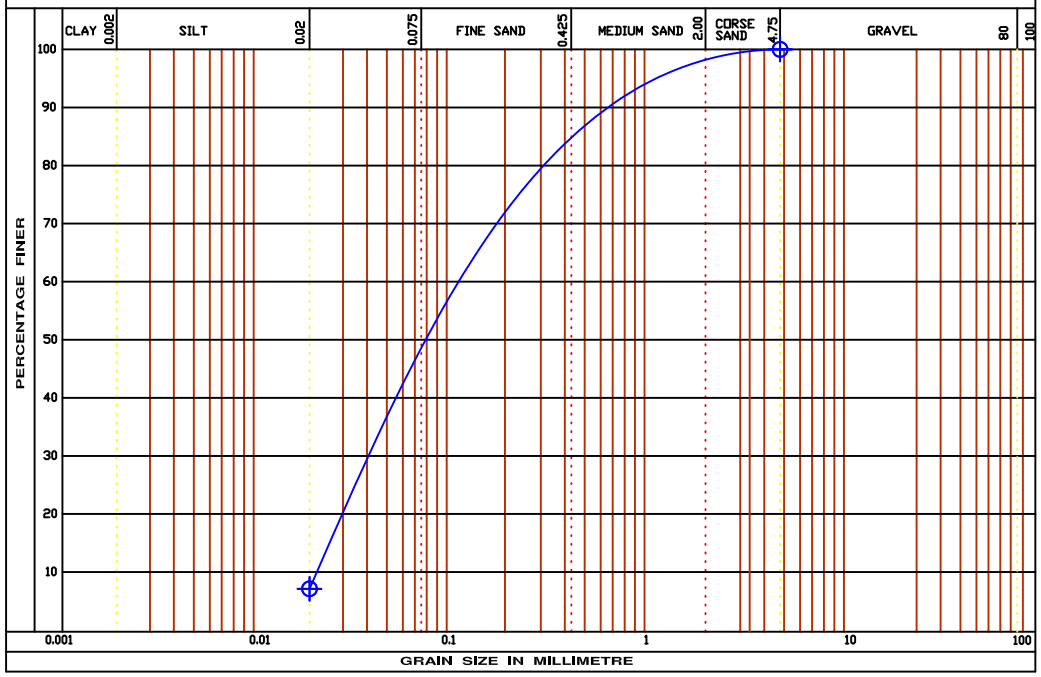
B.H NO:- 01



LOCATION: NTPC RAMAGUNDAM
DEPTH:5.00m

GRAIN SIZE DISTRIBUTION CURVE

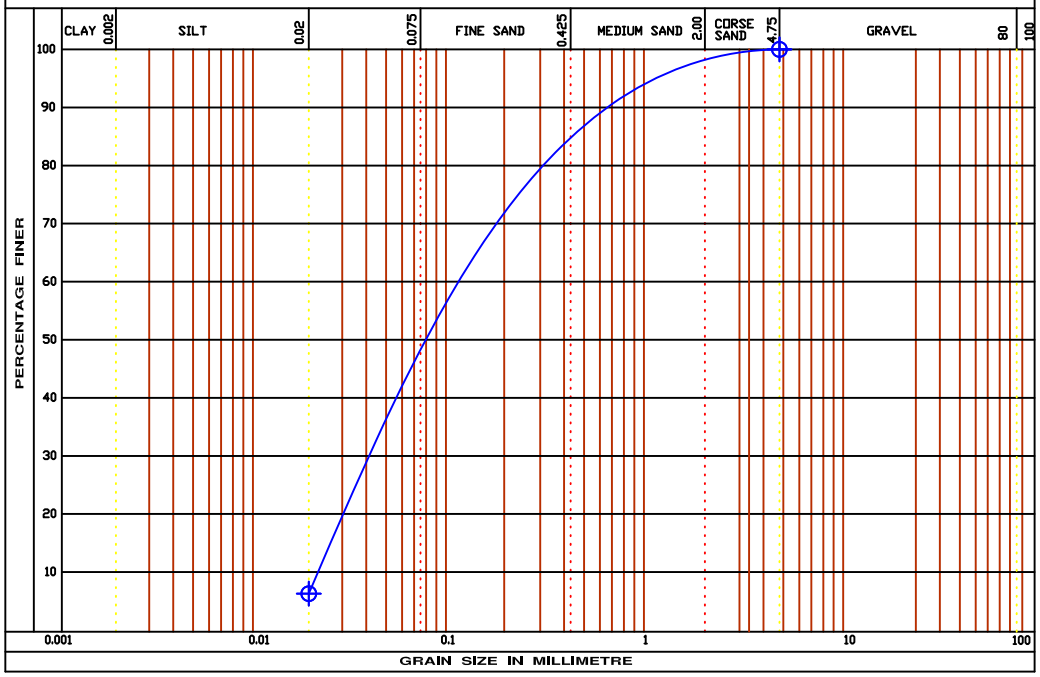
B.H NO:- 02



LOCATION: NTPC RAMAGUNDAM
DEPTH:4.00m

GRAIN SIZE DISTRIBUTION CURVE

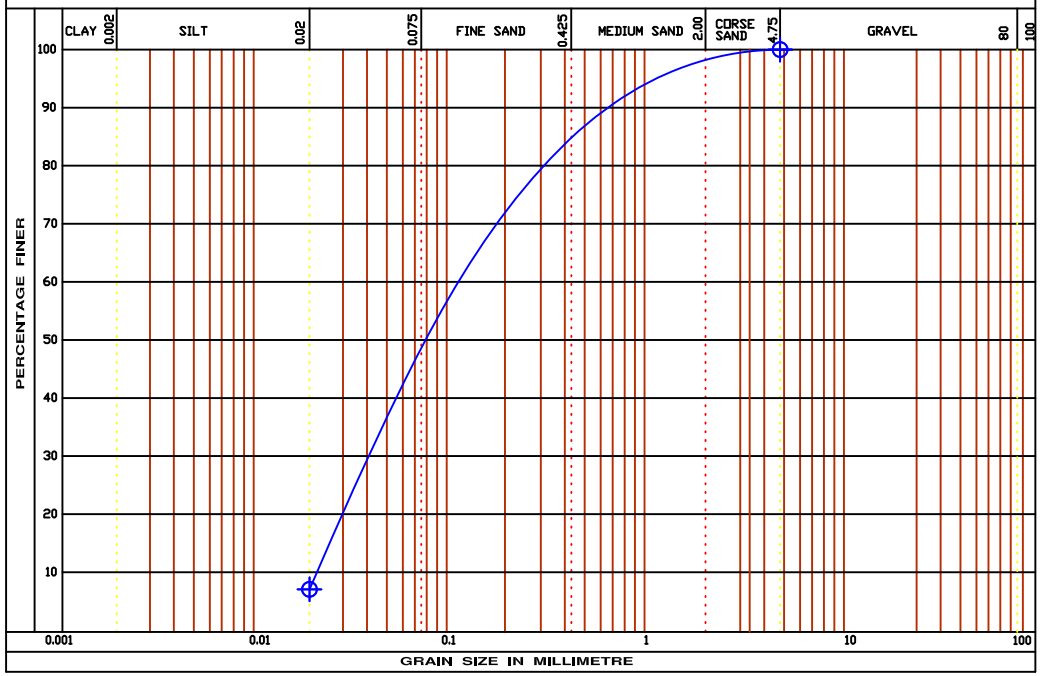
B.H NO:- 03



LOCATION: NTPC RAMAGUNDAM
DEPTH:9.20m

GRAIN SIZE DISTRIBUTION CURVE

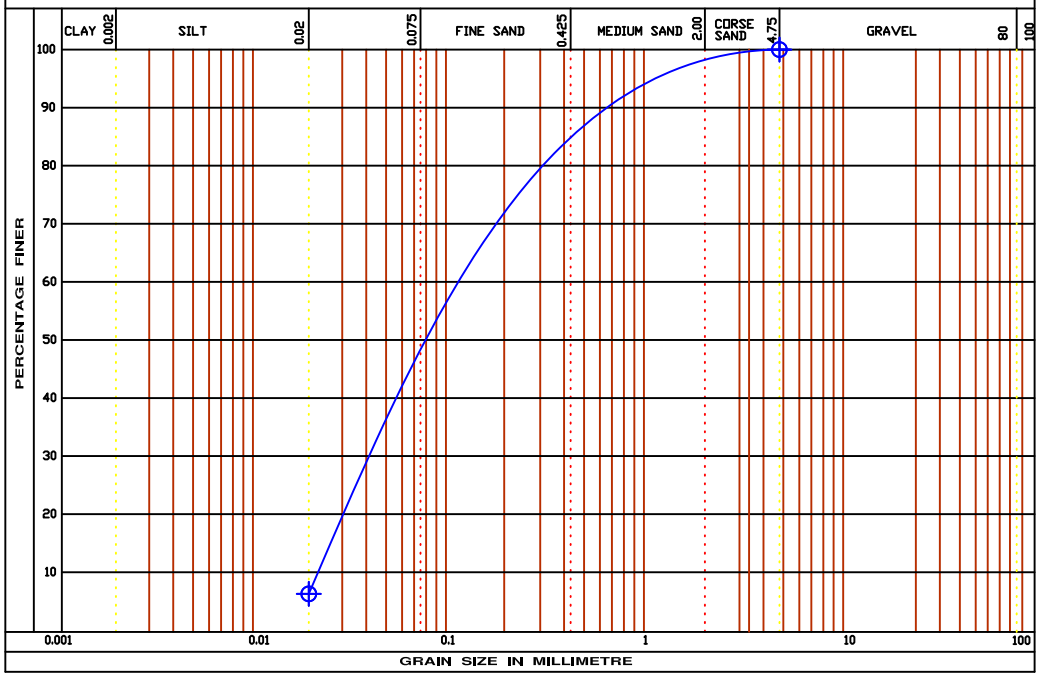
B.H NO:- 04



LOCATION: NTPC RAMAGUNDAM
DEPTH:11.00m

GRAIN SIZE DISTRIBUTION CURVE

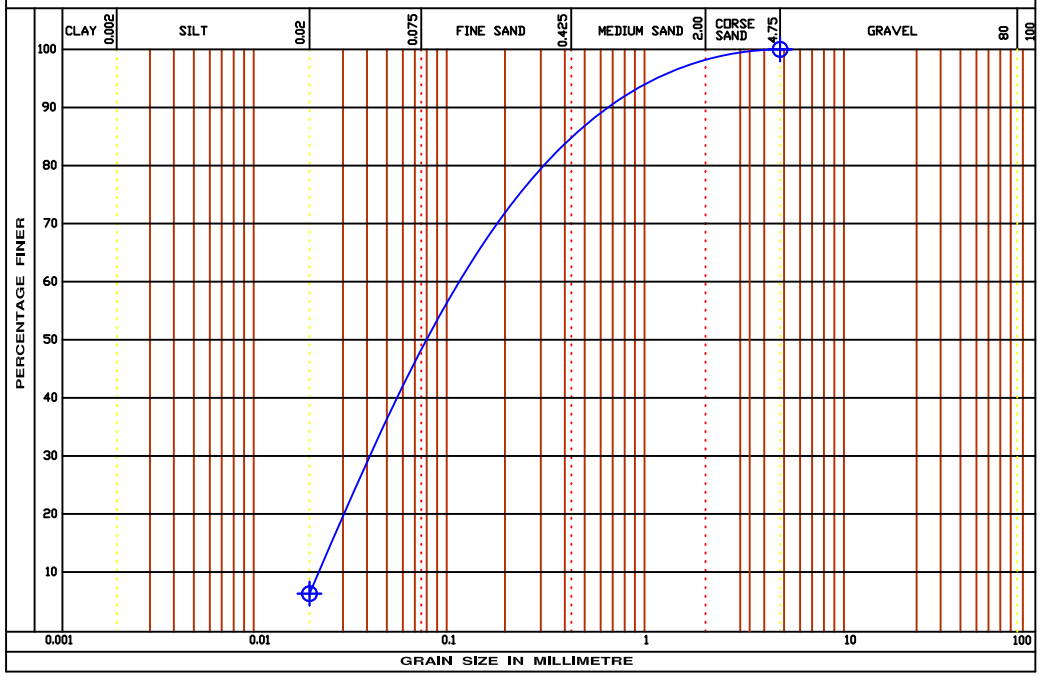
B.H NO:- 04



LOCATION: NTPC RAMAGUNDAM
DEPTH:4.00m

GRAIN SIZE DISTRIBUTION CURVE

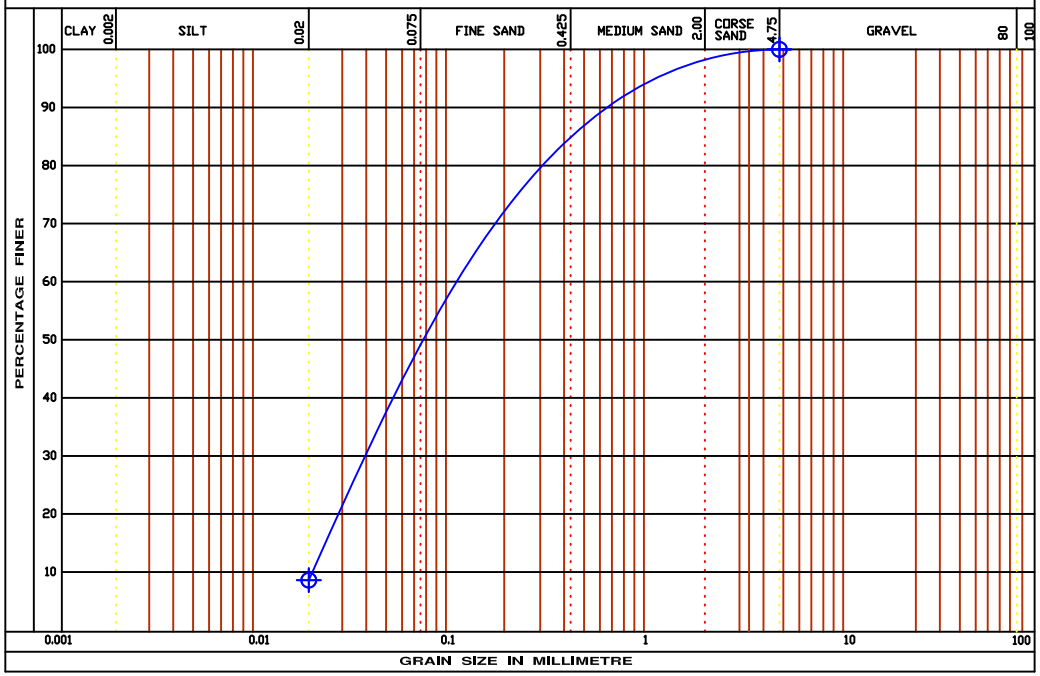
B.H NO:- 05



LOCATION: NTPC RAMAGUNDAM
DEPTH:5.00m

GRAIN SIZE DISTRIBUTION CURVE

B.H NO:- 01



DISCUSSION AND CONCLUSION

Based on the field and laboratory test results and the given Recommendations the following are summarized below:

- The sub – soils stratifications recorded in Boreholes are likely to be same in the Locations of BHEL (NTPC) Project. The Details of Strata have been summarized and presented below for the reference.
  - BH No -01 it is observed that the depth of water is 3.30m from bed level. Bellow 3.30m the top layer is Soft sandy stone up to a depth of 6.60m and the Stratum beneath the 1st layer was Medium to hard Sandy stone up to a depth of 8.50m.
  - BH No -02 it is observed that the depth of water is 3.80m from bed level. Bellow 3.80m the top layer is Soft sandy stone up to a depth of 6.80m and the Stratum beneath the 1st layer was Soft to medium sandy stone up to a depth of 8.80m.
  - BH No -03 it is observed that the depth of water is 1.90m from bed level. Bellow 1.90m the top layer is Soft sandy stone up to a depth of 5.80m and the Stratum beneath the 1st layer was Medium to hard Sandy stone up to a depth of 7.00m.
  - BH No -04 it is observed that the depth of water is 8.80m from bed level. Bellow 8.80m the top layer is Medium to coarse sand up to a depth of 9.30m, the Stratum beneath the 1st layer was Soft sandy stone upto a depth 11.00m & the Stratum beneath the 2nd layer was Medium to hard Sandy stone up to a depth of 14.00m.
  - BH No -05 it is observed that the depth of water is 3.60m from bed level. Bellow 3.60m the top layer is Medium to coarse sand up to a depth of 4.10m, the Stratum beneath the 1st layer was Soft sandy stone upto a depth 7.00m & the Stratum beneath the 2nd layer was Soft to medium sandy stone up to a depth of 8.80m.
- Since the project site has the presence of Sand Stone upto an average depth of 3.00m below the reservoir bed level, it is recommended to adopt Anchoring and Mooring method for the stabilization of facilities/floaters above water.

GEOLOGICAL INFORMATION

Ramagundam is a municipal corporation and city in the Peddapalli district of the Indian state of Telangana. It is the most populous city in the district and falls under the Peddapalli revenue division. It is located on the banks of the Godavari river. As of the 2011 census, the city had a population of 229,644, making it the 6th most populous in the state, and an urban agglomeration population of 242,979.

Geology

A wide variety of geological formations occur in Telangana state, ranging from the oldest Archaean crystalline formations to recent alluvium. The geological set up and principal aquifer system is presented in the Fig. A major part of the area is underlain by gneissic complex with a structural fill of sedimentary formations and basin-fill of meta-sedimentary formations. The gneissic complex is overlain by basaltic lava flows in the north-western part and is intruded by several younger rocks namely granites, dolerites, pegmatites and quartzites etc.

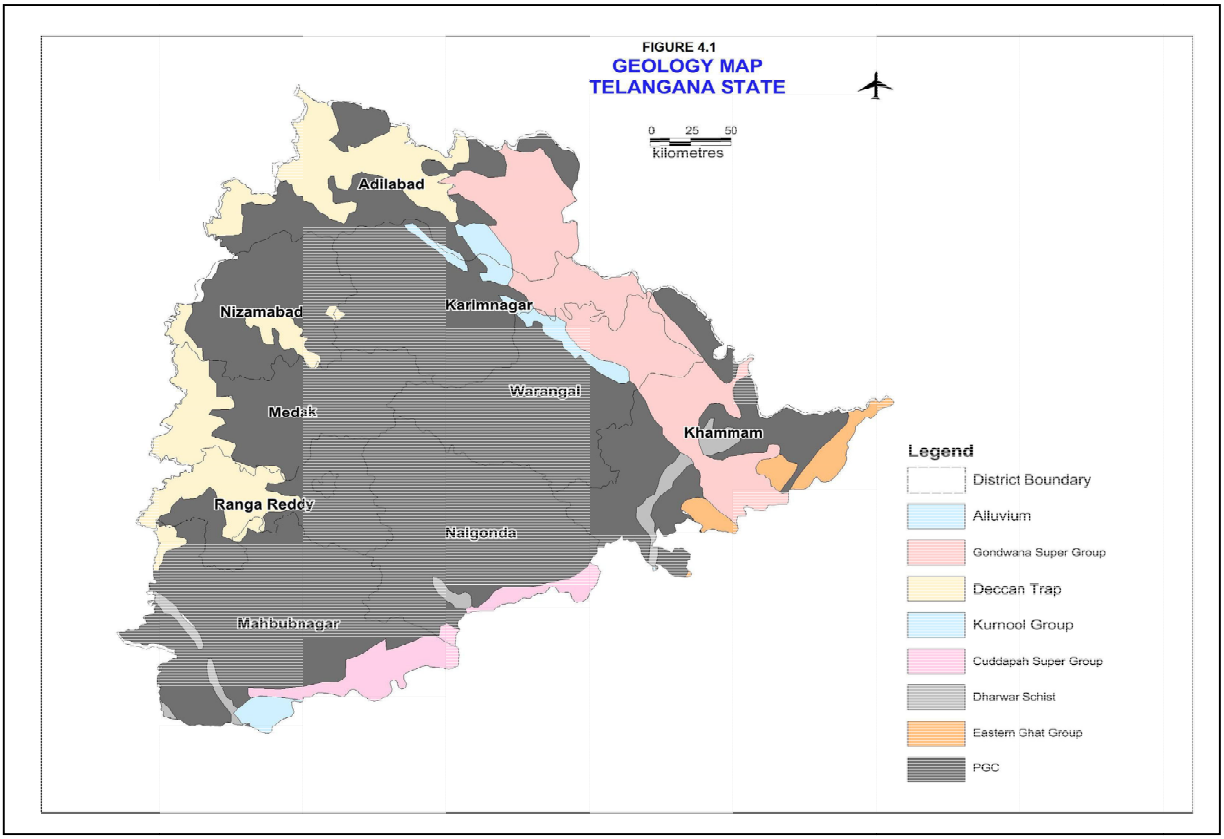


Fig.4.1: Geology of Telangana state

Climate

Ramagundam experiences dry inland climatic conditions with hot summers and cool winters. The city of Ramagundam gets most of its rainfall from the Southwest monsoon. The summer season is extremely hot, but temperatures decline with the onset of the monsoons, and the winter season is generally cool. The most popular season for tourism is from November to February.

The summer season starts in March and can continue through early June. During this period temperatures range from a minimum of 25 °C to a maximum of 40 °C. The highest recorded temperature in the area is around 47.3 °C.[9] Nights are much cooler, and the humidity is around 50%. The city experiences the most rainfall in July and August, from the Southwest monsoon, with the highest rainfall being 112mm and an average annual rainfall of 1129.2mm. During this time, daytime temperatures average around 32 °C. There is additional rainfall in September and October due to Northeast rainfall. The winter season starts in November and lasts through February. During this time, temperatures range from a minimum of 14 °C to a maximum of 32 °C.

Climate data for Ramagundam, India (1981–2010)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °C (°F)	30.5 (86.9)	33.4 (92.1)	37.2 (99.0)	40.1 (104.2)	41.9 (107.4)	37.3 (99.1)	32.5 (90.5)	31.4 (88.5)	33.1 (91.6)	33.1 (91.6)	31.6 (88.9)	30.2 (86.4)	34.4 (93.9)
Average low °C (°F)	15.7 (60.3)	18.3 (64.9)	21.9 (71.4)	25.6 (78.1)	28.2 (82.8)	27.2 (81.0)	25.1 (77.2)	24.6 (76.3)	24.5 (76.1)	22.1 (71.8)	17.7 (63.9)	14.6 (58.3)	22.1 (71.8)
Average precipitation mm (inches)	13.5 (0.53)	8.8 (0.35)	8.3 (0.33)	13.7 (0.54)	28.3 (1.11)	163.4 (6.43)	308.0 (12.13)	297.2 (11.70)	175.6 (6.91)	85.8 (3.38)	21.3 (0.84)	5.5 (0.22)	1,129.2 (44.46)

Source: Indian Meteorological Department[10]

Population Density

The population figures of the past 5 years should be checked. They are as per the following:

1. 2014 – 304,654
2. 2015 – 326,596
3. 2016 – 345,782
4. 2017 – 363,611
5. 2018 – 381,097

The population of Ramagundam from the time frame of 2014-18 has been listed above and it is noticed that the population increases by 76,443 in the span of the last 5 years. In terms of average, the population goes up by about 15,288.6 every year. The population of Ramagundam in 2019 is estimated to be 381,097 + 15,288.6 = 396,385.6. So, the population of Ramagundam in the year 2019 as per estimates = 396,385.6.Ramagundam Population 2019 –396,385.6. (estimated).

As per 2011, the city had a population of about 229,644. Males comprised 51% of the population and females 49%. It has a literacy rate of 69%; literacy of males is 75.3%, while literacy of females is 62.4%. 8% of the population of Ramagundam is under 6 years old. It is the solitary municipal corporation in Peddapalli area.

The population density of Ramagundam is 2400 persons per square kilometer. The population growth of the city in the past 10 years has gone down by about 2.9%. Hence, the population growth of Ramagundam is a tad slow in the current time. As per estimates, the city is expected to get a better population growth rate on the positive side in the coming years.

Rivers

Telangana is separated from Andhra Pradesh by the Krishna River, which acts as a geographical divider between the two. The Krishna River is the third-longest river of the country, originating in the Satara District of Maharashtra in the Western Ghats. This rivers flows across the state of Karnataka before reaching Telangana and Andhra Pradesh. Bhima is one of the prominent tributaries of Krishna River in Telangana.

River Godavari, the other most important river of Telangana, is the second-longest river of the country. This river originates in the Nashik district of Maharashtra and runs across the Deccan Plateau, before crossing Telangana and entering the Bay of Bengal. The river Manjeera is one of its major tributaries.

SITE PHOTOGRAPHS

Boring Work in progress

Soil & Rock Sample

Boring Work in progress

Boring Work in progress

Soil & Rock Sample

Soil & Rock Sample

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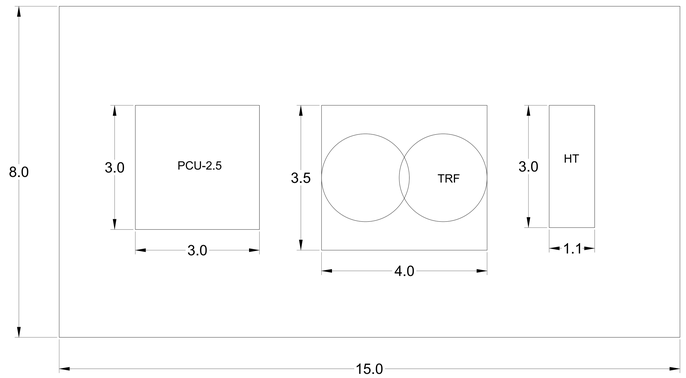
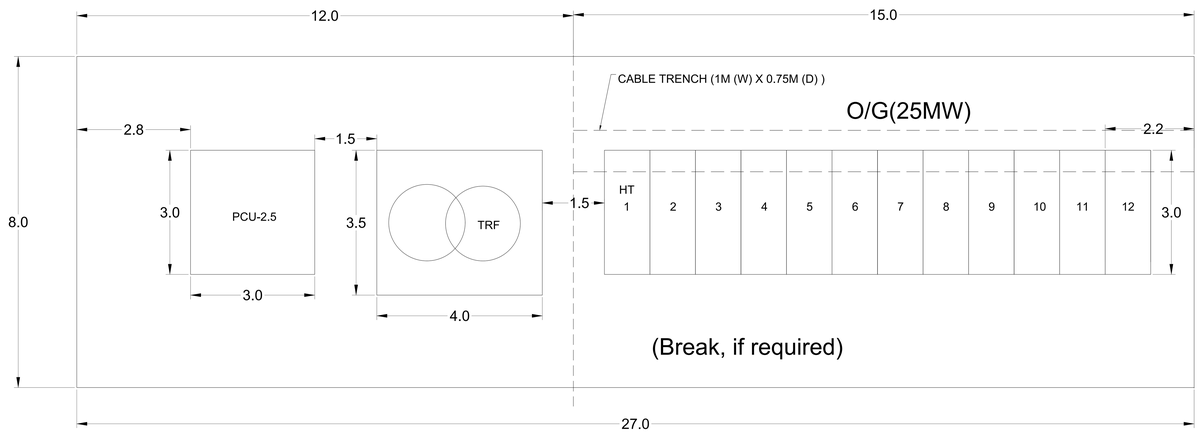
DRG. No.

Inverter Floater Platform (IFP)
-Qty:36Nos



Local Pooling Switchger Floater Platform (LPSFP)
-Qty:4 Nos



NOTE:
1.TRANSFORMER WEIGHT -12T
2.PCU WEIGHT -6T
3.HT PANEL WEIGHT-2T
4.TRANSFORMER HEIGHT -3.5M
5.PCU HEIGHT -2.5M
6.HT HEIGHT -2.8M

PROJECT: 100MW (AC) FSPV
CUSTOMER: NTPC, RAMAGUNDAM

REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED

	NAME	SIGN	DATE
DRAWN			
CHECKED			
APPROVED			

DISTRIBUTION OF PRINTS

DEPT.	CODE

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

TITLE: FLOATING PLATFORM FOR ELECTRICAL EQUIPMENT
EQUIPMENT LAYOUT (TENTATIVE)

No. OF SHEETS
SHEET No.
REV

All Dimension in Meter

BHEL DRG. No.

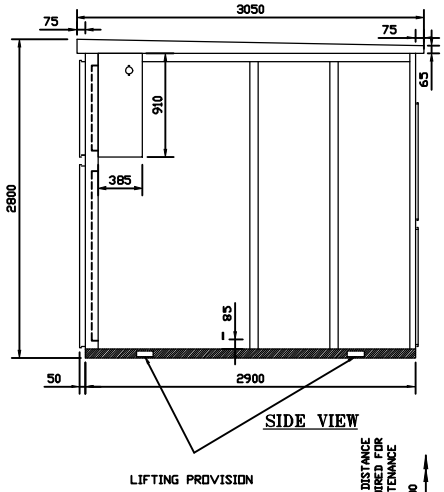
REF. DRG. No.
SIGN. & DATE
INVENTORY No.

FIRST ANGLE PROJECTION

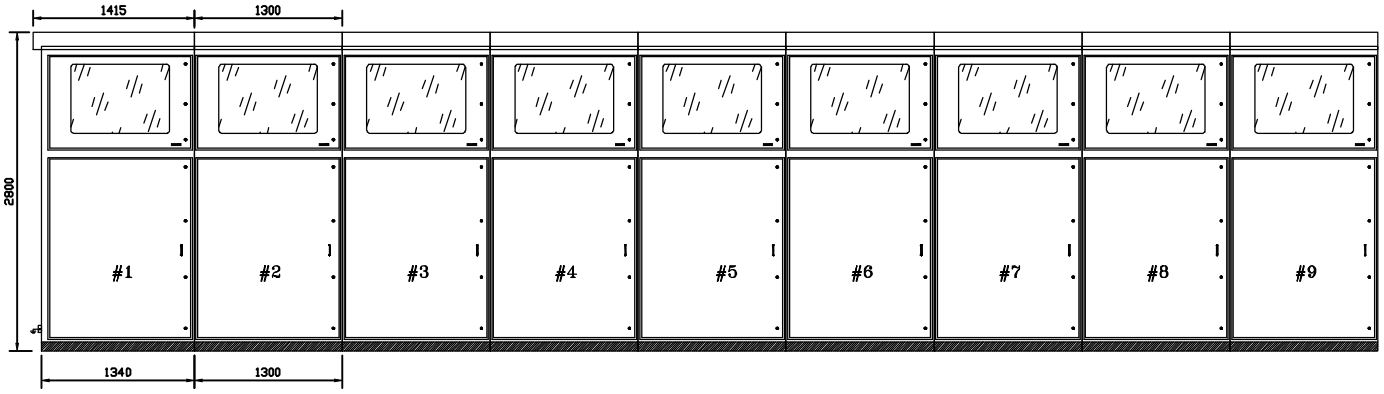
(ALL DIMENSIONS ARE IN mm)

1 521 00 5 2462

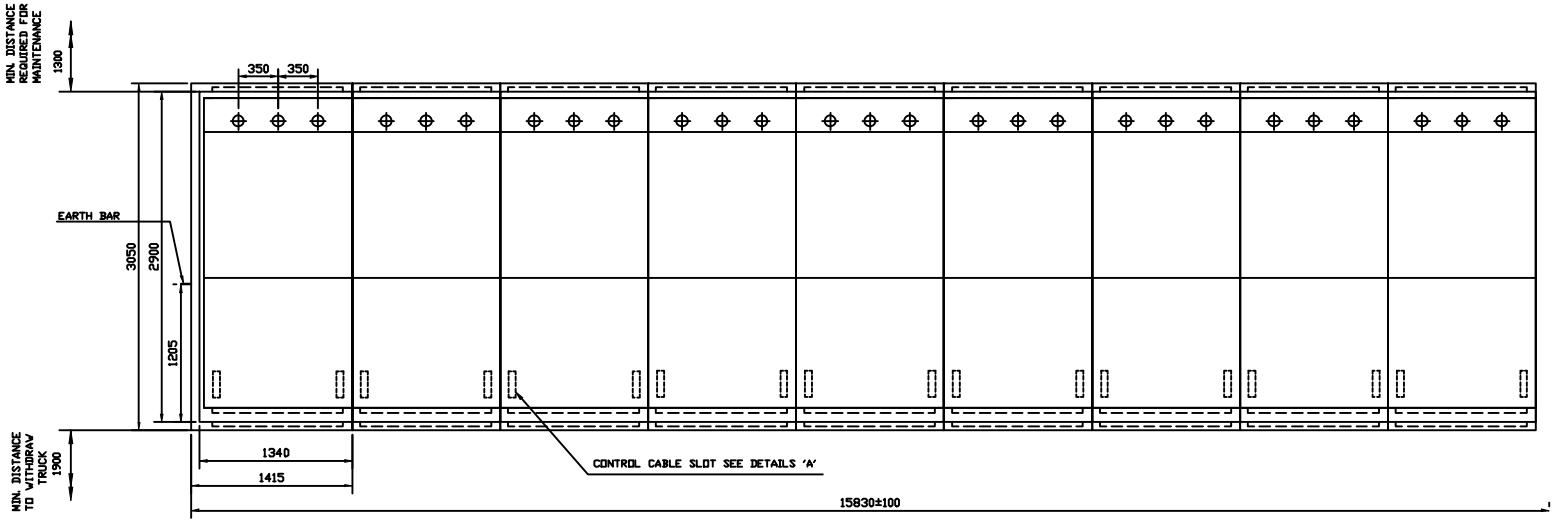
33 KV SWBD AT 25 MW POOLING SWITCHGEAR BLOCK-II



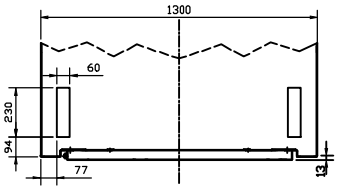
SIDE VIEW



FRONT VIEW



PLAN VIEW



DETAILS 'A'

(CONTROL CABLE OPENING DETAILS)

MDL NO :- 5747-004-PVE-Y-034

ADDITIONAL INFORMATION
W.O. NO :- 99029 T 47502
STATUS OF DRAWING

DISTRIBUTION OF PRINTS :-

TYPE OF PRODUCT:- VM-36
NAME OF PROJECT/ CUSTOMER:- 100MW SPV PLANT, NTPC, RAMAGUNDAM

BHARAT HEAVY ELECTRICALS LTD.
BHOPAL

	NAME	SIGN	DATE
DRN	S.K.S	SD/-	15/11/2019
CKD	S.K.S	SD/-	15/11/2019
APPD	M.H.N	SD/-	15/11/2019

NO. OF VAR. NA

REV.	DATE	ALTD	CHD	APPD

ZONE

DEPT	UNTOL. DIMS. GR.	SCALE	WEIGHT	REF TO ASSY	ITEM NO.	NO. OF ITEM
SWE CODE 409	C	NTS	NA	NA	NA	NA

TITLE
LAYOUT DRAWING OF 33KV SWBD.

DRG NO 1 521 00 5 2462

REV. 00

SHT. NO. 10 NO. OF SHT. 24

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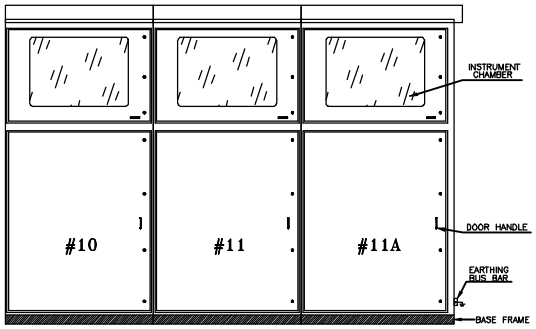
REF. DRG. NO. | SIGN & DATE | INVENTORY NO.

FIRST ANGLE PROJECTION

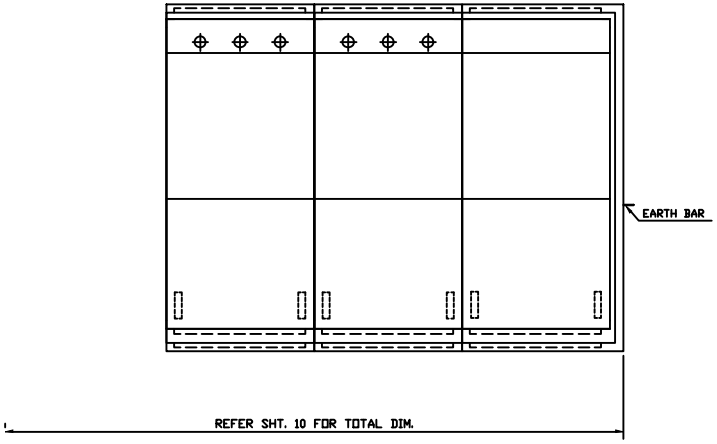
(ALL DIMENSIONS ARE IN mm)

1 521 00 5 2462

33 KV SWBD AT 25 MW POOLING SWITCHGEAR BLOCK-II



FRONT VIEW



PLAN VIEW

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REF. DRG. NO.

SIGN & DATE

INVENTORY NO.

MDL NO :- 5747-004-PVE-Y-034

ADDITIONAL INFORMATION
W.O. NO :- 99029 T 47502
STATUS OF DRAWING

DISTRIBUTION OF PRINTS :-

TYPE OF PRODUCT:- VM-36
NAME OF PROJECT/ CUSTOMER:- 100MW SPV PLANT, NTPC, RAMAGUNDAM

BHARAT HEAVY ELECTRICALS LTD.
BHOPAL

	NAME	SIGN	DATE	NO. OF VAR.
DRN	S.K.S	SD/-	15/11/2019	
CKD	S.K.S	SD/-	15/11/2019	
APPD	M.H.N	SD/-	15/11/2019	NA

REV.	DATE	ALTD	CHD	APPD

ZONE

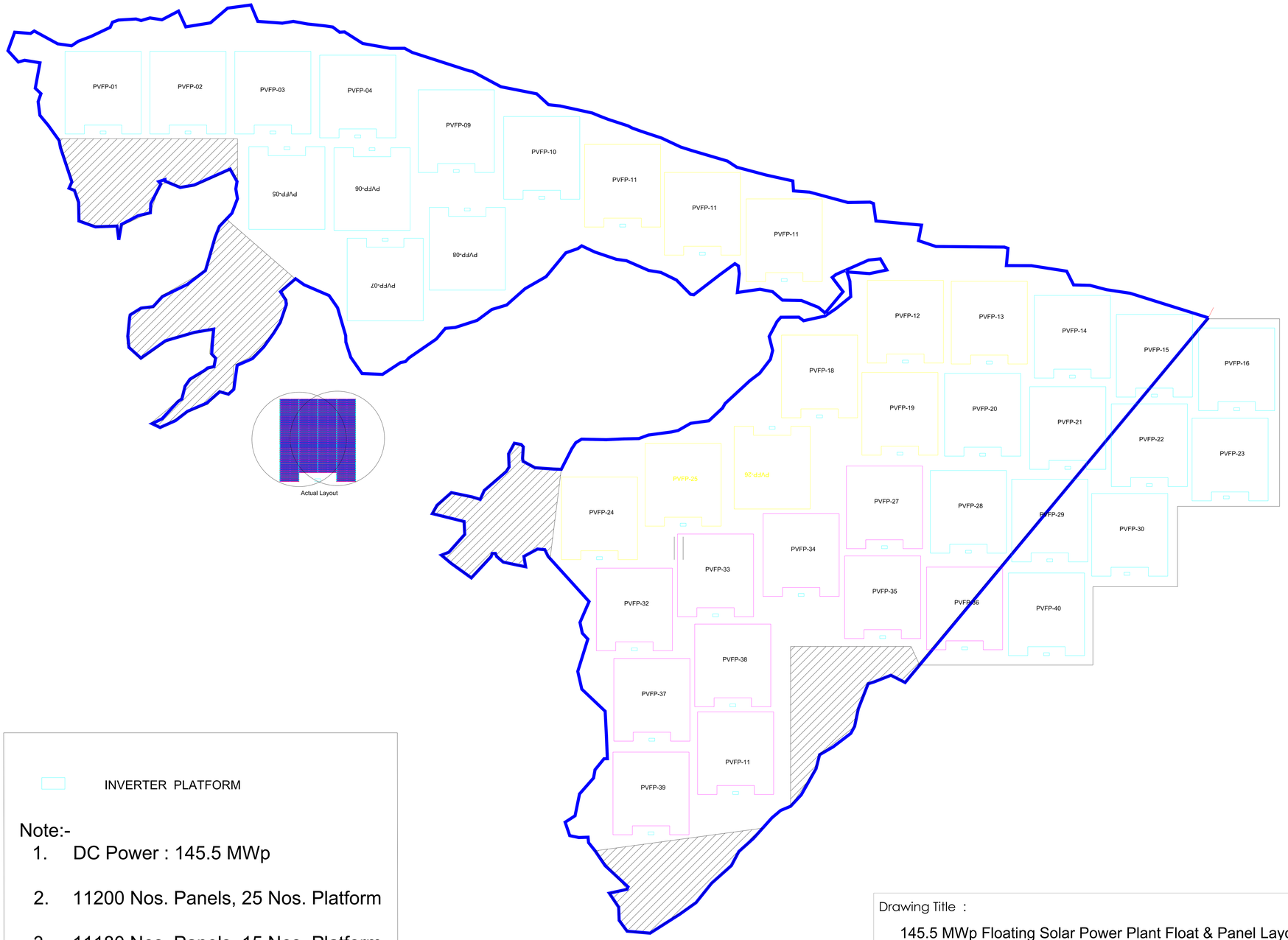
DEPT	UNTOL. DIMS. GR.	SCALE	WEIGHT	REF TO ASSY	ITEM NO.	NO. OF ITEM
SWE CODE 409	C	NTS	NA	NA	NA	NA

TITLE
LAYOUT DRAWING
OF 33KV SWBD.

DRG NO 1 521 00 5 2462

REV. 00

SHT. NO. 11 NO. OF SHT. 24



INVERTER PLATFORM

Note:-

1. DC Power : 145.5 MWp
2. 11200 Nos. Panels, 25 Nos. Platform
3. 11180 Nos. Panels, 15 Nos. Platform

All dimensions are in Meters

Rev No	Revision Note	Date	Signature	Checked
00	FOR APPROVAL	17/10/2019		

Drawing Title : 145.5 MWp Floating Solar Power Plant Float & Panel Layout			Project Developer: NTPC
Drawing No : ASL-SD-DW-11001020-03	Scale : NTS	Sheet Size : A1	Project Execution: BHEL
Project : NTPC Ramagundam Floating Power Plant		Project Number: ASL-SD-TP-11001020-19-FS	
Drawn: SP	17/10/2019	Sheet: 1 OF 1	C:\Users\sanup\Desktop\Drive\Adtech_New_logo.png
Chkd.		Rev: 00	
Appr. KN	17/10/2019		

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Technical Specification
For
Design, supply and installation of
floating platform for electrical equipment for 100 MW floating solar power plant at NTPC Ramagundam (Telangana), India

Approved by : PM			
Revision details: R00	Prepared VKC	Issued SCPV-ENGG	Date 03.12.2019

1.0 Introduction:

Bharat Heavy Electricals Limited (BHEL), Electronics Division, Bangalore is setting up a 100 MW Grid Connected Floating Solar Photovoltaic Power Plant for NTPC at Ramagundam-Telangana. This plant has to be set up in the Raw water reservoir of the thermal plant. 500 acres of water body is available for this project. This specification describes the requirements of the floating platform for electrical equipment of the FSPV plant.

Bidder to submit the filled technical offer data sheet annexed to this specification for evaluation of technical offer.

2.0 Location / approach particulars of the power plant:

100 MW Floating Solar PV Plant shall be setup at NTPC Ramagundam by BHEL. The project site is situated at District Peddapalli of state Telangana. The Nearest Highway is NH-63(10KM). The nearest Railway Station is Ramagundam (05 Km). The nearest Commercial Airport is Hyderabad (260 Km). The area to be covered for setting up the plant is 500-600 Acres of water body. Site is a natural raw water pond for the thermal plant at NTPC Ramagundam.

Bidders have to necessarily visit the site before quoting. Bidder to give request to BHEL for arranging Site Visit. No claim regarding site conditions shall be entertained after opening of tender.

3.0 Vendor's scope of supply and Installation:

A. Supply Scope:

3.1. Design and supply of complete Floatation platforms along with accessories:

Design & Supply of Complete Floatation platforms along with all its accessories as per requirement of this specification. This design has to be approved by BHEL and End Customer-NTPC. Two types of floating platforms to be supplied along with all its accessories. One is called Inverter Floater Platform (IFP) and other is local pooling switchgear Floater Platform (LPSFP). The quantities to be supplied are as follows:

Sr. No.	Description of Floatation Platforms	No. of Platforms
1	Inverter floater Platform (IFP)	36
2	Local pooling switchgear Floater Platform (LPSFP)	04

3.2. Design and supply of Anchoring and Mooring system for the platforms, as above- 40 sets

3.3. Supply of spares and other maintenance material for above platforms (As per **manufacture's recommendation** for a life cycle of 25 years): 40 sets

B. Service Scope:

3.4. Installation and commissioning of floating platform in water body including underwater Anchoring and Mooring- 40 AU (1 AU for 1 Set of Platform and their anchoring & mooring)

3.5. AMC requirements of Platforms as per specification: 10 AU (1 AU for 1 Year)

3.6. Supervision during mounting of electrical equipment on platforms by BHEL: 1 AU (Lumpsum basis)

Note: Any other scope which is not a part of the above list, but is required for the successful establishment of the Floating Platforms is to be included in their prices as per above heads only. Loading, unloading, security, transportation etc. of all supply material from vendor shall be in vendor's scope only. BHEL shall only provide available space for storage of materials.

4.0 Enclosures to this Specification:

1. Drawing /Photographs of the Reservoir.
2. Bathymetric survey report of Water Body
3. Geo-technical Investigation Report of Water Body.
4. Tentative layout of equipment on Platform for tender purpose only.
5. Tentative Array layout

5.0 Warranty for Floating system:

Each Floater unit used in the plant must be warranted against crack, puncture, fissures, breakage, corrosion etc. for which bidder shall assure for integrity of the whole system for 25 years from date of successful completion of trial run. The fasteners/clamping arrangements, if used also has to be warranted against its sequential failure.

Vendor has to provide 10 year's warranty for his Supply BOQ and I&C of Floatation platforms and Anchoring/Mooring. In addition to above Vendor has to provide the complete installation manual for the I&C of their floatation system and the O&M requirements of this floatation system.

6.0 Details of electrical equipment which is to be floated on platform:

6.1. There are two types of floating platforms required. One is called Inverter Floater Platform (IFP) and other is local pooling switchgear Floater Platform (LPSFP). PCU's, HT panels, and Transformers are the major equipment which shall be placed on these floating platforms. Further, it has provisions of easy passage of O&M persons and cable entry/exit, as required. The typical equipment layout of both the floating platform is attached for your understanding along with approx. maximum weights of the equipment. However, actual layout and weights shall be provided along with order for design purpose.

6.2. Suitable arrangement for Embedded metallic frames, lugs etc. for welding the equipment base to the floor also has to be provided. The dimension details of the welding requirements shall be provided during detailed engineering.

6.3. For placement of cables of HT panels on LPSFP, a provision of 1000mm (W)X 750mm (Depth) cable trench should be made below the panels. The HT panel Layout drawing is attached for position of cables. Necessary arrangements for cable entry form 9 other IFP to LPSFP shall be provided as per requirement.

6.4. Any customization required considering base plate for transformers, HT/LT Panels, PCU & Cable etc. shall be done by the bidder as per requirement of BHEL/Customer during drawing approval.

7.0 Detailed specification of Floating Platform:

7.1. General Requirements:

a. The floating platforms shall be suitable for operations in inland waters. The platforms shall be designed and built in accordance with the requirements of the rules and regulations of IRS (Indian Register of Shipping) or any Classification Society who is member of International Association of Classification Society (IACS) or Reputed Institutes like IITs, technical universities etc. or an accredited naval Architecture Firm, as applicable.

b. The platforms built can be tested by Indian Registry for stability, tilt angle, buoyancy, trim and freeboard etc. The original certificates with three copies shall be handed over prior to delivery of platforms.

c. The working life of the platforms shall be minimum 25 years, the life expectancy to be certified by the applicable Inspecting agency.

d. All costs and fees for inspection and approval of Class and Regulation Bodies for the necessary certificates shall be borne by the bidder only.

e. Any material/ fitting/ equipment or procedure not described or left out of these specifications, but considered as normal and necessary for intended services of these platforms shall be supplied and fitted by the vendor without any extra charge.

f. The platform is to be stationed at different locations in the reservoir as per the requirement of the project. If required, these platforms may need to be moved from its stationed location to bank of the reservoir and back for major maintenance activity of the equipment. Suitable provisions shall be given for the movement of the platforms. The procedure for movement of platform shall be submitted to BHEL.

g. The platform should have suitable mooring arrangements along with anchors to be provided for sustaining the conditions given in specification. Detailed design and calculation in this regard to be prepared and same to be approved by BHEL/Customer/customer's consultant before installation. The winches, anchor chain, mooring ropes, shackles etc. shall be as per the class requirement. The requirement of mooring at shore with appropriate arrangement through steel wire rope of adequate dia. shall also be provided.

7.2. Design of Floating Platforms:

a. The platform should be designed to withstand minimum **twice the imposed load** as specified in this technical specification.

b. The floating platform, all accessories and anchoring system shall be designed for base wind speed of 158.4 km/hr.

c. Reservoir details:
Full reservoir Level (FRL):168 M
Minimum Drawdown Level (MDDL):162.30 M
Depth of water: Approx. 10-12 Meters.

Wave Height: 1 Meter

The bathymetric survey report as well as the geotechnical investigation report of water body is attached for reference.

d. Following shall also be considered in designing the floating platforms:

Draft (In loaded Condition): 0.80 M

Safe heel angle: 3°

Extreme heel angle: 10°

Freeboard: Minimum 1 M

Detailed structural design calculations, three dimensional analysis, CFD along with manufacturing drawings shall be prepared and same to be approved by BHEL/Customer/customer's consultant before start of manufacturing.

7.3. Material and workmanship:

The floating platform shall be made of **steel/HDPE/FRP or precast or cast in-situ fixed platform.**

The material may be chosen for the working life of 25 years and have a high Resistance to Impact, De-gradation, Chemicals, UV rays, corrosion etc. Further, the offered material shall fulfill all the requirement of this specification. The details of material offered shall be submitted along with technical offer.

Steel may be mild steel of IS 2062 E250 Grade B or Stainless Steel.

In case of HDPE, use of re-cycled material shall not be accepted. Proof of purchase of virgin material to be submitted. Applicable test certificate from approved laboratory to be submitted. Vendor shall propose the physical parameters of the materials proposed along with the technical offer.

Precast or cast in-situ fixed platform may be of concrete or Ferrocement.

All materials, equipment, and other necessary fittings used shall be new and of very good marine quality.

All Fasteners, connecters, fittings and linking arrangements of platforms should be of an approved standard.

Handrails of Stainless steel (SS304) of minimum 1 M height should be provided all around the floating platform. Step ladder for access from boat or land with handrail to the platform shall also be provided.

The Raw material test certificates, as applicable shall be submitted along with supply and at the time of Pre-Shipment Inspection(s).

Manufacturing: In case of steel, the platforms shall be of all welded steel construction. Welding shall be of high quality, and shall be performed by Classification Society approved personnel. Welding procedures shall be in accordance with the rules and regulations of Class. Necessary precautions shall be taken to eliminate deformations.

In case of material other than steel, the suitable manufacturing process accordance with the rules and regulations of Class shall be adopted.

7.4. Size and Load requirements of the floating platform:

7.4.1. There are two types of floating platform required. One is called Inverter Floater Platform (IFP) and other is local pooling switchgear Floater Platform (LPSFP). The minimum size of Platforms are as follows:

Size of IF: 15 M X 8 M (Usable Surface Area 120 SqM)

Size of LPSFP: 27 M X 8 M (Usable Surface Area 216 SqM).

Note: The above size is minimum requirement for the platforms. Bidder can quote higher sizes than the above requirement as per their design and manufacturing capabilities. However, no additional price will be paid for quoting higher sizes of platform. LPSFP may be divided into two platforms of sizes 15 M X 8 M and 12 M X 8 M. However, proper arrangement of connection between these two platform to be ensured with minimum gap as this shall be used as a single platform only. For quoting prices also, these platforms shall be considered single only.

7.4.2. The Height of electrical equipment on the platform above top surface are as follows:
PCU: 2.5 M
Transformers: 3.5 M
HT Panel: 2.8 M

7.4.3. The approx. maximum weight of Electrical equipment on the platform above top surface are as follows:
PCU: 6 MT
Transformer: 12 MT
HT Panel: 2 MT

The major weight concentration of transformers is at 1/2 to 1/3 height from bottom whereas for PCU and HT Panel it is at bottom of the equipment.

7.4.4. Adequate space shall be provided for handling of equipment and movement of personnel and load of the same shall be considered suitably in design of platforms.

7.5. Design and supply of Anchoring and mooring system

a. The design life of the Anchoring system shall be **25 years**.

b. The floating platform and associated anchoring system shall be designed as per base wind speed as given above and able to withstand dynamic conditions as per IS 875-3.

c. The design of the mooring system shall permit minimal lateral movement of the plant in case of maximum wind loads (as per IS 875-3).

d. Anchoring design report for the project showing that the system could support the maximum wind load on site shall be submitted to NTPC.

e. Water variability: The mooring system should accommodate any fluctuations in water level. Further, the orientation of the equipment needs to be maintained; hence, any fluctuations in water level shall allow minimal movement of the electrical equipment as per mooring system design.

f. The materials used in the anchoring system shall not contaminate the water and affect the aquatic ecosystem.

g. The design of complete system, including CFD modelling, comprising of Floating unit and anchoring system, shall be verified by suitable third party NABL accredited agency/ reputed institutions like IITs, technical universities etc. and submitted for NTPC's approval.

h. Detailed structural and stability calculations shall be submitted for BHEL/NTPC approval.

7.6. Painting and Preservation:

The platforms have to be painted/preserved to withstand severe atmospheric corrosion conditions. The platforms shall be designed/painted/preserved for the corrosion category C4 of BS EN ISO 12944-2. **No re-painting of the platforms shall be allowed up to 25 years**, hence for any type of corrosion, Suitable corrosion prevention mechanism shall be provided. The bidder has to provide warranty against corrosion for minimum 25 Years.

In case of mild steel, the platform is to be cleaned of mill-scale by blast cleaning and coated with an approved high quality marine primer prior to fabrication also. After Fabrication, high quality marine grade paint with sufficient no. of coats shall be applied for corrosion resistance in water for minimum life of 25 years.

Paint specifications and Painting scheme are to be submitted for approval by the BHEL/End Customer before start of any painting works. Primer and Paints of approved make by BHEL/End Customer shall only be used for painting of platforms. Certification from paint manufacturer regarding corrosion resistance capability of the paint for a life of 25 years to be submitted with painting scheme.

After installation of equipment, auxiliaries etc. damaged paint work is to be repainted in original colours and quality. Painting work shall be executed in accordance with paint manufacturer's recommendations. Copper alloy, aluminium, aluminium alloy, stainless steel, non-ferrous materials and galvanized surfaces shall not be painted unless otherwise specifically required.

Non-slip paint is to be applied on the main deck open areas, as applicable.

7.7. Quality Requirements:

The IRS/ Appropriate Classification society shall approve the design before commencement of the manufacturing. The cost of the same shall be borne by the bidder. Quality and Inspection check while manufacturing shall be certified by the IRS/ Appropriate Classification society.

Vendor to submit the MQP (for Supply) and FQP (For I & C) of the Floatation platform and mooring & anchoring system for approval of BHEL/Customer. The MQP and FQP to essentially take care of all the criteria as listed in the technical requirements of this specification.

Vendor shall indicate the contact addresses of any special Test labs or Institutions where the component/ building materials or samples of the Floating platforms are to be sent for carrying out any validation or analysis.

A suitable testing procedure to check for water-tightness is to be prepared and submitted to BHEL for approval as a part of MQP. The tests must be carried out after the completion of manufacturing and before painting, if applicable.

7.8. Test reports

Pre-Shipment Inspection (PSI) Call should accompany the following reports:

1. Raw Material test certificates

2. Internal inspection report as per approved MQP and FQP.

3. Photographs of the offered lot.

BHEL- EDN will go through the reports and depute personnel for PSI.

PSI to be by BHEL/TPI/Customer (NTPC).

Before dispatch of material BHEL/NTPC may carry out required tests on random samples of Raw Material from the NABL accredited testing lab for Raw Material chemical properties, Mechanical properties etc. The cost towards all these tests shall be borne by vendor.

7.9. List of applicable Standards:

The floatation system must conform to the latest edition of IEC/equivalent standards for floating system design qualification and type approval, as applicable. The reports verified by third party NABL national or international accredited agency shall be submitted for approval to BHEL/NTPC.

Indian codes, and/or standards shall govern, in all the cases wherever they are available. In case of a conflict between such codes and/or standards and the specifications, the stringent provisions shall govern. Such codes and/or standard referred to shall mean the latest revision, amendments/changes adopted and published by the relevant agencies. In case of any further conflict in this matter the same shall be referred to the Engineer-In-charge, whose decision shall be final and binding.

Other internationally acceptable standards shall be accepted, only if, no Indian Standards are existing.

8.0 Annual Maintenance Contract (AMC) Requirement:

Vendor has to furnish AMC for 10 years from the date of successful installation of the floating platform. This AMC shall include the following:

a. Attending to and resolving any breakdown/fault of the floatation platform.

b. Mandatory one half yearly visit for the first 3 years to assess the floating platform for any failure or any sign which may lead to subsequent failure. Vendor to send the assessment report to BHEL through email.

c. 1 visit annually from fourth year till the end of tenth year. Vendor to send the assessment report to BHEL through email.

d. All payments towards AMC to be paid after submission of assessment report only.

Vendor to clearly indicate the AMC requirements of floating platform. Vendor to provide the O&M manual to BHEL.

9.0 Supply of spare parts and other maintenance materials:

The spare parts and other maintenance materials, as required for standard wear and tear of the planforms & their accessories including anchoring and mooring system to be supplied as per manufacturer's recommendations. A list of recommended spares and other maintenance materials for 25 years of life along with its approximate quantities shall be submitted by the bidder along with their technical offer. However, in case any new spare parts required in this duration for maintenance of the system which is not recommended by the bidder, the bidder will supply the same free of cost to BHEL.

10.0 Installation and commissioning of floating platform in water body including Anchoring and Mooring:

10.1. Bidder to Install the floating platform at site. The procedure/methodology of anchoring, mooring and installation and commissioning of platforms shall be submitted for approval to BHEL/End Customer before start of I & C.

10.2. Motorised boat and Jetty required for anchoring, mooring, installation and commissioning of platforms shall be arranged by Bidder only. BHEL will not provide any tools, plant and machinery for installation and commissioning activities of platforms.

11.0 Supervision during mounting of electrical equipment on platforms by BHEL:

11.1. Placing of electrical equipment on to the platforms shall be done by BHEL E & C contractor at site under close supervision and direction of floater manufacturer.

11.2. Bidder to provide instructions for installation of electrical equipment onto the platform.

11.3. Supervision shall be done in such a way that no re-installation/modification occurred in placement of equipment later.

12.0 Guidelines to the bidder to be followed during I & C of Floating Platforms including anchoring and mooring:

A. General Guidelines:

12.1 The work shall be executed in the premises of NTPC Ramagundam, hence rules and regulations pertaining to entry of manpower in their premises shall be binding on the bidder.

12.2 The bidder will have to indemnify BHEL against all claims for injury or damage to any person or property caused by his negligence of his employees whilst in NTPC premises, Observance of Labor & Industrial Laws, including regular remittance to EPF and ESI, All claims by way of compensation and all other types of unforeseen claims, which may arise in the period of I &C.

12.3 The Contractor will accept liability for compensation in accordance with the provision of the Indian Worker's Compensation Act, 1948, amendments thereafter and or other law for the time being in force for personal injury caused to any workmen by accident arising out of and in the course of I &C.

B. Safety Guidelines:

12.4 The contractor has to assume full responsibility of the safety of the vehicles/ equipments/ manpower and to comply with the security/ safety regulations of BHEL/NTPC, as applicable, while working at site. The total safety of operation and laborers is bidder's responsibility.

12.5 Bidder should provide Personnel Protective Equipment (PPE) and Consumables, as applicable, to each laborer during execution of the I &C, at his own cost. The Biddder and his workers must strictly take all safety precautions and shall supply to his workers dependable safety appliances like life jackets, hand gloves, safety boots, safety belt, safety helmets, duster cloth, dust mask/nostril filter etc., as applicable.

12.6 Safety Clearance from NTPC to start I &C will be obtained by the bidder.

12.7 Rescue boat with minimum 4 nos. lifejackets and trained swimmer shall be deployed on continuous basis during entire period of I & C. Underwater jobs entailing diving, underwater anchoring, placement etc. shall be carried out only by certified scuba divers/workmen. All diving gears shall be tested and certified by qualified person at the site for each diver.

12.8 One qualified safety officer shall be deployed during entire I & C period.

13.0 General conditions applicable during supply, installation and commissioning including anchoring and mooring:

13.1 Vendor shall organize construction power supply on their own. Accordingly, if required, DG sets of suitable capacity shall be deployed by the vendor for construction works. Alternatively, vendor may arrange temporary power supply connection from local electric supply body after due formalities.

13.2 Similarly, water required for construction works shall be organized by vendor. Vendor shall organize bore wells at the site if required. In case bore well is not successful, vendor shall make their own alternate arrangements (water tankers etc).

13.3 All machinery such as cranes, hydra, JCBs, forklifts, transport trucks, trolleys, concrete mixers, Ajax machines etc necessary for movement and installation of materials shall be organized by the vendor.

13.4 All necessary tools and tackles such as screw driver set, power screw drivers, cutting pliers, nose pliers, spanner sets, adjustable spanners, hole saw cutter set, bending tools, torque wrenches, hack saw blades, pipe wrenches, flat / round files, drilling machines, welding machines, steel bar bending tools / templates for RCC works, spade, shovel, hammer etc shall be organized by the vendor.

13.5 All necessary measuring instruments such as measuring tapes, spirit levels etc. shall be organized by the vendor.

13.6 Vendor shall make their own arrangements for necessary food, drinking water and accommodation for their labour and employees posted at the site. Similarly, food and drinking water required at the site, during the construction operations, shall also be in scope of vendor.

13.7 Vendor shall organize all necessary steps to meet statutory requirements such as labour license, PF, ESI, insurance etc. and also ensure compliance with relevant acts such as minimum wages act, income tax act, employee insurance act, BOCW act etc. for their labour deployed at site.

13.8 Vendor shall organize activities such as receipt of all supply items of Watch Tower at site, unloading from the trucks, safe storage at site, movement from storage location to point of construction etc. Vendor shall deploy their own security watch and ward to safeguard their supply items from pilferage. Insurance for the supplied items until the completion of erection of all the Watch Tower shall be the responsibility of vendor.

13.9 Vendor shall maintain updated labour register, with name, age, qualification, salary, attendance details etc at the site.

13.10 Vendor shall use danger boards, wherever required, to ensure safety of the persons during the work at site.

13.11 Vendor shall adhere to all necessary safety norms such as use of helmet, goggles, hand gloves, gumboots, aprons etc. It is the ultimate responsibility of the vendor in all respect to prevent accidents at the site and safeguard their labour from accidents.

13.12 Vendor shall, at the completion of every work, clear off the debris, which resulted out of their work.

13.13 Vendor shall carry out the work without causing inconvenience to other contract groups at the site. In case of conflicts with other groups, vendor shall ensure that the matter is resolved at once amicably so that the progress of work is not affected.

13.14 Any damages on the other buildings, structures etc. of the site, if attributable to the acts of labour / employees of vendor, shall be rectified and made good by the vendor at their own cost.

13.15 No child labour shall be employed for execution of the present contract.

13.16 Any miscellaneous materials, which are found essential for technical completion of the contract but not mentioned explicitly in this specification, shall be deemed to be included in the specification. Accordingly, such materials shall be included by the vendor as part of the offer.

13.17 BHEL / End customer shall witness routine / acceptance tests performed at manufacturer works for the items supplied by vendor. Vendor shall accordingly provide inspection call to BHEL with submission of quality assurance plan in advance.

For the items bought out from dealers, test certificates, as per relevant IS / IEC standards, as issued by manufacturer shall be submitted to BHEL. However, prior approval shall be obtained from BHEL/ End customer for procurement of the item from dealers.

13.18 Field Quality Plan / Quality control system: Vendor shall make arrangements for testing of all construction materials in accordance with FQP (Field quality control plan) as approved by BHEL/ End customer. If required for this purpose, an exclusive testing laboratory shall be established at site. Vendor shall deploy a well experienced quality control engineer to monitor all QC activities at site as per approved FQP.

13.19 Any deviations during construction shall be discussed with BHEL / End customer site engineers and implementation shall be taken up only after approval from BHEL / End customer.

13.20 Vendor shall submit periodic status report, on daily as well as weekly consolidated basis, to BHEL on the progress of the contract.

14.0 Completion Schedule:

Sr. No.	Activity	Time Schedule
1	Submission of detailed design document of platform, methodology of manufacturing, Anchoring & mooring design, Manufacturing Quality Plan (MQP), Filed Quality Plan (FQP) for Anchoring & mooring, paint specification & painting scheme, as applicable along with all drawings for approval of BHEL/End customer	2 Weeks from date of PO
2	Supply of platforms	32 Weeks from the date of approval of design and drawings by BHEL/End Customer
3	I & C of Platforms including anchoring and mooring at site	8 weeks from date of receipt of material at site
4	Supervision during mounting of electrical equipment on platforms by BHEL	As per requirement of BHEL

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ANNEXURE-A

TECHNICAL OFFER DATA SHEET

(To be filled and submitted along with Technical offer)

Sl. No.	Description	Please Fill
1	Name of the Firm (Bidder)	
2	Address of the Firm (Registered Office)	
3	Name of Contact Person	
4	Contact Numbers	
5	Email ID	

Sl. No.	Description	Status/Data Submitted	Remarks (Attach annexure wherever required)
1	Type of Material of the floating platform offered	Submitted/Not submitted	Type of material and their details like chemical/mechanical properties, details of its suitability to marine application to be submitted.
2	Confirmation of site visit	Submitted/ Not submitted	Vendor has to necessarily visit the site before quoting. A declaration regarding visit of site on bidder's letter head to be submitted.
3	Size of IFP offered		To be filled here
4	Size of LPSFP offered		To be filled here. If divided, the details of offered sizes to be mentioned.
5	Certification Authority for approval of design and built, as applicable		The details of Certification Authority for approval of design and built, as applicable to be mentioned
6	Confirmation of acceptance of Technical specification	Submitted/ Not submitted	Sealed and signed copy of BHEL tender technical specification to be submitted.
7	List of spares and other maintenance material	Submitted/ Not submitted	List of spares and other maintenance materials for above platforms as per manufacture's recommendation for a life cycle of 25 years to be submitted

Annexure-1

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____ _____ _____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions:

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors

6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.

6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 - Independent External Monitor(s)

8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.

8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.

8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.

8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.

8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.12 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.

9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

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

10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

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For & On behalf of the Principal	For & On behalf of the Bidder/ Contractor
(Office Seal)	(Office Seal)
Place----------	
Date----------	
Witness:_____	Witness:_____
(Name & Address) _____	(Name & Address) _____
_____	_____

ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division
PB 2606 , Mysore Road Bangalore , 560026 INDIA

SCPV: BOS: ITB - Rev 04

INSTRUCTIONS TO BIDDERS (ITB)

Bidders are requested to read the instructions carefully and submit their quotations covering all the points:

A. GENERAL INSTRUCTIONS:

1. Any Purchase Order resulting from this enquiry shall be governed by the Instructions to Bidders (document reference: SCPV: BOS: ITB – Rev 01), General Conditions of Contract (document reference: SCPV: BOS: GCC - Rev 01) and Special Conditions of Contract (document reference: SCPV: BOS: SCC: I - Rev 01/ SCPV: BOS: SCC: F - Rev 01), if any, of the enquiry.
2. Any deviations from or additions to the "General Conditions of Contract" or "Special Conditions of Contract" require BHEL's express written consent. The general terms of business or sale of the bidder shall not apply to this tender.
3. Bidders (also includes the term suppliers / contractors wherever used in this document) are instructed to quote their most competitive price and best delivery, etc. in the offer. Prices should be indicated in both figures & words. **(Please also refer clause 11 under section B)**
4. Regret letter (either through post or by mail) indicating reasons for not quoting must be submitted without fail, in case of non-participation in this tender. If a bidder fails to respond against 3 consecutive tenders for the same item, he will be liable for removal as a registered vendor of BHEL.
5. Procurement directly from the manufacturers shall be preferred. However, if the OEM / Principal insist on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from the manufacturer / supplier and his agent, bid received from the agent shall be ignored.
6. Consultant / firm (and any of its affiliates) shall not be eligible to participate in the tender/s for the related goods for the same project if they were engaged for consultancy services for the same project.
7. If an Indian representative / associate / liaison office quotes on behalf of a foreign based bidder, such representative shall furnish compulsorily the following documents:
   a. Authorization letter to quote and negotiate on behalf of such foreign-based bidder.
   b. Undertaking from such foreign based bidder that such contract will be honored and executed according to agreed scope of supply and commercial terms and conditions.
   c. Undertaking shall be furnished by the Indian representative stating that the co-ordination and smooth execution of the contract and settlement of shortages / damages / replacement / repair of imported scope till system is commissioned and handed over to customer will be the sole responsibility of the Indian representative / associates / agent / liaison office.
8. In case of imported scope of supply, customs clearance & customs duty payment will be to BHEL account after the consignment is received at Indian Airport / Seaport. Bidders must provide all original documents required for completing the customs clearance along with the shipment. Warehousing charges due to incomplete or missing documentation will be recovered from the supplier's bill. All offers for imported scope of supply must be made from any of the gateway ports (within the country) indicated. **(Refer Annexure I)**
9. The offers of the bidders who are on the banned list and also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of the banned firms is available on BHEL website: **www.bhel.com.**

10. Business dealings with bidders will be suspended if they are found to have indulged in any malpractices / misconduct which are contrary to business ethics like bribery, corruption, fraud, pilferage, cartel formation, submission of fake/false/forged documents, poor quality, certificates, information to BHEL or if they tamper with tendering procedure affecting the ordering process or fail to execute a contract, or rejection of 3 consecutive supplies or if their firms / works are under strike / lockout for a long period.

B. <u>GUIDELINES FOR PREPARATION OF OFFER:</u>

1. Quotation shall be submitted in Single Part Bid, Two Part Bid or Three Part Bid, as called for in the tender:
   - **SINGLE PART BID**: Technical and Commercial Bid with prices along with price summary & filled in BHEL Standard Commercial terms and conditions in a single sealed envelope.
   - **TWO PART BID**: Unpriced offer i.e. "Techno-commercial Bid" with filled in BHEL Standard Commercial terms and conditions in a sealed envelope **along with the copy of the "Price Bid" without the prices** should be enclosed in one cover and the cover must be super scribed **"Techno-commercial offer** and Priced offer i.e. "Price Bid" containing price summary in a separate sealed envelope and must be super scribed **"Price Bid"**. Both these envelopes shall be enclosed in a single sealed envelope super scribed with enquiry number, due date of tender and any other details as called for in the tender document.
   - **THREE PART BID**: Pre-qualification Bid (Part-I), Techno Commercial Bid with filled in BHEL Standard Commercial terms and conditions (Part-II), and Price Bid (Part-III). All three envelopes shall be enclosed in a single sealed envelope super scribed with enquiry number due date of tender and any other details as called for in the tender document.

   If any of the offers (Part I, Part II or Part III) are not submitted before the due date and time of submission at the venue/place specified or if any part of the offer is incomplete the entire offer of the bidder is liable for rejection.

2. Supplier shall ensure to super scribe each envelope with RFQ number, RFQ Date, RFQ Due date and time, Item Description and Project clearly & boldly. Also mention on the envelope whether it is "Techno Commercial Bid" or "Price Bid" or "Pre-Qualification Bid". Please ensure complete address, department name and purchase executive name is mentioned on the envelope (before dropping in the tender box or handing over) so that the tender is available in time for bid opening.
3. BHEL standard Commercial Terms and Conditions shall be duly filled, signed & stamped and must accompany Technical-Commercial offer without fail and should be submitted in original only. Photocopy will not be accepted. All documents submitted along with the offer shall be signed and stamped in each page by authorized representative of the bidder.
4. Any of the terms and conditions not acceptable to supplier, shall be explicitly mentioned in the Techno-Commercial Bid. If no deviations are brought out in the offer it will be treated as if all terms and conditions of this enquiry are accepted by the supplier without any deviation.
5. Deviation to this specification / item description, if any, shall be brought out clearly indicating "DEVIATION TO BHEL SPECIFICATION" without fail, as a part of Techno-Commercial Bid. If no deviations are brought out in the offer it will be treated as if the entire specification of this enquiry is accepted without deviation.
6. Suppliers shall submit one set of original catalogue, datasheets, bill of materials, dimensional drawings, mounting details and / or any other relevant documents called in purchase specification as part of Technical Bid.
7. "Price Bid" shall be complete in all respects containing price break-up of all components along with all applicable taxes and duties, packing & forwarding charges (if applicable), freight charges (if applicable) etc. Once submitted no modification / addition / deletion will be allowed in the "Price Bid." Bidders are advised to thoroughly check the unit price, total price to avoid any discrepancy.
8. In addition, bidder shall also quote for erection & commissioning charges (I&C charges), documentation charges, service charges, testing charges (type & routine), training charges, service tax, etc. wherever applicable. The price summary must indicate all the elements clearly.
9. Vendors should indicate "lump sum" charges (including To & Fro Fare, Boarding, Lodging, Local Conveyance etc.) for Supervision of Erection, Commissioning and handing over to customer. The quotation shall clearly indicate scope of work, likely duration of commissioning, pre-commissioning checklist and service tax (if any).
10. Wherever bidders require PAC (Project Authority Certificate) for import of raw materials, components required for Mega

Power Projects, Export Projects, MNRE Concession or other similar projects wherein supplies are eligible for customs duty /Excise duty benefits, lists and quantities of such items and their values (CIF) has to be mentioned in the offer. Prices must be quoted taking into account of such benefits.

11. All quotations shall be free from corrections /overwriting. Corrections if any should be authenticated with signature and seal. Any typographical error, totalling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per **Annexure VI** "Guidelines for dealing with Discrepancy in Words & Figures – quoted in price bid". BHEL decision will be final.

C. <u>GUIDELINES FOR OFFER SUBMISSION:</u>

1. Offers / Quotations must be dropped in tender box before 13.00 Hrs. on or before due date mentioned in RFQ. The offers are to be dropped in the proper slot of the Tender Box kept in our reception area with caption "CE, SC&PV, DEFENCE." Tenders are opened on 3 days in a week (Monday/Wednesday/Friday). Tender must be deposited in the slot corresponding to the day (Monday - Box no.4/Wednesday - Box no. 6 /Friday - Box no.8) while depositing the offer. **(This clause will not be applicable for e-tenders).**

2. E-Mail / Internet / EDI offers received in time shall be considered only when such offers are complete in all respects. In case of offers received through E-mail, please send the offer to the email IDs within time of submission of tender.
3. In cases where tender documents are bulky, or due to some reasons tender documents are required to be submitted by hand or through posts/couriers, the offers are to be handed over to purchase officers.
4. Tenders will be opened on due date, time and venue as indicated in the RFQ in the presence of bidders at the venue indicated in the RFQ. In case of e-procurement, bidders can see tender results till seven days after due date and time.
5. Vendor will be solely responsible:
   a. For submission of offers before due date and time. Offers submitted after due date and time will be treated as "Late offers" and will be rejected.
   b. For submission of offers in the correct compartment of the tender box based on the day of due date (Monday/Wednesday/Friday). Please check before dropping your offer in the correct tender box.
   c. For depositing offers in proper sealed condition in the tender box. If the bidder drops the tender in the wrong tender box or if the tender document is handed over to the wrong person BHEL will not be responsible for any such delays.
   d. For offers received through email/courier etc., suppliers are fully responsible for lack of secrecy on information and ensuring timely receipt of such offers in the tender box before due date & time.
   e. In case of e-tender, all required documents should be uploaded before due date and time. Availability of power, internet connections, etc. will be the sole responsibility of the vendor. Wherever assistance is needed for submission of e-tenders, help line numbers and executives of service provider of BHEL may be contacted.
   Service provider: e-Procurement Technologies Limited (abc Procure)
   Website address: https://bhel.abcprocure.com
   Helpline no.: +91-79-68136819/809/862/867/823/872/842 (9:30 am to 5:30 pm)
   10:00 AM - 07:00 PM (Monday - Friday)
   10:00 AM-04:00 PM (Saturday)
   Purchase Executive / BHEL will not be responsible for any of the activities relating to submission of offer.

D. <u>PROCESSING OFFERS RECEIVED:</u>

1. Any discount / revised offer submitted by the supplier on its own shall be accepted provided it is received on or before the due date and time of offer submission (i.e. Part-I bid). The discount shall be applied on pro-rata basis to all items unless specified otherwise by the bidder.
2. Changes in offers or Revised offers given after Part-I bid opening shall not be considered as a part of the original offer unless such changes / revisions are requested by BHEL.
3. In case there is no change in the technical scope and / or specifications and / or commercial terms & conditions by BHEL, the supplier will not be allowed to change any of their bids after Technical bids are opened (after the due date and time of tender opening of Part-1 Bid).

4. In case of changes in scope and/ or technical specifications and/ or commercial terms & conditions by BHEL and it accounts for price implications from vendors, all techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid. Impact price will be applicable only for changes in technical specification / commercial conditions by BHEL. The impact price must be submitted on or before the cut-off date specified by BHEL and the original price bid and the price impact bid will be opened together at the time of price bid opening. Impact price means only for those items which have been impacted by addition / deletion / changes in the technical specifications or commercial conditions. The impact may be +/- incremental value of the currency in which originally quoted. The impact price bid to be submitted on the cut-off date, time & venue as specified by BHEL. The impact price bid shall be opened along with original price bid.
5. Un-opened bids (including price bids) will be returned to the respective bidders after release of PO and receipt of order acknowledgement from the successful bidder.
6. After receipt of Purchase Order, supplier should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and / or any other relevant documents as per Specification / Purchase Order, as and when required by BHEL / Customer.
7. Any deviation to the terms and conditions not mentioned in the quotation by supplier in response to this enquiry will not be considered, if put forth subsequently or after issue of Purchase Order, unless clarification is sought for by BHEL EDN and agreed upon in the Purchase Order.
8. Evaluation shall be on the basis of delivered cost (i.e. "Total Cost to BHEL"). As per RFQ terms.
   "Total Cost to BHEL" shall include total basic cost, packing & forwarding charges, taxes and duties, inspection charges, freight charges, test charges, insurance, service tax for services, any other cost indicated by vendor for execution of the contract and loading factors (for non-compliance to BHEL Standard Commercial Terms & Conditions). Benefits arising out of Nil Import Duty on Mega Projects, Physical Imports or such 100% exemptions & MNRE Exemptions (statutory benefits), customer reimbursements of statutory duties (like Excise Duty, CST, VAT) will also be taken into account at the time of tender evaluation. (Wherever applicable and as indicated in SCC document of tender)
9. For evaluation of offers in foreign currency, the exchange rate (TT selling rate of SBI) shall be taken as under:

Single part bids:	Date of tender opening
Two/three part bids:	Date of Part-I bid opening
Reverse Auction:	Date of Part-I bid opening

   In case of Performance Bank Guarantee (PBG) also, exchange rate will be considered as mentioned above for converting foreign currency to Indian currency and vice versa.

   If the relevant day happens to be a bank holiday, then the exchange rate as on the previous working day of the bank (SBI) shall be taken.
10. Ranking (L-1, L-2 etc.) shall be done only for the techno-commercially acceptable offers and on the basis or evaluation of Total Cost to BHEL.

E. <u>INFORMATION ON PAYMENT TERMS:</u>

1. All payments will be through Electronic Fund transfer (EFT). Vendor has to furnish necessary details as per BHEL standard format **(Refer Annexure IV)** for receiving all payments through NEFT. (Applicable for Indian vendors only)
2. Statutory deductions, if any, will be made and the deduction certificate shall be issued. In case vendor does not provide PAN details, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act. (Applicable for Indian vendors only).Foreign vendors shall submit relevant details of their bankers like Swift Code, Banker's Name & Address etc.
3. Vendors must submit bills & invoices along with required supporting documents in time. Incomplete documentation / delayed submission of invoice / documents will result in corresponding delay in payment.

F. STANDARD PAYMENT TERMS OF BHEL-EDN

Purchase Orders for indigenous procurement

(a) SUPPLY WITH I&C/SUPERVISION:

Supply:

1) 80% of basic Supply value + 100% of taxes, duties and freight charges will be paid with 45 days credit from the receipt of material at site or 15 days credit from the date of submission of complete set of documentation whichever is later.
2) 10% of basic supply value will be paid on completion of I&C against submission of supplementary invoice along with proof of completion of I&C along with I&C charges (if any).
3) Balance 10% (retention money) against submission of supplementary invoice along with PBG valid for Warranty Period+3 months Claim Period from BHEL Consortium Bank.

I&C/Supervision*:* 100% on completion of I&C/Supervision and certification line item wise on pro-rata basis.

O&M: 100% O&M charges are payable as per RFQ terms against report certified by BHEL.

(b) SUPPLY ONLY:

1) 100% of Basic value with taxes, duties and freight will be paid with 45 days credit from the receipt of material at site or 15 days credit from the date of submission of complete set of documentation whichever is later)+ submission of PBG valid for Warranty Period+ 3 months Claim Period from BHEL Consortium Bank ,if applicable.

Purchase orders for import procurement:

(c) SUPPLY WITH I&C/SUPERVISION:

Supply:

1) 80% of the basic value (excluding I&C charges) will be paid with 45 days credit, against Sight draft, from the date of AWB/BOL on submission of complete set of documents as in PO.
2) 10% of basic supply value will be paid on completion of I&C against submission of supplementary invoice along with proof of completion of I&C along with I&C charges (if any).
3) Balance 10% (retention money) against submission of supplementary invoice along with PBG valid for Warranty Period+3 months Claim Period from BHEL Consortium Bank.

I&C: 100% on completion of I&C/Supervision and certification line item wise on pro-rata basis.

(d) SUPPLY ONLY:

1) 100% of PO value will be paid against Sight draft with 45 days Credit from the date of dispatch or 15 days credit from the date of submission of complete set of documents whichever is later)+ submission of PBG valid for Warranty Period+3 months Claim Period from BHEL Consortium Bank ,if applicable.

Note for (a), (b), (c) and (d): In exceptional cases, if vendor fails to submit PBG after supplies, vendors can also accept for the final 10% payment, payable after the warranty period + 3 months of claim period against supplementary invoice subject to the completion of commissioning (if applicable) as PBG is linked to Warranty period.

G. LOADING FACTORS FOR PAYMENT TERMS & DELAYED DELIVERY:

Loading factors as detailed below will be added to the quoted price (basic) to evaluate the lowest quote for non-compliance of BHEL standard commercial term.

Sl No	Deviation on	Nature of Deviation / Offered Terms	Loading %
1.	**Payment Terms**	**For Purchase within India :-**	
		1) Credit period less than 45 days	15
		*** For Foreign Purchase :-**	
		~~1) Payment through At Sight Letter of Credit~~	~~10~~
		~~2)Payment through Letter of Credit with usa~~ of 45 days	
		~~3) Sight Draft with credit period less than 45~~	
2.	**Penalty for Delayed Delivery**	1) Non – Acceptance	10
		2) Partial Acceptance (X%)	(10 – X)

Please see last page (Page No.9) for Loading Factors for foreign Purchase

*** All bank charges shall be to seller's account. If bank charges of BHEL banker are to BHEL's account then additional loading of 2% on the quoted basic value is applicable.**

Offer/s with payment terms other than the standard payment terms indicated at Clause No. F or Deviated Payment Terms with loading indicated at Clause No. G above are liable for rejection.

NOTES:

1. ADVANCE PAYMENT/LC: Quotations with "Advance payment/Inland LC" shall be rejected.

2. Basic value of Purchase Order mentioned above will include all components of the purchase order and will exclude only taxes, duties, freight and I&C charges (wherever applicable).

3. Wherever the Purchase Order is split into import portion and indigenous portion of supply the retention money will be 10% (as applicable) of both purchase order values put together.

4. Non-Compliance of Warranty terms. Offers not complying with Warranty terms as per RFQ Terms is liable for rejection.

5. SALE IN TRANSIT/ LOCAL VAT: Sale in transit under section 6(2) of CST is allowed if movement of goods is interstate. In case intra state movement of goods, benefit of sale in transit is not available.

6. In case of intrastate movement i.e. supply within same state and VAT is applicable, the vendor shall furnish the respective BHEL's nodal agency TIN no. and address in their invoice. (Refer **Annexure IX**)

H. BANK GUARANTEE (BG) / PERFORMANCE BANK GUARANTEE (PBG):

1. Bank guarantee (BG) / Performance bank guarantee (PBG) will be applicable as called in the tender documents. Such PBG shall be valid for a period of Warranty Period + claim period of 3 months for a value equal to 10 % of the basic value of the purchase order. No deviation for the duration of PBG / BG will be permitted.
    a. PBG shall be from any of the BHEL consortium of bankers **(refer Annexure V)**.
    b. PBGs from nationalized banks are also acceptable.

c. PBG should be sent directly by the bank to the dealing executive mentioned in the purchase order located at the address mentioned in the purchase order. PBG should be in the format indicated. **(Refer Annexure III)**. No deviation to these formats will be allowed.

d. Confirmation from any of the BHEL consortium of banks or any of the Indian Public Sector Banks is essential for the acceptance of PBGs issued by foreign banks (located outside India).

e. Expired BGs / PBGs will be returned only after expiry of the claim period or on completion of the contractual obligation.

f. In case vendor does not accept for submission of PBG, the vendor is liable for rejection on commercial grounds.

I. DOCUMENTS (TRIPLICATE COPIES) REQUIRED AT THE TIME OF DISPATCH FOR PROCESSING OF BILL:

1. FOR INDIGENOUS SCOPE OF SUPPLY:

For Supply: Invoice in Triplicate, Lorry receipt (LR) copy, Packing List, PSI Call Letter Copy, Proof of delivery such as MRC (Material Receipt Certificate)/ original acknowledged LR, Insurance intimation Letter and Warranty Certificate. Note that document pertaining to Proof of delivery shall clearly mention number of boxes/panels etc which shall be in line with the Packing list.

For I&C: Supplementary Invoice in Triplicate with copy of I&C Certificate (Proof of Completion of I&C).

For PBG: Supplementary Invoice in Triplicate with copy of PBG. However, PBG should reach concerned Purchase Officer directly from the Bank.

2. FOR IMPORTED SCOPE OF SUPPLY:

For Supply: Invoice in Triplicate, Air Way Bill/Bill of Lading, Packing List, PSI Call Letter Copy, and Warranty Certificate.

For I&C: Supplementary Invoice in Triplicate with copy of I&C Certificate (Proof of Completion of I&C).

For PBG: Supplementary Invoice in Triplicate with copy of PBG. Both PBG & supplementary invoice should reach concerned Purchase Officer directly from the Bank.

J. PROVISONS APPLICABLE FOR MSE VENDORS (MICRO AND SMALL ENTERPRISES)

Vendors who qualify as MSE vendors are requested to submit applicable certificates (as specified by the Ministry of Micro, Small and Medium Enterprises) at the time of vendor registration. Vendors have to submit any of the following documents along with the tender documents in the Part I / Technical bid cover to avail the applicable benefits.

a. Valid NSIC certificate or

b. Entrepreneur's Memorandum part II (EM II) certificate (deemed valid for 2 years).

c. EM II certificate with CA certificate **(in the prescribed format given in Annexure VIII)** applicable for the year certifying that the investment in plant and machinery of the vendor is within permissible limits as per the MSME Act 2006 for relevant status where the deemed validity is over.

d. Documents submitted for establishing the credentials of MSE vendors must be valid as on the date of part I / technical bid opening for the vendors to be eligible for the benefits applicable for MSE vendors. Documents submitted after the Part I / Technical bid opening date will not be considered for this tender.

PURCHASE PREFERENCE FOR MSE VENDORS:

e. MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 25% of the requirement against this tender provided. Minimum of 3% reservation for women owned MSEs within the above mentioned 25% reservation.

1. The MSE vendor matches the L1 price.
2. L1 price is from a non MSE vendor.
3. L1 price will be offered to the nearest vendor nearest to L1 in terms of price ranking (L2 - nearest to L1). In case of non-acceptance by the MSE vendor (L2) next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band).
4. 25% of the 25% (i.e. 6.25% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (1) and (2) are fulfilled.
5. In case no vendor under SC / ST category firms are meeting the conditions mentioned in (1) and (2) or have not participated in the tender, in such cases the 6.25% quantity will be distributed among the other eligible MSE vendors who have participated in the tender.

6. Serial no. 1 to 5 will not be applicable wherever it is not possible to split the tendered quantity / items on account of customer contract requirement, or the items tendered are systems. Such information that tendered quantity will not be split will be indicated in the SCC.

K. INTEGRITY COMMITMENT IN THE TENDER PROCESS, AND EXECUTION OF CONTRACTS:

1. Commitment by BHEL:

BHEL commits to take all measures necessary to prevent corruption in connection with the Tender process and execution of the Contract. BHEL will, during the tender process, treat all bidder / suppliers in a transparent and fair manner, and with equity.

2. Commitment by Bidder(s)/ Contractor(s):

a. The Bidder(s)/ Contractor(s) commit(s) to take all measures to prevent corruption and will not directly or indirectly try to influence any decision or benefit which he is not legally entitled to.
b. The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding or any actions to restrict competition.
c. The Bidder(s)/ Contractor(s) will not commit any offence under the relevant Acts. The Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain or pass on to others, any information or document provided by BHEL as part of business relationship.
d. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to the relevant guidelines issued from time to time by Government of India/ BHEL.

If the Bidder(s) / Contractor(s), before award or during execution of the Contract commit(s) a transgression of the above or in any other manner such as to put his reliability or credibility in question, BHEL is entitled to disqualify the Bidder(s) / Contractor (s) from the tender process or terminate the contract and/ or take suitable action as deemed fit.

L. FRAUD PREVENTION POLICY:

The bidder along with its associate/collaborators/sub-contractors/sub-vendors/consultants/service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.
Fraud Prevention policy and List of Nodal Officers shall be hosted on BHEL website, vendor portals of Units/regions intranet.

PURCHASE EXECUTIVE

Clause G of ITB: Loading Factors for Foreign Purchases

Nature of Deviation / Offered Terms	**Loading %**
100% Sight Draft	1 %
100% Usance LC with 45 days credit	2.5 %
100% LC at Sight	4.5 %

ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division
PB 2606 , Mysore Road Bangalore , 560026 INDIA

SCPV: BOS: GCC - Rev 03

GENERAL COMMERCIAL CONDITIONS FOR CONTRACT (GCC)

These 'General Commercial Conditions for Contract for Purchase' hereinafter referred to as GCC apply to all enquiries, tenders, requests for quotations, orders, contracts and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliveries") to Bharat Heavy Electricals Limited and any of its units, regions or divisions (hereinafter referred to as "BHEL" or the Purchaser) or its projects / customers.

Any deviations from or additions to these GCC require BHEL's express written consent. The general terms of business or sale of the vendor shall not apply to BHEL. Acceptance, receipt of shipments or services or effecting payment shall not mean that the general terms of business or sale of the vendor have been accepted.

Orders, agreements and amendments thereto shall be binding if made or confirmed by BHEL in writing. Only the Purchasing department of BHEL is authorized to issue the Purchase Order or any amendment thereof.

Definitions: Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.

a) 'The Purchaser' means Bharat Heavy Electricals Limited, Electronics division, Mysore road, Bangalore 560 026, a Unit of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the Companies Act having its registered office at BHEL House, Siri Fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
b) 'The vendor' means the person, firm, company or organization on whom the Purchase Order is placed and shall be deemed to include the vendor's successors, representative heirs, executors and administrator as the case may be. It may also be referred to as Seller, Contractor or Supplier.
c) 'Contract' shall mean and include the Purchase Order incorporating various agreements, viz. tender/ RFQ, offer, letter of intent / acceptance / award, the General Conditions of Contract and Special Conditions of Contract for Purchase, Specifications, Inspection / Quality Plan, Schedule of Prices and Quantities, Drawings, if any enclosed or to be provided by BHEL or his authorized nominee and the samples or patterns if any to be provided under the provisions of the contract.
d) 'Parties to the Contract' shall mean the 'The Vendor' and the Purchaser as named in the main body of the Purchase Order.
e) "Bidder" shall mean duly established reputed organisation, manufacturer etc. having requisite financial and technical capability and experience of participating in the bid invited by the purchaser for the tender.
f) Bid- The term "bid" or "bidding" can also relate to the documented Offer submitted in response to a request for quotation (RFQ) /Tender.

Interpretation:

In the contract, except where the context requires otherwise:

a) words indicating one gender include all genders;
b) words indicating the singular also include the plural and words indicating the plural also include the singular;
c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
d) "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

Applicable Conditions:

1. **Price Basis:** All prices shall be firm until the purchase order is executed / completed in all respects. No price variations / escalation shall be permitted unless otherwise such variations / escalations are provided for and agreed by BHEL in writing in the purchase order.

2. **Validity:** The offer will be valid for a period of 90 days from the date of technical bid opening date. Validity beyond 90 days, if required, will be specified in the SCC (special conditions of contract).

3. **Taxes & Duties:** Taxes as mentioned in the Contract Price or Price Schedule shall be paid to the Contractor subject to the Contractor complying with all the statutory requirements and furnishing the relevant documents including error free invoices containing detailed break-up of the taxes. Any duties, levies or taxes not mentioned in Contract Price or Price Schedule but applicable as per any statute(s) shall be deemed to be included in the Contract price and shall be to the account of the Contractor.
   The Contractor shall bear and pay all the costs, liabilities, levies, interest, penalties in respect of non-compliances of any legal requirements as per various statutory provisions. The contractor shall keep the owner indemnified at all times from any tax liability, interest, penalties or assessments that may be imposed by the statutory authorities for non-compliances or non-observation of any statutory requirements by the Contractor.

4. **Ordering and confirmation of Order:** Vendor shall send the order acceptance on their company letter head within two weeks from the date of Purchase Order or such other period as specified / agreed by BHEL. BHEL reserves the right to revoke the order placed if the order confirmation differs from the original order placed. The acceptance of goods/services/supplies by BHEL as well as payments made in this regard shall not imply acceptance of any deviations.
   The purchase order will be deemed to have been accepted if no communication to the contrary is received within two weeks (or the time limit as specified / agreed by BHEL) from the date of the purchase order.

5. **Documentation:** After receipt of Purchase Order, vendor should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/Customer.
   At any stage within the contract period, the vendor shall notify of any error, fault or other defect found in BHEL's documents /specifications or any other items for reference. If and to the extent that (taking account of cost and time) any vendor exercising due care would have discovered the error, fault or other defect when examining the documents/specifications before submitting the tender, the time for completion shall not be extended. However if errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the vendor's documents, they shall be corrected at his cost, notwithstanding any consent or approval.

6. **TERMS OF DELIVERY:**
   FOR IMPORTED PURCHASE:
   Price offered shall be for goods packed and delivered CIF Seaport/ International Airport (FCA) including packing, forwarding, Handling, Ancillary charges like processing of Sight Draft, negotiation charges of bank, Export declaration, Certificate of origin etc.
   Packing shall be Air/Sea worthy, best suitable for trans-shipment and to take care of transit damages. If containerized, no. of containers & size of container shall be mentioned. Packing weight (gross & net) Packing dimensions shall be given prior to shipment to ascertain whether the consignment can be carried on standard cargo in contract or as ODC.
   Wooden packing material for all the foreign consignments should be treated as per ISPM-15 & Fumigation / Phytosanitary certificate to be submitted to the freight forwarders/ BHEL along with the invoice, B/L, packing list etc.
   Vendors shall indicate the name of International Airport/Seaport. The consignment shall be handed over to BHEL approved freight forwarder as mentioned in PO.

FOR INDIGENOUS PURCHASE:

Equipment shall be delivered on "FOR SITE" basis, inclusive of freight, packing, insurance & forwarding charges.

Packing shall be Road / Rail / Air / Sea worthy, best suitable for transhipment and to take care of transit damages. Smaller consignments can be dispatched through Courier services/ RPP with the prior approval of the purchasing Executive.

Deviation for the delivery term is liable for rejection.

7. Penalty:

For delay in delivery: In the event of delay in agreed contractual delivery as per Purchase Order, penalty @ 0.5 % (half percent) per week or part thereof but limited to a max of 10% (ten percent) value of undelivered portion (basic material cost) will be applicable. Delivery will commence from the date of document approval by customer / BHEL or date of issue of manufacturing clearance, whichever is later. The date for which Inspection call is issued by vendor along with test certificates / test reports / Certificate of Conformance / calibration reports, as proof of completion of manufacturing will be treated as date of deemed delivery for penalty calculation. In the absence of furnishing such document indicated above as proof of completion of manufacturing along with inspection call, actual date of inspection will be considered as date of deemed delivery and BHEL will not be responsible for delay in actual date of inspection.

Penalty for delayed delivery, if applicable, shall be deducted at the time of first payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted.

8. **Contract variations (Increase or decrease in the scope of supply):** BHEL may vary the contracted scope as per requirements at site. If vendor is of the opinion that the variation has an effect on the agreed price or delivery period, BHEL shall be informed of this immediately in writing along with technical details. Where unit rates are available in the Contract, the same shall be applied to such additional work. Vendor shall not perform additional work before BHEL has issued written instructions / amendment to the Purchase Order to that effect. The work which the vendor should have or could have anticipated in terms of delivering the service(s) and functionality (i.e.) as described in this agreement, or which is considered to be the result of an attributable error on the vendor's part, shall not be considered additional work.

9. **Reverse Auction:** BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non- consideration of their bids, in case BHEL decides to go for RA.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

10. **Pre Shipment Inspection:** Prior written notice of at least one week shall be given along with internal test certificates / COC and applicable test certificates. Materials will be inspected by BHEL-EDN-QS/CQS or BHEL nominated Third Party Inspection Agency (TPIA) or BHEL authorized Inspection Agency or Customer / Consultant or jointly by BHEL & Customer / consultant. All tests have to be conducted as applicable in line with approved Quality plan or QA Checklist or Purchase specification and original reports shall be furnished to BHEL-EDN, Bangalore for verification / acceptance for issue of dispatch clearance.
    All costs related to inspections & re-inspections shall be borne by vendor. Whether the Contract provides for tests on the premises of the vendor or any of his Sub-contractor/s, vendor shall be responsible to provide such assistance, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by BHEL only if specifically agreed to in the purchase order.

11. **Transit Insurance:** Transit insurance coverage between vendor's works and project site shall be to the account of BHEL, unless specifically agreed otherwise. However, vendor shall send intimation directly to insurance agency through fax/courier/e-mail, immediately on dispatch of goods for covering insurance. A copy of such intimation sent by vendor to insurance agency shall be given to BHEL along with dispatch documents. Dispatch documents will be treated as incomplete without such intimation copy. BHEL shall not be responsible for sending intimations to insurance agency on behalf of the vendor.

12. **Packaging and dispatch:** The Seller shall package the goods safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea / Air / Rail / Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures / hooks and sling marks as may be required for easy and safe handling. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols / instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.
    The packing, shipping, storage and processing of the goods must comply with the prevailing legislation and regulations concerning safety, the environment and working conditions. Any Imported/Physical Exports items packed with raw / solid wood packing material should be treated as per ISPM – 15 (fumigation) and accompanied by Phytosanitory / Fumigation certificate. If safety information sheets (MSDS – Material Safety Data Sheet) exist for an item or the packaging, vendor must provide this information without fail along with the consignment.
    Each package must be marked with Consignee name, Purchase order number, Package number, Gross weight and net weight, dimensions (L x B x H) and Seller's name. Packing list of goods inside each package with PO item number and quantity must also be fixed securely outside the box to indicate the contents of each box. Total number of packages in the consignment must also be indicated.
    Separate packing & identification of items should be as follows.
    1. Main Scope - All items must be tagged with part no. & item description.
    2. Commissioning spares - All items must be tagged with part no. & item description.
    3. Mandatory spares - All items must be tagged with part no. & item description.

13. **Assignment of Rights & Obligations; Subcontracting:** Vendor is not permitted to subcontract the delivery or any part thereof to third party or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from BHEL. Any permission or approval given by the BHEL shall, however, not absolve the vendor of the responsibility of his obligations under the Contract.

14. **Progress report:** Vendor shall render such report as to the progress of work and in such form as may be called for by the concerned purchase officer from time to time. The submission and acceptance of such reports shall not prejudice the rights of BHEL in any manner.

15. **Non-disclosure and Information Obligations: Vendor** shall provide with all necessary information pertaining to the goods as it could be of importance to BHEL. Vendor shall not reveal confidential information that may be divulged by BHEL to Vendor's employees not involved with the tender/ contract & its execution and delivery or to third parties, unless BHEL has agreed to this in writing beforehand. Vendor shall not be entitled to use the BHEL name in advertisements and other commercial publications without prior written permission from BHEL.

16. **Cancellation / Termination of contract:** BHEL shall have the right to completely or partially terminate the agreement by means of written notice to that effect. Termination of the Contract, for whatever reason, shall be without prejudice to the rights of the parties accrued under the Contract up to the time of termination.
    BHEL shall have the right to cancel/foreclose the Order/ Contract, wholly or in part, in case it is constrained to do so, on account of any decline, diminution, curtailment or stoppage of the business.

17. **Risk Purchase Clause:** In case of failure of supplier, BHEL at its discretion may make purchase of the materials / services NOT supplied / rendered in time at the RISK & COST of the supplier. Under such situation, the supplier who fails to supply the goods in time shall be wholly liable to make good to BHEL any loss due to risk purchase.
    In case of items demanding services at site like erection and commissioning, vendor should send his servicemen /representatives within 7 days from the service call. In case a vendor fails to attend to the service call, BHEL at its discretion may also make arrangements to attend such service by other parties at the **RISK & COST** of the supplier. Under such situation the supplier who fails to attend the service shall be wholly liable to make good to BHEL any loss due to risk purchase / service including additional handling charges due to the change.

18. **Shortages:** In the event of shortage on receipt of goods and/or on opening of packages at site, all such shortages shall be made good within a reasonable time that BHEL may allow from such intimation and free of cost.
    Transit Damages: In the event of receipt of goods in damaged condition or having found them so upon opening of packages at site, Supplier shall make good of all such damages within a reasonable time from such intimation by BHEL.

19. **Remedial work:** Notwithstanding any previous test or certification, BHEL may instruct the vendor to remove and replace materials/goods or remove and re-execute works/services which are not in accordance with the purchase order. Similarly BHEL may ask the vendor to supply materials or to execute any services which are urgently required for any safety reasons, whether arising out of or because of an accident, unforeseeable event or otherwise. In such an event, Vendor shall provide such services within a reasonable time as specified by BHEL.

20. **Indemnity Clause:** Vendor shall comply with all applicable safety regulations and take care for the safety of all persons involved. Vendor is fully responsible for the safety of its personnel or that of his subcontractor's men / property, during execution of the Purchase Order and related services. All statutory payments including PF, ESI or other related charges have to be borne by the vendor. Vendor is fully responsible for ensuring that all legal compliances are followed in course of such employment.

21. **Product Information, Drawings and Documents:** Drawings, technical documents or other technical information received by Vendor from BHEL or vice versa shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the Disclosing party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are binding only to the extent that they are by reference expressly included in the contract.
    Vendor, as per agreed date/s but not later than the date of delivery, provide free of charge information and drawings which are necessary to permit and enable BHEL to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in as many numbers of copies as may be agreed upon.
    All intellectual properties, including designs, drawings and product information etc. exchanged during the

formation and execution of the Contract shall continue to be the property of the disclosing party.

22. **Intellectual Property Rights, Licenses:** If any Patent, design, Trade mark or any other intellectual property rights apply to the delivery (goods / related service) or accompanying documentation shall be the exclusive property of the Vendor and BHEL shall be entitled to the legal use thereof free of charge by means of a non-exclusive, worldwide, perpetual license. All intellectual property rights that arise during the execution of the Purchase Order/ contract for delivery by vendor and/or by its employees or third parties involved by the vendor for performance of the agreement shall belong to BHEL. Vendor shall perform everything necessary to obtain or establish the above mentioned rights. The Vendor guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. The Vendor shall do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged) claims by third parties. The Vendor shall indemnify BHEL against any (alleged) claims by third parties in this regard and shall reimburse BHEL for any damages suffered as a result thereof.

23. **Force Majeure:** Notwithstanding anything contained in the purchase order or any other document relevant thereto, neither party shall be liable for any failure or delay in performance to the extent said failures or delays are caused by the "Act of God" and occurring without its fault or negligence, provided that, force majeure will apply only if the failure to perform could not be avoided by the exercise of due care and vendor doing everything reasonably possible to resume its performance.
A party affected by an event of force majeure which may include fire, tempest, floods, earthquake, riot, war, damage by aircraft etc., shall give the other party written notice, with full details as soon as possible and in any event not later than seven (7) calendar days of the occurrence of the cause relied upon. If force majeure applies, dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.

    Notwithstanding above provisions, in an event of Force Majeure, BHEL reserves for itself the right to cancel the order/ contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of deliveries and other schedules.

24. **Guarantee / Warranty:** Wherever required, and so provided in the specifications / Purchaser Order, the Seller shall guarantee that the stores supplied shall comply with the specifications laid down, for materials, workmanship and performance. The guarantee / warranty period as described shall apply afresh to replaced, repaired or re-executed parts of a delivery. If the vendor fails to take proper corrective action to repair/replace defects satisfactorily within a reasonable period, Purchaser shall be free to take corrective action as may be deemed necessary at vendor's risk and cost after giving notice to the vendor, including arranging supply of goods from elsewhere at the sole risk and cost of the vendor. Unless otherwise specifically provided in the Purchase Order, Vendor's liability shall be co terminus with the expiration of the applicable guarantee / warranty period.

25. **Limitation of Liability:** Vendor's liability towards this contract is limited to a maximum of 100% of the contract value and consequential damages are excluded. However the limits of liability will have no effect in cases of criminal negligence or wilful misconduct.
The total liability of Vendor for all claims arising out of or relating to the performance or breach of the Contract or use of any Products or Services or any order shall not exceed the total Contract price.

26. **Liability during guarantee / warranty:** Vendor shall arrange replacement / repair of all the defective materials / services under its obligation under the guarantee / warranty period. The rejected goods shall be taken away by vendor and replaced / repaired. In the event of the vendor's failure to comply, BHEL may take appropriate action including disposal of rejections and replenishment by any other sources at the cost and risk of the vendor.
In case, defects attributable to vendor are detected during first time commissioning or use, vendor shall be responsible for replacement / repair of the goods as required by BHEL at vendor's cost. In all such cases expiry of guarantee / warranty will not be applicable.

27. **Liability after guarantee / warranty period:** At the end of the guarantee / warranty, the Vendor's liability ceases except for latent defects (latent defects are defects / performance issues notices after the

guarantee / warranty has expired). The Contractor's liability for latent defects warranty for the plant and equipment including spares shall be limited to a period of six months from the end of the guarantee / as specified in RFQ.

28. **Compliance with Laws:** Vendor shall, in performing the contract, comply with all applicable laws. The vendor shall make all remittances, give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the laws in relation to the execution and completion of the contract and for remedying of any defects; and the Contractor shall indemnify and hold BHEL harmless against and from the consequences of any failure to do so.

29. **Settlement of Disputes:** Except as otherwise specifically provided in the Purchase Order, decision of BHEL shall be binding on the vendor with respect to all questions relating to the interpretation or meaning of the terms and conditions and instructions herein before mentioned and as to the completion of supplies/work/services, other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the contract, instructions, orders or these conditions or otherwise concerning the supply or the execution or failure to execute the order, whether arising during the schedule of supply/work or after the completion or abandonment thereof. Any disputes or differences among the parties shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration. Vendor shall continue to perform the contract, pending settlement of dispute(s).

30. **Arbitration Clause:** In case amicable settlement is not reached in the event of any dispute or difference arising out of the execution of the Contract or the respective rights and liabilities of the parties or in relation to interpretation of any provision in any manner touching upon the Contract, such dispute or difference shall (except as to any matters, the decision of which is specifically provided for therein) be referred by either party to the sole arbitration of an Arbitrator appointed by the Executive Director/ General Manager of the purchasing unit/ region/ division of BHEL. Vendor shall have no objection even if the Arbitrator so appointed is an employee of BHEL or has ever dealt/ had to deal with any matter relating to this Contract.
    Subject as aforesaid the provisions of the Arbitration and Conciliation Act, 1996 of India or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceedings under this clause. It is a term of contract that the party initiating arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute. The venue for the arbitration shall be Bangalore, India. The award of the arbitrator shall be a speaking award and shall be final, conclusive and binding on all parties to this contract.
    The cost of arbitration shall be borne equally by the parties. Notwithstanding the existence of any dispute or difference or any reference for the arbitration, the vendor shall proceed with and continue without hindrance the performance of the work under the contract with due diligence and expedition in a professional manner.

31. **Applicable Laws and Jurisdiction of Courts:** Prevailing Indian laws both substantive and procedural, including modifications thereto, shall govern the Contract. Subject to the conditions as aforesaid, the competent courts in BANGALORE alone shall have jurisdiction to consider over any matters touching upon this contract.

32. **General Terms:** That any non-exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents.
    That the headings used in this agreement are for convenience of reference only.
    That all notices etc., to be given under the Purchase order shall be in writing, type script or printed and if sent by registered post or by courier service to the address given in this document shall be deemed to have been served on the date when in the ordinary course, they would have been delivered to the addressee.

33. Vendors shall provide their state wise list of GSTIN number as per Govt of India Statute.

34. If the vendor is below the threshold limit, viz Rs.20. lacs as per existing provisions, then a declaration to be provided to that effect along with copy of accounts, failing which the supplier will be treated as an Unregistered dealer (URD) for which tax is payable on reverse charge (RCM) by BHEL.
35. If the vendor is above the threshold limit & is yet not registered, GST is payable by BHEL on reverse charge basis.
36. All supply items are linked to HSN code (Harmonised System Nomenclature). This goods list is mapped with HSN code which is released by Govt of India & available in public domain. All registered suppliers submitting the quote shall mandatorily mention HSN code relevant for the goods quoted.
37. Under GST, Govt of India has linked every service to a service accounting code called SAC. The list of services and the corresponding service accounting code (SAC) is released by Govt of India & available in public domain. All registered suppliers submitting the quote shall mandatorily mention SAC code relevant for the service quoted.
38. The rate of tax applicable for 35 services is also released by Government and rate for any service not falling in the list of 35 services is 18% .
39. Invoice should contain all particulars as per invoice Rules and should include the GST registration number (GSTIN) , service accounting code (SAC) apart from all other details mentioned.
40. Invoice should contain all particulars as per invoice Rules and should include the GST registration number (GSTIN) , HSN code apart from all other details mentioned.
41. In case GST is payable on reverse charge (RCM) invoice should mention that tax is payable on reverse charge
42. For a registered supplier, the supplier uploaded sales data for the month will be available to recipient on 11th of the subsequent month & details can be verified by BHEL. Credit availment can be confirmed based on this verified data
43. If the Supplier is not registered, then tax is payable on Reverse charge & will be to the account of the supplier
44. All services in the course of business or furtherance of business are eligible to credit subject to other compliances listed herein.
45. If service is eligible for credit, then the credit can be availed only if the invoice is as per the prescribed format, the supplier has uploaded the invoice in the GSTN portal, paid the taxes & uploaded the return, and matches with our inward data, failing which any availment of credit attracts interest.
46. Even in case of services where credit is not eligible,

    (i) either the supplier should have registered (if above threshold limit) & comply with all above statutory provisions relating to invoice, tax remittance, return filing etc. This can be verified by BHEL from the GSTN portal OR
    (ii) if not registered BHEL shall be liable to pay applicable taxes on reverse charge

47. For any deficiency in services, where a recovery is made / adjusted in supplier bills, the supplier has to raise a credit note on BHEL & upload in GSTN portal. All above rules applicable for invoice also apply for credit note.
48. All notifications and rules as per central board of excise and customs will be applicable.

ANNEXURE - I

LIST OF INTERNATIONAL GATEWAY AIRPORTS

SCHEDULE NO	COUNTRY	CURRENCY CODE	AIRPORT
D01	UK	GBP	LONDON (HEATHROW)
D02	UK	GBP	NEW CASTLE
D03	UK	GBP	OXFORD. CHETLAM
D04	UK	GBP	BRISTOL. WELLINGBOROUGH
D05	UK	GBP	BIRMINGHAM
DO6	UK	GBP	EAST MIDLANDS
D07	UK	GBP	MANCHESTER
D08	UK	GBP	LEEDS
D09	UK	GBP	GLASGOW
D10	FRANCE	EURO	PARIS (ROISSY) & LYON
D11	SWEDEN	EURO	STOCKHOLM
D12	SWEDEN	EURO	GOTHENBERG & MALMO
D13	ITALY	EURO	ROMA, MILAN
D14	ITALY	EURO	TURIN, BOLOGNA, FLORENCE
D15	NETHERLANDS	EURO	AMSTERDAM, ROTTERDAM
D16	AUSTRIA	EURO	VIENNA, LINZ, GRAZ
D17	BELGIUM	EURO	ANTWERP, BRUSSELS
D18	DENMARK	DKK	COPENHAGEN
D19	JAPAN	JPY	TOKYO, OSAKA
D20	SINGAPORE	SGD	SINGAPORE
D21	CANADA	CAD	TORONTO
D22	CANADA	CAD	MONTREAL
D23	USA	USD	NEW YORK, BOSTON
D24	USA	USD	CHICAGO
D25	USA	USD	SAN FRANCISCO, LOS ANGELES
D26	USA	USD	ALANTA, HOUSTON
D27	GERMANY	EURO	MUNICH, KOLN, DUSSELDORF, HANNOVER, HAMBURG, STUTTGART, DAMSTADT, MANIHIEM, NURUMBERG
D28	GERMANY	EURO	FRANKFURT
D29	GERMANY	EURO	BERLIN
D30	SWITZERLAND	SFR	BASLE, ZURICH, GENEVA
D31	SPAIN	EURO	BARCELONA
D32	AUSTRALIA	AUD	SYDNEY
D33	AUSTRALIA	AUD	MELBOURNE
D34	AUSTRALIA	AUD	PERTH
D35	CZECH	EURO	PRAGUE
D36	HONG KONG	HKD	HONG KONG
D37	NEW ZELAND	NZD	AUCKLAND
D38	RUSSIA	USD	MOSCOW
D39	SOUTH KOREA	USD	KIMPO INTERNATIONAL, INCHEON
D40	FINLAND	EURO	HELSINKI
D41	ROMANIA	EURO	BUCHAREST
D42	NORWAY	EURO	OSLO
D43	IRELAND	EURO	DUBLIN
D44	ISRAEL	USD	TEL AVIV
D45	UAE	USD	DUBAI
D46	OMAN	USD	MUSCAT
D47	EGYPT	USD	CAIRO
D48	TAIWAN	USD	TAIPEI
D49	UKRAINE	USD	KIEV
D50	CHINA	USD	SHANGHAI, SHENZHEN
D51	PHILIPINES	USD	MANILA
D52	MALAYSIA	USD	KUALALUMPUR, PE NANG
D53	CYPRUS	USD	LARNACA
D54	SOUTH AFRICA	USD	JOHANNESBERG, DURBAN
D55	SLOVAKIA	EURO	BARTISLOVA
D56	SAUDI ARABIA	SAR	RIYADH
D57	TURKEY	EURO	ISTANBUL
D58	THAILAND	USD	BANGKOK
D59	BRAZIL	USD	SAO PAULO, RIO DE JANEIRO

ANNEXURE - II

REQUEST FOR C FORM

NAME OF VENDOR :

VENDOR CODE ALLOTED BY BHEL :

E mail id for c form correspondence :

BHEL PO NO	INVOICE NO	INVOICE DATE	INVOICE AMOUNT	SUPPLY FROM - STATE	SUPPLY TO - STATE	CST TIN NUMBER (SUPPLIER)	INVOICE AMOUNT EXCLUDING FREIGHT	C FORM QTR	YEAR	SUPPLY TO BHEL EDN / SITE

Please note that one 'C' form will be issued for a quarter.

Any modification and cancellation of c form is not possible from our end since it is generated online therefore include all invoices pertaining to quarter in your request
Also check the data are correct in all respect

General Instruction:
1. C form request should be given only in this file.
2. Amount should be 100% of Invoice value but should Not include freight, Insurance etc.
3. PO No. should be numeric, starting with 4 and has 10 digits
4. For every quarter separate file to be provided
5. All Invoices pertaining to the relevant quarter to be included.
6. No corrections will be entertained once c-form is issued.

ANNEXURE D

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____[1] through its Unit até é é é é é ..(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) with its registered office at_____[2] hereinafter referred to as the ' Vendor / Contractor / Supplier ', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref Noé é é é é é é dated é é é é é é é é é é é é é .[3] valued at Rsé é é é [4] (Rupees ----------)/FCé é é é é é (in wordsé é é ..) for é é é é é é é é é é [5] (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to é é % (é . Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we, é é é é é é é , (hereinafter referred to as the Bank), having registered/Head office at é é é é é . and inter alia a branch at é é é é being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount of Rs ---------- [6] (Rupees ----------) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor / Contractor / Supplier shall have no claim against us for making such payment.

We the é é é é é é é é bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till

all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We é é é é é ..BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Vendor / Contractor / Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / Contractor / Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor / Contractor / Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor / Contractor / Supplier 's liabilities.

This Guarantee shall remain in force upto and includingé é é é é é é é é é .. [7] and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the é é é é é é é é é é é .[8]we shall be discharged from all liabilities under this guarantee thereafter.

We, é é é é é é BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceedé é é é é é é é é [6]
b) This Guarantee shall be valid up to é é é é é é [7]
c) Unless the Bank is served a written claim or demand on or before _____[8] all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Datedé é é é é é .

Place of Issueé é é é é é .

[1] NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

[2] NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

[3] DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

[4] CONTRACT VALUE

[5] PROJECT/SUPPLY DETAILS
[6] BG AMOUNT IN FIGURES AND WORDS

[7] VALIDITY DATE

[8] DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.

2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.

3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Regionôs Law Deptt.

4. **In Case of Bank Guarantees submitted by Foreign Vendors-**

   a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

   b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**

      b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bankôs (BHELôs Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

      b.2 **In case, Foreign Vendors intend to provide BG from** Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.

      b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

ANNEXURE - IV

Electronic Funds Transfer (EFT) OR
Paylink Direct Credit Form

Please Fill up the form in **CAPITAL LETTERS** only.
TYPE OF REQUEST(Tick one): _____ CREATE _____ CHANGE

BHEL Vendor / Supplier Code:
Company Name :
Permanent Account Number(PAN):
Address

City: _____ PINCODE _____ STATE _____

Contact Person(s)
Telephone No:
Fax No:
e-mail id:

1 Bank Name:
2 Bank Address:
3 Bank Telephone No:
4 Bank Account No:
5 Account Type: Savings/Cash Credit
6 9 Digit Code Number of Bank and branch appearing on MICR cheque issued by Bank
7 Bank swift Code(applicable for EFT only)
8 Bank IFSC code(applicable for RTGS)
9 Bank IFSC code(applicable for NEFT)

A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account.

B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transfering Bank responsible.

C This authority remains in full force until BHEL, EDN,Bangalore receives written notification requesting a change or cancellation.

D I have read the contents of the covering letter and agree to discharge the resposibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:
Designation: Telephone NO. with STD Code

Company Seal

Bank Certificate

We certify that_____has an Account No_____ with us and we confirm that the bank details given above are correct as per our records.

Date: (……..)
Place: Signature

Please return completed form along with a blank cancelled cheque or photocopy thereof to:
Bharath Heavy Electricals Ltd,
Attn:
Electronics Division, Mysore Road,
BANGALORE - 560 026
In case of any Querry, please call : 080-26998xxx / 2674xxxx or fax no. 080-2674xxxx

List of Consortium Banks

Sl. No	Nationalised Banks	Sl. No	Public Sector Banks
1	State Bank of India	18	IDBI
2	Allahabad bank		
3	Andhra bank	**Sl. No**	**Private banks**
4	Bank of Baroda	19	Axis Bank
5	Canara Bank	20	HDFC
6	Corporation bank	21	ICICI
7	Central bank	22	The Federal Bank Limited
8	Indian Bank	23	Kotak Mahindra Bank
9	Indian Oversea Bank	24	Indusind Bank
10	Oriental bank of Commerce	25	Yes Bank
11	Punjab National Bank		
12	Punjab & Sindh Bank	**Sl. No**	**Foreign banks**
13	Syndicate Bank	26	CITI Bank N.A
14	UCO Bank	27	Deutsche Bank AG
15	Union Bank of India	28	HSBC
16	United Bank of India	29	Standard Chartered Bank
17	Vijaya Bank	30	J P Morgan

ANNEXURE - VI

DISCREPANCY IN WORDS & FIGURES – QUOTED IN PRICE BID

Following guidelines will be followed in case of discrepancy in words & figures-quoted in price bid:

(a) If, in the price structure quoted for the required goods/services/works, there is discrepancybetween the unit price and the total price (which is obtained by multiplying the unit price by thequantity), the unit price shall prevail and the total price corrected accordingly, unless in theopinion of the purchaser there is an obvious misplacement of the decimal point in the unit price,in which case the total price as quoted shall govern and the unit price corrected accordingly.

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

(d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

ANNEXURE - VII

BENEFITS FOR MSE SUPPLIERS AS PER MSMED ACT 2006 AND PUBLIC PROCUREMENT POLICY 2012

MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of Acknowledgement in EM II).

Or

Valid NSIC certificate or EM II certificate along with attested copy of CA certificate (Format enclosed: ANNEXURE VIII) where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited).

Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid).

Non-submission of such documents will lead to consideration of their bid at par with other bidders.

No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazette officer.

ANNEXURE - VIII

CERTIFICATE BY CHARTERED ACCOUNTANT ON LETTER HEAD

This is to certify that M/s …….……
…… ……..(Hereinafter referred to as `Company') having its registered office at …….. is registered under MSMED Act 2006, (Entrepreneur Memorandum No ((Part-II) …… dtd …… Category: …… (Micro/Small). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year **…….. as per MSMED Act 2006 is as follows:**
1. For Manufacturing Enterprises: Investment in plant and machinery (i.e., original cost excluding land and building and the items specified by the Ministry of Small Industries vide its notification No.S.O.1722 (E) dated October 5, 2006:
Rs. ……..Lacs.

2. For Service Enterprises: Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
Rs. ……..Lacs.

The above investment of Rs. …… Lacs in within permissible limit of Rs…… Lacs for……..Micro / Small (Strike off which is not applicable) Category under MSMED Act 2006.

(or)

The company has been graduated from its original category (Micro/Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is ……(dd/mm/yy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O.No.3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:
(Signature)
Name -
Membership Number -

Seal of Chartered Accountant

Public Procurement (Preference to Make in India)

"For this procurement, Public Procurement (Preference to Make in India),Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and /or local content in respect of this procurement, same shall be applicable."

Arbitration Clause in case of Contract with contractors/vendors /consultants other than Public Sector Enterprise (PSE) or a Government Department:

ARBITRATION & CONCILIATION

The parties shall attempt to settle any disputes or difference arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, or in connection with this contract through friendly discussions. In case no amicable settlement can be reached between the parties through such discussions, in respect of any dispute; then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration of an arbitrator appointed by Head of the BHEL – EDN. Such Sole Arbitrator appointed, shall conduct the arbitration in English language.

The Arbitrator shall pass a reasoned award and the award of the Arbitration shall be final and binding upon the Parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be Bangalore.

The cost of arbitration shall be borne as decided by the Arbitrator upon him entering the reference.

Subject to the Arbitration Clause as above, the Courts at Bangalore alone shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the parties shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and efficiency in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

Arbitration Clause in case of Contract with contractors/vendors /consultants when they are a Public Sector Enterprise (PSE) or a Government Department:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, such dispute or difference shall be referred by either party for Arbitration to the Sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any Party aggrieved by such Award may make further reference for setting aside or revision of the Award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the Parties hereto finally and conclusively. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.''

////////Pl get letter from M/s……(OEM/TECHNOLOGY PARTNER) ON their letter head" //////////

Ref: Date:

To

BHARAT HEAVY ELETRICALS LIMITED
ELECTRONICS DIVISION,
MYSURU ROAD,
BENGALURU-560026.
INDIA.

Kind Attention: (Tender Officer Name) Mr.
Ref: <<<<RFQ no>>>>>
Subject: Autorisation letter for……..

We, M/s…… …….. here by inform BHEL that M/s. …… is the only authorized representative of M/s……. in India and we do not have any other authorized representative for our company in India. Also we hereby authorize M/s….., India to receive tender enquiries , submit quotation, participate in tendering process in BHEL –EDN-Bengaluru - 560026 like technical and commercial negotiation, Reverse Auction on behalf of M/s……(OEM).

M/s…….. (OEM) will not quote directly to customers like BHEL in India. We honour all the commitments made by M/s……,India on behalf of M/s…….,(OEM) for all the tenders w.r.t technical and commercial terms finalised between BHEL and our authorized representative. M/s……..,(OEM) will supply material from ---------- based on the purchase order placed by BHEL and based on the commitment made by our authorized representative M/s. …….

We, M/s…….(OEM) will also stand guarantee for the system supplied by M/s……. for period of …….as per RFQ no……

(AUTHORISED SIGNATORY)

Certificate by statutory auditor or cost auditor of the company (in the case of companies)

or

from a practicing cost account or the practicing charted accountant (in respect of supplies other than companies) on their letter head

In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017, P-45021/2/2017-PP (BE-II) dated 28.05.2018 AND P-45021/2/2017-PP (BE-II) dated 29.05.2019, we hereby certify that

……

(Supplier name) are local supplier meeting requirement of minimum local content (50%) defined in as above orders for the material against Enquiry No. (details of tender to be mentioned)

……

Details of location at which local value addition will be made is as follows:

……

……

……

We also understand, false declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

Seal and Signature of Authorized
Signatory with date

ANNEXURE C

List of Documents to be submitted by Vendors/Subcontractors for SPV Contracts.		Confirmation on submission	DEVIATION OR REMARKS
IR Documents (Type - A): For all Civil & I&C & O&M			
Sl No.	**Documents**		
1	Wage Sheet (Form 17)	YES	
2	Attendance Register (w.r.t Sl No.1)	YES	
3	Workman Policy & Additional Insurance (Automotive Liability, Group Service Insuarnce Policy etc	YES	
4	PF Challan	YES	
5	ESI (Employee State Insurance)	YES	
6	ECR (Electronic Challan Receipt)	YES	
7	Bank Statement for PF deposit	YES	
8	RCS (Remittance Confirmation Slip)	YES	
Quality Documents (Type - B): For all MMS Civil Works			
Sl No.	**Documents**		
1	FQA (Field Quality Assuarance)	NA	
2	Field Content, Slump Test	NA	
3	Gradiation of Aggregate (10mm, 20mm)	NA	
4	Fine Aggregate Test (for Sand)	NA	
5	Cube Test Registered	NA	
6	Material Test Certificate for Steel & Cement	NA	
7	Consumption Register for Steel & Invoice	NA	
8	Pour Card for Concreting purpose	NA	
9	Royalty Reports (10mm, 20mm, Sand)	NA	
10	Sand Soundess Test Reports	NA	
11	Slump Test Register	NA	
12	Sieve Analysis, Flakiness Index, Elongation Index - Register to be maintained	NA	
13	Moisture Content Coarse and Fine Aggregate - Register to be maintained	NA	
14	Water Test Report for Concrete	NA	
15	Design Mix Report for Concrete	NA	
Quality Documents (Type - B): For all Civil related Works			
Sl No	**Documents**		
1	FQA (Field Quality Assuarance)	NA	
2	Field Content, Slump Test	NA	
3	Gradiation of Aggregate (10mm, 20mm)	NA	
4	Fine Aggregate Test (for Sand)	NA	
5	Cube Test Registered	NA	
6	Material Test Certificate for Steel & Cement	NA	
7	Consumption Register for Steel & Invoice	NA	
8	Pour Card for Concreting purpose	NA	
9	Royalty Reports (10mm, 20mm, Sand)	NA	
10	Sand Soundess Test Reports	NA	
11	Warpage of Bricks Test Reports	NA	
12	Core Cutting (Compaction Test) - Roads & Pathways	NA	
13	Slump Test Register	NA	
14	Sieve Analysis, Flakiness Index, Elongation Index - Register to be maintained	NA	
15	Moisture Content Coarse and Fine Aggregate - Register to be maintained*	NA	
16	Brick Test Reports	NA	
17	Plastering profile and thickness	NA	
18	Compaction test beneath floor of all buildings. - Reports	NA	
19	Test Certificates for Paint, Glan, Glazing, etc.	NA	
20	Test Certificates Aluminium Section for doors and windows (Anodisation Certificates also)	NA	
21	BBS for Buildings	NA	
22	Water Test Report for Concrete	NA	
23	Design Mix Report for Concrete	NA	

Quality Documents: for Electrical & Mechanical Installation Works (BOS)			
Sl No	Documents		
1	FQA (Field Quality Assuarance)	YES	
2	Inspection Reports	YES	
3	Guarantee Certificates	YES	
4	Factory Acceptance Test Reports	YES	
5	Commissioning Reports	YES	

NOTE:

*** This list of documents is indicative and intended towards all Solar Projects.**

*** Apart from the above, any other document required by the Customer and which are mandatory for Billing by BHEL to the Customer, the same respective vendors.**