

## **NOTICE INVITING TENDER**

**INDIAN INSTITUTE OF TECHNOLOGY  
(INDIAN SCHOOL OF MINES), DHANBAD**



**Notice Inviting Tender (NIT) in Two-Bid System for  
Supply and Installation of Hydraulic Power Pack Unit,  
Hydraulic Test Set-ups and the Hydraulic Components**

Tender No.: IIT(ISM)/MME/PRJ/063/2019-20

Date: 24 June 2019

**Bid Submission deadline: 26.07.2019 , 1:00 P.M.**

**ASSISTANT REGISTRAR**

**Indian Institute of Technology (Indian School of Mines), Dhanbad**

**P.O. – Indian School of Mines (I.S.M.)**

**DHANBAD –826004 (INDIA)**

**[www.iitism.ac.in](http://www.iitism.ac.in)**

**GSTIN : 20AAAAI0686D1ZA**

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**INDEX**

<b><u>CHAPTER</u></b>	<b><u>CONTENT</u></b>	<b><u>PAGE NO.</u></b>
1	Instructions to Bidders	03
2	Terms & conditions of Contract	05
3	Schedule of Requirements	11
4	Specifications and allied technical details	12
5	Price Schedule	27-28
6	Contract Form	30
	Other forms	
7	Form - 7.1 (Checklist)	31
	Form - 7.2 (Covering Letter with Techno-Commercial Bid)	32
	Form - 7.3	33
	Form - 7.4 (Techno-Commercial Bid)	34

## **CHAPTER 1**

### **Instructions to Bidders**

IIT (ISM), Dhanbad was formerly known as Indian School of Mines (ISM) and was a Deemed University before it got converted into an Institute of National Importance under the Institutes of Technology (Amendment) Act, 2016 passed by the Parliament of India and got the assent of President of India. The Indian School of Mines, now IIT (ISM), Dhanbad, was formally opened on 9th December 1926, by Lord Irwin, the then Viceroy of India to address the need for trained manpower related to mining activities in the country with disciplines of Mining and Applied Geology. In 1967, it was granted the status of a deemed to be university under Section 3 of UGC Act, 1956 and it was renamed as Indian Institute of Technology (Indian School of Mines) in 2016. It started as an institution to impart mining education, and today, has grown into a technical institution with various academic departments. IIT(ISM) is located in the mineral-rich region of India, in the city of Dhanbad in the state of Jharkhand. It is the third oldest institute [after IIT Roorkee and IIT (BHU) Varanasi] which got converted into an IIT.

IIT (ISM), Dhanbad intends to procure the equipment “**Supply and Installation of Hydraulic Power Pack Unit, Hydraulic Test Set-ups and the Hydraulic Components**” to enrich its teaching and research facility at Dhanbad.

Reputed manufactures or authorized distributors are invited to submit their bid for “Integrated Gas Hydrate Raman Mapping System” for IIT (ISM), Dhanbad as per this tender document in a Two-Bid System: - (a) Techno-Commercial (also termed as technical bid) bid (Part-1) consisting of all technical details of the item along with commercial terms and conditions, Tender Fee and EMD and (b) Price bid (Part-2) indicating price for their items mentioned in the technical bid. All instructions and terms and conditions must be followed, failing which bid(s) will liable to be rejected.

### **INSTRUCTIONS**

1. Offer should be submitted under TWO-BID system in two separate sealed covers i.e. “Techno-commercial bid” and “Price bid”.
2. Tender Number and tender submission deadline must be clearly mentioned on the top of the envelope.
3. a) In a tender, either the Indian agent on behalf of the principle/ OEM or the Principle/OEM itself can bid, but both cannot bid simultaneously for the same item/product in the same tender.  
b) If an agent submit bid on behalf of the principle/ OEM, the same agent shall not submit a bid on behalf of another principle/ OEM in the same tender for the same item/product.  
c) Indian agent/must submit authorization letter for submission of bid for this NIT from their OEM/Principle.
4. Bidder(s) must submit PAN given by Income Tax authorities, TIN, GSTIN and copy of PAN / TIN with the bid.

5. The offer must be submitted in **Two-Bid**. Tender should be dropped in the tender box kept in the office of **Assistant/Deputy Registrar (Purchase & Stores), IIT (ISM), Dhanbad– 826004 (Jharkhand, India)** only. Bids may be submitted by Speed Post / Courier in sealed cover only, but IIT(ISM), Dhanbad will not accept such bid if delivered/submitted to the office of the Deputy Registrar (Purchase & Stores section), IIT (ISM), Dhanbad after the submission deadline and such bids will be treated as Late bids / non-responsive bids. It will be the sole responsibility of the bidders that their bid should be submitted/ delivered as per bid submission deadline. IIT (ISM), Dhanbad will not be responsible for any delay or transit loss or late delivery of bids to the office of the Deputy Registrar. No tender is to be handed over to any staff of IIT (ISM), Dhanbad personally. All bids / correspondences should be sent to the following address only: “Deputy. Registrar (P&S), IIT (ISM), Dhanbad, P.O. – Indian School of Mines (ISM), DHANBAD – 826004 (Jharkhand, India)”. Bids sent through Email/Fax or submitted in unsealed cover(s) will not be accepted and such bids will be treated as non-responsive bids.
6. Bid(s) must be sent sufficiently in advance so that it reaches the institute on or before the submission deadline. Bid(s) received after the submission deadline will not be considered.
7. Bid document(s) and all enclosures must contain the signature and seal of the authorised representative of the bidder.
8. The bidder quoting for item(s) as per this tender should be the registered to provide the item/services with the appropriate government authority. Copy of registration certificate should be enclosed with the tenders (part-1). Offers submitted without proper registration certificate shall be rejected summarily.
9. The bidder quoting for item(s) as per this tender should be the registered to provide the item/services with the appropriate government authority. Copy of registration certificate should be enclosed with the tenders (part-1). Offers submitted without proper registration certificate shall be rejected summarily.
10. The Bank/RTGS detail on the letter-head of the bidder(s) must be submitted along with the tenders (part-1). A copy of the cancelled cheque should also be attached.
11. Name and PAN/Voter Card No. /Aadhar No. of the authorized signatory of the bidder(s) must be mentioned in the Form 7.2.
12. A copy of PAN/Voter Card/Aadhar Card of the authorized signatory of the bidder(s) must be attached with the Form 7.2

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## CHAPTER 2

### Terms and Conditions

**The offer must comprise of the following, failing which it will be treated as non-responsive bid hence will be rejected:**

1. The bids under Two-Bid System will consist of two parts as per following details:- **a) Techno-Commercial bid (Part 1)** consisting of all technical details along with Commercial terms and conditions and Earnest Money Deposit (EMD) to be submitted in form of A/C payee demand draft drawn in favor of Registrar, IIT(ISM) and payable at SBI, IIT (ISM) campus branch or any other Bank/Branch located in Dhanbad and **b) Price bid (Part 2)** indicating price for the items / services mentioned in technical bid (part-1). In stage-one, only the Techno-Commercial (Part 1) shall be opened and evaluated. In stage-two, the Price bids (Part 2) of only the technically qualified and acceptable offers will be opened, for further evaluation.
2. Sealing and Marking of Bids:
  - a) The Techno-Commercial bid (Part 1) must be sealed in a separate envelope (ENVELOPE-ONE) with EMD in the form of two separate Demand Drafts, duly super-scribed as “**Techno-Commercial Bid (Part 1), Tender No.: IIT(ISM)/MME/PRJ/063/2019-20, Submission Deadline: 26.07.2019**” as per following details: -  
**EMD: Rs. 1,70,000/- (Rs. One Lakh Seventy Thousand only).**
  - b) The Price bid (Part 2) should be sealed in separate envelopes (ENVELOPE-TWO), duly super-scribed as “**Price Bid (Part 2), Tender No.: IIT(ISM)/MME/PRJ/063/2019-20, Submission Deadline: 26.07.2019**”.
  - c) The above TWO separate sealed envelopes are to be put in a bigger envelope (ENVELOPE-THREE), which should also be sealed.
  - d) Each of the above THREE envelopes MUST be super-scribed with “**Bid for Supply and Installation of Hydraulic Power Pack Unit, Hydraulic Test Set-ups and the Hydraulic Components against Tender No.: IIT(ISM)/MME/PRJ/063/2019-20, Dated: 24 June 2019, Submission Deadline: 26.07.2019**”.
3. The bids must be neatly typed/computer printed. Hand written offer will be rejected. Bids must carry the numbers of GSTIN/ sales tax / VAT / TIN / PAN / Service Tax Registration No. Bids must be in sealed envelope.
4. Since IIT(ISM) Dhanbad is an Indian Institute of Technology and subject item will be used for research, hence benefit of reduced rate of GST should be considered if applicable.
5. All relevant technical specifications/details of offered items, drawings, printed technical leaflets, and commercial details which are necessary to ensure that offer is complete in all respects should be attached with the technical bid documents.
6. A ‘Compliance Statement’ along with a certificate and duly signed that the tenderer satisfies the technical requirements. The said statement should be in a tabular form with the columns: sl. no., (2) technical requirement as per NIT; (3) what is offered by the tenderer; and (4) status of compliance: Complied/Not complied).

7. IIT(ISM) does not bind itself to offer any explanation to those bidders whose Technical Bids have not been found acceptable by the Evaluation Committee of the Institute.
8. Following documents have to be furnished by the bidders with the technical bids (part-1):
  - (a) Self attested copies of credentials in support of capability to undertake the supply/work.
  - (b) Technical literature/catalogue with the detail specification of the material
  - (c) Satisfactory performance certificate from their customers for same/similar supply/service must be enclosed alongwith the technical bid.
  - (d) A copy of this tender document must be signed and sealed on all pages by the bidder(s) accepting the instructions and terms & conditions of the NIT and must be attached with the bid.
9. Price should be quoted as per our price schedule **Annexure-A or Annexure-B**. Justification of the price quoted must be provided with the Price Bid. For this, Price List of the OEM and purchase order of govt. organizations / IITs/ NITs/ CSIR Labs / ISRO labs etc. should be attached. Price bids of only technically qualified tenderers shall be opened in on a pre-notified date and time. Decision of IIT (ISM), Dhanbad in this regard will be final and binding by all the bidders. The comparison between the indigenous and the foreign offers shall be made on FOR destination basis CIF/CIP basis respectively. However, the CIF/CIP prices quoted by any foreign bidder shall be loaded further as under:

Towards customs duty, IGST and other statutory levies, Custom clearance, inland transportation, currency fluctuation etc. – 15% of the CIP/CIP value.
10. IIT(ISM), Dhanbad is entitled for Custom Duty Exemption under Govt. of India notifications and is registered with DSIR, Govt. of India for this purpose. This may be taken into consideration while quoting minimum possible rate. It will not be issued any Indian Agent/dealer or distributor at any circumstances. IIT(ISM) will provide only custom duty exemption certificate for availing concessional custom duty. IIT(ISM) will not pay any extra custom duty other than duty exemption certificate. It will sole responsibility of the bidder to get DSIR copy from IIT(ISM) on time.
11. IIT (ISM), Dhanbad does not issue form 'C' or 'D' for concessional Sales tax/VAT. Hence, full rate of sales tax as applicable to educational institutions against the form of certificate should be indicated.
12. Bid Security or Earnest Money Deposit (EMD):- Required Amount for EMD must be submitted in the form of Demand Draft issued from any Nationalized/Scheduled commercial Bank in favour of Registrar, IIT (ISM), Dhanbad payable at Dhanbad with the bid (part-1). Bid received without EMD in part-1 (techno-commercial bid) will be rejected. It must not be clubbed with Tender Fee. No interest will be payable by IIT (ISM), Dhanbad on the Earnest Money Deposit. The earnest money of all the unsuccessful bidder(s) will be returned to the respective bidder(s) through bank / RTGS transfer without any interest within 60 (sixty) days only after placing the order / awarding the contract. The Earnest Money of successful bidder(s) shall be returned on receipt of Performance Security (Performance Bank Guarantee / PBG) as mentioned in this tender document. If the successful bidder(s) fails to furnish the performance security or fails to deliver/provide the item/installation/service as per the order's terms and conditions within stipulated period, the earnest money shall be liable to be forfeited by IIT (ISM), Dhanbad. An undertaking to this is to be submitted.
13. EMD must be in the separate Demand Draft.

14. **Performance Security or Performance Bank Guarantee (PBG):-** The successful bidder(s), on whom order will be placed, has to submit a performance security of 10% of the total order value within seven days of placement of purchase order and as per PO terms before release of any payment. Performance security has to be submitted in the form of Bank Guarantee/Demand Draft from any Nationalized/Scheduled commercial Bank in favour of the Registrar, IIT (ISM), Dhanbad. Performance security should remain valid for a period of two months beyond the date of completion of all contractual obligations of the successful bidder(s). No interest will be payable by IIT (ISM) Dhanbad on the Performance Security deposited. In case the contractor fails to provide satisfactory service, the Performance Security submitted by the bidder(s) is liable to be forfeited. An undertaking to this is to be submitted.
15. **Validity Period:** - The validity period of the tender should be clearly specified. It must be at least for **270 (Two Hundred Seventy) days** from opening of price bid.
16. **Warranty:** All the active components must carry minimum **three (03) years** onsite comprehensive warranty from the date of satisfactory installation.
17. **Comprehensive Annual maintenance contract (AMC):** The cost of 'annual maintenance contract (AMC)' and "comprehensive maintenance contract (CMC)" should be provided separately for extension of warranty for additional years (which is beyond the normal warranty period mentioned earlier) on yearly basis as an option with the price bid. Offer including terms & conditions should be quoted on per year basis to enable purchaser make AMC for any period from 01 to 05 years, if required.
18. **Delivery & installation Period and Liquidated Damage:** As time of the essence for this procurement, hence the ordered materials/work complete in all respects are required to be delivered and installed within the period stipulated in the purchase order failing which liquidated damages of 1% per week or part thereof for the delayed period subject to maximum of 5% of the total value of the order shall be deducted from the invoice of the supplier. Earliest/ expected delivery period should be clearly indicated. Packing should be suitable for 'Air freight'.
19. **Inspection:** Inspection shall be carried out at IIT (ISM), Dhanbad after arrival of the materials and decision of the Institute in this regard shall be final.
20. **Rejection and Replacement:** Rejection, if any, shall be notified to the supplier within 30 days of receipt and inspection of the material/workmanship. Rejected materials/work is to be removed by the supplier at his own risk and cost from IIT (ISM). Campus within 14 days of intimation of rejection. Defective Supplies are required to be replaced within 14 days of the removal of the rejected materials/work. Failing which IIT(ISM) will dispose the materials at risk and cost of the bidder.
21. **Risk Purchase:** IIT (ISM) shall be at liberty to realize from the supplier the differential amount, if any, which it shall have to incur on purchase of the material/work at higher price(s) from elsewhere in the market, if the supplier, due to their fault, fails to supply the ordered quality and quantity of the material/work within the stipulated time.
22. **Conditional offer will not be accepted.**
23. **Payment:** In case of indigenous item i.e. inside India, payment may be released through RTGS / online payment mode against complete execution of the purchase order (PO) and submission of all

the required documents as per the order within 30-45 days after satisfactory supply, inspection, installation/commissioning & acceptance and on submission of pre-receipted tax invoice, delivery challan, warranty certificate and installation report in triplicate and Performance Bank Guarantee. The invoice should be duly certified by the Head of Deptt. of IIT (ISM), Dhanbad to which supply is made or any other IIT (ISM) official authorized for this purpose. IIT (ISM), Dhanbad does not make any advance payment or part payment.

24. Advance payment will not be released. Any bid having condition of advance payment will be treated as non-responsive bid.
25. Country of origin and port of shipment must be stated in the technical bid itself in case of foreign supply. Any change at later stage will not be accepted.
26. Name and address of Indian Agent, percentage of agency commission, if any and role of the Agent with respect to the subject supplies and a statement thereon that "Agency Commission is included in the bid.
27. Payment will be released through bank/ RTGS/Wire transfer. The payment will be released after statutory deductions and compensation of delay / liquidated damage (LD) / late delivery etc., if any.
28. Any payment will be released only after satisfactory completion of the work/installation and after submission the certified bill(s) / invoice(s).
29. All communications are to be addressed to the Registrar, IIT (ISM), Dhanbad quoting the Tender No. and Date.
30. IIT (ISM), Dhanbad reserves the right to accept or reject or cancel any or all tender notice or bid(s) or order(s) at any stage without assigning any reason thereof.
31. For any dispute, the place of jurisdiction shall be Dhanbad (Jharkhand, India) only.
32. It will be the sole responsibility of the bidder(s) that its bid should reach on or before the submission deadline to Registrar, IIT (ISM), Dhanbad.
33. **Governing Law:** The order, placed, will be the contract between the successful bidder(s) and IIT (ISM), Dhanbad and shall be governed by the LAWS of India and under the contract shall be taken by the parties only in Dhanbad (Jharkhand, India) to competent jurisdiction.
34. Bid(s) shall be submitted in official tender form / format only. If submitted in any other form / format, the same shall be rejected. No paper shall be detached from the tender. All pages must be numbered properly and there must be seal and sign of the bidder(s) on all the pages of its bid.
35. The name and address of the bidder(s) shall be clearly written in the space provided and no overwriting, correction, insertion shall be permitted in any part of the tender. The tender should be filled-in and submitted in strict accordance with the instructions laid down herein; otherwise the bid is liable to be rejected.
36. The bid is liable to be rejected if complete information is not given therein, or if the particulars and data (if any) asked for in the Schedule to the tender are not filled-in properly.



37. The successful bidder(s) will indemnify IIT (ISM), Dhanbad, in case of any damage or liability, which may arise on account of any act or omission directly/indirectly attributable to the bidder(s).
38. Dispute, if any arising out of providing the said service(s) shall be settled mutually or arbitration by sole Arbitrator to be appointed by the Registrar, IIT (ISM), Dhanbad at Dhanbad as per the provisions of the Indian arbitration and Conciliation Act, 1996 and the Rules framed there under. The award passed by the said sole Arbitrator, will be binding upon the parties. The arbitration proceedings shall be held at Dhanbad only.
39. The bidder shall ensure that its authorized representative should be present at the time of any discussion/presentation/negotiation at IIT (ISM), Dhanbad regarding the bid, for which no any kind of TA/DA/boarding/lodging will be facilitated by IIT (ISM) Dhanbad.
40. The schedules of items/services are required as per Chapter-4 of this tender. Bidder(s) must clearly indicate in its tenders, the different taxes and duties which they propose to charge mentioning clearly the present rate(s) thereof with appropriate reference. Vague offer like "duties as applicable" shall not be considered.
41. Price should be quoted according to the format of Price Bid (Part-2) (Chapter – 5 of this tender) only for the item(s)/services as mentioned at Chapter – 4 of this tender. The required item(s)/services to be delivered / provided on or before the dead line as per purchase order.
42. The bidder(s) should be registered with VAT/CST/SST, Income Tax/service tax authorities/GST etc. and to enclose the copies of the relevant certificate along with the technical bids. The agency must be authorized by appropriate government authority to deliver the items/services at the IIT (ISM) Dhanbad.
43. The successful bidder(s) will ensure that its employees/staff/personnel would strictly follow all the security instructions and rules and regulations of IIT (ISM), Dhanbad during their visit in the campus.
44. If the successful bidder(s) commits breach of any of the above or Order's terms and conditions or is not able to deliver the item / provide the services / complete the work on time, the contract will be cancelled and security deposit shall be forfeited and a damage liability at the discretion of IIT (ISM), Dhanbad will be imposed on the bidder(s).
45. Bills / Invoices raised by the bidder(s) will be subject to applicable statutory deductions including T.D.S.
46. Necessary corrigendum(s), if required, will be issued at any stage, which must be acceptable to the bidder(s). Any corrigendum will be published on our website [www.iitism.ac.in](http://www.iitism.ac.in) only. Bidder(s) must be in touch with our website [www.iitism.ac.in](http://www.iitism.ac.in) for corrigendum(s). It will be sole responsibility of the bidder(s) that they will go through the corrigendum(s) published, if any, on our website [www.iitism.ac.in](http://www.iitism.ac.in) and submit its tender accordingly.
47. Shortlisted bidder(s) may be called for presentation / demonstration / meeting at IIT (ISM), Dhanbad office with a short notice. Request from the bidder(s) to change the date and time of presentation / demonstration / meeting will not be accepted. If the bidder(s) will not attend for the same, then their

bid(s) will be treated as non-responsive and hence the bid(s) will not be considered for further process.

48. Price bids will be opened for those bidder(s) who are shortlisted and declared as technically qualified bidder(s) by the Committee of the IIT (ISM), Dhanbad. In this regard, decision of IIT (ISM), Dhanbad will be final and binding to all the bidder(s).
49. Please note that no part shipment/transshipment/third party shipment is acceptable to us.
50. Submission deadline / last date & time for submission of the bids and date & time for opening of the same are given in this bid. The bids will be opened as per IIT(ISM) rules. Authorized representative of bidders having authorization letter, a govt. issued ID card and an employment ID card issued by the bidder may present during bid opening at their own discretion. In case of submission deadline / last date or bid opening date is a holiday/declared as a holiday, then next working date will be the submission deadline / last date for submission/ opening of tender. However, Submission deadline or bid opening date & time will not be changed upon any request from the bidder side may be changed as per IIT(ISM) rules. In this regard, decision of the IIT (ISM), Dhanbad will be final and binding to all the bidders.
51. For the items / services, the bidders must ensure the required quality, quantity, materials, dimensions & other parameters and quote accordingly. In case items / services provided are not same as quoted/ordered, the claim for payment shall not be accepted. No payment, claims for such items / services shall be released. In this regard, decision of IIT (ISM), Dhanbad will be final and binding to the bidders.
52. IIT (ISM), Dhanbad at its discretion may change the quantity/quality/parameters/upgrade the criteria/drop any item(s) or part thereof at any stage. In case of any dispute, the decision of IIT(ISM) shall be final and binding on the bidders/tenderers.
53. IIT (ISM), Dhanbad reserves the right to accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The decision of the competent authority of IIT (ISM), Dhanbad will be final and binding to the bidder(s).
54. All the bidders, those are interested to participate in this bid, must have to submit the technical specification of their bid in MS-Word Format in a CD with the technical bid. The CD must be marked with the NIT No. and submission deadline.
55. Professional(s) to be deployed by the successful bidder(s) for the supply of the item / installation / execution of the work in order to provide the item(s) /service(s) as per order must be well qualified.

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**CHAPTER 3****Schedule of Requirements**

<b><u>Description</u></b>	<b><u>Details</u></b>
NIT No.	IIT(ISM)/MME/PRJ/063/2019-20
Date of Tender	24 June 2019
Bid submission deadline	26.07.2019, 1:00 P.M.
Date of opening of the bids (technical part-1)	26.07.2019, 4:00 P.M.

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**CHAPTER 4**

Sl. No.	Item	Quantity
1.	Hydraulic Power Pack Unit, Hydraulic Test Set-ups and the Hydraulic Components	One

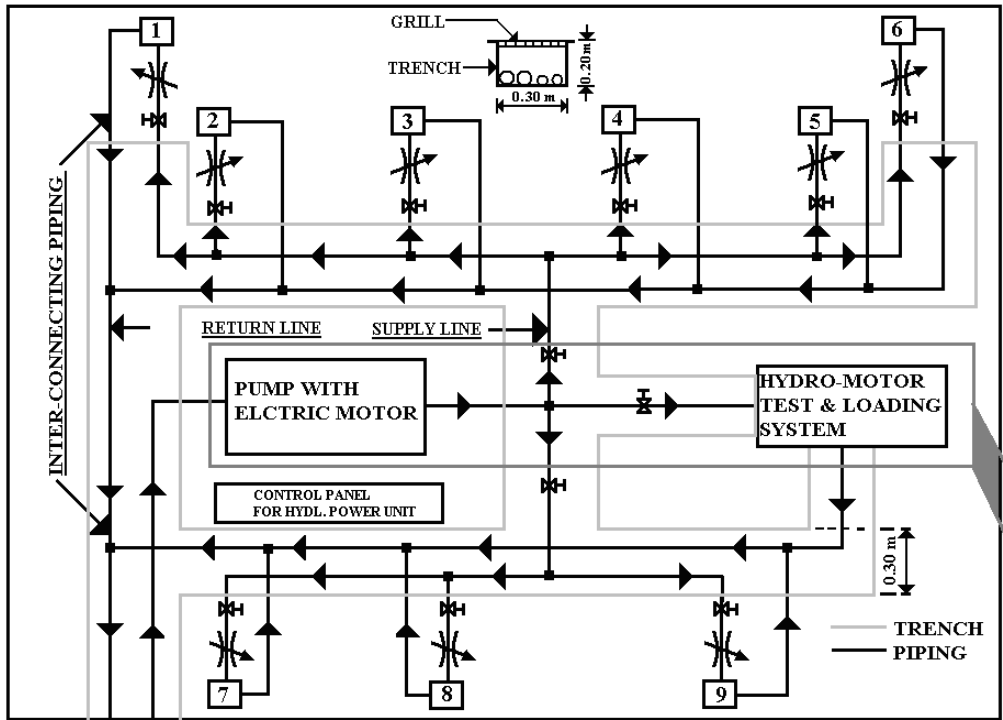
**Specifications for Supply and Installation of Hydraulic Power Pack Unit, Hydraulic Test Set-ups and the Hydraulic Components:****Item No.- 1: Hydraulic Power Pack unit**

The Hydraulic Power Pack unit consists of the following major components. They are to be assembled as per given schematic shown in Fig. 1.

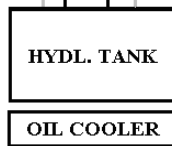
SL NO.	DESCRIPTION
[i]	<b>Hydraulic tank of 1200 litre capacity (Material : CS) consisting of</b>
	a) Oil Tank of capacity 1200 litre
	b) Ball Valve
	c) Air Dehumidifier with Silica Gel
	d) Temp Sensor & Transmitter with display unit. Measuring Range: 0 – 100 <sup>0</sup> C (The display unit should also be in the panel)
	e) Oil Level Sensor with float switch, with Analogue output: 0 – 10V DC or 4 – 20 mA.
	f) Oil filling provision through Quick Release Coupling
	g) HY-Check Valve at pump outlet
	h) Return line Filter assembly with electrical clogging sensor with visible LED indication of 75% clogging and 100% clogging along with two switching output for panel display.
[ii]	<b>Main Pump Station consisting of</b>
	a) Electric Motor with bell-housing Power Rating: 115 kW(approx.) Speed: 1500 rpm (approx.) Supply Voltage: 415 VAC,3 phase, 50 Hz
	b) Hydraulic main pump with flow and pressure variation by Electronic remotely control.(In Manual and Auto mode) with through drive feature. Type: Open loop Variable displacement Axial Piston Pump. Maximum Displacement: 125 cc/rev Maximum speed at maximum displacement: 1800 rpm Nominal Pressure: 350 bar, Peak Pressure: 400 bar Analogue Input: 0 – 10 V DC for step less controlling flow and pressure of the pump. Max Flow: 225 lpm(appx.) @ 1800 rpm Suitable for Mineral Oil (ISO VG 68)
	c) Pilot Pump (Mounted on the main pump shaft) Type: Internal gear fixed displacement Maximum displacement: 20cc/rev (appx.) Maximum operating speed: 2000 rpm (appx.) Nominal Pressure: 100 bar Maximum Pressure: 120 bar (appx.)
	d) Suction Valve with limit switch
	e) Suction Bellow , Bell Housing

	<p>f) Coupling with suitable hose connection</p> <p>g) Pilot operated unloading valve with suitable adaptor plate. The ON/Off control of the valve by 10 VDC signal. Maximum flow: 250 lpm (appx.) Maximum operating Pressure: 300 bar (appx.) Maximum set pressure: upto 300 bar (appx.)</p> <p>h) Proportional pilot pressure control valve with integrated control electronics for flow and pressure control of the main pump Operating Pressure range: 50 to 100 bar (appx.) Maximum Flow: 15 lpm @ <math>\Delta P = 50</math> bar Analogue input signal: <math>\pm 10</math> V DC (For valve operating) Supply Voltage: 24V DC</p> <p>i) Suitable Amplifier card with holder for proportional pilot pressure control valve mounted in operating panel and suitably wired.</p> <p>j) Flow Meter with display Type: Turbine Type Supply Voltage : 24V DC Measuring range: 0 – 200 lpm (appx.) Analogue output: 0 – 10V DC or 4 – 20 mA proportional to the flow</p> <p>k) Pressure Gauge (400 bar max.)</p>
<b>[iii]</b>	<p><b>Cooling and Recirculation system Consisting of</b></p> <p>a) Gear Type Recirculation pump Maximum flow: 100 lpm (approx.) @ 1500 rpm Nominal pressure: 15 bar (appx.) Minimum required driving power: 3 kW (appx.) at 10 bar @ 1450 rpm</p> <p>b) Electric Motor with bell-housing Power Rating: 3.5 kW (appx.) Rated speed: 1500 rpm Supply Voltage: 415 VAC, 3 Phase, 50 Hz</p> <p>c) Suction Valve with limit switch</p> <p>d) Suction Bellow with bell housing</p> <p>e) Coupling with suitable hose connection</p> <p>f) Heat Exchanger, 40 kW (appx.), Air cooled</p>
<b>[iv]</b>	<p><b>Hydro Motor test unit and loading system consisting of</b></p> <p>a) Bidirectional Fixed displacement Loading Pump Type: Axial Piston type Maximum Displacement: 48 cc/rev (appx.) Maximum Operating Pressure: 350 bar Maximum flow: 70 lpm (appx.) @ 1450 rpm Maximum operating speed: 3500 rpm (appx.)</p> <p>b) Suction Valve with limit switch</p> <p>c) Suction Bellow with bell housing</p> <p>d) Coupling With suitable hose connection</p> <p>e) Foot bracket mounting for Hydro-motor (identical of pump). Hydro-motor is not in vendor's scope of supply</p> <p>f) 4/3 Directional control valve solenoid operated with adapter plate to be used for bidirectional operation of test hydro-motor Centre Position: Tandem centred Maximum Flow: 300 lpm(appx.) @ <math>\Delta P = 5</math> bar Maximum Operating Pressure: 280 bar (appx.) Operating Voltage: 0 to 10 VDC</p>

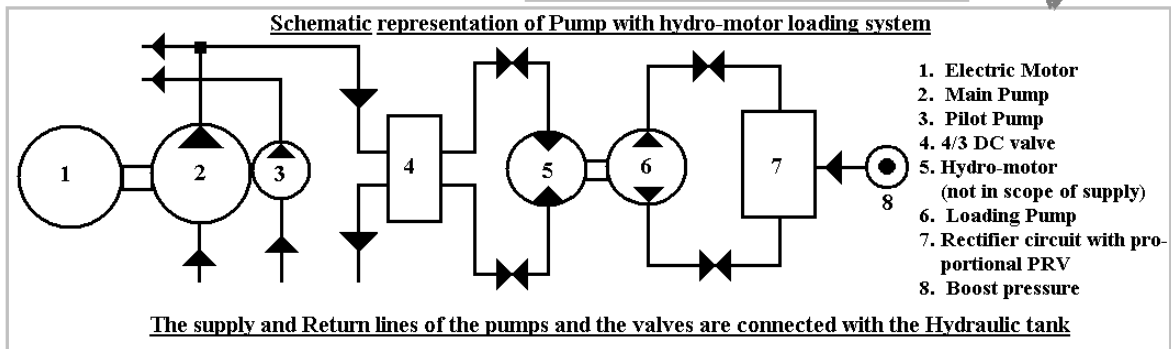
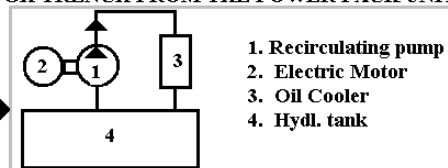
	<p>g) Proportional Pressure Relief valve for loading with rectifier circuit  Maximum operating Pressure: 350 bar  Set Pressure: 315 bar  Maximum flow: 275 lpm (appx.)  Supply Voltage: 24 V DC  Control Signal: 0 – 10 V DC  Response time: 100 ms for 10 – 90% step input  Hysteresis: <math>\leq 5\%</math> of the maximum set pressure  Linearity: <math>\pm 3\%</math> of the maximum set pressure  Suitable for Mineral Oil (ISO VG 68)</p>
[v]	<p><b>Piping and its mountings</b></p> <ul style="list-style-type: none"> <li>• Inter connecting Piping between Hydraulic power pack unit and various test set ups. Pipe network for main supply and return line, pilot supply and return line each of 35 m run (appx.).</li> <li>• Main supply and return lines should be connected with main pump and should be capable to handle the maximum flow of 200 lpm (appx.) and pressure of 350 bar (appx.). The pilot supply and return line should be capable to handle maximum flow of 30 lpm (appx.) and pressure of 100 bar (appx.).</li> <li>• Piping materials: Cast Steel (CS) / Stainless Steel (SS 304 grade) included seamless pipe</li> <li>• Manually operated Pressure compensated flow control valve and pressure gauge at each termination point. Total termination point is 09 (nine) nos. The details of pressure and flow at the termination points are:  Maximum flow: 30 lpm, Maximum Operating Pressure: 315 bar (Qty: 04 Nos. for four termination points)  Maximum flow: 50 lpm, Maximum Operating Pressure: 315 bar (Qty: 03 Nos. for three termination points)  Maximum flow: 60 lpm, Maximum Operating Pressure: 315 bar ( Qty: 02 No for two termination points)</li> <li>• Hoses, Clamps, Fittings, Ball Valves.</li> <li>• Erection of interconnecting piping with weld less technology (Wall form)</li> </ul>
[vi]	<p><b>Control panel:</b>  It consists of all gauges, display unit for oil level, Oil temp., Filter clogging indicator, flow, pressure, switches and Indicators with SMPS for 24VDC. (Manual and Auto mode)</p>
<b>Note 1:</b>	All items and accessories required for complete installation and commissioning of Hydraulic power pack unit at site to be supplied by vendor.
<b>Note 2:</b>	415 VAC, 3phase, 50 HZ power supply and 220 VAC supply are available at site.
<b>Note 3:</b>	Star-Delta starter for main electric motor (115 kW (approx.)) is optional and price for the same to be indicated separately.
<b>Note 4:</b>	Necessary civil work for making trench with covered grill and space for housing the hydraulic tank and oil cooler will be provided by the customer.
<b>Note 5:</b>	Separate prices to be indicated for the interconnecting Piping of Stainless Steel (SS 304 grade) and CS material.



ITEM NO. (1 - 9) TERMINATION POINT FROM POWER PACK UNIT FOR DIFFERENT TEST SET-UPS  
 TOTAL LENGTH OF INTERCONNECTING PIPING FOR MAIN SUPPLY AND RETURN LINE EACH OF 35 M APPX. WILL RUN THROUGH TRENCH.  
 SIMILAR PIPING NETWORK WILL ALSO RUN FOR PILOT SUPPLY AND PILOT RETURN LINE THROUGH TRENCH FROM THE POWER PACK UNIT



Cooling and Recirculating System



The supply and Return lines of the pumps and the valves are connected with the Hydraulic tank

**Fig. 1 Schematic of Hydraulic Power pack Unit**

**Item No.- 2: Hydraulic Test Set-ups****Sl. No. 1****Name of the Test set-up: Cooling system with fan drive (Fig. 2)- Quantity: 1 set**

It consists of the following main items:

- a. Heat Exchanger Air blast type with hydraulically driven fan. Hydraulic motor of 10 cc/rev driving the fan is the customer's scope of supply.
- b. Electronically controlled Variable displacement pump with Electric motor, bell-housing, Suitable amplifier card and card holder for Pump  
Pump type: Axial Piston Pump  
Maximum Displacement: 18cc/rev (appx.)  
Operating Pressure: Nominal 280 bar (appx.), Maximum 350 bar (appx.)  
Flow: 32 lpm (appx.) @1800 rpm
- c. Oil temp sensor with transmitter and analogue output  
Measuring Range:0-100 degree Celsius  
Analogue output: 0-10V DC or 4 – 20mA
- d. Suitable oil heater for 100 litre oil tank capacitycapacity (maxm. Oil temperature will be around 80<sup>0</sup>C)
- e. Mounting block with pressure relief valve  
Maximum Pressure: 250 bar (appx.)  
Maximum flow: 30 lpm (appx.)
- f. Coupling with suitable hose connections
- g. Control panel  
The hydro-motor speed will be varied to maintain nearly constant temperature of the oil irrespective of the heat input given to the oil using heater. Suitable control panel to be provided by the vendor from where the pump displacement will be controlled to vary the fan speed. The panel should also incorporate the temperature indicator and provision for speed indicator. The controller for the pump using 0 to 10 VDC input signal is the customer's scope of supply.

**Note 1:** All items and accessories required for complete installation and commissioning of the cooling system with fan drive test set-up at site to be supplied by vendor.

**Note 2:** Speed sensor and its digital display unit and pump controller are the customer scope of supply.

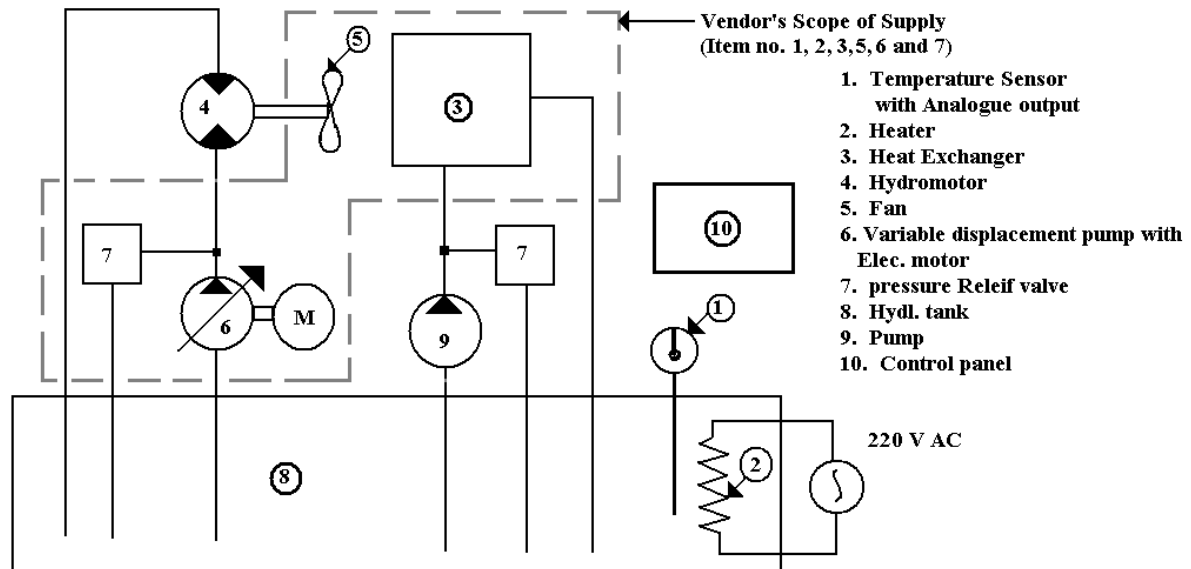
**Note 3:** Oil tank (100 litre capacity) and pump with electric motor for circulating oil through the Heat Exchanger are available at site.

**Note 4:** Suitable power supply unit to be provided

**Note 5:** 415 V and 220 V AC supply are available at site.

A schematic representation of Cooling system with fan drive test set-up is shown in Fig. 2.





**Fig. 2 Cooling System with fan Drive Test set-up**

**Sl. No. 2**

**Name of the Test set-up: Dual spool valve control test set up (Fig. 3) - Quantity: 1 set**

It consists of the following main items:

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| a. Manually operated pressure reducing valve<br>(Adjustable range 100 bar to 350 bar for 30 lpm flow)                                                                                                                                                                                                                                                                                                                                                                                                                          | 01 no. |
| b. Proportional directional control valve with integrated electronics<br>Centre position: Closed centre<br>Rated flow 25 lpm(appx.) @ 10 bar max. pressure difference<br>Maximum operating pressure: 315 bar (appx.)<br>Analogue input signal: $\pm 0-10$ V DC<br>Supply Voltage: 24 V DC<br>Response to step input: 40 ms (appx.) @100% stroke<br>Hysteresis: $\leq 0.1\%$<br>Response sensitivity: $\leq 0.05\%$                                                                                                             | 02 nos |
| c. Pressure transmitter having analogue output with pressure gauge<br>Measuring Range: 0-200 bar (appx.)<br>Analogue output: 0-10V DC or 4-20mA                                                                                                                                                                                                                                                                                                                                                                                | 02 no. |
| d. Loading arrangement with rectifier circuit using Proportional<br>Pressure Relief valve to provide controlled hydro-static<br>load on the main cylinder<br>Maximum operating pressure: 200 bar (appx.)<br>Maximum Pressure Rating:0-200 bar (appx.)<br>Maximum Flow: 30 lpm (appx.)<br>Analogue input signal: 0-10 V DC to operate Proportional PRV<br>Hysteresis: $\pm 3\%$ of maximum setting pressure<br>Repeatability: $< \pm 2\%$ of maximum setting pressure<br>Response time: 130 ms(appx.) for 10% to 90% step input | 01 set |
| e. Mill type Hydraulic cylinder (double acting) with LVDT<br>Bore diameter: 80 mm<br>Rod diameter: 56 mm<br>Stroke: 800mm<br>Maximum operating pressure: 250 bar<br>Maximum force: 125 kN(appx.) @ 250 bar<br>LVDT length: 800 mm with analogue output 0 - 10 V DC or 4 - 20 mA                                                                                                                                                                                                                                                | 01 no. |

Linearity  $\leq \pm 0.02$  % of FS

Reproducibility % mm:  $\pm 0.001$  or less

Hysteresis  $\leq 0.004$  mm

Supply voltage: 24 V DC

f. Mill type Hydraulic cylinder (double acting) without LVDT 01 no.

Bore diameter: 80 mm

Rod diameter: 56 mm

Stroke: 800 mm

Maximum operating pressure: 250 bar (appx.)

Maximum force: 125 kN(appx.) @ 250 bar

g. Digital controlled 4/3 proportional directional control valve 01 no.

Maximum operating pressure: 250 bar (appx.)

Maximum flow: 16 lpm(appx.) @  $\Delta P = 10$  bar

Input Supply: 24 VDC

Analogue Input: 0-10 VDC

Response Time: 25 ms (appx.) @ 100% stroke

Hysteresis:  $\leq 0.1$ %

Response sensitivity:  $\leq 0.05$ %

h. Manually operated flow control valve of 10 lpm max. (Metering valve) 01 no.

i. Coupling with suitable hose connections

**Note 1:** Suitable loading arrangement using proportional pressure relief valve with the rectifier circuit to be provided for the loading cylinder.

**Note 2:** The supply to the loading arrangement will be provided from the pilot line of the hydraulic power pack unit

**Note 3:** Test set up should be fitted with control panel for controlling the valves.

**Note 4:** Provision to be made on control panel to control the Proportional DCV, Digital control DCV and the Proportional PRV in both manual (POT) and Auto (0-10 V DC input) modes.

**Note 5:** All the valves to be mounted on a common manifold block with suitable stand.

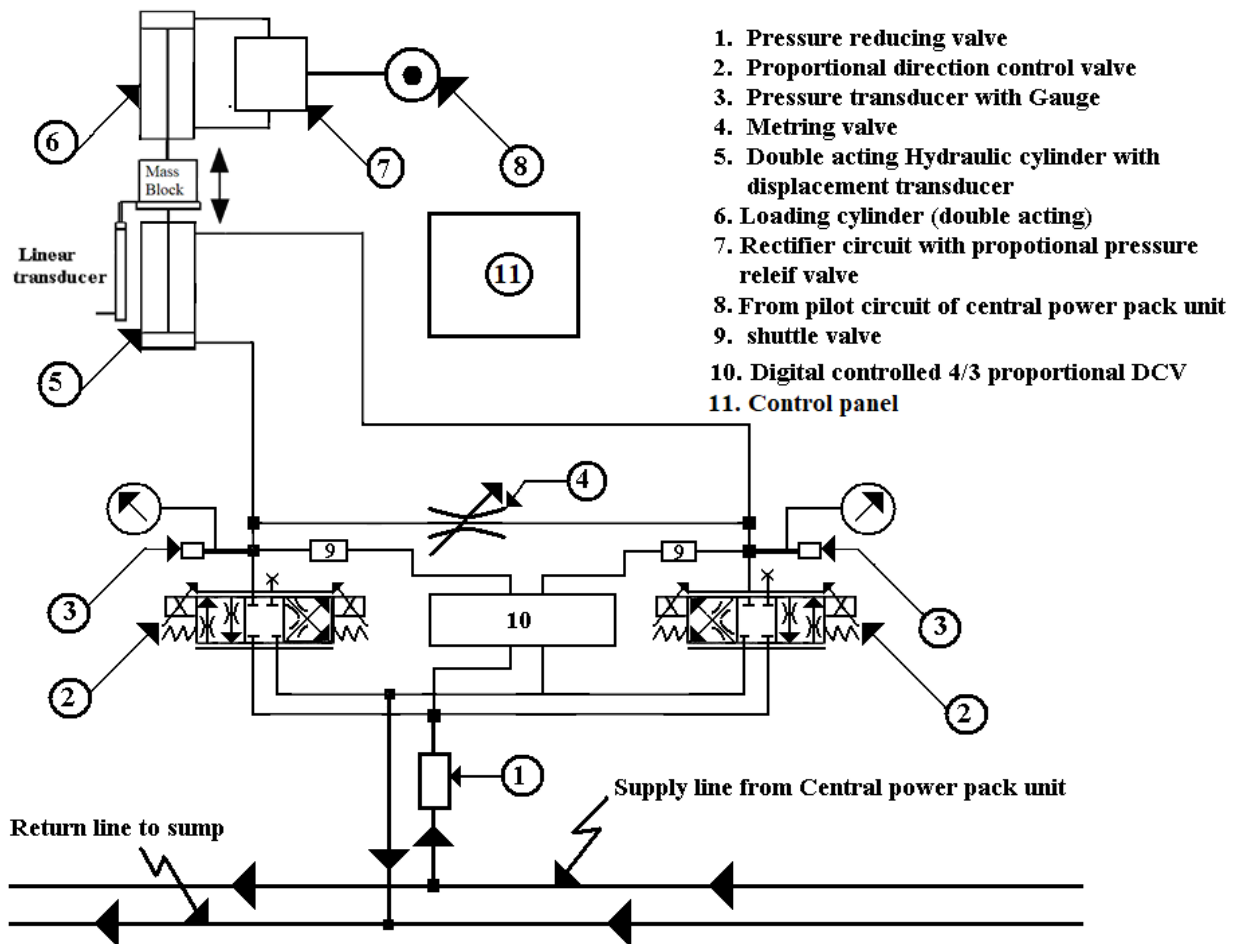
**Note 6:** The cylinders are horizontally mounted with inertia load on trolley.

**Note 7:** Panel should incorporate Pressure gauges and display unit of the displacement sensor.

**Note 8:** The display unit should have provision for analogue output (0-10 V DC)

**Note 9:** All items and accessories required for complete installation and commissioning of dual spool control test set up at site to be supplied by vendor.

A schematic representation of the hydraulic system is provided (Fig. 3).



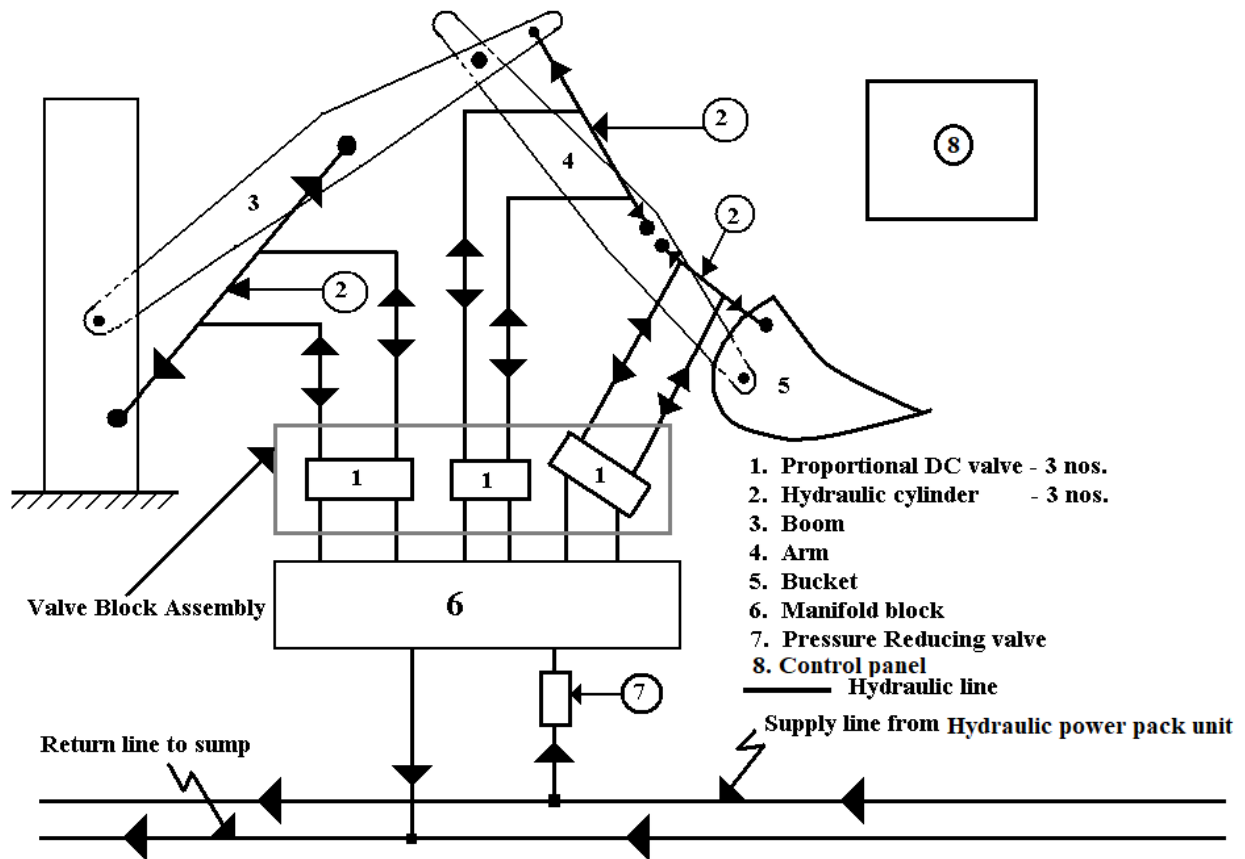
**Fig. 3 Dual Spool controlled valve test set-up**

**Sl. No. 3**

**Name of the Test set-up: Modification of the Existing Hydraulic Digger System (Fig. 4)**

Existing Hydraulic system of a digger is shown in Fig. 4. The items indicated against sl. no. 6 and 7 are to be supplied and necessary modification needs to be carried out to operate the existing system. In this regard the valve block assembly of the existing system with the supply and return lines of the Hydraulic power pack unit is to be connected.

The hydraulic power pack unit as mentioned in item no. 1 will be separately procured by the customer.



**Fig. 4 Schematic representation of the Hydraulic System of a Digger**

**Sl. No. 4**

**Name of the Test set-up: Energy Recovery System using accumulator (Fig. 5)-**

**Quantity: 1 set**

It consists of the following items:

- |                                                                                                                                                                                                                    |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| a. Diesel Engine 10 kW (customer's scope of supply)                                                                                                                                                                | - 01 no.  |
| b. Electric Motor with bell-housing 5 kW, Single phase, 220 V AC                                                                                                                                                   | - 01 no.  |
| c. Electromagnetic Clutch (customer's scope of supply)                                                                                                                                                             | - 03 nos. |
| Maximum operating speed: 4000 rpm                                                                                                                                                                                  |           |
| Maximum operating Torque: 60 Nm                                                                                                                                                                                    |           |
| Supply Voltage: 0-24V DC                                                                                                                                                                                           |           |
| (Connection of the gear box (1:1 gear ratio) – engine, gear box (1:1 gear ratio) – electric motor and the gear box (1:20 gear ratio) – flywheel) through the clutches are to be taken into account by the vendor). |           |
| d. Gear unit of 1: 1 gear ratio                                                                                                                                                                                    | -1 no.    |
| Gear unit of 1:20 gear ratio                                                                                                                                                                                       | - 1 no.   |
| e. Torque sensor (customer's scope of supply)                                                                                                                                                                      | - 1 no.   |
| (Mechanical groove arrangement for connecting the gear box (1:1 gear ratio) and the pump with and without the torque sensor is to be provided by the supplier)                                                     |           |
| f. Variable displacement pump with suitable amplifier card and card holder                                                                                                                                         | - 1 no.   |
| Pump type: Axial Piston Pump                                                                                                                                                                                       |           |
| Maximum Flow: 30 lpm @ 1500 rpm                                                                                                                                                                                    |           |
| Operating Pressure: Nominal 250 bar, Maximum 280 bar                                                                                                                                                               |           |
| Maximum Operating speed: 3300 rpm                                                                                                                                                                                  |           |

- Analogue i/p signal: 0- 10 V DC to vary pump displacement  
Maximum Pressure Rating: 280 bar
- g. Unloading pressure Relief valve  
Maximum Pressure setting: 300 bar  
Maximum flow: 30 lpm
- h. 4/3 closed centred DC valve - 02 nos.  
Maximum flow: 25 lpm  
Maximum operating pressure: 250 bar  
Supply voltage: 24V DC
- i. 4/3 J centred spool type DC valve - 01 no.  
Maximum flow: 25 lpm  
Maximum operating pressure: 250 bar  
Supply voltage: 24V DC
- j. Radial piston hydro-motor with brake and vertical shaft arrangement - 01 no.  
Displacement: 160cc/rev  
Maximum torque: 1146 Nm  
Maximum Speed: 670 rpm
- k. 2/2 spool type DC valve with coil and connector - 03 nos  
Supply Voltage: 24V DC  
Maximum operating pressure: 250 bar  
Maximum flow: 20 lpm
- l. Check Valve - 07 nos.  
Type: Cartridge type  
Maximum operating pressure: 250 bar  
Maximum flow: 25 lpm
- m. Manually operated flow control valve of 10 lpm max. - 01 no.
- n. Flywheel (Customer's scope of supply) - 01 no.  
(Connection of the hydro-motor shaft and the gear box through the flywheel and the clutch are to be considered while assembling the components)
- o. Loading pump - Gear type, fixed displacement Pump - 01 no.  
Maximum flow: 40 LPM @ 1500 rpm,  
Maximum Pressure: 200 bar
- p. Proportional pressure relief valve for Pump Loading - 01 set  
with amplifier card and card holder  
Maximum operating pressure: 350 bar  
Maximum pressure rating: 200 bar  
Maximum flow: 30 lpm  
Analogue input signal: 0-10 V DC  
Hysteresis:  $\leq \pm 3\%$  (appx.) of maximum setting pressure  
Repeatability:  $\leq \pm 2\%$  (appx.) of maximum setting pressure  
Response time: 130 ms(appx.) for 10% to 90% step input
- q. Pressure compensated proportional flow control valve - 03 nos.  
Maximum flow: 30 lpm,  
Maximum Operating Pressure: 250 bar  
Analogue input signal: 0-10 V DC
- r. Hydraulic cylinder (double acting) with LVDT - 01 no.  
Bore diameter: 80 mm  
Rod diameter: 56 mm  
Stroke: 800mm  
Maximum operating pressure: 250 bar  
LVDT analogue output: 0- 10V DC
- s. Arrangement for placing 5 weight blocks of 20 kg - 01. no.

- |    |                                                                                         |           |
|----|-----------------------------------------------------------------------------------------|-----------|
| t. | Logic cartridge valve with 2/2 poppet DC valve for accumulator isolation                | - 02 nos. |
|    | Maximum flow: 30 lpm                                                                    |           |
|    | Maximum pressure: 250 bar                                                               |           |
| u. | Accumulator stand - Bladder Type accumulator assy                                       | - 01 no.  |
|    | Maximum operating pressure: 250 bar                                                     |           |
|    | Nominal Volume: 6 ltr                                                                   |           |
| v. | Accumulator stand - Piston Type accumulator assy                                        | - 01 no.  |
|    | Maximum operating Pressure: 250 bar                                                     |           |
|    | Nominal Volume: 10 ltr                                                                  |           |
| w. | Ball valve                                                                              | - 05 nos. |
|    | Maximum flow: 30lpm                                                                     |           |
|    | Maximum pressure: 250 bar                                                               |           |
| x. | Hydraulic tank unit with all accessories (100 litre)                                    | - 01 set  |
| y. | Suitable Coupling and Mounting for hydraulic motor and loading pump and hydraulic hoses | - 01 set  |

**Note: The vendor should provide the following:**

**Note 1:** Control panel with all electrical sensor and display unit of the sensors.

**Note 2:** Provision for controlling the proportional valve, Hydro Motor brake, Pump & Logic cartridge valve manual (POT) and auto (0-10 VDC) to be made on panel. 0 – 10 V DC source for auto mode of operation is customer's scope of supply.

**Note 3:** The display unit should have provision for analogue output (0-10 VDC).

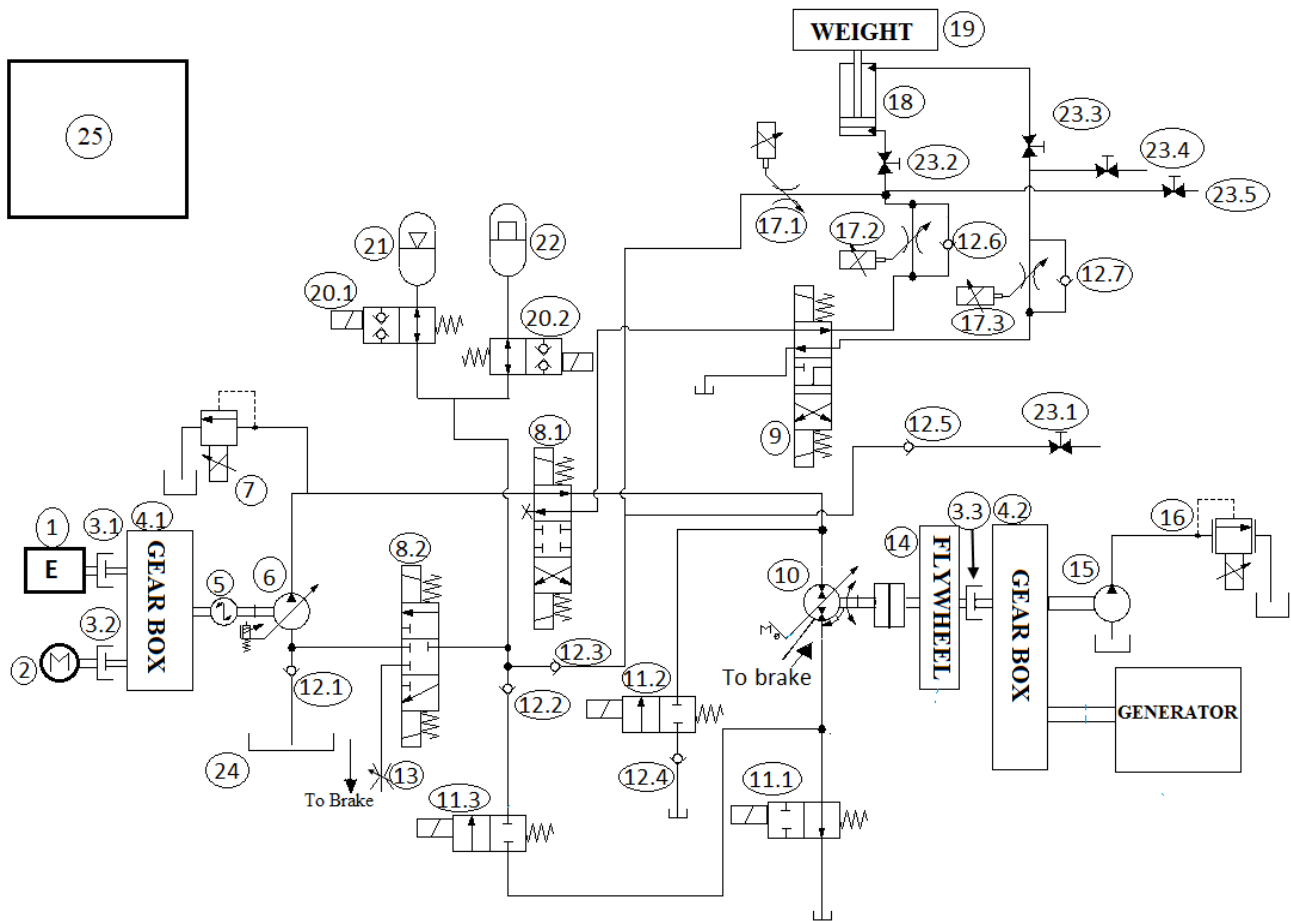
**Note 4:** All solenoid valves should be operated through relay operating at 0 to 10 VDC.

**Note 5:** Necessary 24 V DC power supply unit to be provided.

**Note 6:** All items and accessories required for complete installation and commissioning of the test set-up at site to be supplied by the vendor.

**Note 7:** Available power supply in the laboratory is 3 phase, 415 V AC and single phase, 220 V AC.

A schematic representation of the hydraulic system is provided (Fig. 5).



#### LIST OF MAJOR EQUIPMENT

- |                                                       |                                                                      |
|-------------------------------------------------------|----------------------------------------------------------------------|
| 1. 10 kW diesel engine (Two cylinder four stroke)     | 15. Fixed displacement loading pump                                  |
| 2. 5 kW electric motor with bell housing              | 16. Proportional pressure relief valve                               |
| 3. Electro-magnetic clutch (item no.- 3.1 to 3.3)     | 17. Pressure compensated flow control valve (item no.- 17.1 to 17.3) |
| 4.1 Gear box (1:1)                                    | 18. Double acting hydraulic cylinder with LVDT                       |
| 4.2 Gear box (1:20)                                   | 19. Arrangement for placing weight blocks                            |
| 5. Torque sensor                                      | 20. Logic cartridge valve with poppet DCV (item no.- 20.1 to 20.2)   |
| 6. Variable displacement pump                         | 21. Bladder type accumulator with volume capacity of 6 Ltr           |
| 7. Pressure relief valve                              | 22. Piston type accumulator with volume capacity of 10 Ltr.          |
| 8. 4/3 closed centered DCV (item no.- 8.1 & 8.2)      | 23. Ball valve (item no.- 23.1 to 23.5)                              |
| 9. 4/3 J spool type DCV                               | 24. Hydraulic tank                                                   |
| 10. Radial piston motor with brake and vertical shaft | 25. Control panel                                                    |
| 11. 2/2 DCV (item no.- 11.1-11.3)                     |                                                                      |
| 12. Check valve (item no.-12.1 to 12.7)               |                                                                      |
| 13. Metering valve                                    |                                                                      |
| 14. Arrangement for vertical fixing of circular discs |                                                                      |

**Fig. 5 Energy Recovery System using accumulator**

**Item No.- 3: Hydraulic Components**

The hydraulic components to be supplied and tested at site are described below:

<b><u>Sl. No.</u></b>	<b><u>Description</u></b>	<b><u>Qty</u></b>
[i]	<p><b>Cam Ring design Low speed high torque hydraulic motor</b>            Displacement: 500 cc/rev.            Speed: Min: 8 rpm and Max: 350 rpm            Specific Torque: 8 Nm/bar            Max torque: 1945 Nm            Maximum Operating Pressure: 250 bar</p>	1 No.
[ii]	<p><b>Hydraulic pump station inclusive of Power control operated variable displacement pump with Electric motor 15kW rated and suitable bell housing mounted on the base plate</b>            Type: Axial piston pump (Constant power pump) having Angle Sensor with analogue output.            Power control valve actuation with 0 to 10 VDC command            Maximum working Pressure: 350 bar            Maximum operating speed: 2600 rpm            Control time (at 200 bar pressure output): 0.10 s (approx.)            Hysteresis: <math>\leq \pm 3</math> % of max. displacement (approx.)            Repeatability <math>\leq 1</math> % of max. displacement (approx.)            Accessories needed for connecting the suction and delivery lines of the pump with the existing system to be supplied.</p>	1 No.
[iii]	<p><b>Axial Piston Hydro Motor fixed displacement type with suitable Foot bracket mounting</b>            Type: Swash plate Axial piston            Displacement: 28 cc/rev.            Maximum operating speed: continuous 4250 rpm, intermittent 5000 rpm            Maximum Working Pressure: 400 bar            Maximum torque: Approx. 178 Nm @ 400 bar</p>	1 No.
[iv]	<p><b>SERVO Valve, Flapper jet type, 20 lpm(appx.) with on-board electronics</b>            Maximum operating pressure: 315 bar (appx.)            Maximum Flow: 20 lpm @ <math>\Delta P=70</math> bar (appx.)            Type of signal: Analogue            Supply Voltage: 24V DC            Response time: 12 ms @ 40 bar pressure (appx.)            Feedback system: Mechanical            Response sensitivity : <math>\leq 0.2</math> % (approx.) of operating pressure</p>	1 No.
[v]	<p><b>Proportional DC valve with on-board electronics</b>            Maximum operating pressure: 315 bar            Maximum flow: 25 lpm @ <math>\Delta P=10</math> bar            Response time: 40ms @ 100% stroke            Analogue input: <math>\pm 0 - 10</math> V DC            Supply Voltage: 24V DC            Hysteresis: <math>\leq 0.1</math> % (approx.)            Response sensitivity: <math>\leq 0.05</math> % (approx.)</p>	1 No.



[vi]	<b>Proportional DC valve with on-board electronics</b> Maximum Working Pressure: 315 bar Maximum flow: 50 lpm @ $\Delta P = 10$ bar Response time: 40 ms @ 100% stroke Analogue input: $\pm 0 - 10$ V DC Supply Voltage: 24 V DC Hysteresis : $\leq 0.1$ % (approx.) Response sensitivity: $\leq 0.05$ % (approx.)	1 No.
[vii]	<b>Proportional Pressure Relief Valve (PRV) with on-board electronics</b> Maximum Working Pressure: 350 bar Pressure rating : 350 bar Rated Flow: 30 lpm Supply Voltage: 24 V DC Analogue Input Signal : 0 - 10 V DC Hysteresis: $\pm 3$ % (appx.) of the maximum setting pressure Repeatability $< \pm 2$ % (appx.) of the maximum setting pressure Response time for 10 % - 90 % of input signal – 130 ms	1 No.
[viii]	<b>Proportional PRV valve with on-board electronics</b> Maximum Working Pressure: 315 bar Pressure rating: Rated flow: 60 lpm Supply Voltage: 24V DC Analogue input: 0-10 V DC Response time (100 % signal change): 70 ms (010 % signal change): 15 ms	1 No.
[ix]	<b>Portable Accumulator test stand consists of 5 bladder type accumulator of sizes 1ltr, 2.5ltr, 4 ltr, 6 ltr and 10 ltr with charging kit.</b> Maximum operating pressure : 350 bar Maximum oil temperature: 80 <sup>0</sup> C Installation position: Bottom fluid connection socket Type of mounting: With clamping collars and console	1 set

**Note:**

- The items mentioned against Sl. No. iv through viii should be mounted on trolley mounted test stand with suitable 24 V power supply along with the control unit for auto (0 to 10 V dc) and manual control mode of operations. All the valves are to be subplate mounted. 220 V AC source is available.
- All the valves are to be tested at site.

General Technical Requirements

Complete system assembled and tested at supplier's own facility in India as per QAP approved.

- a) Supplier should have their own service back up in terms of site report as well as servicing of major components in India.
- b) All major components like hydraulic pump, proportional & servo valves, hydraulic motors etc. should be the supplier's own product. Supplier should ensure that their supplied system should not contain more than 30% bought out items from other sources.
- c) All electrically operated control valves should be operated by 0 to 10 VDC.
- d) All operating panel should be with Auto and Manual operating feature.
- e) Interconnecting piping (with seamless tube and hydraulic fittings), between centralized power pack and different test /lab set ups should be made by the supplier at site. Piping joints should be of weld less type (Wall form).
- f) All manifold blocks as per test set ups requirement shall be of material GGG 40 (Cast iron alloy).
- g) Piping joints of the centralized power pack should be weld less type up to pipe size 42 mm (appx.) OD.
- h) All test set ups should be with dedicated control panel with arrangement to operate manually (POT) and automatic (0-10 V DC). Where the source for 0 - 10 V DC for automatic operation is in customer's scope of supply.
- i) Supplier should provide component list with data sheet for technical validation.
- j) All the items should preferably be from a single supplier.
- k) All the items are to be installed and commissioned at site.
- l) The suppliers should also provide their list of previous supply executed for industries and educational institutions.

**CHAPTER 5**  
**(On the letter head of the bidder)**

**Price Bid (Part 2) Annexure-A**

**1. PRICE SCHEDULE FOR GOODS BEING OFFERED FROM ABROAD**

Name of the Bidder \_\_\_\_\_ (On bidders letter head)

NIT Reference No. **MME/PRJ/063/19-20**Date: **24 June 2019**

Bidder's Reference No. \_\_\_\_\_

Date: \_\_\_\_\_

Sl. No.	Description/Part No./Make Model	Quantity	Unit Price (in foreign currency)	Total Amount (in foreign currency)
1.				
2.				
Total Ex-Works Price-				
Packing & Forwarding and inland freight				
*FCA (at port)				
Terminal charges, loading on vassal				
**FOB (name of port)				
Air freight & insurance up to destination port				
*CIF				
Carrier charges & insurance up to final destination				
**CIP				
Concessional Custom Duty (Against DSIR Certificate)				
IGST rate (Against IIT (ISM) Certificate)				
Other Duties/taxes/clearance charge, if any				
Transportation charges up to IIT ISM Dhanbad				
Chargeable weight/Gross weight of consignment				
Indian agency Commission (%)				
Installation & Commissioning charge				
Training charges, if any				
Additional Warranty Charges, if any				
Annual Maintenance Charge, if any				
Educational discounts, if any				

\*&amp;\*\* Mandatory requirement

##Total Bid Price \_\_\_\_\_ in words \_\_\_\_\_

**Note :**

Total Bid price in foreign currency \_\_\_\_\_ in words

- (a) Indian agent name & address \_\_\_\_\_
- (b) Installation, commissioning & training charges, if any \_\_\_\_\_
- (c) Please note that Indian agents' commission shall be paid in Indian Rupees only.
- (d) Banker's details such as- Name of account holder, Account Number, Name of Bank, Branch code, RTGS code, NEFT code, SWIFT code etc.
- (f) Price schedule of optional items shall be indicated in a separate sheet in the same performa.
- (g) **Quoting Price for FOB/FCA and for CIF/CIP basis, otherwise bid will be rejected.**
- (h) Wherever the price quoted on FOB/FCA and CIF/CIP basis are the same, the contract would be made on CIF/CIP basis only.
- (i) Country of Origin, Dimension and Gross Weight must be provided

Signature of Bidder

Name \_\_\_\_\_

Business Address with contact details \_\_\_\_\_

**Price Bid (Part 2) Annexure-A****2.PRICE SCHEDULE FOR GOODS BEING OFFERED WITHIN INDIA**

Name of the Bidder \_\_\_\_\_ (On bidders letter head)

NIT Reference No. **MME/PRJ/063/19-20**

Date: 24 June 2019

Bidder's Reference No. \_\_\_\_\_

Date:

Sl. No.	Description/Part No./Make Model	Quantity	Unit Price (in foreign currency)	Total Amount (in foreign currency)
1.				
2.				
3.				
Ex-Works Price-				
Packing & Forwarding				
Transportation				
FOR (IIT ISM) Dhanbad				
GST/IGST (their rate(s) as the case may be, clearly specified)				
Please note that IIT ISM is eligible for Concessional GST as per Notification No. 45/2017 – Central Tax (Rate) for CGST, 45/2017 – State Tax (Rate) for SGST and 47/2017 – Central Tax (Rate) for IGST,				
Insurance up to Destination/handover (in case of fabrication)				
Installation & Commissioning charge				
Training charges, if any				
Additional Warranty Charges, if any				
Annual Maintenance Charge, if any				

\*(On the basis of the technical specifications submitted)

Total Bid Price \_\_\_\_\_ in words \_\_\_\_\_

Note :

(a) The Price schedule of optional items shall be indicated in a separate sheet in the same Performa.

(b) Cost spare parts may be indicated separately

Signature of Bidder

Name \_\_\_\_\_

Business Address with contact details \_\_\_\_\_

**(To be attached with Price Bid)**

**(On the letter head of the bidder)**

**UNDERTAKING BY THE BIDDER(S)**

I have carefully gone through the various terms and conditions mentioned in the tender document of **Supply and Installation of Hydraulic Power Pack Unit, Hydraulic Test Set-ups and the Hydraulic Components**. I agree to all the conditions and offer to supply the item at IIT (ISM), Dhanbad. I am making this offer after carefully reading the conditions and understanding the same. I have acquainted with all the tasks required to be carried out, before making this offer. I will abide by the corrigendum(s), if any, to be issued by IIT (ISM) Dhanbad on its website [www.iitism.ac.in](http://www.iitism.ac.in). I hereby sign this undertaking as token of our acceptance of various conditions mentioned in tender document. Justification of the price is also attached herewith.

Place: \_\_\_\_\_

Dated: \_\_\_\_\_

Name & Signature of the bidder(s):

Address: \_\_\_\_\_

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**CHAPTER 6****Contract Form**

With reference to the tender reference no. **IIT(ISM) /PE/PRJ/063/2019-20**, Dated: **24 June 2019** of IIT(ISM), Dhanbad for **Supply and Installation of Hydraulic Power Pack Unit, Hydraulic Test Set-ups and the Hydraulic Components**, we (bidder(s)'s name) \_\_\_\_\_ accept all the instructions and terms and conditions of the tender and accordingly hereby submit our quotation no. \_\_\_\_\_ dated \_\_\_\_\_.

**ALL TERMS AND CONDITIONS OF THE N.I.T. ARE ACCEPTED**

1	Name and address of the bidder	
2	Telecom nos. of the bidder i.e. phone fax, & email id.	
3	Signature, name & designation of the person signing on behalf of the bidder & his/her office seal	
4.	Name & designation of the contact person & his phone/mobile no./e-mail ID	

We hereby declare that all statements/details made in this tender are true, complete and correct to the best of my knowledge and belief. I understand that in the event of any information being found false or incorrect at any stage or we do not satisfy any of the stated criteria, our offer is liable to be cancelled automatically and IIT (ISM), Dhanbad may take an action against this firm for such false information including legal action.

**Signature:**

**Name:**

**Designation:**

**Bidder(s)'s Name:**

**Seal:**

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**CHAPTER 7****Form 7.1- Checklist****(to be submitted with technical bid part-1)**

1. Duly sealed and signed (on all pages) of the tender document.	
2. Demand draft is attached as Tender Fee	
3. Demand draft is attached as EMD.	
4. Form No. 7.4 (Techno-Commercial bid, Part-1) is attached	
5. Form No. 7.2 and 7.3 are attached with Techno-commercial bid (part-1)	
6. Details of PAN, TIN, Service Tax Registration No., GST No. etc. is attached	
7. Bank account details is attached	
8. Complete contact details (Name, Postal address, E-mail address, phone no. mobile no.) is provided	
9. Complete technical details attached	
10. The Techno-Commercial bid (Part 1) is sealed in a separate envelope (ENVELOPE-ONE) with EMD and Tender Fee in the form Demand Draft and duly super-scribed as "Techno-Commercial bid (Part 1) - Bid for Supply and Installation of....."	
11. The Price bid (Part 2) is sealed in separate envelopes (ENVELOPE-TWO) and duly super-scribed as "Price Bid (Part 2) – Bid for Supply and Installation of....."	
12. A copy of PAN/Voter Card/Aadhar Card including ID card of the bidder (firm) of the authorized signatory of the bidder(s) is attached with the Form 7.1	

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**Form No.: 7.2**

To,  
 The Registrar,  
 Indian Institute of Technology (Indian School of Mines), Dhanbad,  
 P.O. – I.S.M.  
 DHANBAD– 826004.

**Ref.:** Your Notice Inviting Tender No. IIT-ISM /MME/PRJ/063/ 2019-20, Dated: 24 June 2019

**Sub:** Technical bid relating to **Supply and Installation of Hydraulic Power Pack Unit, Hydraulic Test Set-ups and the Hydraulic Components.**

Sir/ Madam,

1. I/We have gone through all Chapters of the tender document such as Instructions and Terms and conditions, minimum eligibility criteria, schedule of requirements, Specifications and allied technical details etc. as enlisted by you in your Notice Inviting Tender for the subject under reference.
2. I/We, hereby confirm that we have understood all the above and confirm my/our commitment to abide by them.
3. I/We also confirm my/our commitment to provide the services as enlisted in your Notice Inviting Tender under reference.

**Seal and Signature of authorized signatory of the bidder(s)with date→**

Documents	Yes/No	Document No. (If submitted a copy of the same)
PAN Card/Voter ID/Aadhaar Card		
Official ID Card		
Other Documents (specify below)		

(A copy of PAN/Voter Card/Aadhaar Card and official ID card of the authorized signatory of the bidder(s) must be attached with this letter.).

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**Form No.:7.3****(to be submitted with technical bid part-1)**

1. Earnest Money Deposit: DD NO. \_\_\_\_\_ Date: \_\_\_\_\_ Amount: Rs. One Lakh Seventy Thousand only, Issued by bank and branch \_\_\_\_\_
2. Validity of Quotation: Days from the date submission deadline (minimum 270 days from the submission deadline).....
3. Performance Security or PBG: Will Be Submitted with the Performance Security (PBG), if Purchase Order placed by I.I.T. (I.S.M.), Dhanbad
4. Payment Terms: Payment after supply, satisfactory installation and submission of all required documents as per Purchase Order after statutory deductions and penalty (liquidity damage), if any as decided by I.I.T. (I.S.M.), Dhanbad.

**ALL THE ABOVE MENTIONED TERMS & CONDITIONS ARE ACCEPTED BY US AND PROFORMA IS SUBMITTED FOR CONSIDERATION.**

\_\_\_\_\_  
Signature & Seal of the Bidder(s)

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**Form No.: 7.4****TECHNO-COMMERCIAL BID (Part-1)****TECHNICAL BID**

1. Name of the Bidder(s).....
2. Name of the authorized person (who signs on the tender document on behalf of bidder(s)) with PAN/Voter Card No./Aadhar No. ....
3. Address of the Bidder(s)..... , Website .....
4. Phone No. .... (Mobile).....Fax..... E-mail .....

**Details of the item and its specification:**

Sl. No	Particulars	Description

**Name of the authorized signatory:**

**Name of the Bidder(s):**

**Contact No.:**

\_\_\_\_\_  
**Signature & Seal of the Bidder(s)**

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