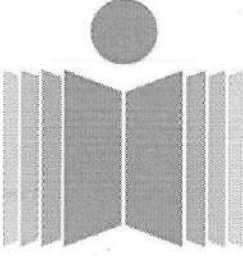


NIT No.: IITH/CMD/ELE/NIT/2022-23/06



భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

**NOTICE INVITING TENDER
(NIT)**

Name of the work: "Supply, Installation, Testing and Commissioning (SITC) of 125 kVA & 50 kVA Diesel Generating (DG) sets with AMF panel for one Lift at each existing Faculty Towers and Staff Towers, IIT Hyderabad, Kandi Campus, Sangareddy".


Executive Engineer-Electrical
IIT Hyderabad

INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD

NOTICE INVITING TENDER

NIT No. IITH/CMD/ELE/NIT/2022-23/06

Indian Institute of Technology Hyderabad invites on behalf of President of India online bids (e-tenders) in Item rate / ~~Percentage rate~~ in Two Bid (Technical Eligibility + Financial) System, from approved and eligible Electrical contractors of CPWD and those of appropriate list of M.E.S. / BSNL/ Railways/ State P.W.D./Central PSUs/State Govt. departments/Central Govt. Departments /working Electrical contractors of IIT Hyderabad OR the Specialized Agencies for the following work as per the stipulated terms and conditions mentioned below:

Copy of valid Registration of Firm (ROF) certificate, PAN card, GST Registration certificate & GSTIN should accompany the Technical Bid and those certificates should be valid on the last date of submission of bid.

1.1	NIT No.:	IITH/CMD/ELE/NIT/2022-23/06
1.2	Name of Work:	<i>Supply, Installation, Testing and Commissioning (SITC) of 125 kVA & 50 kVA Diesel Generating (DG) sets with AMF panel for one Lift at each existing Faculty Towers and Staff Towers, IIT Hyderabad, Kandi Campus, Sangareddy</i>
1.3	Estimated Cost: <i>(given merely as a rough guide)</i>	<i>Rs. 40,51,509/-</i>
1.4	Earnest Money Deposit (EMD):	<i>Rs. 81,100/-</i>
1.5	Period of Completion:	120 days
1.6	Date of Online Publication/Download of Tender	21/10/2022 @ 15:00hrs
1.7	Last Date for Submission of Bids	04/11/2022 @ 15:00hrs
1.8	Date and time of Opening of Technical Bids	04/11/2022 @15:30hrs
1.9	Date and time of Opening of Financial Bids	To be decided
1.10	Cost of Bid Document:	NIL

The Tender Document can be downloaded from <https://mhrd.euniwizarde.com> OR Institute website- <https://www.iith.ac.in/tenders/#Civil%20Works>.

The bid is to be submitted online mode only through the E-procurement portal of <https://mhrd.euniwizarde.com> up to the last date and time of submission of tender. Manual bids shall not be accepted. All quotation (both Technical and Financial) should be submitted online through E-procurement portal of <https://mhrd.euniwizarde.com>.

Any queries relating to the process of online bid submission or queries relating to e-tender Portal in general may be directed to the Helpdesk Support - Phone No. 011-49606060. Mail id: - helpdeskeuniwizarde@gmail.com.

INSTRUCTIONS FOR ONLINE BID SUBMISSION:

The Tender Document can be downloaded from <https://mhrd.euniwizarde.com> OR Central Public Procurement (CPP) Portal <https://eprocure.gov.in/epublish/app> OR Institute website- <https://iith.ac.in/tenders>.

The bidders are required to submit soft copies of their bids electronically on the <https://mhrd.euniwizarde.com> using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the Portal, prepare their bids in accordance with the requirements and submitting their bids online.

More information useful for submitting online bids may be obtained at: <https://mhrd.euniwizarde.com>

GUIDELINES FOR REGISTRATION:

1. Bidders are required to enrol on the e-Procurement Portal with clicking on the link "Bidder Enrolment" on the e-tender Portal by paying the Registration fee as applicable + Applicable GST.
2. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the e-Wizard Portal.
4. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Only Class III Certificates with signing + encryption key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.) with their profile or bidders can contact help desk for getting the DSC.
5. Only valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
6. Bidder then logs in to the site through the secured log-in by entering their user ID/password and the password of the DSC / e-Token.
7. The scanned copies of all original documents should be uploaded in **pdf format** on portal <https://mhrd.euniwizarde.com>
8. After completion of registration payment, bidders need to send their acknowledgement copy on help desk mail id helpdeskeuniwizarde@gmail.com for activation of their account.

SEARCHING FOR TENDER DOCUMENTS:

1. There are various search options built in the e-tender Portal, to facilitate bidders to search active tenders by several parameters like Department name, Tender category, estimated value, Date, other keywords, etc. to search for a tender published on the Online Portal
2. Once the bidders have selected the tenders they are interested in, you can pay the form fee and processing fee (NOT REFUNDABLE) by net-banking / Debit / Credit card then you may download the required documents / tender schedules, Bid documents etc. Once you pay both fee tenders will be moved to the respective 'requested' Tab. This would enable the e- tender Portal to intimate the bidders through e-mail in case there is any corrigendum issued to the tender document.
3. The bidder should make a note of the unique Tender No assigned to each tender, in case they want to obtain any clarification/help from the Helpdesk.

PREPARATION OF BIDS:

1. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid.
3. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in **PDF/XLSX/PNG etc., formats**. Bid Original documents may be scanned with 100 dpi with Colour option which helps in reducing size of the scanned document.
4. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GST, Annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Documents" available to them to upload such documents.
5. These documents may be directly submitted from the "My Documents" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.
6. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that needs to be submitted. Any deviations from these may lead to rejection of the bid.

SUBMISSION OF BIDS:

1. Bidder should log into the website well in advance for the submission of the bid so that it gets uploaded well in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document as a token of acceptance of the terms and conditions laid down by IIT Hyderabad.
3. Bidder has to select the payment option as "**e-payment**" to pay the **tender fee / EMD** as applicable and enter details of the instrument.

4. *In case of Bank Guarantee (BG) bidder should prepare the BG as per the instructions specified in the tender document. The BG in original should be posted/couriered/given in person to the concerned official of IIT Hyderabad before the Online Opening of Technical Bid. In case of non-receipt of BG in original by the said time, the uploaded bid will be summarily rejected.*
5. *Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white Colored (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.*
6. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
7. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data, which cannot be viewed by unauthorized persons until the time of bid opening.
8. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
9. *Upon the successful and timely submission of bid click "Complete" (i.e. after Clicking "Submit" in the portal <https://mhrd.euniwizarde.com>), the portal will give a successful Tender submission acknowledgement & a bid summary will be displayed with the unique id and date & time of submission of the bid with all other relevant details.*
10. The tender summary has to be printed and kept as an acknowledgement of the submission of the tender. This acknowledgement may be used as an entry pass for any bid opening meetings.
11. The off-line tender shall not be accepted and no request in this regard will be entertained whatsoever.
12. As per portal norms Tender Processing Fee will be applicable.

AMENDMENTS OF BID DOCUMENT:

At any time prior to the deadline for submission of Bids, the department reserve the right to add/modify/delete any portion of this document by the issuance of a Corrigendum, which would be published on the website and will also be made available to the all the Bidder who has been issued the tender document. The Corrigendum shall be binding on all bidders and will form part of the bid documents.

ASSISTANCE TO BIDDERS:

For any clarification in using <https://mhrd.euniwizarde.com>

1. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
2. Any queries relating to the process of online bid submission or queries relating to e-Wizard Portal in

general may be directed to the 24X7 e-Wizard Helpdesk Support.

Please feel free to contact euniwizard helpdesk (as given below) for any query related to e- tendering - Phone No. 011-49606060.

Mail id: - helpdeskeuniwizarde@gmail.com

The contact number for the helpdesk is 8448288994/86/87/89/88/81/90/92/82

011-49606060, 07903269552, 9355030608, 9055030613, 7903810198, 9355030606, 9315620706, 9355030623, 9355030628, 8800526452, 9205898228, 9122643040, 9355030604

epochhelpdesk.01@gmail.com, epochhelpdesk.44@gmail.com, epochhelpdesk.06@gmail.com

3. The tender inviting authority has the right to cancel this e-tender or extend the due date of receipt of the bid(s).

4. The bid should be submitted through e-Wizard portal (<https://mhrd.euniwizarde.com/>) only.

NOTICE INVITING TENDER

NIT No. IITH/CMD/ELE/NIT/2022-23/06

Technical Eligibility Criteria:

1. Bidders shall produce definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:

Experience of having successfully completed similar works during the last 7 years ending last day of the month previous to the one in which tenders are invited

Three similar completed works each costing not less than 40% of the estimated cost put to tender or

Two similar completed works each costing not less than 60% of the estimated cost put to tender or

One similar completed work costing not less than 80% of the estimated cost put to tender

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of submission of tender.

"Similar Work" shall mean the work of SITC (Supply, Installation, Testing and commissioning) of DG set with AMF panel with capacity of individual DG set as minimum 100kVA.

(For private works TDS certificate or Form-26 AS in support of value of work done.)

2. **Turnover:** Average annual financial turnover on similar works should be at least 50% of the estimated cost put to tender during the immediate last three consecutive financial years ending 31st March 2022. The value of annual turnover figures shall be brought to current value by enhancing the actual turnover figures at simple rate of 7% per annum. The certificate from the Chartered Accountant shall be enclosed with the bid.
 - 2.1 **Profit/loss :** The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last five consecutive balance sheet (balance sheet in case of private/public limited company means its standalone financial statement and consolidated financial statement both), duly audited and certified by the Chartered Accountant.
 - 2.2 **Banker's Certificate** from a Commercial Bank or Net worth Certificate:
Banker's Certificate of the amount equal to 40% of the Estimated Cost put to tender (ECPT),
or
Net worth certificate of minimum 10% of the estimated cost put to tender issued by certified Chartered Accountant with UDIN as per format enclosed as Annexure-I

3. To become eligible, the tenderer shall have to furnish an affidavit as per Form 'J' of the NIT.
4. The bidder shall have Employees Provident Fund (EPF) enlistment and proof of the same shall be attached along with the Technical Bid clearly showing the Provident Fund Code number.
5. The bidder shall submit the Indemnity bond as per format provided in Annexure-II.
6. To become eligible, the tenderer shall have to furnish an affidavit as per Form 'J' of the NIT.
7. Agreement shall be drawn with the successful tenderer on prescribed Form which is available in the website: https://drive.google.com/file/d/19_LkFZ11eQb_3BznXQtinslcLISYVdbo/view **(with up to date correction slips if any)** Tenderer shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
8. The time allowed for carrying out the work will be as stated at para 1 from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the tender documents.
9. The site for the work is available.
10. Tender documents consisting of plans, specifications, the schedule of quantities of the various classes of work to be done and the set of terms & conditions of contract to be complied with by the contractor whose tender may be accepted and other necessary documents can be seen for information at the above-mentioned website.
11. Applicants are advised to keep visiting the above-mentioned website from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respects including updates thereof, if any. An incomplete application may be liable for rejection.
12. The contractor whose tender is accepted, will be required to furnish performance guarantee of 3% (Three Percent) of the tendered amount within the period specified in Schedule F. This guarantee shall be in the form of Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any scheduled bank or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F'. including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor.
13. The description of the work is as follows:

Supply, Installation, Testing and Commissioning (SITC) of 125 kVA & 50 kVA Diesel Generating (DG) sets with AMF panel for one Lift at each existing Faculty Towers and Staff Towers, IIT Hyderabad, Kandi Campus, Sangareddy

Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

14. Tenders with any condition including that of conditional rebates shall be rejected forthwith.
15. Cost of **Bid document cost** and **EMD** may also be remitted to Institute's account number as per bank particulars given below:

Name of the Account Holder : Indian Institute of Technology Hyderabad
Account Number : 30412797764 (Current Account)
Name of the Bank : State Bank of India
Address of the Bank : IIT Kandi, IIT Hyderabad Campus,
Kandi, Sangareddy, Telangana - 502284
Branch code : 14182
IFSC code : SBIN0014182
MICR code : 502002528
SHIFT code : SBININBB762

16. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other tender and reserves to itself the authority to reject any or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.
17. Canvassing whether directly or indirectly, in connection with tenderers is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.
18. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.
19. The contractor shall not be permitted to tender for works if his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Institute.
20. No Engineer of gazette rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service,

without the previous permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractor's service.

21. The tender for the works shall remain open for acceptance for a period of Sixty (60) days from the date of opening of tenders/Sixty days from the date of opening of financial bid in case tenders are invited on 2/3 envelop system (strike out as the case may be) if any tenderer withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the tenderer shall not be allowed to participate in the retendering process of the work.

22. (A) All taxes, Labor Cess etc., as applicable shall be borne by the contractor himself. The contractor shall quote his rates considering all such taxes including GST on works. Any recovery towards GST is notified by the competent authority, the same shall be effected and no claim what so ever shall be entertained by IITH. The contractor shall quote his rates accordingly.

(B) 2% as TDS amount of GST amount payable on the bills will be deducted as per the Govt. of India, Ministry of Finance, Department of Revenue notification vide No.65/39/2018-DOR, dtd: 14-09-2018.

23. *GST registration certificate of the state in which the work is to be taken up, if already obtained by the bidder.*

If the bidder has not obtained GST registration in the state in which the work is to be taken up or as required by GST authorities, then in such a case the bidder shall scan and upload following under taking along with other bid documents.

"If the work awarded to me, I/We shall obtain GST registration certificate of the state, in which work is to be taken up, within one month from the date of receipt of award letter or before release of any payment by IIT Hyderabad, whichever earlier, failing which I/We shall responsible for any delay in payments which will be due towards me/us on a/c of the work executed and/or for any action taken by IIT Hyderabad or GST department in this regard."

24. *Bidder has to submit Undertaking on their letter head pursuant to the Section 206AB (as applicable) of the Income Tax Act,1961 in prescribed format as enclosed at Annexure-A along with each and every bill submitted for payment.*

25. This notice inviting Tender shall form a part of the contract document. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of :-

- a) The Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

- b) Standard Contract form (General Conditions of Contract) as posted in the website of the Institute. The bidder is deemed to have gone through and understood the Standard Contract Form and the General Conditions of Contract.



**Executive Engineer-Electrical
IIT Hyderabad**

(Signature of bidder)

FORM 'J'

AFFIDAVIT

I/we undertake and confirm that our firm/partnership firm has not been blacklisted by any state/Central Departments/PSUs/Autonomous bodies during the last 7 years of its operations. Further that, if such information comes to the notice of the department then I/we shall be debarred for bidding in IIT Hyderabad in future forever. Also, if such information comes to the notice of IIT Hyderabad on any day before date of start of work, the Engineer-in-charge shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee (Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid)

NOTE: Affidavit to be furnished on a 'Non-Judicial' stamp paper worth Rs.100/-

Signature of Bidder(s) or an authorized Officer of the firm with stamp

Signature of Notary with seal

Checklist of documents to be submitted along with Technical Bid

Sl. No.	Doc Ref	Description of the Document	Enclosed Yes/No	Remarks
	<i>Applicant shall submit the following documents for Technical scrutiny</i>			
1	Registration of Firm (ROF)	Copy of valid Registration of Firm (ROF)		
2	PAN details	Copy of PAN card		
3	GST registration details	Copy of GST Registration certificate & GSTIN should accompany the Technical Bid		
4	Details of similar works executed <i>(Detailed statements to be enclosed)</i>	Not less than 40% of estimated cost (Three similar works)		
		Not less than 60% of estimated cost (Two similar works)		
		Not less than 80% of estimated cost (One Similar work)		
5	As per Para No. 1.4 of NIT	Cost of EMD		
6	As per Sl. No.2 of NIT	Copy of Certificate from CA for Average Annual Financial Turnover		
7	As per Sl.No.2.1 of NIT	Profit and loss statement for Last 05 financial years		
8	As per Sl.No.2.2 of NIT	Net worth certificate		
9	As per Sl.No.23 of NIT	Undertaking for GST registration in the state in which the work is to be taken up		
10	As per Sl.No.24 of NIT	Undertaking pursuant to Section 206AB (as applicable) of the Income Tax Act, 1961 (Proforma enclosed as Annexure-A)		

On Contractor/ Agency's Letter Head

Undertaking pursuant to Section 206AB (as applicable) of the Income Tax Act, 1961

To,
Registrar
IIT Hyderabad
Kandi, Sangareddy- 502284.

Dear Sir/Madam,

Subject: Declaration confirming filing of Income Tax Return for immediate two preceding years.

I, Ms./Mrs./Mr. _____ in capacity of Authorized Signatory of _____ having PAN _____ and registered office at _____ do hereby declare that _____ has filed Income Tax Returns for immediately last 2 preceding Financial Years as mentioned below per due dates under Section 139 (1) of the Income Tax Act, 1961 ('the Act') and details of which are as given under:

Financial Year for which Income Tax Return was due as per Section 139(1)	Acknowledgement no. of ITR filed under Section 139(1)	Date of Filing
2020-21 <i>(if applicable on date of this declaration)</i>		
2019-20		
2018-19		

Further, I confirm that _____ has lined the above PAN with Aadhaar number as on this date.

I also undertake that _____ hereby indemnify ***Indian Institute of Technology Hyderabad*** for any loss/liability (including any Tax, interest, penalty, etc.) that may arise due to incorrect reporting of above information.

For _____

Signature: _____

Name of person:

Designation:

Place:

Date:

PROFORMA OF SCHEDULES

SCHEDULE 'A'

Schedule of quantities (Enclosed): Part A (Item Rate)

SCHEDULE 'B'

Schedule of materials to be issued to the contractor

Sl. No.	Description of item	Quantity	Rates in figure & words at which the material will be charged to the Contractor	Place of issue
..... NIL				

SCHEDULE 'C'

Tools and plants to be hired to the contractor

Sl. No.	Description	Hire Charges per day	Place of issue
..... NIL			

SCHEDULE 'D'

Extra schedule for specific requirements/documents for the work, if any.

--- NIL ---

SCHEDULE 'E'

Reference to General Condition of Contract.: *Posted in the website of the Institute.*

Name of the work

: ***Supply, Installation, Testing and Commissioning (SITC) of 125 kVA & 50 kVA Diesel Generating (DG) sets with AMF panel for one Lift at each existing Faculty Towers and Staff Towers, IIT Hyderabad, Kandi Campus, Sangareddy***

Estimated cost of work

: ***Rs. 40,51,509/-***

Earnest money

: ***Rs. 81,100/-***

Performance Guarantee

: ***3.0% of the accepted tendered value***

Security Deposit

: ***2.5% of the tendered value***

SCHEDULE 'F'

GENERAL RULES AND DIRECTIONS:

Officer inviting tender: : *Executive Engineer-Electrical, IITH*

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3 : *See below*

Definitions:

2(v) Engineer -in- Charge : *Executive Engineer-Electrical, Indian Institute of Technology, Hyderabad.*

2(viii) Accepting Authority : *Superintending Engineer, Indian Institute of Technology, Hyderabad.*

2(x) Percentage on cost materials and Labour to cover all overheads and profit : *15% (Fifteen) per cent.*

2(xi) Standard Schedule of Rate : *CPWD, Delhi Schedule of Rates (DSR) 2018 Civil / Electrical, with up to date correction slips.*

Standard Contract Form : *IITH General Conditions of Contract for Construction Works*

Clause 1

i) Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance, in days : *15(Fifteen) Days*

ii) Maximum allowable extension beyond the period provided in (i) above : *7 (Seven) Days*

Clause 1A

Whether Clause 1A is applicable : *Yes*

Clause 2

Authority for fixing Compensation under Clause 2 : *Superintending Engineer, Indian Institute of Technology, Hyderabad*

Clause 3(VII): If the contractor had secured the contract with Government as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement-will be made ineligible.

Clause 5:

Number of days from the date of issue of letter of acceptance for reckoning date of start : *7 Days or date of issue of LOC whichever is later*

Milestones : *Not Applicable*

Time allowed for execution of work : *120 Days*

Authority to give fair and reasonable Extension of time for completion of work (Web based hindrance register) : *Superintending Engineer, IITH*

Rescheduling of mile stones : *Superintending Engineer, IITH*

Clause 6:- Measurement Book : *(i) For works having estimated cost more than Rs 15 Lakh – Clause 6*

Clause applicable, 6

(ii) For works having estimated cost Rs. 15 Lakh or less – Contractor's option of Clause 6 or to be exercised at the time of Tender Submission

Clause 7:

Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment : *Rs. 5 Lakhs/-*

Clause 7A: : *Yes.*

Whether Clause 7A is applicable : *No running account bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-charge.*

Clause 10A:

List of testing equipment to be provided by the contractor at site lab : *As given in additional specifications*

Clause 10B (i)- Secured advance on Materials:

Whether Clause 10 B (i) shall be applicable : *NA*

Clause 10C:

Component of labour expressed as percent of value of work : NA

Clause 10CA : Not Applicable

Clause 10CC : Not Applicable

Clause 10D : Applicable

Clause 11:

Specification to be followed for execution of work : **For ELECTRICAL WORKS**

CPWD General Specifications for Electrical works:

Part I Internal 2013

Part II External 1994

Part IV Substations 2013

Part VII DG Sets 2013

up to date Corrections Slips.

For CIVIL WORKS

CPWD Specifications (Civil) Volume I-2019 & Volume II-2019 with up to date corrections slips

Clause 12:

12.2 & 12.3: Deviation limit beyond which Clause 12.2 & 12.3 shall apply for building work : 100% (as per CPWD circular No. DG/CON/313 Dt: 17.02.2021)

12.5 : Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work : 100% (One hundred per cent)

Clause 14:

Whether Clause 14 is applicable : Yes.

Clause 16

Competent Authority for deciding reduced rates. : Superintending Engineer, IIT Hyderabad up to 5% of tendered amount, beyond which, Director, IITH.

Clause 18:

List of mandatory machinery, tools & plants to be deployed by the contractor at site : As required for the work.

Clause 25:

Settlement of disputes by Conciliation and Arbitration:

Conciliator : Dean (Planning)

Authority to appoint arbitrator : Director, IIT Hyderabad

Place of arbitration : Hyderabad

Venue of arbitration : IIT Hyderabad

Type of Arbitration Tribunal : Sole Arbitrator
Note: Provisions of Arbitration and Conciliation Act 1996 with latest amendments in force shall be applicable.

Clause 32: As required for the work.

Clause 38

(i): Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates : DSR – 2021 Civil published by CPWD

(ii): Variations permissible on theoretical quantities:

- | | |
|---|-------------------------------------|
| (a) Cement | 2% plus/minus |
| (b) Bitumen All Works | 2.5% plus only & nil on minus side. |
| (c) Steel Reinforcement and structural steel sections for each diameter, section and category | 2% plus/minus |

Special Conditions of Contract

1. Before tendering, the Agency shall inspect the site of work and shall fully acquaint himself about the conditions prevailing at site, availability of materials, availability of land and suitable location for construction of godowns, stores and camp, transport facilities, the extent of lead and lifts involved in the work (over the entire duration of contract) including local conditions, as required for satisfactory execution of the work and nothing extra whatsoever shall be paid on this account.
2. The Agency shall at his own expense and risk arrange land for accommodation of labour, setting up of office, the storage of materials, erection of temporary work-shops, and construction of approach roads to the site of the work including land required for carrying out of all jobs connected with the completion of the work. In any case. **IIT Hyderabad (Institute) shall not permit setting up of labour camps within its premises.** If during construction it becomes necessary to remove or shift the stored materials shed workshop, access roads, etc. to facilitate execution of any other work by any other agency, the contractor shall do as directed by the Engineer-in-charge and no claim whatsoever, shall be entertained on this account.
3. It shall be deemed that the contractor shall have satisfied himself as to the nature and location of the work, transport facilities, availability of land for setting up of camp etc. The department will bear no responsibility for lack of such knowledge and the consequences thereof.
4. The Agency shall have to make approaches to the site, if so required and keep them in good condition for transportation of labour and materials as well as inspection of works by the Engineer-in-charge. Nothing extra shall be paid on this account.
5. The Agency shall at his own cost submit samples of all materials sufficiently in advance and obtain approval of the Engineer-in-charge. Subsequently, the materials to be used in the actual execution of the work shall strictly conform to the quality of samples approved by the Engineer-in-charge and nothing extra shall be paid on this account. The acceptance of any sample or material on inspection shall not be a bar to its subsequent rejection, if found defective.
6. The contractor shall at his cost, make all arrangements and shall provide necessary facilities as the Engineer-in-charge may require for collecting, preparing, packing forwarding and transportation of the required number of samples for tests for analysis at such time and to such places as directed by the Engineer-in-charge, and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The cost of tests shall be borne by the contractor/Institute in the manner indicated below (except for water):
 - a) By the contractor, if the results show that the material does not conform to relevant specifications and BIS codes or any other relevant code for which conformity test is carried out.
 - b) By the Institute, if the results show that the material conforms to relevant specifications and BIS codes or any other relevant code for which conformity test is carried out.
7. Materials used on work without prior inspection and testing (where testing is necessary) and without approval of Engineer-in-charge are liable to be considered unauthorized, defective and not acceptable. The Engineer-in-charge shall have full powers to require removal of any or all of the materials brought to site by contractor which are not in accordance with the contract, Specifications or do not conform in character or quality to the samples approved by the Engineer-in-charge. In case of default on the part of the contractor in removing rejected materials, the Engineer-in-charge shall be

at liberty to have them removed at the risk and cost of the contractor.

8. The work shall be carried out in such a manner so as not to interfere/or effect or disturb other works being executed by other agencies, if any.
9. Any damages done by the contractor to any existing work or work being executed by other agencies shall be made good by him at his own cost.
10. The work shall be carried out in the manner complying in all respects with the requirement of relevant rules and regulations of the local bodies under the jurisdiction of which the work is to be executed and nothing extra shall be paid on this account.
11. The contractor shall maintain in good condition all work executed till the completion of the entire work entrusted to the contractor under this contract and nothing extra shall be paid on this account.
12. No payment will be made to the contractor for damage caused by rain, floods and other natural calamities whatsoever during the execution of the works and any damage to the work on this account shall have to be made good by the contractor at his own cost and nothing whatsoever shall be paid on this account.
13. The Item Rates or ~~Percentage Rates~~ for all items of work, unless clearly specified otherwise shall include the cost of all labour for materials, de-watering and other inputs involved in the execution of the items.
14. No claim whatsoever for idle labour, additional establishments, costs of hire and labour charges for tools and plants etc. would be entertained under any circumstances.
15. For the safety of all labour directly or indirectly employed in the work for the performance of the contractor's part of this agreement, the contractors shall, in addition to the provisions of Safety code and directions of the Engineer-in-charge make all arrangements to provide facility as per the provisions of Indian Standard Specifications (Codes) listed below and nothing extra shall be paid on this account.
 - (a) IS 3696 Part I Safety Code for scaffolds and ladders
 - (b) IS 3696 Part II Safety Code for scaffolds and ladders Part II ladders
 - (c) IS 764 Safety Code for excavation work
 - (d) IS 4081 Safety Code for Blasting and Drilling operations,
 - (e) IS4138 Safety Code for working in compressed air.
 - (f) IS 7293 Safety Code for working with construction machinery
 - (g) IS 7969 Safety Code for storage and handling of building materials
 - (h) IS 5216:1982 code of safety procedures and practices in electrical works
16. The contractor shall take all precautions to avoid all accidents by exhibiting necessary caution boards and by providing red flags, red lights and barriers. The contractor shall be responsible for any accident at the site of work and consequences thereof.

17. Labour Welfare Cess @ 1% shall be deducted at source from the bills of Gross value (which includes the cost of stipulated materials) of the work done and Government shall not entertain any claim whatsoever in this respect in this contract. The Labour cess will be deducted in conformity with the Govt. guidelines for Electrical works and Civil works accordingly.
18. The ESI and EPF Contribution on the part of the employer in respect of the contract shall be paid by the contractor.
19. The contractor shall obtain a valid licence under the contract labour (R A) Act, 1970 and the contract labour (Regulation and Abolition) Central Rules, 1971 before the commencement of the work, and continue to have a valid licence until the completion of the work. The contractor shall also comply with provision of the Inter- State Migrant Women (Regulation of Employment and conditions of service) Act 1979.
20. All tools, tackles, safety equipment and labours required for maintenance and testing works / AMC at all levels and heights shall have to be provided by the tenderer at no extra cost.
21. Spare parts used by vendor should conform to IS specifications as applicable.
22. Any damaged due to mishandling by the person deputed by the vendor shall have to be restored back to its original condition by the vendor at their own cost.
23. After the award of work, the contractor is required to submit:
 - (i) Written commitment from OEM/OEA to supply the DG Sets and delivery schedule as per requirement of department i.e., IITH.
 - (ii) Certificate from OEM/OEA or authorized service provider of engine manufacturer for satisfactory installation and commissioning of DG Set after completion of the work.
 - (iii) Required Guarantee of DG Set from OEM/OEA in favour of Engineer-in-Charge to cover defect liabilities.
 - (iv) An undertaking that mandatory free service is carried out during the guarantee period by the authorized service provider of engine manufacturer
24. The lowest tenderer is required submit, along with the performance guarantee after the acceptance of tender, an undertaking from the OEM regarding :
 - (a) Authorization certificate.
 - (b) The OEM is unconditionally support the lowest tenderer technically throughout the execution of contract as well as for Maintenance/ Comprehensive Maintenance Contract for the useful life of the system, and
 - (c) OEM provides all the spares required for healthy functioning of the equipment for at least seven years from the date of supply of equipment as per terms and conditions of guarantee period and Maintenance contract (if any) after the expiry of guarantee period

TECHNICAL SPECIFICATION

The work shall be carried out as per CPWD Specifications and relevant IS codes. In case of discrepancy between technical specification and BOQ, the BOQ prevails.

The following CPWD specifications shall be invariably followed for this work:

(A) For ELECTRICAL WORKS:

- i. CPWD General Specifications for Electrical Works Part I -Internal 2013
- ii. CPWD General Specifications for Electrical Works Part II- External 1994
- iii. CPWD General Specifications for Electrical works Part IV Substations 2013
- iv. CPWD General Specifications for Electrical works Part VII DG sets 2013

(B) For CIVIL Works:

- i. CPWD Specifications Volume I -2019 & Volume II-2019

SECTION-I SPECIFICATIONS (GENERAL)

1.0 SCOPE

A) The specification covers the general requirement for manufacturing, inspection, testing & supply, installation, testing & commissioning of 125KVA and 50 KVA Silent Diesel Engine driven alternator suitable for operation with Auto Mains Failure system along with AMF panel, cabling, panels, cabling etc as per the site. Loading, unloading, transportation of new D.G., new AMF Panel are in the scope of Supplier/Contractor including requisite Civil works.

B) The alternator is driven by I. C. Diesel Engine as per following technical specifications.
Specification for the Alternator – Section II

Specification for Engine - Section III

Specification for soundproof enclosure - Section IV

Specification for AMF Panel (inclusive of - Section V Control & Monitoring Panel)

C) Vendor to obtain statutory permissions like CEA, PCB/ CPCB as per the requirement. The offered DG set must have type approval meeting CPCB-2 norms for smoke emission and also noise emission.

1.1 Documents to be submitted with Technical Bid:

- a) Alternator
- b) Engine
- c) AMF Panel
- d) Documentation

G.A. drawing of the complete assembly shall be submitted for approval before commencement of work.

1.2 Installation location

The DG set shall be installed Indoor in acoustic enclosure (specification for which has been provided in the document) at IIT Hyderabad – 502284.

1.3 General

- 1.3.1 All the supply & work shall be in accordance with the relevant IS Specifications, recognized standards, modern approved practice and shall meet the requirements of the latest issue of applicable codes, factory rules and regulations, supply codes.
- 1.3.2 All the materials & accessories provided by Contractor under terms of this contract shall conform to relevant IS Specifications samples of all equipment's, materials, and accessories to be supplied by Contractor shall be submitted for the approval of Engineer before the use.
- 1.3.3 Contractor shall provide all necessary labor, tools, scaffolding and requisite work like drilling, cutting, welding at his cost.
- 1.3.4 Good workmanship is the essence of this contract and shall be complied with at all times. The Contractor shall have the works supervised by qualified & experienced Engineer. All the defects pointed out by the Engineer shall be rectified immediately by the contractor free of cost.
- 1.3.5 Applicable Indian Electricity Rules, Act (latest), CPCB Norms and all other statutory regulations that might be relevant to the installation shall be followed.
- 1.3.6 No alteration which may affect the structures and architecture of building shall be done without the prior approval of the engineer. All work shall be carried out in such a manner that it should not cause any inconvenience to other works which are under progress. The Contractor shall cooperate with other agencies in the area for the smooth execution of all works.
- 1.3.7 Accidental damage to any property shall be reported immediately to site engineers and letter confirmed in writing.
- 1.3.8 Operation and Maintenance spares: -

Bidder shall provide the list of spares required as standby to maintain the DG Set in Good working condition.

1.4 Tests and Inspection:

The authorized representatives from IIT Hyderabad may visit the works during manufacture of equipment to assess the progress of work as well as to ascertain that only quality raw materials are used for the same. They shall be given all assistance to carry out the inspection without any extra cost.

To conduct factory and site load test as per requirement as stated in the Tender specification including sufficient sized load bank in order to conduct full load testing as required, the contractor shall arrange the complete load bank at his own cost. For factory test, the contractor shall facilitate IITH officials for the same.

For Diesel Engine:

Manufacturer's internal test certificates in line with IS-10002 /BS-5514 shall be furnished for review and vetting by the engineer/engineers during inspection of combined assembly DG set.

For Alternator:

Manufacturer's internal test certificates in line with IS-4722 - 1968 shall be furnished for review and vetting by the engineer/engineers during inspection of combined assembly DG set.

- 1.5 All major items/equipment's i.e. engine & alternator in assembled condition, associated AMF panel etc. shall be offered for inspection & testing at factory/ manufacturers work.
 - a) Complete set along with AMF panel shall be tested for control wiring, manual, automatic start, stop function including fault tripping/ protection of the set. AMF panel shall be tested separately for all routine & functional test prior to load test.

- b) Dimensions and Alignment.
 - c) DG Set control panel, safety / protective devices, interlocks, IR, HV, Phase sequence, voltage regulation, frequency.
 - d) Partial load test at 50% and 75 % for one hour each and fuel consumption will be recorded
 - a) Full Load testing of complete set at 100% rated load with acoustic enclosure till the differential temperature remain steady but not less than 3 hrs. The engine and alternator parameter shall not exceed the guaranteed value during the testing. Fuel consumption shall be recorded.
 - b) Overload testing at 10% overload for one hour immediately after the full load test.
 - c) Over speed test (1.2 times the rated speed for 2 minutes)
 - d) Transient response and Governor response tests for sudden application and rejection of loads of 25%, 50%, 75% & 100% of the rated capacity.
 - e) Smoke test certificate as per rules.
 - f) The noise level at 1 m from the enclosure and the temperature rise inside the enclosure shall be measured during the load test.
- DG Vendor to Study Site & Confirm Transportation of DG set to location without Dismantling any component after Factory Test is Conducted. **Vendor to make all constructional damages good to any part of the building during transportation, unloading.**

1.6 Site Testing:

Following tests shall be conducted at site in the presence of the Engineer during commissioning.

The contractor shall provide all testing equipment, Load bank, labour and consumables required for the testing (Diesel oil shall be arranged by the contractor only) with DG set load testing as stipulated in specifications/BOQ. Entire cost is to be borne by Vendors.

- a) Checking the alignment by engine manufacturer's representative and obtaining approval.
- b) HV, IR, continuity, phase sequence, frequency, voltage regulation test on alternator, control panel and cabling.
- c) Checking the AMF operation both on auto and manual mode, start, stop, tripping / protection, IR, HV, functional and routine tests.
- d) Checking the DG Set safeties and interlocks for satisfactory operation.
- e) Checking vibration levels.
- f) Testing of individual protective devices on engine and alternator & ensuring that the wiring is carried out properly.
- g) The DG set shall be tested for load available at site for minimum one hour. All the readings shall be logged to evaluate the fuel consumption, tube oil pressure, water and oil temperature vis-à-vis the electrical load.

Any deviation from the guaranteed parameters shall be made good and these performance parameters should be measured once again till the required results are achieved.

The DG set shall be deemed to be commissioned after satisfactory performance of all associated equipment's.

1.6 Compliance:

- a) The DG set being provided by the bidder shall comply with latest environment protection rules and latest BIS standards. Conformance label as per the said rule is to be affixed on the DG set. A copy of each type approval certificate and conformity of production certificate is to be provided in along with the offer. Supplier shall clearly specify the codes and standards for designing manufacturing, inspection and testing of the DG Set along with the bid. The DG Set shall have one-hour overload capacity of 10% in every twelve hours of duration of operation.
- b) All the cables route to be marked at both sides of cable termination with brass plate and letter to be imposed.

- c) Other staff training shall include training sessions provided on site after hand over of the system. The training sessions shall be given by an experienced and competent engineer familiar with system installed. The scope of training provided shall include full operating instructions in the use of DG Set.
- d) The contractor shall provide operating instruction as required for operating the system. "Hands-on" demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.
- e) The contractor and/or the systems manufacturer's representatives shall provide printed Sequence of Operation sheets for ready reference.

SECTION -II ALTERNATOR SPECIFICATION

1.0. Rating & General

The DG Set shall be Prime Power rating Duty as per ISO: 8528-1. It comprises of alternator which shall be self -excited, self-regulated and shall be rated for an output of 125 KVA and 50 KVA Continuous Duty Power at 415 Volts, 3 Phase, 50 Hz suitable for the 4 wire system exclusive of power requirement of auxiliaries. Winding is to be STAR connected and neutral shall be brought out through a separate terminal and will be solidly grounded.

Rating Voltage	:	125 KVA & 50 KVA (Continuous Duty)
	:	415 Volt 3 Phase with neutral brought out through separate terminal
Frequency	:	50 Hz
RPM	:	1500 RPM
Duty Rating	:	Continuous
S1 Short circuit withstand		
Capacity	:	3 times FLC for 10seconds
Overload	:	10%overload for one hour in 12 hours
Suitability for parallel	:	
Operation Harmonic		
Distribution factor	:	NL L-L
2.5% Unbalanced Load	:	25%
Ball Bearing	:	SINGLE

1.1 Excitation

Self-excited, self-regulated and with brushless type solid state excitation facility. The rectifier shall be suitable for operation at high ambient temperature at site as indicated in Specification. Over excitation protection shall be provided as per Alternator Manufacturer standard.

2.0 Standards

The alternator shall be in accordance with latest editions of the following standards:

- i) IS : 4722/ 68 & BS : 2613/ 1970. The electrical performance of rotating electrical machine.
- ii) IS : 4889/ 68 & BS : 269/1970, Rules for method of declaring efficiency of electrical machine.
- iii) Other IS/BS/IEC/EN applicable for design, manufacturing, testing and supply of subject Alternator/DG set like IEC 43, BS 6250, EN62581, IS13364 (I&II) with CE marking.

3.0 Voltage Regulation:

An automatic voltage regulator system compatible with excitation system described above shall be provided, so as to furnish a performance as defined herein under all conditions of loads. The AVR shall be static type with provision for control from remote through push buttons.

4.0 Performances:

Voltage regulation from no load to rated load shall be within a range of 2.5% for rated voltage. The frequency regulation from no load to full load shall be as defined by the Engine Governor. Voltage dip for any addition of load upto and including 60% load shall not exceed 15% of rated voltage and shall recover to and remain within the steady band within not more than 1.5 sec. Similarly, the frequency shall recover to the steady state frequency band within 5 seconds. The windings shall not develop hot spots exceeding safe limits due to an imbalance of 25% between any two phases from no load to full load.

5.0 Enclosure

Alternator enclosure should be screen protected drip proof (IP23) conforming to IS : 4691 - 1968.

6.0 Terminal Box

It shall be suitable for necessary PVC insulated 1.1 KV grade 3 Nos. of 3.5 Core 300 sqmm Al. armoured cable conforming to IS : 1554 - Part - I with sufficient space for trifurcation inside the box. Necessary individually removable gland plates, cable lugs, connections shall all be included. Suitable segregation shall be available for other cables such as excitation, control etc. The terminal box shall be suitable for withstanding the mechanical and thermal stresses developed due to any short circuit at the terminals.

Two Nos. earth terminals on opposite side with vibration proof connections, nonferrous hardware etc. With galvanized or plated and passivated washers of minimum size 12 mm dia. shall be provided.

7.0 Windings: Class H insulation shall be used.

8.0 Space Heaters

Space heater to be incorporated in the alternator to maintain the winding temperature such that it does not absorb moisture during long idle periods. The heater terminals shall be brought to a separate terminal box suitable for 240 V 50 Hz AC supply.

9.0 Under Speed Protection:

Alternator shall be provided with under speed protection.

10.0 Parallel Operation:

Parallel operation provision shall be provided as in-built part of AVR.

11.0 Wave Form:

Sinusoidal Wave form with THD content line to line on no load shall be less than 5%.

12.0 Transient Voltage Dip:

Transient voltage Dip due to sudden application of full load shall be taken care.

13.0 Radio interference shall meet VDE 0875(N).

14.0 Painting, Packing and Transport

All metal surfaces shall be thoroughly cleaned of scale, rust, and grease etc. prior to painting. Cleaned surface shall be given two coats of primer and prepared for final painting. Final finish shall be free from all sorts of blemishes.

The equipment shall be shipped to site suitable packed to prevent and damage. Each package shall have labels to show purchaser's name, purchase order and equipment no. Suitable lifting lugs etc. shall be provided and lifting points shall be clearly marked on the package. Packing shall be suitable for storage at site for a minimum period of 8 months.

SECTION – III ENGINE SPECIFICATION

1.0 SPECIFICATIONS FOR DIESELENGINE

1.1 Engine

The major subassemblies of the prime mover shall be as follows:

- i) Four stroke diesel oil engine, Battery starting type, Turbocharged, coolant cooled/Water cooled, Forced feed lubricated with its auxiliaries.
- ii) Steel channel fabricated common base plate (skid) for engine and alternator along with anti-vibration mounting pads.
- iii) Flex Plate cum Fly Wheel Bolted type coupling method between Engine and Single Bearing type Alternator.
- iv) Control system for the Diesel engine.

1.2. The engine shall be rated suitably to meet the requirement of alternator at its maximum rating and overload of 10% of the rated output for 1 hour in 12 hours of running as per Prime Power Duty definition mentioned in ISO:8528-I.

13 The diesel engine offered shall be suitable for operation with high speed diesel oil as per IS : 1460 Grade A. Performance requirement of the engine shall meet the requirement of IS-10002/BS-5514 standards (latest editions).

14 The diesel engine shall be furnished with all accessories like governor, daily service fuel tank, exhaust piping with exhaust silencer (Residential type silencer) and spark arrestor etc. The fuel tank shall be 850 Ltr Capacity and shall be fitted within Acoustic Enclosure with visual fuel level indicator/ Gauge, fuel level switches, fuel filling in remote mode with steel channel structure to mount the tank and inter-connecting fuel piping,

15 The engine set shall have proper instrumentation & control for semi - automatic operation as per the following:

1.5.1 Unit Start-Up

The DG set shall be started by means of battery. The unit shall be controlled locally for inspection, periodic start-up, check and normal operation. It shall have the facility to remotely switch on/off through auxiliary potential free contacts of relay to be provided in the AMF Panel. The engine control circuit shall provide terminal contacts for permissive signal to run/ stop from an external relay contact that will close by shorting the terminals and allow the engine to start/ stop on remote mode from Owner's control panel.

1.5.2 Unit Shut Down

The shutdown of DG shall be made effective through a STOP solenoid switch mounted in the engine. The DG set shall permit:

- a) Immediate automatic shut-down of the unit due to irregular operation and shall have provision for creating audio-visual signals of shut-down cause at the AMF panel which shall include the following:
 - i) Low lube oil pressure (through a pressure switch).
 - ii) High Jacket water temperature (through a temperature switch)
 - iii) Diesel tank fuel level low(through a level switch).
 - iv) Engine fails to start.
 - v) Engine over speed.
- b) To facilitate generation of these fault signals suitable instruments/relays having required potential free contacts shall be provided for effecting the above. All these potential free contacts shall be wired to terminate in a separate terminal strip with proper identification in the engine local control panel. Status of potential free contact shall be changed as soon as above mentioned parameters reaches/ crosses their acceptable limits. Initially during the starting lube oil pressure switch shall be bypassed and will regain its normal status after start. **Necessary provision shall be made for remote starting/stopping of the engine through push buttons mounted in the AMF panel.** All the above-referred contacts shall be wired up to a terminal strip for wiring up to remote AMF panel.

1.6 Operation

Suitable facilities shall be provided for operation and monitoring of the Engine which shall include the following: -

For status monitoring (local), following gauges shall be available in engine local control panel.

- i) Engine Lube oil pressure gauge
- ii) Engine Jacket water.
- iii) Ammeter for battery charging.
- iv) DG set in Local / Remote / Manual indication.
- v) Digital hour-cum-RPM indicator.

1.7 Lubricating oil system

- 1.7.1 The engine shall be complete with its own self-contained lubricating oil system in which all the moving parts shall be lubricated by force feed system with the pump driven by the power drawn from the engine.
- 1.7.2 The lubricating oil sump shall have such capacity so as to ensure continuous operation of 48 hours without makeup.
- 1.7.3 Heat exchanger type in-built lube oil cooler shall be provided for cooling the lube oil.
- 1.7.4 Full flow paper / felt element lube oil filters (simplex / duplex) shall be provided at the beginning of lubricating oil circuit. Filter shall be equipped with a by-pass arrangement to make it possible to change the filter (while the engine is running) by using by-pas filter.
- 1.7.5 As per the manufacturer's standard design, lube oil pump shall be provided for providing lubrication when the engine is not running.

1.8 Starting system

The engine shall be started from cold by automotive type lead acid battery both locally or from remote.

1.8.1 Electrical system

Engine electrical system shall consist of the following:

- i) **Battery:** Automotive low maintenance type lead acid battery of reputed brand and having sufficient

capacity & terminal voltage for continuous duty application and for 3 consecutive no. of starts of the engine shall be supplied. Battery capacity & the connecting cables sizes shall be adequate so as to avoid problem of poor starting of the engine. The battery capacity shall not be less than 12Volt 180AH. Supplier shall furnish details of Battery capacity calculations along with the bid.

- ii) **Dynamo:** A dynamo shall be provided with the engine. This Dynamo shall be generating a charging current whenever the engine is operating. This shall be sufficient to continuously charge the battery.
- iii) For facilitating battery trickle /boost charging during idling of engine, the battery shall have a static battery charger to be installed in the AMF panel.
- iv) **Starter Motor:** The cranking of the engine shall be through a starter motor. The starter motor shall be provided with sealed type bearing.
- v) All the interconnecting cables (Except main Power cable) with require no. of core for interconnecting fuel tank level switches, DG starting battery to Engine and to AMF panel, all the engine control/ protection parameter from engine to AMF panel including interconnection of AMF panel to Owner"s MCC panel where DG incomer & Main incomer are located shall be in the Vendor scope of supply. Supplier shall furnish details of electrical parts & its make for which the make/details are not mentioned in the tender.

1.9 Exhaust System

- 1.9.1 Exhaust piping shall be provided by the Vendor as per the Pollution Control Board's guidelines of the relevant state.
- 1.9.2 Exhaust piping system should be adequately insulated and protected by a robust Aluminum cladding cover over glass wool and a shield to prevent fuel spray on to the cladding cover, in case of failure of fuel injector piping. The exhaust piping system shall be complete in all terms to provide the exhaust piping from engine to outside atmosphere within battery limit.
- 1.9.3 Exhaust silencers (residential type) with spark arrestor shall be supplied with the engine. The silencer shall be provided with 50 mm thick glass wool insulation and with 26 SWG Aluminium cladding.
- 1.9.4 The silencer shall be straight through type with drain plug at lowest point and one accessible clean out part. The silencer shall be finished with rust preventive primer. Flexible sections shall be connected between the exhaust pipe and the engine exhaust manifold. The flexible exhaust pipe shall be of carbon or stainless steel, smoke tight and inner diameter same as of exhaust pipe. The exhaust piping shall be extended beyond roof of the shed.
- 1.9.5 All the additional pipe, bellow, vertical length, right angle band, horizontal length including cladding of pipe with all required glass wool cladded with Aluminium foil/sheet as deemed fit, shall be supplied by the Vendor. The DG Set shall be kept in open. Details of lengths for each part of the exhaust system shall be indicated.

1.10 Fuel Oil System

1.10.1 The fuel oil circuit shall include: -

- i) Independent daily service tank of 850 ltrs. capacity or continuous operation of 12 hours shall be provided. The fuel tank shall have provision for flanged inlet/outlet connections, vent, top cover with opening, overflow drain, drain plug, breather and also necessary level monitoring instrumentation and alarm. Fuel tank shall be installed/ housed within Acoustic Enclosure.
- ii) Manual type fuel transfer pump for filling of fuel tank like in automobiles as per site condition.
- iii) Pipe, flanges, fittings, valves, gaskets and all other material required for the circuit i.e. from fuel

tank to Engine.

- iv) Full flow fuel filters, fuel inlet & outlet, air vent, drain plug etc. Level indicator inside the fuel tank and level switch (High & low) indication on Control Panel with alarm to be provided.
- v) Fuel tank shall be fabricated from 2 mm thick CRCA sheet.
- vi) The fuel level shall be measured through a dip stick / Gauge / Electronic fuel indicator with high and low level indications.
- vii) Fuel tank shall be provided with strainer.
- viii) Fuel tank connected to engine with wire braided fuel pipes.
- ix) The fuel tank shall be painted after Antirust treatment as mention in Sound Proof Enclosure specifications.
- x) The minimum capacity of fuel tank shall be 850 Ltr with lockable top cover.
- xi) The fuel tank preferably shall be located at Subbase/ within Acoustic Enclosure as per approved design by DG Set OEM/ Manufacturer.

1.11 Cooling System

- 1.11.1 The engine waste heat shall be dissipated to a closed circuit water system which in turn shall be cooled by radiator cooling system driven by the power from the engine. The proposal shall be complete including the necessary pipe work for radiator, accessories etc. for the cooling system.
- 1.11.2 Engine jacket water shall be circulated by an engine driven self priming pump.
- 1.11.3 Jacket water valve / Thermostatic switches for temperature control and alarm will be provided as per design.
- 1.11.4 Radiator Heat Ducting shall be provided as per the site condition.

1.12 Engine Governor

- 1.12.1 An over speed device required to shut off the system.

1.12.2 Fly Wheel

Engine shall be fitted with a heavy flywheel with guard to ensure smooth operation throughout the speed range and at rated power. The effect of this fly wheel shall be such that cyclic irregularity of the system should comply with (or better than) the limit laid down in BS-5514.

1.13 Name Plate

A corrosion resistant name plate of proper size shall be securely fastened by stainless steel pins at an easily visible and accessible point on the engine and gear unit. The name plate shall be stamped with the following information.

- i) Type, Model and SerialNumber
- ii) Brake Horse Power
- iii) RPM
- iv) Manufacturer's Name
- v) Conform to which standard.
- vi) Weight
- vii) Firing order of the engine.
- viii) P.O.No.

In addition to the above an arrow shall be stamped at an easily observable point on the engine to indicate direction of rotation.

SECTION – IV SOUND PROOF ENCLOSURE

1.0 CONSTRUCTION

- a) The Enclosure should be designed for easy access to serviceable parts.
- b) Modular construction for easy assembling and dismantling.
- c) Fabricated out of CRCA sheet of 1.6 mm. Base Frame shall be made out of ISMC of suitable sections or made out of sheet steel minimum of thickness 5 mm.
- d) The hardware shall be of high tensile grade i.e. bolts of 10.9/8.8 grade. Hardware should be passivized.
- e) Battery should be accommodated in a separate tray in the enclosure.
- f) There should be provision for drain plugs for draining mobile oil.
- g) The doors should be gasket with high quality EPDM gaskets to avoid leakage sound.
- h) The door handles should be lockable type.

1.1 PAINTING (for Fuel tank, Soundproof Enclosure, AMF Panel, Control Panel etc.)

- a) The sheet metal components should be hot dip seven tank pre-treated.
- b) Proper Antirust treatment shall be provided to suit the location
- c) To have long life of container it should be P.P. based powder coated (inside as well as outside).
- d) Base frame should be epoxy quoted when fabricated.

1.2 ACOUSTIC ENCLOSURE

- a) Sound proofing of enclosure should be done with quality rock wool/mineral wool conforming to IS-8183 of 64 Kg/M³ density.
- b) The rock wool /Glass wool should further be covered with fibre glass cloth/fiber tissue paper fire resistive and perforated powder coated sheet of 0.6 mm thickness.
- c) Residential silencer shall be provided within the DG to control the exhaust noise.
- d) Interconnection between silencer and engine should be through stainless steel flexible hose/pipe.
- e) Attenuators should be provided to control sound at air entry to the container and exit from the container.

1.3 VENTILATION AND AIRCIRCULATION

The system shall be engineered to provide air inlet/exhaust acoustic louvers for efficient air circulation and shall have following special features:

- a) Adequate ventilation is to be provided to meet air requirement for combustion and heat removal.
- b) The temperature inside the enclosure shall not exceed 40 degree centigrade above ambient under full load condition while ambient is below 35 Deg. C. under the shed. There should be no Derating due to temperature under Full load condition (100% load).

1.4 ELECTRICAL

- a) The earthing point shall be isolated through DMC insulator mounted on enclosure.
- b) Control panel should be mounted in the container itself. All parameters should be visible from outside and all push buttons accessible easily.

1.5 GENERAL

- a) Engine carries warranty/guarantee of engine manufacturer for the DG Set in the enclosure of Silent Diesel Generating Set.
- b) Emergency Stop Push Button shall be provided outside the container. The maximum sound pressure level shall be average 75 db(A) at one meter from the enclosure at Free field condition at 75% load as per CPCB-2 Norms.

SECTION – V AMF Panel

Supply, Erection, testing and commissioning of AMF cum Auto Synchronizing Auto Load Sharing Auto Load Depended start /Stop panel suitable for 125KVA and 50 KVA DG Sets separately for each DG set. The AMF panels are of cubical type base/floor mounting control panel with hinged doors, undrilled bottom gland plate, aluminium Bus Bar with the accommodation for 4P, EDO type ACB for alternator with thermal O/L relay, short circuit protection, Microprocessor based AMF cum Synchronizing DG Set controller module with supply failure timer, Restoration timer, 3 impulse automatic engine start/stop logic, Mains/generator voltage, 436V.capacity bypass switch and frequency sensing, DG Controller as per DG Set manufacturer standard Practice controller with water temperature/Lube oil pressure/ engine speed, Voltage/ampere/Frequency/ KVA, Running-hour count, No of starts, Fault indication, over / under speed, Fails to start, Low oil pressure, High engine temperature, Under/over voltage, over current, Earth fault relay, with indications for Mains on, Load on Mains, Battery charger on Push buttons AMF module by pass Mode, Battery charger unit with inbuilt Auto/Manual and Flat/Boost facility. DG Set controller should have Auto Synchronizing, Auto Load Sharing, Load Dependent Start/ Stop facility etc. inbuilt without depending on external PLC. The EDO breaker capacity shall be suitable for 125 KVA and 50 KVA with standard accessories.

1.0 AMF Panel (inclusive of Control &Monitoring)

The AMF panel shall be PLC based, cubicle, floor mounting type with hinged type doors suitable for 415 Volt 50 Hz AC supply.

- i. The normal power supply shall be constantly monitored by a mains voltage monitor. When the mains voltage fail or drops below 80%, D.G. set should start.
- ii. System shall permit 3 attempts for starting the DG set: failing which the annunciation circuit shall be activated for alarm.
- iii. If the engine starts during 3 attempts & the engine reaches its operating speed and the alternator its operating voltage, the cranking circuits shall be isolated, and the load shall be transferred to the DG set.
- iv. Upon return of the normal supply voltage of 90% (adjustable & selectable) of the rated voltage for a minute, the load shall be transferred to the normal source. However, the DG set shall continue running for 3 minutes and then stop.
- v. If the DG set fails to start and reach its operating speed in 25 seconds in three attempts the DG set shall automatically be disconnected and locked in isolated position.
- vi. A clock / time switch shall be provided for automatic run of lube oil primer pump of the Engine for a specified period of time. The DOL starter of the lube oil priming pump shall be provided in the AMF panel. The control signal as per the preset time shall be used to start & stop the DOL starter.
- vii. The AMF system shall include a battery charger for trickle / boost charging of AMF panel battery and DG set battery during DG set idling period. The charger shall be of approved capacity to cater to the battery requirements.
- viii. All control fuses shall be of link type (HRC) conforming to ISS. Rewireable fuses shall not be accepted. All fuses shall be readily accessible for replacement. Fuses shall have an operating indicator which will be visible without removal of fuses from the service. It shall not be necessary to remove any piece of equipment or to disconnect any wiring before replacing the fuses.
- ix. The following details of the existing DG sets / Control panels can be collected from the site before quoting.

- a) Engine Make/ Model
- b) Alternator Make/ Frame Size/ KVA Rating
- c) Date/ Month/ Year of Commissioning
- d) Type of Governor existing.
- e) Type of AVR existing.
- f) DG Set Controller Make/ Model existing.
- g) Panel SLD/ Wiring Drawing.
- h) Qty x Type of ACB used in existing Panel.

ix AMF panel should be suitable to accommodate 3 Nos. of 3.5 core 300 sq.mm armoured cable as incomer, 3Nos. of 3.5 core 300 sqmm armoured cable from DG Set to AMF panel and 3Nos. of 3.5 core 300 sqmm armoured cable as common output from AMF Panel to Distribution Panel.

2.0 Construction:

2.01 All dimensions in mm.

2.02 Degree of Protection IP54.

2.03 Danger Notice Board shall be provided.

2.04 **AMF Panel shall have following sections. Control & Monitoring Section.**

i) Change over & power section.

- | | | | |
|------|---|---|--|
| 2.05 | Main Switch Board frame | : | 2 mm thick CRCA sheet. |
| 2.06 | Base Frame | : | 100 x 40 x 4 mm (Base frame should be independent of Main Panel) |
| 2.07 | Frame for MCCB, MCBs
Protection relays, Contactors, instruments etc. | : | 2 mm thick CRCA sheet |
| 2.08 | Partitions(internal/external) | : | 2 mm thick CRCA sheet |
| 2.09 | Fixing bracket for MCCB, Protection

Doors | : | Relays, Contactors, Rectifiers & other Control & Monitoring compartments 3 mm thick CRCA sheet

Hinged type door made of 2 mm thick CRCA sheet |
| 2.11 | Earthing Terminals (interconnected with 25 x 3 mm Copper strip) | : | 4 Nos. (2 top + 2 bottom) |
| 2.12 | Gland Plate | : | 3 mm thick CRCA sheet |

- Rating of Busbar : 1.5 times of FLC 99.9% pure
100% conductivity Electrolytic Copper tinned.
- 2.14 Riser Connections for MCCB & Change over MCCB"s : ----- do -----
- 2.15 Breaking Capacity : 55 KA
- 2.16 Control Circuit Voltage : 110 V 50 Hz AC
- Control Circuit wiring : 2.5 sq. mm PVC FRLS Insulated
Copper wire
- 2.18 Control cable from DG Set to conductor armoured (No. of cores depend on Control Circuit/Mounting) : 2.5 sq.mm. Copper AMF & PCC
- 2.19 Panel manufacturer should have in house fabrication plant with CNC turret punching & NC bending machine. Manufacturer should have 7 tank pretreatment cleaning process & powder coating plant. If panel fabrication is to be outsourced by the contractor, the details of such panel manufacturers should be included in the offer.

APPROVED MAKES LIST

Sl.No.	ITEM DESCRIPTION	MAKE
1	Air circuit breaker	Schneider / L&T / ABB / Siemens
2	MCCB	Schneider / L&T / ABB / Siemens
3	Relays	AVK-SEGC / ABB / Telemecanique / L&T / Schneider
4	Power factor relay	Epcos / Ducati / Beluk / Enercon / Meher
5	Change over switch	HPL / Schneider / L&T / ABB
6	Power contactors	L&T / ABB / SCHNEIDER / TELEMCHANIQUE
7	Instrument transformers	Kappa / Kalpa / Instrans / Voltamp
8	Meters	Conserv / L&T / Elmeasure
9	MCB / MCB DB	Legrand / Schneider / Havells / L&T / ABB
10	ELCB / ELMCB / RCBO	Legrand / Schneider / Havells / L&T / ABB
11	LT Cable	Finolex / Polycab / Havells / Gloster
12	End Termination Materials	Dowels / SMI / Wago
13	MS Powder coated Cable Tray	As per panel fabricator
14	PVC Wires & Flexible Cables - FRLS	Finolex / L&T / Havells / Polycab
15	Glands - Single / Double Compression	Dowells / Comet / Jainson / HMI
16	Aluminium / Copper Lugs	Dowells / Connectwell / Jainson / 3D
17	Surge Arrestors	L&T / ABB / OBO Betterman
18	DG set with AMF Panel	Kirloskar / Cummins / Caterpillar