

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



**Notice Inviting Tender (NIT) in Two-Bid System
for
Supply and Installation of Hydraulic Fracturing System with
Accessories and Relevant Data Acquisition System for In-situ
Stress Measurement**

Tender No.: IIT(ISM)/ME/PRJ/311/ 2018-19

Date: 8 February 2019

Bid Submission deadline: 12.03.2019 , 1:00 P.M.

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

GSTIN : 20AAAAI0686D1ZA

**Notice Inviting Tender (NIT) in Two-Bid System For
Supply and Installation of Hydraulic Fracturing System with
Accessories and Relevant Data Acquisition System for In-situ
Stress Measurement**

Tender No.: IIT(ISM)/ME/PRJ/279/2018-19

दिनांक/ Date: 8 February 2019

INDEX

<u>CHAPTER</u>	<u>CONTENT</u>	<u>PAGE NO.</u>
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	19
6	Contract Form	22
	Other forms	
	Form - 7.1 (Checklist)	23
7	Form - 7.2 (Covering Letter with Techno-Commercial Bid)	24
	Form - 7.3	25
	Form - 7.4 (Techno-Commercial Bid)	26

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 Fracturing System with Accessories and Relevant Data Acquisition System for In-situ Stress Measurement**” to enrich its teaching and research facility at Dhanbad.

Reputed manufactures or authorized distributors are invited to submit their bid for “**Supply and Installation of Hydraulic Fracturing System with Accessories and Relevant Data Acquisition System for In-situ Stress Measurement**” 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, 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 **Deputy/Assistant 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 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.
10. Name and PAN/Voter Card No. /Aadhar No. of the authorized signatory of the bidder(s) must be mentioned in the Form 7.2.
11. A copy of PAN/Voter Card/Aadhar Card of the authorized signatory of the bidder(s) must be attached with the Form 7.2

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 EMD (Earnest Money Deposit), in the form of Demand Drafts issued from any Nationalized / Scheduled commercial bank in favour of “Registrar, IIT (ISM), Dhanbad” and payable at “Dhanbad (Jharkhand, India)”, 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)/ME/PRJ/311/2018-19, Submission Deadline: 12.03.2019**” as per following details: -
EMD: Rs. 1,30,000/- (Rs. One Lakh Thirty 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)/ME/PRJ/311/2018-19, Submission Deadline: 12.03.2019**”.
 - 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 Fracturing System with Accessories and Relevant Data Acquisition System for In-situ Stress Measurement against Tender No.: IIT(ISM)/ME/PRJ/311/2018-19, Dated: 8 February 2019, Submission Deadline: 12.03.2019**”.
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 and CIF/CIP basis respectively. However, 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, currenty fluctutation etc. - 15% of the CIF/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 Demand Drafts with technical bid.
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 (01) year/s 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 (A) or (B) 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 only. Bidder(s) must be in touch with our website 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 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 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.

CHAPTER 3**Schedule of Requirements**

<u>Description</u>	<u>Details</u>
NIT No.	IIT(ISM)/ME/PRJ/311/2018-19
Date of Tender	8 February 2019
Bid submission deadline	12.03.2019 , 1:00 P.M.
Date of opening of the bids (technical part-1)	12.03.2019 , 4:00 P.M.

CHAPTER 4

Sl. No.	Item	Quantity
1.	Hydraulic Fracturing System with Accessories and Relevant Data Acquisition System for In-situ Stress Measurement	One Set

Specifications for Supply and Installation of Hydraulic Fracturing System with Accessories and Relevant Data Acquisition System for In-situ Stress Measurement:

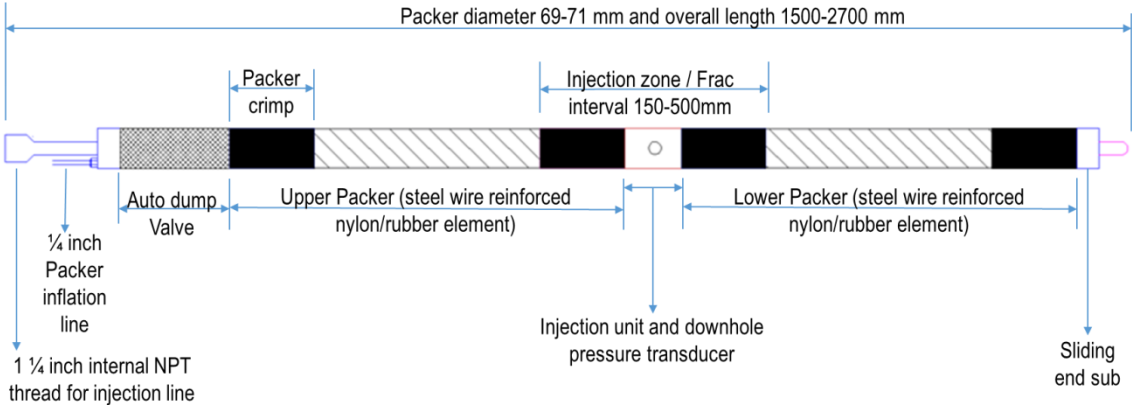
Detailed Specifications

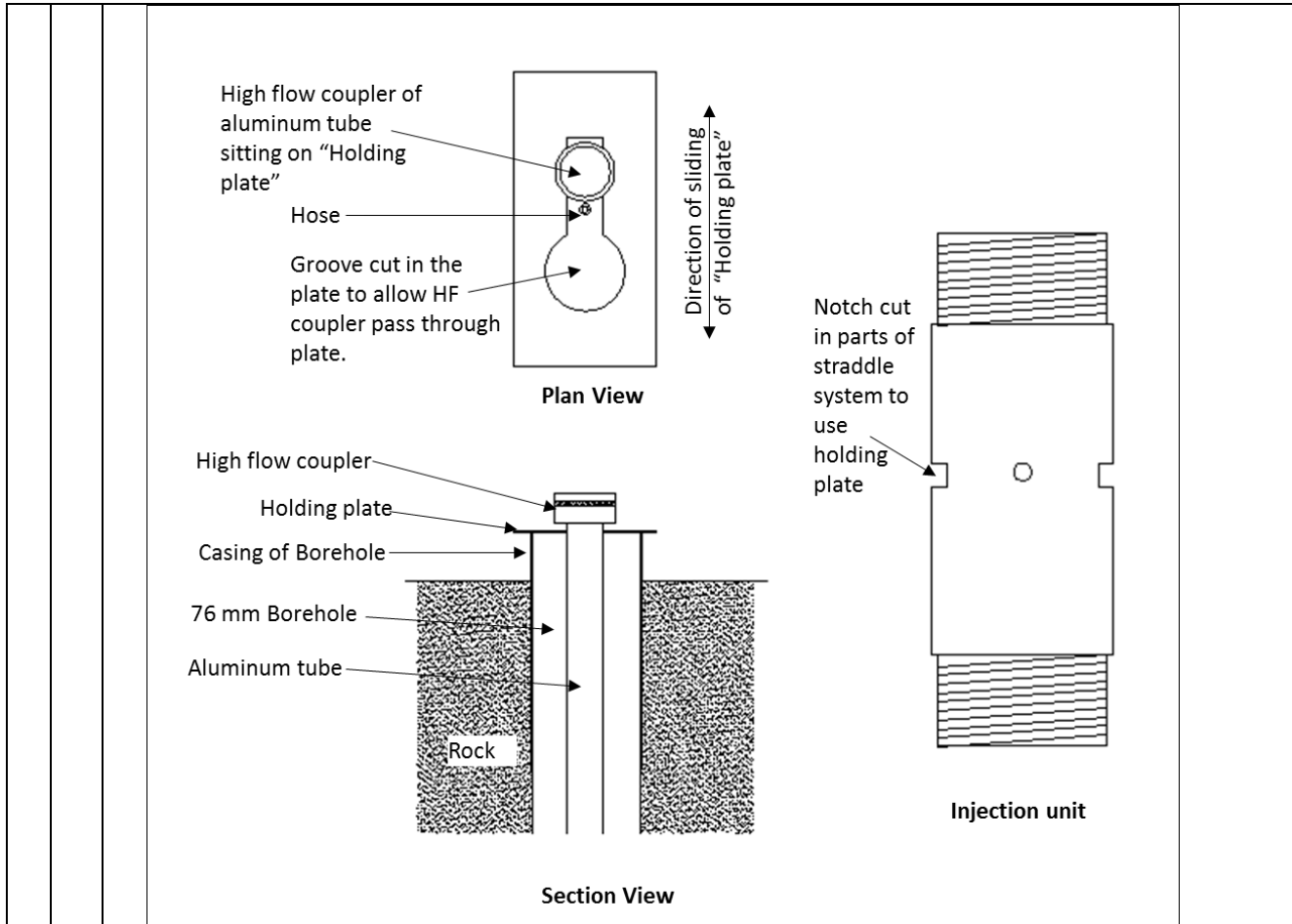
Hydraulic Fracturing (HF) System with Accessories and Relevant Data Acquisition System
(Items 1 to 12) for *In-situ* Stress Measurement

Contents

Sl. No.	Item	Page No.
1	HF Straddle Packer system (suitable for use in NX-Size borehole of Finished Diameter 76 mm) with downhole pressure transducer	2
2	Auto dump valve for release of water from packer (compatible to Item 1)	3
3	Replacement Packer elements as per Item 1: 4 Nos. additional	3
4	HF Impression Packer System	3
5	Replacement HF Impression Packer System : 2 No.	4
6	Packer orientation tool (with compatible adapter to HF Impression Packer system) based on electronic compass module and data logger	4
7	BHA Interconnected Lowering/Pushing Rods: 1 ¼ inch outer diameter light weight seamless aluminium tubes of 1500 mm length, working pressure > 500 bars, non-valved high flow coupler on one end and nipple on the other end for interconnection with next tube: 35 Nos.	5
8	High Pressure hoses of length 20 m each with BSP female swivel type crimped connectors : 5 Nos.	5
9	Cross Over Assembly Compatible with Item 1, 4, 5, 7 and 8	5
10	High Pressure Pump of capacity 1-5.5lpm at 450-500 bars running on 550 V motor with VFD control	6
11	Pressure control Panel	8
12	Flow and Pressure Transducers with Online Real-time Data Acquisition	9

Hydraulic Fracturing (HF) System with Accessories and Relevant Data Acquisition System (Items 1 to 12) for In-situ Stress Measurement

Item No.	Detailed Specification
1	HF Straddle Packer system (suitable for use in NX-Size borehole of Finished Diameter 76 mm) with downhole pressure transducer
A	The overall length of the borehole apparatus (BHA) including Automatic Dump Valve (item 2), two straddle packers, an injection zone and the downhole gauge should be between 1500-2700 mm approximately
B	Outer diameter of the packers should be between 69-71 mm to allow smooth running of the BHA in the NX-size borehole
C	The metal parts of the straddle system should be made of heat treated 4140 Carbon steel or an equivalent material of similar properties and non-corrosive in nature
D	Injection unit length : 150-500 mm
E	Under differential pressure against Inflation, the packer burst pressure should have limiting value of about 80MPa or more.
F	The upper and lower packers of the HF straddle should be interchangeable as well as it should be replaceable. The packers should deflate faster and recover to their original diameter, enabling them to be run with smaller radial clearance.
G	The straddle should accompany a downhole pressure transducer housed in water-tight enclosure for logging the pressure-time activity of the hydraulic fracturing process on a chip which can be downloaded into PC-computer after the straddle system is taken out of the borehole.
H	<p>The injection line of the straddle system should have suitable arrangement for connecting push rods of 1 ¼ inch external diameter (item 7).</p>  <p style="text-align: center;">ROCK STRESS TESTING -SCHEMATIC OF HF STRADDLE SYSTEM</p>
I	Suitable pipe wrench and other tools along with a separate field tool box should be provided for dismantling, cleaning and assembling the components of the straddle system.
J	Suitable steel hollow tube of 76 mm Internal Diameter should be provided to test the inflation and deflation of the HF Straddle systems under pressure up to 400 bars.
K	The Packer Element should be made of Nylon/Rubber and steel wire reinforced.
L	<p>A suitable slot/notch should be designed in the straddle system with a C-plate arrangement (see figure below) to help the assembly during rigging up and also during lowering in the borehole. C-Plate may also be provided along with the items.</p> <p style="text-align: center;">The Figure below is helpful to understand the requirements.</p>



2 Auto dump valve for release of water from packer (compatible to Item 1)

A The straddle system should accompany an auto dump valve for use in watery vertical boreholes. The purpose of the auto dump valve is to avoid pressure build up in the packers due to the water column in the inflation line. In the absence of auto dump valve the water column in the inflation line will keep the packers in inflated position, causing trouble in retrieval of straddle system from the borehole. As soon as the water is vented out from the inflation line, the auto dump valve must act to release the water from the packer and deflate it to its normal diameter enabling the straddle system to be removed out of the borehole without any trouble.

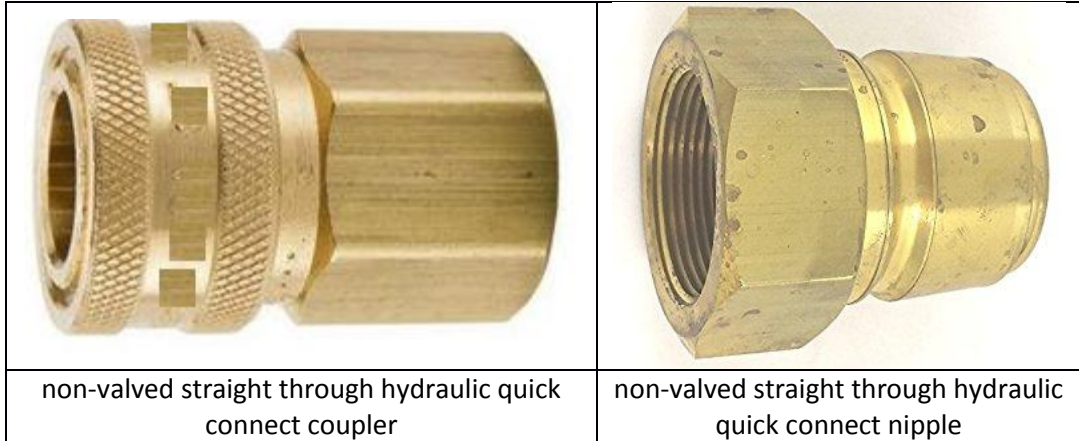
3 Replacement Packer elements as per Item 1: 4 Nos. additional

4 HF Impression Packer System

- A The HF Impression packer should be designed for taking impression of the fracture created during hydraulic fracturing process for determination of in situ stress in rock having a rubber length of about 750 mm.
- B The diameter of the packers should be between 69 mm and 71 mm for use in NX-size core drilled boreholes of finished diameter 76 mm. The packers should deflate faster and recover to their original diameter, enabling them to be run in smaller radial clearance.
- C The packer should be wrapped with a layer of soft rubber for taking impression of fracture
- D Under differential pressure against Inflation, the packer burst pressure should have limiting value of about 80 MPa (800 bars) or more.
- E The straddle system should accompany an auto dump valve for use in watery vertical boreholes. The purpose of the auto dump valve is to avoid pressure build up in the packers due to the water column in the inflation line. In the absence of auto dump valve the water column in the inflation line will keep the packers in inflated position, causing trouble in retrieval of straddle system from the

	<p>borehole.</p> <p>As soon as the water is vented out from the inflation line at surface, the auto dump valve must act to release the water from the packer and deflate it to its normal diameter enabling the straddle system to be removed out of the borehole without any trouble.</p>
F	<p>The straddle system should have suitable arrangement for connecting push rods (Item 7) of 1 ¼ inch external diameter.</p> <p style="text-align: center;">ROCK STRESS TESTING - IMPRESSION STRADDLE SYSTEM</p> <p>NPT : National Pipe Thread</p>
G	<p>The other end of the straddle system should have suitable arrangement for connecting Orientation tool (Item-6) to acquire the in-hole magnetic orientation of the HF impression straddle.</p>
H	<p>Suitable pipe wrench and other tools along with a separate field tool box should be provided for dismantling, cleaning and assembling the components of the HF Impression straddle system.</p>
5	<p>Replacement HF Impression Packer System:2 No. The item should be compatible with Item-4 mentioned as above.</p>
6	<p>Packer orientation tool (with compatible adapter to HF Impression Packer system) based on electronic compass module and data logger</p>
A	<p>The packer orientation tool is used to measure the orientation of an impression packer while taking the impression.</p>
B	<p>It should include an electronic compass module and a data logger</p>
C	<p>It should be built in a sealed (water tight) pressure barrel (made of brass / non-magnetic metal) with a locking connector for ensuring the reference direction maintained during the experimentation/measurement.</p>
D	<p>The electronic components should be powered by internal battery system.</p>
E	<p>The accompanying software should enable importing of data in MS-Excel.</p>
F	<p>Suitable pipe wrench and other tools along with a separate field tool box should be provided for dismantling, cleaning and assembling the components of the Packer Orientation Tool.</p>
7	<p>BHA Interconnected Lowering/ Pushing Rods: 1 ¼ inch outer diameter light weight seamless aluminium tubes of 1500 mm length, working pressure > 500 bars, non-valved high flow coupler on one end and nipple on the other end for interconnection with next tube: 35 Nos.</p>
A	<p>The seamless tube should have an outer diameter of 1 ¼". Length of the tube should be 1500 mm.</p>
B	<p>Each tube should be fitted with non-valved straight through hydraulic quick connect couplers on one end and nipples on the other end designed for maximum flow and minimum</p>

pressure drop. The couplers and nipples should have a pressure rating of 500 bars or more.

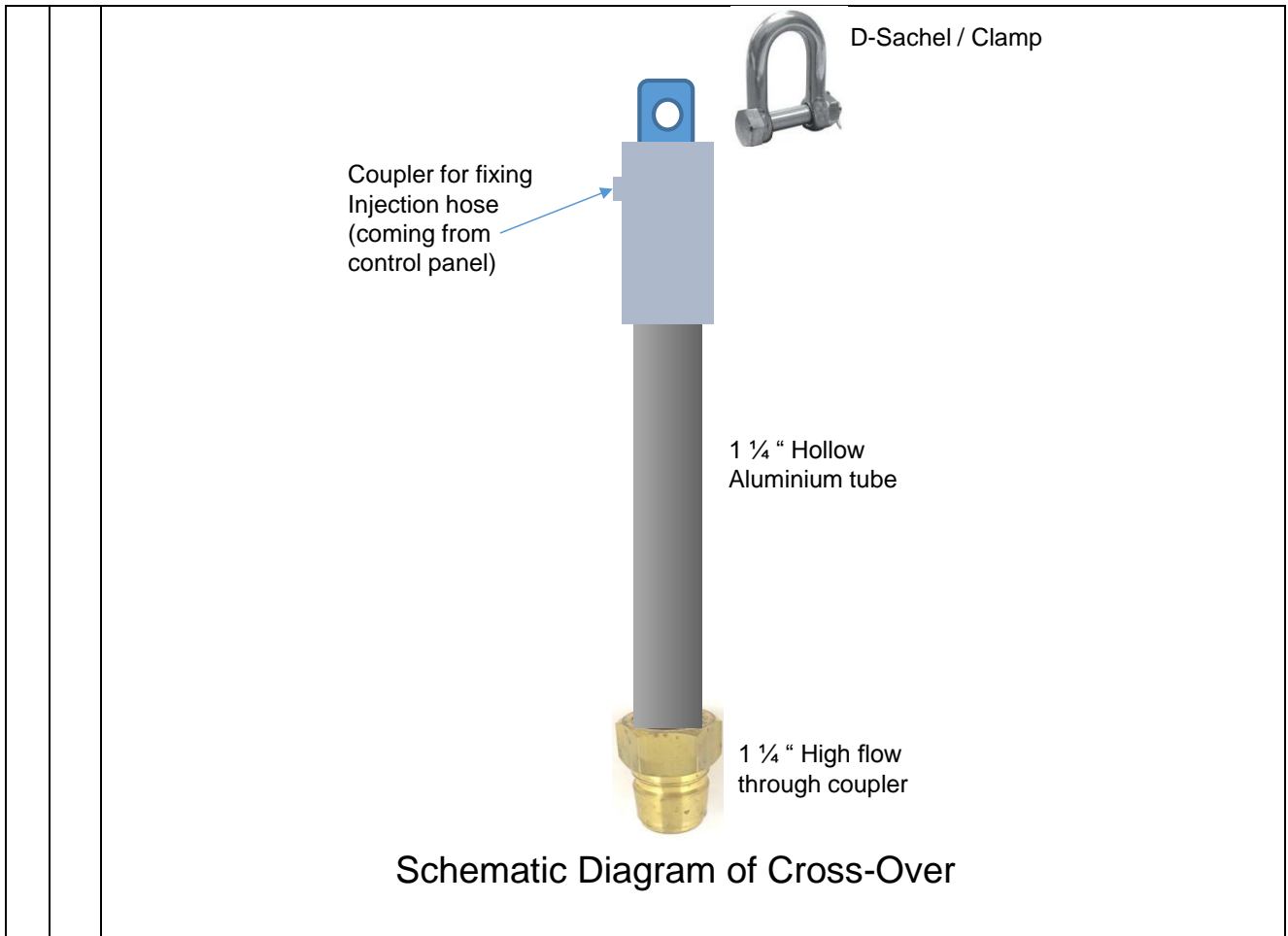


8 High Pressure hoses of length 20 m each with BSP female swivel type crimped connectors : 5 Nos.

A	Cover : Polyurethane/Nylon including pressure reinforcement using high tensile steel wires
B	Dimensions <ul style="list-style-type: none"> • Internal diameter: ¼ inch (standard) • Outer diameter: ~ ½ inch
C	Working pressure: Not less than 500 bars
D	Burst pressure: 2000 bars or more
E	End connectors(both ends) Type :BSP female swivel type (60° cone) Material: non-corrosive steel or better material Working pressure : 500 bars or more Ferule OD: not more than 16-20 mm

9 Cross Over Assembly Compatible with Item 1, 4, 5, 7 and 8

A	The cross-over assembly must be compatible with the items 1, 4, 5, 7 and 8. A schematic diagram is given below.
---	--



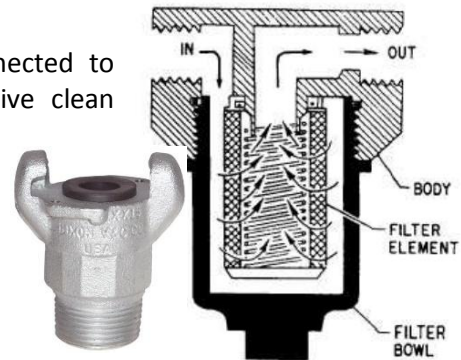
10 High Pressure Pump of capacity 1-5.5lpm at 450-500 bars running on 550 V motor with VFD control

A Flow pump Setup with 550 V FLP Motor and VFD Control

The pump should be high pressure three plunger (triplex) pump driven electrically (with Variable Frequency Drive - VFD), all items built in a mobile heavy duty (circular hollow section) stainless steel frame preferably large-wheeled for use in underground mines of inflammable gaseous environment.

B Features of the Pump

Item	Specifications
Pump Type	High pressure three plunger pump
Pressure media	water
Maximum working pressure	450 bars or more
Maximum flow rate	Not more than 5.5 l/min
Inlet filter and suction hose	Preferable: Full flow hydraulic filter connected to inlet of pump so as to receive clean water through a non-corrosive heavy duty mesh. The filter bowl should be transparent to allow visual inspection of filter clogging. The inlet of the filter should



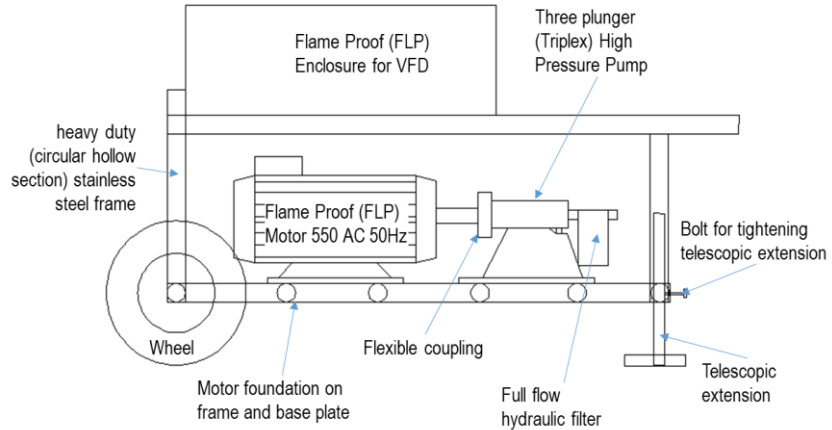
		<p>have “two lug universal coupling, 1” NPT male” This must allow connecting a suction hose of 1 inch to the pump.</p> <p>The suction hose should be of 5 m length with a strainer connected on one end and the other end should be having a matching “two lug universal coupling as shown in the figure.</p> <p>Alternate/Equivalent system is also acceptable.</p>												
		<p>Pressure Gauge Bourdon type pressure gauge fitted on inlet side of the full flow hydraulic filter to monitor inlet pressure of fluid</p>												
		<p>Unloader Valve Fixed at the outlet of the pump. Pressure setting for unloader valve: 400 bars (set at 400 bars at the time of supply).</p>												
	C	<p>Motor and Speed Control</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Desirable Specifications</th> </tr> </thead> <tbody> <tr> <td>Electric motor specifications</td> <td>Flame Proof (FLP) Motor Voltage : 3 phase 550V Frequency : 50Hz.</td> </tr> <tr> <td>Power Rating of motor</td> <td>Compatible for pump.</td> </tr> <tr> <td>Motor speed control</td> <td> <ul style="list-style-type: none"> i. Variable frequency drive (VFD)/ latest available drive for controlling the motor speed, (preferably - with plug and play remote control unit). ii. Suitably enclosed in a Flame Proof Enclosure made up of stainless steel and fitted onto the frame to work in humid and inflammable gaseous environmental conditions of underground mines. </td> </tr> <tr> <td>Safety feature</td> <td> <ul style="list-style-type: none"> i. Suitable fuse and safety features and FLP enclosures for VFD and FLP Motor. ii. The setup should be suitable for use in underground mines of inflammable gaseous (methane) environment. </td> </tr> <tr> <td>Separate 3Phase Step-up Transformer 440V-550 V AC</td> <td>Suitable for running the Pump on Surface where only 440V is available as input. FLP is not required for the transformer as it will be used in open atmosphere on surface.</td> </tr> </tbody> </table>	Item	Desirable Specifications	Electric motor specifications	Flame Proof (FLP) Motor Voltage : 3 phase 550V Frequency : 50Hz.	Power Rating of motor	Compatible for pump.	Motor speed control	<ul style="list-style-type: none"> i. Variable frequency drive (VFD)/ latest available drive for controlling the motor speed, (preferably - with plug and play remote control unit). ii. Suitably enclosed in a Flame Proof Enclosure made up of stainless steel and fitted onto the frame to work in humid and inflammable gaseous environmental conditions of underground mines. 	Safety feature	<ul style="list-style-type: none"> i. Suitable fuse and safety features and FLP enclosures for VFD and FLP Motor. ii. The setup should be suitable for use in underground mines of inflammable gaseous (methane) environment. 	Separate 3Phase Step-up Transformer 440V-550 V AC	Suitable for running the Pump on Surface where only 440V is available as input. FLP is not required for the transformer as it will be used in open atmosphere on surface.
Item	Desirable Specifications													
Electric motor specifications	Flame Proof (FLP) Motor Voltage : 3 phase 550V Frequency : 50Hz.													
Power Rating of motor	Compatible for pump.													
Motor speed control	<ul style="list-style-type: none"> i. Variable frequency drive (VFD)/ latest available drive for controlling the motor speed, (preferably - with plug and play remote control unit). ii. Suitably enclosed in a Flame Proof Enclosure made up of stainless steel and fitted onto the frame to work in humid and inflammable gaseous environmental conditions of underground mines. 													
Safety feature	<ul style="list-style-type: none"> i. Suitable fuse and safety features and FLP enclosures for VFD and FLP Motor. ii. The setup should be suitable for use in underground mines of inflammable gaseous (methane) environment. 													
Separate 3Phase Step-up Transformer 440V-550 V AC	Suitable for running the Pump on Surface where only 440V is available as input. FLP is not required for the transformer as it will be used in open atmosphere on surface.													

D

CONSTRUCTION:

The construction of the frame made of stainless steel pipes (for mounting the FLP motor, pump and FLP enclosure of VFD) should be sturdy and robust to sustain mechanical shock during transportation of the setup in trucks running on rough roads.

Schematic construction of the Frame for the High Pressure Pump including its electrical components is given as under.



11 Pressure control Panel

A

Pressure control panel is used to control pressure and flow of fluid in the packer and injection lines separately. This has an added option to measure the flow in the injection line. The control panel should be light and portable having the following features:

- i. **Inlet Line for fluid** : single inlet line that will be connected to the high pressure pump, using High Pressure Hydraulic Quick Coupler (manual threaded connection and actuation) made of non –corrosive metal.
- ii. **Outlet lines for fluid** : all outlet lines will be terminating with High Pressure Hydraulic Quick Coupler (manual threaded connection and actuation). 20 sets of spare Couplers and Nipples should be supplied along with the panel.



High Pressure Hydraulic Quick Coupler (manual threaded connection and actuation).



High Pressure Hydraulic Quick Coupling Nipples (manual threaded connection and actuation)



B

Line shut –in valves : Provision of independent opening and closing of the outlet lines, viz. the packer inflation and injection lines to control the fluid flow and pressure in the lines. The valves (Preferably Needle Valves of size 3/8 inch) should control the flow and pressure efficiently and easy to operate and made of non- corrosive material.



	C	Pressure Gauges : Two glycerine filled pressure gauges (dial size more than 150 mm range from 0 to 1000 bars marked in bars (or equivalent MPa) mounted on the control unit to indicate the pressure in the packer and injection lines.
12	Flow and Pressure Transducers with Online Real-time Data Acquisition	
	A	These will be used in conjunction with the Pressure Control Panel
	B	Pressure transducers: range 0 to 700 bars and compatible to working pressure, both in packer and injection lines.
	C	Flow meter and Flow transducer: Made of non-corrosive material, fitted in the injection line with a flow range 0-10 l/min and compatible to the flow in the injection line
	D	Data acquisition System and Software: The data acquisition system should be capable of acquiring the data from both the pressure and flow transducers simultaneously in online real-time mode. The data acquisition system should be supplied along with Rugged/Tough book/ Laptop (IP54 or better), with multi-touch screen, Intel core i5 processor, 16 GB RAM and SSD, Windows 7 / 10 Professional. The system should be pre-loaded with necessary software for data logging and storage. The data should be amenable for analysis in MS-Excel and sufficient for in-situ stress calculations.

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. **ME/PRJ/311/18-19**

Date: **8 February 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				
Total Ex-Works Price-				

*&** 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-B**2.PRICE SCHEDULE FOR GOODS BEING OFFERED WITHIN INDIA**

Name of the Bidder _____ (On bidders letter head)

NIT Reference No. **ME/PRJ/311/18-19**

Date: 8 February 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 Fracturing System with Accessories and Relevant Data Acquisition System for In-situ Stress Measurement**. 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. 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: _____

CHAPTER 6**Contract Form**

With reference to the tender reference no. **IIT(ISM) /ME/ PRJ/311/2018-19**, Dated: 8 February 2019 of IIT(ISM), Dhanbad for **Supply and Installation of Hydraulic Fracturing System with Accessories and Relevant Data Acquisition System for In-situ Stress Measurement**, 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:

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	

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 / ME/PRJ/311/ 2018-19, Dated: 8 February 2019

Sub: Technical bid relating to **Supply and Installation of Hydraulic Fracturing System with Accessories and Relevant Data Acquisition System for In-situ Stress Measurement.**

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.).

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

1. Tender Fee (Non-refundable): DD NO. _____ Date: _____ Amount: Rs. Five Thousand only, Issued by bank and branch _____
2. Earnest Money Deposit: DD NO. _____ Date: _____ Amount: Rs. One Lakh & Thirty Thousand only, Issued by bank and branch _____
3. Validity of Quotation: days from the date submission deadline (minimum 270 days from the submission deadline).....
4. Performance Security or PBG: Will Be Submitted with the Performance Security (PBG), if Purchase Order placed by I.I.T. (I.S.M.), Dhanbad
5. 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)

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)
