भारत सरकार
अंतरिक्ष विभाग
सतीश धवन अंतरिक्ष केंद्र शार
श्रीहरिकोटा रेंज डा.घ. 524 124
श्री पोट्टि श्रीरामुलु नेल्लूर जिला, आं.प्र., भारत
दूरभाष : +91-8623 245060 (6 जं)
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सत्यमेव जयते

Goverment of India
Department of Space
Satish Dhawan Space Centre SHAR
Shriharikota Range P.O. 524 124
SPSR Nellore Dist., AP., India
Telephone : +91-8623 245060 (6 Lines)
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निविदा सूचना सं. NOTICE INVITING TENDER
No. SDSC SHAR/Sr.HPS/PT/SMPC-U1/03/2026-2027

भारत के राष्ट्रपति की ओर से वरि. प्रधान, क्रय एवं भंडार, सतीश धवन अंतरिक्ष केंद्र श्रीहरिकोटा निम्नलिखित वस्तुओं के लिए **ऑनलाइन निविदाएं** आमंत्रित करते हैं /On behalf of the President of India, Sr. Head, Purchase & Stores, SDSC SHAR, Sriharikota invites **online quotations** for the following:

क्र.सं. Sl.No	संदर्भ सं.Ref. No.	विवरण Description	मात्रा Qty.
01	SDSC SHAR/SMPC-U1 PURCHASE/ SH202600108801 E-Procurement (Public Tender – Two Part basis)	Supply, Erection, Testing and Commissioning of IR-1 Automation System for Premix and Final Mix operations at Inhibition facility in SMPC Unit-1	2 Line items

निविदा जमा करने की प्रारंभिक तिथि (ऑनलाइन)/Bid Submission Start Date (online) : 12-08-2026, 17:00 hrs.
निविदा स्पष्टीकरण की अंतिम तिथि (ऑनलाइन)/Bid clarification Due date(online) : 19-08-2026, 14:00 hrs.
निविदा जमा करने की अंतिम तिथि (ऑनलाइन)/Bid submission due date (online) : 02-09-2026, 14:00 hrs.
निविदाएं खोलने की तिथि (ऑनलाइन)/Bid opening date(online) : 02-09-2026, 14:05 hrs.
मूल्य निविदाएं खोलने की तिथि (ऑनलाइन)/Price Bid opening date(online) : 10-09-2026, 14:00 hrs.

निविदाकार के लिए निर्देश Instructions to Tenderers:

ईजीपीएस के माध्यम से भेजी गईनिविदाओं पर निविदा शुल्क तथाबयाना जमा राशि लागू नहीं होगी।
Tender fee and EMD not applicable for tenders submitted through EGPS

1) कार्य के सम्पूर्ण विवरण/जानकारी तथा नियम व शर्तों इत्यादि के लिए संलग्न अनुलग्नक को देखें। / For full details/scope of work and terms and conditions etc., please see the enclosed annexures.
2) इच्छुक निविदाकार इसरो के ई-क्रय वेबसाइट **https//:eproc.isro.gov.in** से ई-निविदा डाउनलोड कर सकते हैं तथा अपनी निविदा (बोली) को ई-क्रय पोर्टल पर ऑनलाइन जमा कर सकते हैं \Interested tenderers can download the e-tender from ISRO e-procurement website **https//:eproc.isro.gov.in** and submit the offer online in the e-procurement portal.
3) निविदा दस्तावेज इसरो की वेबसाइट **www.isro.gov.in**, इसरो ई-क्रय वेबसाइट https://eproc.isro.gov.in तथा सतीश धवन अंतरिक्ष केंद्र शार की वेबसाइट www.shar.gov.in पर भी उपलब्ध हैं। इन्हें डाउनलोड करके अपनी निविदा (बोली) को ई-क्रय पोर्टल पर ऑनलाइन जमा किया जाना चाहिए। / Tender documents are also available on ISRO website **www.isro.gov.in**, ISRO e-procurement website https://eproc.isro.gov.in and SDSC SHAR, Sriharikota website www.shar.gov.in. The same can be downloaded and offer shall be submitted online in the e-procurement portal.
4) आखिरी समय पर होने वाली भीड़-भाड कम करने के लिए निविदाकार अपनी निविदा (बोली) ऊपर विनिर्दिष्ट समय के अंदर ही जमा कर दें। नए विक्रेता के रूप में अनुमोदन के लिए आवेदन / अनुरोध पत्र ई-मेल द्वारा निविदा दस्तावेज में अंकित निविदा संख्या का उल्लेख करते हुए ऑनलाइन जमा करें। / Tenderers shall submit their offers within the given time as specified above and last moment rush for bid submission shall be avoided. Request for new vendor approval shall be submitted online and the same shall be intimated by mail (mentioned in the tender document) referring the tender number.
5) चूँकि यह दो भागों वाली निविदा हअर्थात् तकनीकी एवं वाणिज्यिक भाग और मूल्य भाग, इसलिए निविदाकर्ता को तकनीकी एवं वाणिज्यिक बोली के साथ मूल्य निर्धारण संबंधी कोई भी दस्तावेज़ संलग्न नहीं करना चाहिए। सामान्यतः, यदि भाग-I (तकनीकी प्रस्ताव) हमारी तकनीकी विशिष्टताओं को पूरा नहीं करता हतो हम भाग-II (मूल्य बोली) नहीं खोलते हैं। निविदा दस्तावेज़/अनुसूची में उल्लिखित मूल्य बोली खोलने की तिथि केवल अस्थायी हाहालाँकि, मूल्य बोली केवल भाग-I के तकनीकी बोली मूल्यांकन के संतोषजनक समापन और विक्रेताओं को पूर्व सूचना के बाद ही खोली जाएगी। / This being a two part tender i.e. Technical & Commercial Part and Price Part, the tenderer should not attach any documents containing Pricing information along with Technical & Commercial Bid. Normally we do not open PART-II (Price bid), if PART-I (Technical Offer) does not meet with our technical specification requirements. Price bid opening date mentioned in the tender document/ Schedule is tentative only. However, price bid opening will be made only after satisfactory completion of Part-I technical bid evaluation and with prior intimation to vendors.
6) वरि. प्रधान क्रय एवं भंडार, सतीश धवन अंतरिक्ष केंद्र श्रीहरिकोटा के पास किसी भी या सभी निविदाओं को स्वीकार / अस्वीकार करने का अधिकार हा / Sr. Head, Purchase and Stores, SDSC-SHAR, Sriharikota reserves the right to accept or reject any/or all the quotations.

वरि. प्रधान क्रय एवं भंडार
Sr. HEAD, PURCHASE AND STORES

Satish Dhawan Space Centre, Sriharikota
सतीश धवन अंतरिक्ष केन्द्र, श्रीहरिकोटा
दिनांक DT: 11.08.2026

Signer: SRIRAM VENKATA SIVA REDDY
Wed Aug 12 13:10:31 IST 2026

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE
SATISH DHAWAN SPACE CENTRE SHAR SRIHARIKOTA (SDSC SHAR)
TIRUPATI

Tender for IR-1 Automation System for Premix and Final Mix Operations

Bids to be submitted online

Tender No.: SDSC SHAR/SMPC-U1 PURCHASE/SH202600108801 dated 12-08-2026

A. Tender Details

Tender No :	**SDSC SHAR/SMPC-U1 PURCHASE/SH202600108801**
Tender Date :	**12-08-2026**
Tender Classification:	**GOODS**
Purchase Entity :	**SMPC-U1 PURCHASE**
Centre :	**SATISH DHAWAN SPACE CENTRE SHAR SRIHARIKOTA (SDSC SHAR)**

IR-1 Automation System for Premix and Final Mix Operations

IR-1 Automation System for Premix and Final Mix Operations

(GeM Report Id: GEM/GARPTS/16072026/YUEUPPDFZ7EA)

[BEING A TWO PART TENDER, WE REQUEST BIDDERS NOT TO DISCLOSE/INDICATE ANY OF THE PRICE WHILE SEEKING/PROVIDING CLARIFICATION. IN CASE IF ANY BIDDERS DISCLOSE ANY OF THE PRICE, THEIR OFFER WILL BE REJECTED. ALSO, PLEASE NOTE THAT BIDS SHALL BE SUBMITTED IN TWO PARTS.
PART-1 :TECHNO-COMMERCIAL PART OF THE BID &
PART -2: PRICE PART OF THE BID.
BIDDERS SHALL NOT DISCLOSE ANY PRICE IN PART-1 AND IF ANY BIDDER DISCLOSES THE PRICE IN THEIR PART-I BID, THEIR OFFERS WILL BE REJECTED.]

A.1 Tender Schedule

Bid Submission Start Date :	**12-08-2026 17:00**
Bid Clarification Due Date :	**19-08-2026 14:00**
Bid Submission Due Date :	**02-09-2026 14:00**
Bid Opening Date :	**02-09-2026 14:05**
Price Bid Opening Date :	**10-09-2026 14:00**

B. Tender Attachments

NA

Instructions To Vendors

1. STANDARD TERMS & CONDITIONS

1. Tele No.08623-225174/226377
Fax No.08623-225170/22-5028

e-Mail ID : hps@shar.gov.in, spsoscfpurchase@shar.gov.in, smpcu1-purchase@shar.gov.in
1. Instruction to Indigenous Suppliers:
a) Payment Terms shall be as specified in RFP. If not specifically mentioned Our Normal payment term is 100% within 30 days after receipt and acceptance of the item at our site. Please confirm acceptance in your quotation.
b) GST/IGST: Please specify GST percentage, if any, in your offer. Please mention HSN/SAC code in your offer and Our GST No. is. 37HYDF00385A1DZ
c) Purchase / Price preference to MSEs
Purchase/Price preference will be applicable to the product reservation admissible to the Micro and Small Enterprises. Purchase/Price Preference shall be extended to the MSEs under the Public Procurement Policy for MSEs formulated under the Micro, Small and Medium Enterprises Development Act, 2006. The participating MSEs in a tender, quoting price within the band of L-1 plus 15% may also be allowed to supply a portion of the requirement by bringing down their price to the L-1 price, in a situation where L-1 price is from someone other than an MSE. Such MSEs may be allowed to supply up to 25% of the total tendered value. In case of more than one such eligible MSE, the supply will be shared equally.
Micro & Small Enterprises which have technical capability to deliver the goods & Services as per prescribed technical & quality specifications and may not be able to meet the qualification criterion relating to prior experience-prior turnover may be relaxed as per guidelines issued by Ministry of MSMEs & as amended from time to time.
Interested vendors shall specifically claim the benefit with supporting documents.
d) Purchase / Price preference to Make-in-India Products:
Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document 50%. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of

the local content and the details of locations at which the local value addition is make along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs. 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in-India) order 2017 dated 04.06.2020. In case Buyer has selected Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.

2. Instruction to Foreign Suppliers:

a) Payment Terms shall be as specified in RFP. If not specifically mentioned Our normal payment term is SIGHT DRAFT, Please confirm acceptance in your offer, if you insist for L/C, and all bank charges shall be to your account. Confirm acceptance.

b) Please specify whether any export clearance is required in case of an order on you.

c)Warranty/Guarantee applicable for the item shall be mentioned in your offer

d)Special Certification for packing Material : as per Plant Quarantine (Regulation of Control into India) Order 2003, Articles packed with packing material of plant origin viz., hay, straw, wood shavings, wood chips, saw dust, wood waste, wooden pallets, Dunn age Mats, wooden packages, coir pith, pear or sphagnum moss etc., will be allowed entry by Customs only with a Phytosanitary Certificate. In case if a Purchase Order, if you propose to us any of the above material for packing such a certificate issued by your local Plant Quarantine Authority shall be furnished.

e) Confirm whether any Export License is required and for which End User Certificate is to be provided by us, in case of an Order on you. (Enclose format for EUC, if applicable)

f) Either Indian Agent on behalf of the foreign principals or the foreign principal directly can quote against this order, but not both. In either case an Indian agent cannot represent more than one principal against the same tender.

g) In case the quote is in INR we prefer to execute the same on HSS Basis and for which Concessional Customs duty as per Notification no.50/2017 Customs dated 30.06.2017,Serial No.539(A) as amended by Notification no.05/2018 dated 25.01.2018. In case the quote is on Indian Rupee (Outside High Sea Sale), the price shall include taxes and duties if any. We shall not able to provide any duty or IGST tax exemption/concession certificates. If the item quote is of USA make, please quote for all-inclusive price since we prefer to get the item on FOR destination basis.

h) Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with Competent Authority as specified in Office Memorandum no.F.No.6/18/2019-PPD, Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23rd July 2020. All the conditions mentioned in the above OM is applicable for this tender.

Common terms to Indigenous and foreign suppliers:

3.Warranty

You shall provide applicable warranty for the items offered by you without fail. For the applicable period you shall provide necessary warranty certificate.

4.Performance Bank Guarantee

Towards the performance of the systems during the warranty period you shall submit a performance bank guarantee equivalent to 3% of the order value to cover the warranty period. This PBG shall be interest free and the same shall be returned to you on successful completion of all contractual obligations. The said PBG shall have a further claim period of 2 months.

5.Security Deposit

On acceptance of the order, you shall submit an interest free amount equivalent to 3% of the total contract/order value towards security deposit. This security deposit is collected towards the performance of the Contract. The said Security Deposit shall be submitted either in the form of Bank Guarantee/Demand Draft/FDR receipts duly endorsed in the name of the centre. The Security Deposit will be returned to you on successful completion of the Contractual obligations; failing which it shall be forfeited/adjusted.

6.Offer Validity : - In case of single part tender - the validity of offers/tenders should be 90 days. In case of two part tender - 120 days from the date of opening of Part-I bid and 60 days from the date of opening of Part-II bid. Tenders shorter than offer validity mentioned above will not be considered for evaluation.

7.Liquidated Damages:

If you fail to deliver the ordered items satisfactorily within the time specified or any extension thereof, Liquidated Damage @ 0.5%(zero point five percent) of the order value or part thereof the un-delivered items for each calendar weeks of delay shall be recovered from your bill. However total Liquidated Damage shall not exceed 10% (ten percent) of the order value.

FORCE MAJEURE:

Should a part or whole work covered under this contract be delayed in delivery/completion of work due to reasons of Force majeure which shall include legal lockouts, strikes, riots, civil commotion, fire, accidents, quarantines, epidemic, acts of God & War, stoppage of deliveries by the Government , freight embargoes etc; the delivery period/completion of work referred to in this Contract shall be extended by a period not in excess of duration of such Force Majeure. The occurrence shall be notified by either party within reasonable time.

8.Offers received through post, courier, fax or email will not be considered.

9. Technical and commercial bid (Part-I) shall not contain any price details. Optional accessories or other price details, if any shall be uploaded in Supporting documents related to Price Bid, to be opened along with Price Bid.

10. In respect of FIM being issued, the fabricator shall submit Bank Guarantee for equivalent sum compulsorily. In case, submission of Bank Guarantee is not possible, the reasons there for shall be clearly mentioned. However, for such cases the fabricators at their cost shall secure such FIM through

Insurance Policy with Director, SDSC SHAR as beneficiary. In case of PSU and Government Organization, Indemnity Bond in lieu of Bank Guarantee is acceptable. Balance FIM/Scrap, if any shall be returned along with the supply of the items. Please confirm acceptance in your quotation.

11. SDSC SHAR shall have the right to place part order among the parties for the items for which they are the lowest.

12. Arbitration:

In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Contract, such dispute/s or difference/s or claim/s shall be settled amicably by mutual consultations of the good Offices of the respective Parties and recognizing their mutual interests attempt to reach a solution satisfactory to both the parties. If such a resolution is not possible, within 30 days from the date of receipt of written notice of the existence of such dispute/s, then the unresolved dispute/s or difference/s or claim/s shall be referred to the Sole Arbitrator appointed by the Parties by mutual consent in accordance with the rules and procedures of Arbitration and Conciliation Act 1996 as amended from time to time. The arbitration shall be conducted in Bengaluru in the Arbitration and Conciliation Centre Bengaluru (Domestic and International) as per its rules and regulations. The expenses for the Arbitration shall be shared equally or as may be determined by the Arbitrator. The considered and written decision of the Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be English only.

Work under the Contract shall be continued by the CONTRACTOR during the pendency of arbitration proceedings, without prejudice to a final adjustment in accordance with the decision of the Arbitrator unless otherwise directed in writing by the DEPARTMENT or unless the matter is such that the works cannot be possibly continued until the decision (whether final or interim) of the Arbitrator is obtained.

2. INSTRUCTIONS TO TWO PART TENDER

1. We are proposing to invite Tenders in Two Parts viz., Part-I Techno and Commercial & Part-II Price. All Tenderers are requested to follow carefully the following instructions before preparing their offer.

PART- I- TECHNO COMMERCIAL BID:

(1)This part should contain detailed Specifications of the items quoted by you along with Technical Literature and Leaflets if any.

(2)All the Commercial terms and Conditions applicable also should be indicated separately under separate heads.

(3)The Commercial terms such as delivery terms, delivery period, payment terms, warranty, validity of the offer, Installation & Commissioning, Duties and Taxes etc shall come into this.

(4)Either Technical Specifications or Terms & Conditions as above should be very clearly reflected items wise with reference to the items called for in the tender.

(5)Please note that Prices should not be indicated in this part.

(6)Any deviations from the Technical Specifications and Commercial Terms shall be indicated separately.

PART II-PRICE BID:

(1)The prices applicable for the items, item wise in response to the tender shall come into this part.
(2)Tender shall indicate very clearly item wise prices with reference to their Technical Offer.

Note: 1. PLEASE NOTE THAT THE OFFERS SUBMITTED CONTRADICTORY TO ABOVE INSTRUCTIONS WILL BE LIABLE FOR REJECTION. PLEASE ENSURE OFFERS ARE SUBMITTED WITHIN THE DUE DATE.
2. BIDDERS SHALL NOT DISCLOSE ANY PRICES IN PART-1 BID AND IF INDICATED, THE OFFERS WILL BE REJECTED.
3. BEING TWO PART TENDER, WE REQUEST YOU NOT TO DISCLOSE / INDICATE ANY OF THE PRICE VALUE WHILE SEEKING / PROVIDING CLARIFICATION. YOU SHOULD INDICATE ONLY IN PERCENTAGE. IN CASE IF YOU DISCLOSE ANY OF THE PRICE AMOUNT YOUR OFFER WILL BE REJECTED.

3. General Instructions to Vendor

1. Instructions to tenderers

TeleNo.08623-225174/226377
Fax No.08623-225170/22-5028

e-Mail ID : hps@shar.gov.in, spsoscfpurchase@shar.gov.in, smpcu1-purchase@shar.gov.in
1. Interested tenderers may, at their option, login to https://eproc.isro.gov.in and submit your offers.

2. TENDER FEE IS NOT APPLICABLE.

3. EARNEST MONEY DEPOSIT IS NOT APPLICABLE IF NOT MENTIONED IN THE RFP SPECIFICATION.
4. Indian agents while quoting on behalf of their principals are requested to attach Principals original quote, necessary authorization letter from their Principals, copy of agency agreement etc. in their bid.

5. TWO PART BIDS: In case of Two part tender, price details shall not be uploaded in the Technical & Commercial Bids (Part I), failing to which the bid will be treated as INVALID.
6. VALIDITY OF OFFER: - In case of single part tender - the validity of offers/tenders should be 90 days. In case of two part tender - 120 days from the date of opening of Part-I bid and 60 days from the date of opening of Part-II bid. Tenders shorter than offer validity mentioned above will not be considered for evaluation.
7. Due date & time: Sufficient time has been allotted for Bid submission. Vendors are requested to complete Bid submission well in advance. Last minute requests for due date extension citing server problems etc. will not be entertained. Bids will not be entertained after the due date and time.

7 (A). Request for the extension of the due date will not be considered.

8.
(a) Bid Opening for Public Tender: In case of Public Tender-Two Part Tenders: Technical and Commercial Bids will be opened on the first day specified for Tender opening. Interested vendors can attend the tender opening session to know the bidding details (Bidders presence is not mandatory to consider the quote for evaluation). Price Bid opening of the selected vendors will be scheduled later and it will be intimated to the selected Bidder (s).

(b) For Limited Tender: Bidders participation is not allowed.

9. Prices are required to be quoted according to the units indicated.

10. Preference will be given to those tenderers offering supplies from ready stocks and on the basis of FOR destination delivery at site.

11. (a) All available technical literature, catalogues and other data in support of the specifications and detail of the items should be furnished as attachments.

(b) Samples, if called for, should be submitted free of all charges by the tenderer and the Purchaser shall not be responsible for any loss or damage thereof due to any reason whatsoever. In the event of non-acceptance of tender, the tenderer will have to remove the samples at his own expense.

(c) Approximate net and gross weight of the items offered shall be indicated in your offer. If dimensions details are available the same should be indicated in your offer.

(d) Specifications: Stores offered should strictly conform to our specifications. Deviations, if any, should be clearly indicated by the tenderer in their quotation. The tenderer should also indicate the Make/Type number of the stores offered and provide catalogues, technical literature and samples wherever necessary. Test certificates wherever necessary should be attached. Whenever options are called for in our specifications, the tenderer should address all such options. Wherever specifically mentioned by us the tenderer could suggest changes to specifications with appropriate response for the same.

12. The purchaser shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portion of quantity offered and the tenderers shall supply the same at the rates quoted.

13. All amounts shall be indicated both in words as well as in figures. Where there is difference between amounts quoted in words and figures, amount quoted in words shall prevail.

14. The tenderer will be required to furnish a document containing the name of his bankers as well as

the latest income-tax clearance certificate duly counter signed by the Income-tax Officer of the Circle concerned under the Seal of his office, if required by the Purchaser.

15. The Purchaser reserves the right to place order on the successful tenderers for additional quantity up to 25% of the quantity offered by them at the rates quoted.

16. Sr. Head, Purchase and Stores, SDSC SHAR SRIHARIKOTA reserves the right to accept or reject any bid in part or full without assigning any reason thereof.

17. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with Competent Authority as specified in Office Memorandum no.F.No.6/18/2019-PPD, Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23rd July 2020. All the conditions mentioned in the above OM is applicable for this tender.

18. Micro and Small Enterprises [MSEs]

a). In order to avail the benefits extended by Government of India to the Micro and Small Enterprises [MSEs] in respect of Goods and Services as per provision of the policy, MSEs registered with District Industries Centre [DIC] or Khadi and Village Industries Commission [KVIC] or Khadi and Village Industries Board [KVIB] or Coir Board or National Small Industries Commission [NSIC] or Directorate of Handicrafts and Handlooms or Udyog Aadhar Memorandum, or any other Body specified by Ministry of MSME have to submit a copy of Valid Certificate with self-attestation along with the Technocommercial bid. No Certificate claiming exemption will be entertained after Tender due date.
b) .MSEs are entitled for [i] issue of Tender documents Free of Cost [ii] Exemption of Earnest Money Deposit [EMD]. However, Performance Security is mandatory for Goods and Services.
c). If the Tenderer[s] is/are SC/ST/Woman entrepreneur owned MSEs, specific mention for the same should be there in the valid certificate submitted by the tenderer.
d) .Tenderers claiming MSME benefit shall furnish copy of UAM No. as uploaded on CPP portal to avail benefit.

19. Public Procurement [Preference to Make in India]:

Public Procurement (Preference to Make in India) order 2017- revision issued by Government of India, Department of Promotion of Industry andInternal Trade [DPIIT] Public Procurement [preference to Make in India] vide Order No P-45021/2/2017-PP(BE II) dated 16/09/2020 or as amended thereafter. The Tenders submitted are subjected these orders.

Bidders are required to submit necessary certificates & documents as detailed in the above referred GOI Order in support of their claim to avail benefit against this order. The bidders who claim Purchase

Preference under Make in India Policy shall fulfill all requirements of tender document applicable for Indigenous Manufacturer. FAILURE TO SUBMIT THE REQUIRED DOCUMENTS MAY RENDER A TENDER UNACCEPTABLE.

Local Content means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

Local Supplier: Class-I Local Supplier means a supplier whose product offered for procurement has local content equal to or more than 50%. Class-II Local Supplier means a supplier whose product offered for procurement has local content more than 20% but less than 50%. Non-Local Supplier means a supplier whose product

Margin of Purchase Preference: For being eligible for purchase preference under this clause, the Margin of purchase preference shall be 20% (i.e. L1 puls 20% band). Preference: Purchase Preference shall be given to Class-I Local Supplier only in the manner specified here under:
(a) In the procurement of Goods which are divisible in nature:

i. If L1 is from a Class-I local supplier, the contract for full quantity will be awarded to L1.

ii. If L1 is not a Class-I local supplier, 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the Class-I local supplier will be invited to match the L1 price for the remaining 50% quantity subject to the Class-I local supplier(s)quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such Class-I local supplier subject to matching the L1 price. In case such lowest eligible Class-I local supplier fails to match the L1 price or accepts less than the offered quantity, the next higher Class-I local supplier within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on Class-I local supplier, then such balance quantity may also be ordered on the L1 bidder

(b)In the procurement of Goods which are not divisible in nature:

i. If L1 is Class-I local supplier, the contract for full quantity will be awarded to L1
ii. If L1 is not Class-I local supplier, the lowest bidder among the Class-I local supplier will be invited to match the L1 price subject to the Class-I local supplier(s) quoted price falling within the margin of purchase preference, and the contract shall be awarded to such local supplier subject to matching the L1 price.

iii. In case such lowest eligible Class-I local supplier fails to match the L1, the Class-I local supplier with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the local suppliers within the margin

of purchase preference matches the L1 price, then the contract may be awarded to the L1bidder

(c) Class-II local supplier will not get purchase preference

Verification of local content:

i. The Class-I local supplier / Class-II local supplier at the time of biding shall be required to indicate percentage of Local Content and provide self-certification that the items offered meet the local content required for Class-I local supplier/ Class-II local supplier and shall give the details of the location(s) at which the local value addition is made .

ii. False declarations will attract banning of business of the bidder or its successor(s) for a minimum period of three years along with any other penal action as may be deemed fit including rejection of the offer, forfeiture of all dues including EMD/ Security Deposit / banning of the firm.

iii. A supplier who has been debarred by any procuring entity for violation of this order shall not be eligible for preference for procurement for the duration of debarment. It will be the bidders responsibility to provide self-certification, clearly stating that the bidder is not serving debarment from any procuring entity for the tendered item at the time of tendering.

4. STANDARD TERMS & CONDITIONS

1. Tele No.08623-225174/226377
Fax No.08623-225170/22-5028

e-Mail ID : hps@shar.gov.in, spsoscfpurchase@shar.gov.in, smpcu1-purchase@shar.gov.in
1. Instruction to Indigenous Suppliers:
a) Payment Terms shall be as specified in RFP. If not specifically mentioned Our Normal payment term is 100% within 30 days after receipt and acceptance of the item at our site. Please confirm acceptance in your quotation.
b) GST/IGST: Please specify GST percentage, if any, in your offer. Please mention HSN/SAC code in your offer and Our GST No. is. 37HYDF00385A1DZ
c) Purchase / Price preference to MSEs
Purchase/Price preference will be applicable to the product reservation admissible to the Micro and Small Enterprises. Purchase/Price Preference shall be extended to the MSEs under the Public Procurement Policy for MSEs formulated under the Micro, Small and Medium Enterprises Development Act, 2006. The participating MSEs in a tender, quoting price within the band of L-1 plus 15% may also be allowed to supply a portion of the requirement by bringing down their price to the L-1

price, in a situation where L-1 price is from someone other than an MSE. Such MSEs may be allowed to supply up to 25% of the total tendered value. In case of more than one such eligible MSE, the supply will be shared equally.

Micro & Small Enterprises which have technical capability to deliver the goods & Services as per prescribed technical & quality specifications and may not be able to meet the qualification criterion relating to prior experience-prior turnover may be relaxed as per guidelines issued by Ministry of MSMEs & as amended from time to time.

Interested vendors shall specifically claim the benefit with supporting documents.

d) Purchase / Price preference to Make-in-India Products:

Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document 50%. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is make along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs. 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in-India) order 2017 dated 04.06.2020. In case Buyer has selected Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.

2. Instruction to Foreign Suppliers:

a) Payment Terms shall be as specified in RFP. If not specifically mentioned Our normal payment term is SIGHT DRAFT, Please confirm acceptance in your offer, if you insist for L/C, and all bank charges shall be to your account. Confirm acceptance.

b) Please specify whether any export clearance is required in case of an order on you.

c)Warranty/Guarantee applicable for the item shall be mentioned in your offer

d)Special Certification for packing Material : as per Plant Quarantine (Regulation of Control into India) Order 2003, Articles packed with packing material of plant origin viz., hay, straw, wood shavings, wood chips, saw dust, wood waste, wooden pallets, Dunn age Mats, wooden packages, coir pith, pear or sphagnum moss etc., will be allowed entry by Customs only with a Phytosanitary Certificate. In case if a Purchase Order, if you propose to us any of the above material for packing such a certificate issued by your local Plant Quarantine Authority shall be furnished.

e) Confirm whether any Export License is required and for which End User Certificate is to be provided by us, in case of an Order on you. (Enclose format for EUC, if applicable)

f) Either Indian Agent on behalf of the foreign principals or the foreign principal directly can quote against this order, but not both. In either case an Indian agent cannot represent more than one principal against the same tender.

g) In case the quote is in INR we prefer to execute the same on HSS Basis and for which Concessional Customs duty as per Notification no.50/2017 Customs dated 30.06.2017,Serial No.539(A) as amended by Notification no.05/2018 dated 25.01.2018. In case the quote is on Indian Rupee (Outside High Sea Sale), the price shall include taxes and duties if any. We shall not able to provide any duty or IGST tax exemption/concession certificates. If the item quote is of USA make, please quote for all-inclusive price since we prefer to get the item on FOR destination basis.

h) Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with Competent Authority as specified in Office Memorandum no.F.No.6/18/2019-PPD, Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23rd July 2020. All the conditions mentioned in the above OM is applicable for this tender.

Common terms to Indigenous and foreign suppliers:

3.Warranty

You shall provide applicable warranty for the items offered by you without fail. For the applicable period you shall provide necessary warranty certificate.

4.Performance Bank Guarantee

Towards the performance of the systems during the warranty period you shall submit a performance bank guarantee equivalent to 3% of the order value to cover the warranty period. This PBG shall be interest free and the same shall be returned to you on successful completion of all contractual obligations. The said PBG shall have a further claim period of 2 months.

5.Security Deposit

On acceptance of the order, you shall submit an interest free amount equivalent to 3% of the total contract/order value towards security deposit. This security deposit is collected towards the performance of the Contract. The said Security Deposit shall be submitted either in the form of Bank Guarantee/Demand Draft/FDR receipts duly endorsed in the name of the centre. The Security Deposit will be returned to you on successful completion of the Contractual obligations; failing which it shall be forfeited/adjusted.

6.Offer Validity : - In case of single part tender - the validity of offers/tenders should be 90 days. In case of two part tender - 120 days from the date of opening of Part-I bid and 60 days from the date of opening of Part-II bid. Tenders shorter than offer validity mentioned above will not be considered for evaluation.

7.Liquidated Damages:

If you fail to deliver the ordered items satisfactorily within the time specified or any extension thereof, Liquidated Damage @ 0.5%(zero point five percent) of the order value or part thereof the un-delivered items for each calendar weeks of delay shall be recovered from your bill. However total Liquidated Damage shall not exceed 10% (ten percent) of the order value.

FORCE MAJEURE:

Should a part or whole work covered under this contract be delayed in delivery/completion of work due to reasons of Force majeure which shall include legal lockouts, strikes, riots, civil commotion, fire, accidents, quarantines, epidemic, acts of God & War, stoppage of deliveries by the Government , freight embargoes etc; the delivery period/completion of work referred to in this Contract shall be extended by a period not in excess of duration of such Force Majeure. The occurrence shall be notified by either party within reasonable time.

8.Offers received through post, courier, fax or email will not be considered.

9. Technical and commercial bid (Part-I) shall not contain any price details. Optional accessories or other price details, if any shall be uploaded in Supporting documents related to Price Bid, to be opened along with Price Bid.

10. In respect of FIM being issued, the fabricator shall submit Bank Guarantee for equivalent sum compulsorily. In case, submission of Bank Guarantee is not possible, the reasons there for shall be clearly mentioned. However, for such cases the fabricators at their cost shall secure such FIM through Insurance Policy with Director, SDSC SHAR as beneficiary. In case of PSU and Government Organization, Indemnity Bond in lieu of Bank Guarantee is acceptable. Balance FIM/Scrap, if any shall be returned along with the supply of the items. Please confirm acceptance in your quotation.

11. SDSC SHAR shall have the right to place part order among the parties for the items for which they are the lowest.

12. Arbitration:

In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Contract, such dispute/s or difference/s or claim/s shall be settled amicably by mutual consultations of the good Offices of the respective Parties and recognizing their mutual interests attempt to reach a solution satisfactory to both the parties. If such a resolution is not possible, within 30 days from the date of receipt of written notice of the existence of such dispute/s, then the unresolved dispute/s or difference/s or claim/s shall be referred to the Sole Arbitrator appointed by the Parties by mutual consent in accordance with the rules and procedures of Arbitration and Conciliation Act 1996 as amended from time to time. The arbitration shall be conducted in Bengaluru in the Arbitration and Conciliation Centre Bengaluru (Domestic and International) as per its rules and regulations. The expenses for the Arbitration shall be shared equally or as may be determined by the Arbitrator. The considered and written decision of the Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be English only.

Work under the Contract shall be continued by the CONTRACTOR during the pendency of arbitration proceedings, without prejudice to a final adjustment in accordance with the decision of the Arbitrator unless otherwise directed in writing by the DEPARTMENT or unless the matter is such that the works cannot be possibly continued until the decision (whether final or interim) of the Arbitrator is obtained.

5. Additional Instructions to tenderers

1. 1. This requirement can be quoted only through online e-procurement mode using ISRO portal

https://eproc.isro.gov.in. No manual tender will be considered.

2. The parties are advised to download the tender and submit the bid on online at least two days prior to tender closing date to avoid last minute network problem. The due date shall not be extended due to network or computer related problems.

3. Tender fee is not applicable.

4. Our Tender Enquiry contains technical requirements and specification. The detailed technical specification of your offer along with price details shall be provided.

5. The quote should indicate quantity wise unit rate separately which have to be filled online. The Prices are to be mentioned both in figures as well as in words. The taxes, duties etc. are to be calculated and
indicated in the column provided in online forms explicitly.

6. Bidders are expected to comply with the technical & commercial and other terms and conditions given in vendor specified terms of this tender. In case of any deviation, the reasons thereof should be clearly specified in the vendor specified terms column.

7. The vendors have to compulsorily submit the compliance statement online otherwise their offer will not be considered for further evaluation. Before entering the compliance statement, vendors are advised to refer the detailed specification provided in the Technical Writeup/ Drawings document. The specification offered by the vendors may also be indicated in the compliance statement wherever necessary.

8. The Technical Specification / Drawing / Product Catalogues / Works carried by vendor / Make offered etc. as a single PDF file has to uploaded online mode by the vendor.

9. Original Equipment Manufacturer (OEM) or their representative can submit bid. Indian agents while quoting on behalf of their principals are requested to attach necessary authorization letter from their Principals in their bid.

10. Instructions on Indian Agent (if any):- Bidders are required to provide the following information in respect of their authorised Indan Agent, if any, alongwith technical bid as the same is mandatory as is required for consideration of the bid. Name, Address, Telephone no. , fax no., email of the Indian Agent including the contact person.

11. A letter from the OEM in the current date certifying that the said Indian Agent is their authorized Indian Agent and also indicating the responsibilities/role of the Indian Agent under the proposed purchase. Remuneration/service charges payable to the Indian Agent under the proposed purchase.

12. The offer should be valid for a minimum period of 90 days from the date of tender opening.
13. Due date & time: Sufficient time has been allotted for Bid submission. Vendors are requested to complete Bid submission well in advance. Last minute requests for due date extension citing server problems etc. will not be entertained. Bids will not be entertained after the due date and time.
15. The vendors may contact 91471 2565454/4574/2527/3753/3289 or eproc@vssc.gov.in for any technical assistance in bid submission.

16. Once the offer is submitted in on line mode by the vendor and Bid Sealing is done by SDSC SHAR, vendor will not be able to provide revised offer.

17. Request for the extension of the due date will not be considered.

18. Tender which is not prepared in terms of these instructions are liable to be rejected.

19. SDSC SHAR reserves the right to change any milestone date of the tendering activity.

20. SDSC SHAR reserves the right to verify all claims made by the bidder.

21. Tender Opening: Tenders will be opened on the specified day mentioned in the schedule.

22. Tenderers cannot participate in tender opening.

23. SDSC SHAR, SRIHARIKOTA reserves the right to accept or reject any/or all the tenders in part or full without assigning any reasons thereof.

6. Format for MII declaration

1. (to be printed in letter head) -

Self-Certification under preference to Make in India order Certificate

2. In line with Government Public Procurement Order No. P-45021/2/2017-PP(BE-II)-Part(4)Vol.II dated 19.07.2024 its latest directives/amendments there of, we hereby certify that we M/s. _____are local suppliers and the offered item having local content of _____% [Local content means the amount of value added in India which shall, unless otherwise prescribed by the respective Nodal Ministry, be the total value of the item procured (excluding Net Domestic Indirect Taxes, Transportation, Insurance, Installation, Commissioning, Training and after sales service support like AMC/CMC etc.) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent] as defined in above orders for the material against Tender/Bid No _____ dated _____

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

_____

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

5. Thanking You

_____

Signature with date
Name
Designation
Official Seal

7. Format for Land Border Sharing Declaration under Rule 144 (X) of GFR 2024

1. (to be printed in letter head)
DECLARATION BY AUTHORISED SIGNATORY OF THE FIRM

2. I, the undersigned, _____ (full names), do hereby declare, in my capacity as _____ of M/s _____ (name of bidder entity), that:

3. 1) I have read the Order (Public Procurement No.1, 2 & 3) dtd 23 Jul 2020 & 24 Jul 2020 office memorandum (OM) No. F.18/37/2020-PPD Dt:08.02.2021, OM NO. F.12/1/2021-PPD (Pt) dated 02.03.2021 and OM No. F.7/10/2021-PPD dated 08.06.2021 and OM No.F.7/10/2021-PPD dated 23.02.2023 on the subject of Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs), 2017 regarding restrictions on procurement from a bidder of a country which shares a land border with India and comply to all the provisions of the Order.

4. I certify that M/s. _____ (name of bidder entity)

5. (A) IS NOT FROM SUCH A COUNTRY

6. (B) IS FROM SUCH A COUNTRY AND HAS BEEN REGISTERED WITH THE COMPETENT AUTHORITY i.e., Department for Promotion of Industry and Internal Trade (DPIIT) (attach evidence of valid registration obtained from DPIIT)

7. (Select any one of the above (A) or (B) and strike off the other)
I hereby certify that this SUPPLIER fulfils all requirements in this regard and is eligible to be considered.

8. 3) I understand that the submission of incorrect data and / or if certificate / declaration given by M/s _____ (name of bidder entity) is found to be false, this would be a ground for debarment and further legal action in accordance with law as per Clause 18 of Procurement Policy Division OM No.F.7/10/2021-PPD dated 23.02.2023

9. AUTHORIZED SIGNATURE: DATE: _____

(Seal / Stamp of Bidder)

C. Bid Templates

C.1 Technical Bid - IR-1 Automation System for Premix and Final Mix Operations

1. Automation: Supply of IR-1 Automation System for Premix and Final Mix operations as per tender document

Item specifications for Automation: Supply of IR-1 Automation System for Premix and Final Mix operations as per tender document

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	As per tender specifications	As per tender specifications	Yes / No / Explain		

Document : Tender Specifications

2. Automation: Erection, Testing and Commissioning of IR-1 Automation System for Premix and Final Mix operations at Department Site as per tender document

Item specifications for Automation: Erection, Testing and Commissioning of IR-1 Automation System for Premix and Final Mix operations at Department Site as per tender document

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	As per tender specifications	As per tender specifications	Yes / No / Explain		

Document : Tender Specifications

Common Specifications (Applicable for all items)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	As per the tender specifications	As per the tender specifications	Yes / No / Explain		

Supporting Documents required from Vendor

1. As per the tender specifications (Price Bid Related)

2. Duly filled Annexures without revealing prices in technical part.

3. Furnish Latest UDYAM Registration Certificate

4. MII Local content declaration

5. Land Border sharing declaration

6. Compliance statement to the Tender document duly signed and stamped as a token of understanding without mentioning price

7. Documents mentioned in Bid-Qualification criteria of Annexure-1

8. Previous PO Copies

9. Satisfactory Work Completion Certificates for the previously executed Orders

10. IT Return Copies for the last three(03) years ending 31.03.2025

5 additional documents can be uploaded by the vendor

C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	As per the tender specifications	Yes / No / Explain	
2	GST AND OTHER COSTS, IF ANY: (a)As per the Notification No. No. 9/2025 - Integrated tax dated 17.09.2025, S. No. 462 and as per Notification No. 9/2025 - Central tax dated 17.09.2025, S. No. 462 issued by Ministry of Finance (Dept. of Revenue) & Government of Andhra Pradesh, Revenue (Commercial Taxes) Department, G.O.MS.No. 345, Dated: 20.09.2025, S.No.462, SDSC SHAR is eligible to avail GST/IGST @5% for the procurements related to Scientific and technical instruments, apparatus, equipment, accessories, parts, components, spares, tools, mock ups and modules, raw material and consumables required for launch vehicles and satellites and payloads. We will issue End Use Certificate for availing GST/IGST @5%. Hence, kindly confirm your acceptance and submit your price quotation accordingly.(As per Instructions to bidders and General conditions clause No. 1.5 of Annexure) SDSC SHAR GSTIN: 37HYDF00385A1DZ (b)Please confirm here whether your quoted "UNIT PRICE" in our Price Bid is EXCLUDING GST or INCLUDING GST. ---------- NOTE: If you are not clearly stating "GST is Inclusive OR Extra in basic cost" it will be treated as "GST is included in the quoted Basic/Unit cost in the price bid". Your offer will be evaluated as INCLUSIVE OF GST.	Yes / No / Explain	
3	DELIVERY SCHEDULE: As per Instructions to bidders and General conditions clause No. 1.6 of Annexure. Please confirm your acceptance.	Yes / No / Explain	
4	DELIVERY TERM: FOR-SRIHARIKOTA	Yes / No / Explain	

5	PAYMENT TERM: As per Instructions to bidders and General conditions clause No. 1.14 of Annexure. Bidders shall clearly indicate acceptance to either general payment term or advance payment in their bid.	Yes / No / Explain	
6	Please confirm the following, in case of opting for Advance payment: (A) Bank Guarantee for advance payments for equivalent amount to be furnished and advance payment will be recovered and interest will be levied as per the Marginal Cost of Lending Rate (MCLR) of SBI Plus 2% penal interest in case the vendor is not supplying the material within the delivery schedule after drawl of advance. This will be in addition to applicability of LD clause. (B) In case of any delay attributable to the supplier/contractor in effecting the supply after the prescribed delivery date, Interest at MCLR of SBI will be charged for the period beyond the specified delivery date on the amount of balance advance payment. (C) Interest will be loaded for advance payments/stage payments as per the lending rate of the bank and will be added to the landed cost for comparison purpose. In case of different milestone submitted by the parties, a standard and transparent methodology like the Net Present Value (NPV) will be adopted for evaluating the offers.	Yes / No / Explain	
7	LIQUIDATED DAMAGES: In case of delay in completion of total scope of work beyond the stipulated delivery period, LD will be levied @0.5% of the PO value per week or part of on undelivered portion as pre-estimated damages subject to a maximum of 10% of the Order value.	Yes / No / Explain	
8	WARRANTY: The offered items shall have warranty for a period of Twelve Months from the date of commissioning and acceptance against any manufacturing defects/ bad workmanship. If any defects are noticed during the above period, the same should be rectified/ replaced at FREE OF COST. As per Instructions to bidders and General conditions clause No. 1.8 of Annexure	Yes / No / Explain	

9	PERFORMANCE BANK GUARANTEE(PBG): A Bank Guarantee for 3% of the order value (or as notified by Govt. Of India/ISRO from time to time) shall be provided towards the performance of the system. PBG may be furnished in the form of Insurance Surety Bonds/ Account Payee Demand Draft/ Bankers Cheque/ Fixed Deposit Receipts or Bank Guarantee from a Commercial bank executed on Rs.200/- non-judicial stamp paper valid till the successful completion of warranty period plus 60 days. This will not carry any interest and shall be returned to you after successful completion of warranty period against your request. In case of non-performance/poor performance the Bank Guarantee shall be forfeited.	Yes / No / Explain	
10	SECURITY DEPOSIT (SD): If the Order value exceeds Rs.5 Lakhs, Security Deposit shall be submitted for 3% of the order value (or as notified by Govt. Of India/ISRO from time to time) in single instalment through Insurance Surety Bonds/ Account Payee Demand Draft/ Bankers Cheque/ Fixed Deposit Receipts from a Commercial bank executed on Rs.200/- non-judicial stamp paper within 14 days after receipt of Purchase Order valid till completion of the Delivery period plus 60 days claim period. This security deposit shall not carry any interest and shall be returned to you only after successful completion of total scope of work. In case of poor performance/ non performance of the contractual obligation security deposit shall be forfeited. In case of non submission of Security deposit within the stipulated period, this order shall be liable to be cancelled.	Yes / No / Explain	

11	COMBINED BANK GUARANTEE/PERFORMANCE SECURITY: In case, if You are unable to provide two separate BGs, i.e., one for SD and one for PBG, You can submit a combined BG for SD & PBG for 3% of the Order value valid till the completion of total contractual obligation (i.e. valid till supply, installation, testing and commissioning of items at site plus completion of warranty period plus 60 days). Please confirm. (As per Instructions to bidders and General conditions clause No. 1.8 of Annexure)	Yes / No / Explain	
12	Items supplied shall be of the Make specified. Offers other than these makes will not be considered. Please mention the offered make.	Yes / No / Explain	
13	In case of Specific Brand items, please provide Authorization certificate from OEM.	Yes / No / Explain	
14	Compliance to the Technical specifications shall be mentioned.	Yes / No / Explain	

15	Purchase preference to Micro and Small Enterprises (MSEs): Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1 plus 15% (Selected by Buyer) of margin of purchase preference/price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 100% (selected by Buyer) percentage of total QUANTITY. Please specify whether you belong to MSE or not. If YES, supporting documents shall be uploaded. Latest Udyam Registration Certificate for the current financial year shall be submitted.	Yes / No / Explain	

16	Make-In-India (MII) Clause: For this procurement, provisions contained in Public Procurement (Preference to Make in India), Order 2017 issued by Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industries vide letter No. P-45021/2/2017-PP(BE-II) dated 16.09.2020 & directives related shall be followed. Accordingly, you are requested to indicate the percentage of local content in the material, clearly mentioning the details of location(s) at which value addition is made in line with clause 9 to O.M dated 16.09.2020 referred above. It may be noted that Local Content shall not include services such as Transportation, Insurance, Installation, Commissioning, Training and after sales service support like AMC/CMC etc.	Yes / No / Explain	
17	The Bidder shall give self certification for local content in the quoted item (goods/works/services) at the time of tendering. However, at the time of execution of the project, for all contracts above INR 10 Crore, the contractor/ supplier shall be required to give local content certification duly certified by cost/ chartered accountant in practice. For cases where it is not possible to provide certification by Cost/ Chartered Accountant at the time of execution of project, the supplier shall be permitted to provide the certificate for local content from Cost/Chartered Accountant after completion of the contract, within time limit acceptable to the procuring entity. In case the contractor/supplier does not meet the stipulated local content requirement and the category of the supplier changes from Class-I to Class-I or from Class-II to Non-local, a penalty upto 10% of the contract value shall be imposed. Bidders shall ensure that for tenders involving supply of multiple items, weighted average of all items to be taken while calculating the local content.	Yes / No / Explain	

18	The bidder shall provide compliance to Order No. F.No.6/18/2019 PPD dated 23.07.2020 and amendments thereof by Ministry of Finance, Department of Expenditure, Public Procurement Division regarding restrictions on procurement from a bidder of a country which shares a land border with India and comply to all the provisions of the Order. In this regard, you shall certify that the bidder entity is not from such a country or, is from such a country, has been registered with the Competent Authority.	Yes / No / Explain	
19	Do you have Unique GeM Seller ID? If YES, provide details. If NO, As per Office Memorandum No 6/9/2020-PPD dated 24/08/2020 of Department of Expenditure, it is mandatory for sellers providing Goods and Services to Central Government Organizations to be registered on GeM and obtain a Unique GeM Seller ID, at the time of Placement of Order/acceptance of contract. Tenderer shall ensure the same.	Yes / No / Explain	
20	FORCE MAJEURE: If at any time during the continuance of the order the performance in whole or part by either party of any obligation under this order shall be prevented or delayed by reasons of any war, hostility, acts of public enemy, civil commotion, sabotage, fire, floods, lightening, epidemic, quarantine restrictions, strikes, go-slow, lockout or acts of God, notice of which is given either party to the other within 21 days from the date of occurrence thereof, neither party shall be reasons of such eventually be entitled to terminate this order nor shall either party have any claim for damages against the other in respect of such non-performance or delay in performance. (As per Instructions to bidders and General conditions clause 1.10 of Annexure)	Yes / No / Explain	

21	ARBITRATION:- The Contract shall be interpreted, construed and governed by the Laws in India. In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Work Package Order(s), such dispute/s or difference/s or claim/s shall be settled amicably by mutual consultations of the good Office of the respective Parties and recognizing their mutual interests attempt to reach a solution satisfactory to both the parties. If such a resolution is not possible, within 30 days from the date of receipt of written notice of the existence of such dispute/s, then the unresolved dispute/s or difference/s or claim/s shall be referred to the Sole Arbitrator appointed by the Parties by mutual consent in accordance with the rules and procedures of Arbitration and Conciliation Act 1996 as amended from time to time. The arbitration shall be conducted in Bengaluru in the Arbitration and Conciliation Centre - Bengaluru (Domestic and International) as per its rules and regulations. The expenses for the Arbitration shall be shared equally or as may be determined by the Arbitrator. The considered and written decision of the Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be English only. (As per Instructions to bidders and General conditions clause No.1.9 of Annexure)	Yes / No / Explain	
22	Vendors may note the Guidelines on Debarment of Firms vide O.M No. F.1/20/2018-PPD dated 02.11.2021 in line with rule no.151 & 175 (Code of Integrity) of GFR (General Financial Rules)	Yes / No / Explain	
23	Please furnish Contact details i.e. valid E-mail id, Mobile no/ Landline no. etc. for further communication.	Yes / No / Explain	
24	Please send your queries through clarification provision only. However, bidder may also send a copy to smpcu1-purchase@shar.gov.in duly quoting tender number. Contact No.08623-22-6377.	Yes / No / Explain	

25	EVALUATION CRITERIA :As all the items within tender specification are interdependent splitting of order is not possible. Hence, overall lowest bidder will be considered.	Yes / No / Explain	
26	VALIDITY OF OFFER: - In case of single part tender - the validity of offers/tenders should be 90 days. In case of two part tender - 120 days from the date of opening of Part-I bid and 60 days from the date of opening of Part-II bid. Tenders shorter than offer validity mentioned above will not be considered for evaluation.	Yes / No / Explain	
27	INSURANCE: Being a Govt. Of India Dept., Insurance is not required at our cost. Please ensure the safe delivery of the ordered item with proper transport worthy pack.	Yes / No / Explain	
28	Remarks, if any	Yes / No / Explain	
29	OTHERS: BEING A TWO PART TENDER, WE REQUEST YOU NOT TO DISCLOSE/INDICATE ANY OF THE PRICE VALUE WHILE SEEKING/PROVIDING CLARIFICATION. IN CASE IF YOU DISCLOSE ANY OF THE PRICE AMOUNT, YOUR OFFER WILL BE REJECTED.	Yes / No / Explain	
30	Bidder shall note that indented item IR1 mixing System being critical item used in Manufacturing the Solid Rocket Motors/segments,PRIOR EXPERIENCE & TURNOVER relaxation cannot be given to MSEs and Start-ups.	Yes / No / Explain	
31	All the supporting documents sought in the tender document shall be furnished.	Yes / No / Explain	
32	Country of origin of the quoted items if any	Yes / No / Explain	
33	Percentage of local content for the quoted items if any	Yes / No / Explain	
34	EGPS Dash board price and Price break-Up submitted in Annexure-5 shall match. In case, if any discrepancy is noticed after opening of price bids, EGPS Dash board price shall prevail over break-up price submitted. Kindly confirm.	Yes / No / Explain	

C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	Automation: Supply of IR-1 Automation System for Premix and Final Mix operations as per tender document	1.00 Lot		-		
2	Automation: Erection, Testing and Commissioning of IR-1 Automation System for Premix and Final Mix operations at Department Site as per tender document	1.00 Lot		-		

Common charges (Applicable for all items)

Additional Charges, if any (P&F, Freight etc.)	

Tender Specifications for
IR-1 Automation System
for
Premix and Final Mix Operations



Satish Dhawan Space Centre SHAR
Indian Space Research Organization
Sriharikota -524 124, A.P

1. Instructions to Bidders & General Conditions:

1.1. Introduction

- Satish Dhawan Space Centre (SDSC-SHAR), Indian Space Research Organization (ISRO), Department of Space, Government of India, Andhra Pradesh 524124, Tirupathi District, Andhra Pradesh State, India (here in after referred to as "Department"). This centre is involved in the production of solid propellant motor segments required for various PSLV, LVM3 and SSLV missions. As part of production requirements, procurement of IR-1 Automation System for Premix and Final Mix operations in SMPC Unit-I is envisaged at SDSC SHAR Centre, Sriharikota.
- Quotations are invited from the interested bidders for Supply, Installation, Testing & Commissioning of IR-1 Automation System for Premix and Final Mix operations.
- As this Project is of national interest and to be completed within the stipulated period, the bidder shall supply the materials at the earliest.
- The Supplier may visit SMPC UNIT-I, SDSC SHAR and acquaint himself fully with the requirements before submitting the tender. Supplier shall collect all other information which may be required for preparing and submitting the Bid and entering into the contract. Claims and objections due to ignorance of existing conditions or inadequacy of information shall not be considered after submission of the Bid and during implementation.

Geographical Location and Climatic Conditions:

Sl. No.	Description	Details
a)	Owner / Purchaser	ISRO, SDSC SHAR
b)	Project Title	Supply, Installation, Testing & Commissioning of IR-1 Automation System for Premix and Final Mix operations at Inhibition Facility in SMPC UNIT-I.
c)	Plant Location	Satish Dhawan Space Centre, SHAR, Sriharikota – 524 124 Tirupati Dist., Andhra Pradesh
d)	Transportation	
	Nearest Railway Station	▪ The actual site is located about 13.0 km from main gate of Sriharikota. ▪ Sriharikota is 18 km east of Sullurpeta in Tirupathi Dist. (Sullurpeta is on main rail line from Chennai to Vijayawada) ▪ Sriharikota is 100 km North of Chennai.
	Road	Sullurpeta is located on NH-5 from Chennai to Vijayawada

1.2. Instructions to the bidders

- Proposals are invited for the specified scope of work in two-part bid basis. The two parts are:
- Part-1: Technical and unpriced commercial part.
- Part-2: Price Bid

- For seeking clarifications regarding this tender document, please contact below officials:

(a)	Bids/ queries to be addressed to	Sr. Purchase & Stores Officer, SMPC / Purchase & Stores Officer, SMPC
(b)	Name/designation of the contact personnel	Smt. Veena G P, Sr. Purchase & Stores Officer. Mr. SV Siva Reddy, Purchase & Stores Officer.
(c)	Telephone numbers of the contact personnel	08623-22 6377 08623-22 5174
(d)	e-mail ids of contact personnel	spsoscfpurchase@shar.gov.in smpcu1-purchase@shar.gov.in

1.3. Bid Submission

- Prices quoted should be on the basis of F.O.R. Sriharikota.
- All risk in transit shall be exclusively borne by the bidder and shall pay only for such items as are actually received in good condition in accordance with the purchase order.
- Department may open Part – 1 of the bids on the due date of opening at stipulated time. Subject to meeting the minimum evaluation criteria, Price bid (Part-2) of the technically and commercially acceptable bids shall be opened at a later date.
- Compliance to proposal requirement: Technical compliance statement as given **Annexure-2**. shall be submitted by bidder without which offer will not be considered for evaluation. Department expects bidder's compliance to requirement of proposal document without any deviation. Deviation on clauses, if felt absolutely necessary should be furnished as per **Annexure-4**. in the Techno commercial part (and not in proposal document or Price part). Department shall not take cognizance of any deviation stipulated elsewhere in the bid. Any wilful attempt by the bidders to camouflage the deviations by giving them in the covering letter or in any other documents that are enclosed may render the bid itself non-responsive.
- Bids duly filled in by the bidder should invariably be submitted as stipulated in the Letter inviting bid. Bids shall be submitted in two parts as given below.

Part – 1: Technical and unpriced commercial part.

- Complete Techno-Commercial part of the bid shall be duly filled in by the bidder and should invariably be submitted as stipulated in the e-procurement portal. Any documents related to technical literature, guarantee /warrantee certificates and any other document as per the tender shall be scanned and uploaded in the e-Procurement Portal.
- Part-1 shall comprise the following attachments, specifying attachment number arranged in the order as follows:
- Submission of bid letter along with one set of this tender document duly signed and stamped as token of acceptance.
- Technical details, catalogues, etc. as applicable and any other document as mentioned in the proposal.
- Compliance enclosed in proposal duly filled, signed, stamped, scanned and uploaded.
- Unpriced copy of schedule of prices with all other commercial terms, taxes, duties, exemption certificates and conditions duly filled (prices to be kept blank), signed and stamped.
- Any other relevant document, bidder desires to submit.

- Any bids/offers with price details in techno-commercial offer (Part –1) shall be rejected.
- Confirmation w.r.t bid qualification criteria as per **Annexure-1**.
- Compliance statement as per **Annexure-2.**
- Quality Assurance Plan as per **Annexure-3.** Bidder shall confirm the broad guidelines mentioned in QAP.
- Deviations, if any, w.r.t technical and commercial terms & conditions shall be clearly brought out under deviation list **Annexure-4**. If deviations are not listed separately, it will be presumed that you are adhering to all the specification and terms & conditions given in this document
- Bidder shall also submit the un-priced Format along with Techno – Commercial Bid by mentioning **"Quoted"** against each item as per **annexure-5**. The same shall be uploaded along with technical specification.

Part–2: Priced commercial part.

- Priced commercial part shall contain "Schedule of Price" marked "PRICE - BID" duly filled in e-Procurement portal. No stipulation, deviation, terms and conditions, presumption basis etc. shall be stipulated in price part of bid. Department shall not take cognizance of any such statement and may at their discretion reject such bids.
- Unit rate for each of the item shall be indicated separately as mentioned in the guidelines for bidder to quote
- If the offer submitted by the bidder is silent on taxes, it will be presumed that quoted rates are inclusive of taxes & duties and no claim in this regard will be entertained later.
- Total amount shall be spelt out in terms of numbers and words also.

1.4. General conditions:

- Transit insurance: Prices quoted should be on the basis of F.O.R. SDSC SHAR, Sriharikota.
- Liquidated Damages (LD): In the event of the bidder failing to complete the work within the delivery period specified in the contract agreement or in extension agreed thereto, the Department shall reserve the right to recover from the contractor as liquidated damages, a sum of 0.5 % per week or part thereof on undelivered portion subjected to a maximum of 10% of the total contract price.
- Offer validity: Bid shall remain valid for acceptance for a period of 120days from the due date of submission of the bid. The bidder shall not be entitled during the said period to revoke or revise his bid or to vary the bid except and to the extent required by SDSC SHAR in writing. Bid shall be revalidated for extended period as required by SDSC SHAR in writing. In such cases, unless otherwise specified, it is understood that validity is sought and provided without varying either the quoted price or any other terms and conditions of bid finalized till that time.

1.5. Taxes and Duties:

GST: As per the Notification No. 9/2025 - Integrated tax dated 17.09.2025, S. No. 462 and as per Notification No. 9/2025 - Central tax dated 17.09.2025, S. No. 462 issued by Ministry of Finance (Dept. of Revenue) & Government of Andhra Pradesh, Revenue (Commercial Taxes) Department, G.O. MS. No. 345, Dated: 20.09.2025, S.No.462, SDSC SHAR is eligible to avail GST/IGST @5% for the procurements related to Scientific and technical instruments, apparatus, equipment, accessories, parts, components, spares, tools, mock ups and modules, raw material and consumables required for launch vehicles and satellites and payloads. We will issue End Use Certificate for availing GST/IGST @5%. Hence, kindly confirm your acceptance and submit your price quotation accordingly.

Income Tax (IT): Income tax at the prevailing rate as applicable and if applicable from time to time shall be deducted from the supplier's bills as per Income Tax Act and a certificate issued (TDS Certificate).

1.6. Delivery schedule:

- Supply, Installation & commissioning shall be completed as per the milestone events mentioned in the below table from the date (T) of placement of purchase order (PO):

Table 1. Delivery Schedule

Delivery schedule		
S. No	Milestone	Days
1.	Configuration of the system	T1= PO+21
2.	Submission of Data sheets and drawings of premix station and final mix stations	T2=T1+21
3.	Review & Clearance by department	T3 = T2+15
4.	Pre-delivery inspection (Inspection call shall be given 15 days in advance)	T4 = T3+180
5.	All items receipt at SMPC	T5 = T4 + 15
6.	Installation, testing and commissioning of system	T6 = T5 + 60

- Party shall strictly adhere to the milestones mentioned above
- Site is ready for erection, testing and commissioning activities of the system
- Delivery stipulated in the purchase order shall be the essence of the contract and delivery must be completed not later than the date(s) specified therein. Failure to do so, without adequate justification may involve cancellation of the contract at the discretion of Department. The schedule given above is only indicative. However, Department prefers early delivery (if required) schedule based on the Project Commitments.

1.7. Risk coverage:

The contractor shall arrange comprehensive risk coverage at his own cost covering the value of equipment including transportation to the site from manufacturer's works, storage at site, fabrication, erection, testing and commissioning at site. The period of such coverage shall be up to contractual completion period or any extension granted by Department thereof.

1.8. Warranty:

- The items supplied as part of this tender shall have warranty for a period of 12 months from the date of commissioning and acceptance against any manufacturing defects/ bad workmanship. If any defects are noticed during the above period, same shall be rectified/ replaced at free of cost. The warranty certificate shall be submitted.
- Performance Security towards Security Deposit (SD) cum Performance Bank Guarantee(PBG):

  A combined Bank Guarantee for 3% of the order value shall be provided immediately within 10 days after receipt of purchase order towards the performance of the contract & the performance of the system as per terms & conditions (i.e., valid till supply, installation, testing and commissioning of items at site + completion of warranty period + 60 days).
- Where counter terms and conditions / printed or cyclostyled conditions of sale have been offered by the bidders, the same shall not be deemed to have been accepted by the Department unless the Department's specific written acceptance thereof is obtained.
- The contractor shall at all times indemnify the Department against all claims which may be made in respect of the stores for infringement of any right protected by the patent registration of design or trade mark and shall take all risks of accidents or damage, which may cause a

failure of the supply from whatever cause arising and the entire responsibility for the sufficiency of all means used by contractor.

1.9. Arbitration:

- The Contract shall be interpreted, construed and governed by the Laws in India. In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Work Package Order(s), such dispute/s or difference/s or claim/s shall be settled amicably by mutual consultations of the good Office of the respective Parties and recognizing their mutual interests attempt to reach a solution satisfactory to both the parties. If such a resolution is not possible, within 30 days from the date of receipt of written notice of the existence of such dispute/s, then the unresolved dispute/s or difference/s or claim/s shall be referred to the Sole Arbitrator appointed by the Parties by mutual consent in accordance with the rules and procedures of Arbitration and Conciliation Act 1996 as amended from time to time. The arbitration shall be conducted in Bengaluru in the Arbitration and Conciliation Centre - Bengaluru (Domestic and International) as per its rules and regulations. The expenses for the Arbitration shall be shared equally or as may be determined by the Arbitrator. The considered and written decision of the Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be English only.
- Work under the Contract shall be continued by the BIDDER during the pendency of arbitration proceedings, without prejudice to a final adjustment in accordance with the decision of the Arbitrator unless otherwise directed in writing by the DEPARTMENT or unless the matter is such that the works cannot be possibly continued until the decision (whether final or interim) of the Arbitrator is obtained.
- In case order is concluded on the Public Sector Undertakings, the following Arbitration Clause will be applicable:
- In the event of any dispute(s) or difference(s) relating to the interpretation and application of the provisions of the commercial contracts between ISRO/SDSC SHAR & Central Public Sector Enterprises (CPSEs)/Port Trusts inter se and also between ISRO / SDSC SHAR & CPSEs and Government Departments / Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute(s) or difference(s) shall be taken by either party for resolution through the Administrative Mechanism for Resolution of CPSEs Disputes (AMRCD), as mentioned in the Office Memorandum DPE-GM-05/0003/2019-FTS-10937 dated 20.02.2020 and its subsequent amendments from time to time issued by the Director of the Department of Public Enterprises (DPE) under the Ministry of Heavy Industries and Public Enterprises, Government of India.
- Applicable law and jurisdiction: The laws of India shall govern this RFP / tender for the time being in force. The courts of Andhra Pradesh, India only shall have jurisdiction to be with and decide any legal matters or disputes whatsoever arising out of the purchase order.

1.10.Force majeure (FM):

If at any time during the continuance of the order the performance in whole or part by either party of any obligation under this order shall be prevented or delayed by reasons of any war, hostility, acts of public enemy, civil commotion, sabotage, fire, floods, lightening, epidemic, quarantine restrictions, strikes, go-slow, lockout or acts of God, notice of which is given either party to the other within 21 days from the date of occurrence thereof, neither party shall be reasons of such eventually be entitled to terminate this order nor shall either party have any claim for damages against the other in respect of such non-performance or delay in performance.

1.11.Packing & forwarding:

The bidder will be held responsible for the stores being sufficiently and properly packed for transport by rail, road, sea or air, to withstand transit hazards and ensure safe arrival at the destination. The packing and marking of packages shall be done by and at the cost of the bidder.

1.12.Placement of PO:

Overall L1 will be considered for the placement of PO. Split order will not be issued.

1.13.Inspection & acceptance:

- No items shall be dispatched to SDSC SHAR without inspection and approval by the Department unless such inspection is waived in writing by Department.
- Inspection and testing shall be conducted in approved manner (either by physical or video mode) satisfactory to department.
- No item is to be delivered unless an acceptance certificate for the same has been issued by Department.
- Inspection call shall be given at least 15 days in advance.

1.14.Payment terms:

After placement of confirmed Purchase Order:

- In general, our payment terms will be 100% within 30 days after receipt of all items, installation, testing, commissioning and acceptance by CLIP (Centre level Inspection Panel).
- However, if Bidder's/Suppliers are requesting for advance payment, department may consider as given below,
  - For supply portion
    - 20% of supply cost as advance against submission of bank guarantee for an equal amount from a nationalized/scheduled bank and shall be valid till Contract completion period plus 60 days. Format of Bank guarantee shall be obtained from Department after award of contract.
    - 60% of supply cost along with 100% tax on supply portion against receipt of material at site, visual & functional check of all the items and CLIP (Centre level Inspection Panel) clearance at SDSC SHAR.
    - Balance 20% of supply cost after successful completion of Installation, testing and commissioning of all items by the vendor, CLIP clearance and Acceptance of full system by the Department.
  - For installation portion
    - 100% of installation cost along with 100% tax on installation portion after installation, testing and commissioning along with CLIP Clearance.
- Bidder shall specify any one of the above payment terms only. Deviation in other than the above for payment terms will not be acceptable.
- Advance Payment
    - Wherever advance payment is requested, Bank Guarantee for advance payments for equivalent amount to be furnished and advance payment will be recovered and interest will be levied as per the Marginal Cost of Lending Rate (MCLR) of SBI Plus 2% penal interest in case the vendor is not supplying the material within the delivery schedule after drawl of advance. This will be in addition to applicability of LD clause.

- In case of any delay attributable to the supplier/contractor in effecting the supply after the prescribed delivery date, Interest at MCLR of SBI will be charged for the period beyond the specified delivery date on the amount of balance advance payment.
- Interest will be loaded for advance payments/stage payments as per the lending rate of the bank and will be added to the landed cost for comparison purpose. In case of different milestone submitted by the parties, a standard and transparent methodology like the Net Present Value (NPV) will be adopted for evaluating the offers.

1.15. Mode of Payment

Bidders can submit the banker details and payments can be made through NEFT/RTGS/ECS through PFMS.

1.16. General Terms

- After delivery of items to site, the installation works shall be taken up after obtaining clearance from department.
- In case Bidder suggests any changes in the Make/vendor, same shall be supported with complete technical details including need for such changes proposed. Alternate make suggested by the Bidder shall be better than the make suggested in this tender document. Department has the right to accept or reject the changes in the suggested make/vendors list.
- The details shown in the drawing shall be verified with actual site conditions and minor changes if any required shall be incorporated at no extra cost. It is advised to visit the site to understand the interfaces and take essential dimensions wherever equipment is having interface with civil structure/already realised equipment. Minor changes/additions if any suggested to meet the functional requirement of the total system shall be incorporated at no extra cost by the Bidder.
- During the warranty period, the bidder has to arrange unlimited breakdown calls and replacement of failed/ malfunctioning components without any additional cost.
- The supplier shall provide comprehensive warranty for all equipment, accessories and software against any manufacturing defects/bugs. They shall maintain the equipment and repair/replace all the defective components at the installed site at no additional cost. The new releases/patches of the software shall be provided at free of cost.

2. System Introduction & Technical Specifications

2.1. Introduction:

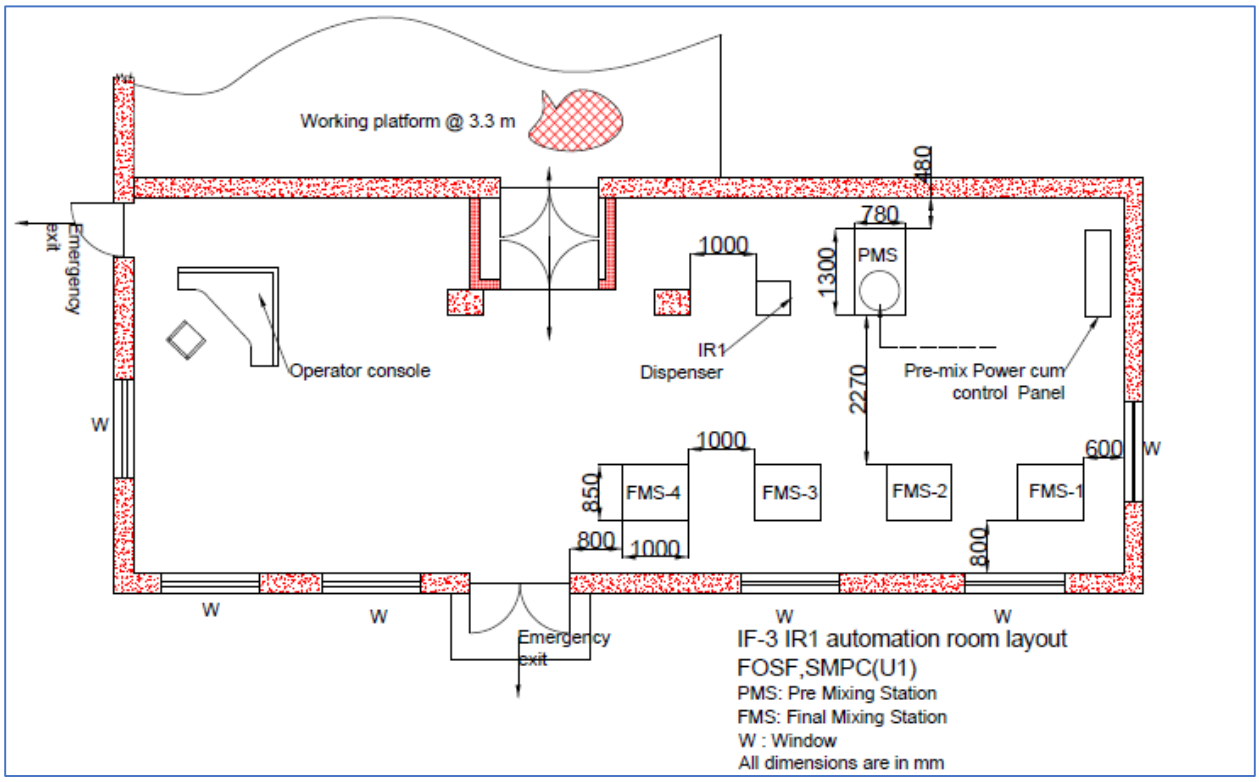
Satish Dhawan Space Centre (SDSC), Sriharikota Range (SHAR), ISRO has been involved in production of solid propellant required for various PSLV and GSLV missions. These launch vehicles use 5 segments for PS1 or GS1 stage comprising one Head End Segment, 3 Middle Segments and one Nozzle End Segment and one HPS3 motors for PSLV missions as third stage.

The functions carried out in Finishing Operations & Segment Storage Facility (FOSF) are loose flap filling with epoxy resin and inhibition resin (IR-1) pouring for required thickness on machined propellant grain end surfaces to avoid flame propagation and restrict burning only to port surfaces and tilting the segment from vertical position to horizontal and vice versa.

A control system with semi automation is envisaged for the Operation and Control of IR-1 Mixing System. The system carries out the following functions.

- IR-1 mixing and dispensing stations with a control system called as IR1 Pre-Mix Station
- Final mix stations with supervisory control called as IR1 Final Mix Station
- Displaying process status information, Monitoring and recording of alarms on fault conditions for future reference (SCADA System)

2.2. IR-1 MIXING SYSTEM:



IR-1 mixing involves a thorough mixing a premix manually to achieve homogeneity and preparing final mix by adding curator and accelerator that are volatile and toxic organic compounds. This system is proposed to minimize the prolonged exposure of human to these chemical vapors. The proposed system should carry out thorough mixing of premix mixture and subsequently addition of curator, accelerator and mixing them independently during addition for final mix preparation. This system consists of two modules namely Pre-Mix System to prepare the premix mixture and Final Mix System to prepare IR-1 final mix inhibition resin.

2.2.1. Premix Station – 1 no.

IR1- Premix contains approximately 40% solid i.e. solid filler powder and 60% liquid i.e. Castor oil. The solid component tends to settle down within 10 minutes due to its high density. Hence a continuous mixing is proposed during premix batching of 1.5kg as standard or required size. This system should lift 80 kg of premix material in a container capacity of 100kg up to stirrer (Platform along with IR1 premix drum to be lifted to height of premix stirrer) and carry out mixing thoroughly so as to get a homogeneous mixture of premix. Premix of 1.5kg is subsequently pumped out and collected in 3kg capacity container.

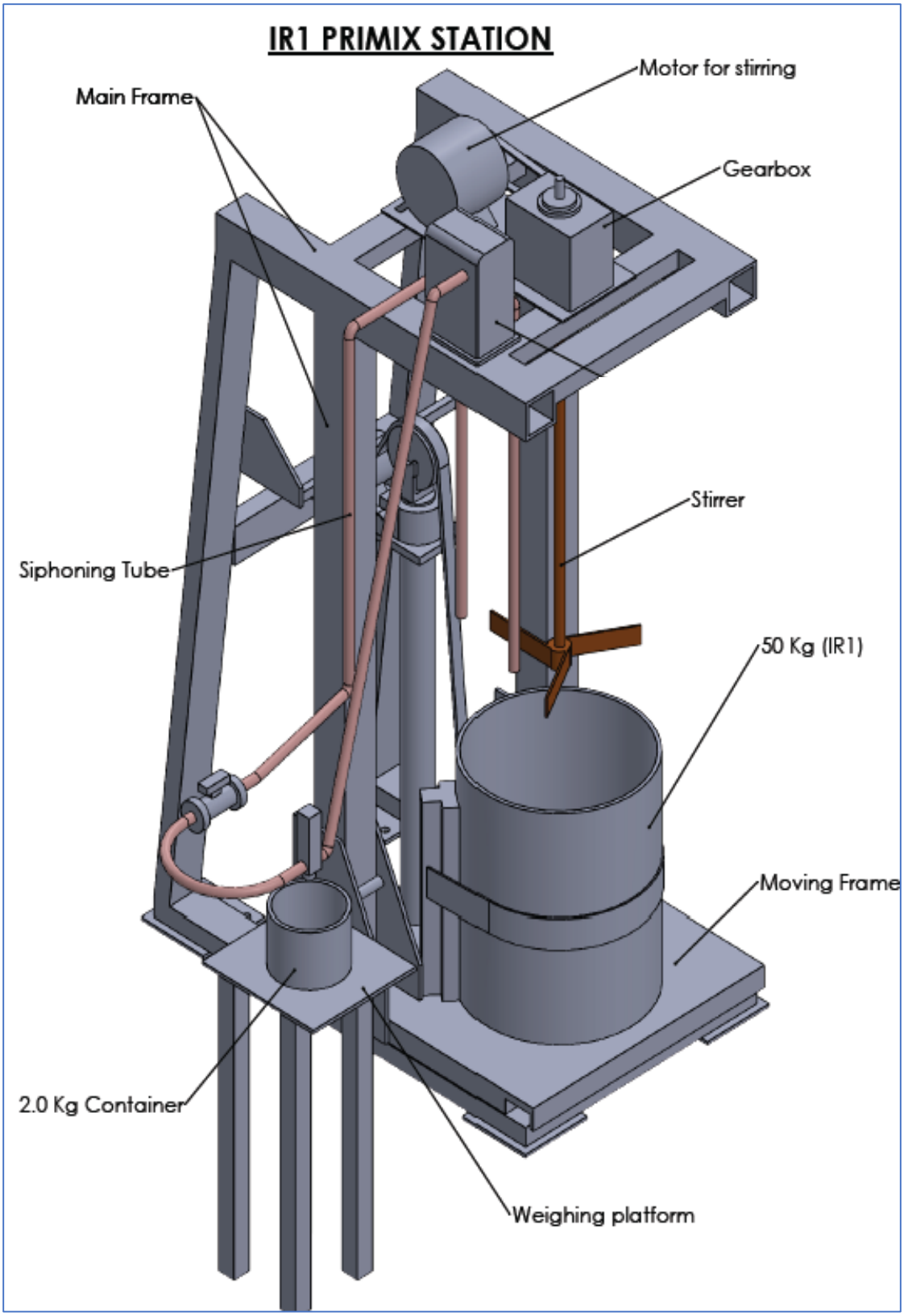


Fig.1: IR1 Premix Station

IR1 – PREMIX WORKING SYSTEM



Fig.2: Front view of IR1 premix station



Fig.3: Side view of IR1 premix station

2.2.2. Subsystems & Operations performed at premix station

a) Suitable mechanism for lifting 80 kg premix:

Pillars to hold the moving frame, linear actuator & geared motor for lifting the 80 kg premix filled in a container capacity of 100 kg, mixing the content by stirrer built-in with gear motor. The movement of frame or platform with drum is monitored by limit switches as it is lifted from bottom to upside.

Total six numbers of stages should be made starting from bottom in order to mix the IR1 premix totally while stirrer entering in the drum.

b) Weigh Controller:

1.5 kg of premix is transferred into 3kg capacity container by using gear pump, siphoning valve and a controller controls the feed of premix. Weigh the premix using a calibrated weighing scale and controlling is done by relay controller. Frame of weighing balance and container filling platform should be separated so that no disturbance occurs to weigh balance while filling IR1 premix.

c) 1.5kg filling:

Place the empty container on filling stand and acknowledge through HMI. The relay controller opens siphoning valve based on the pre-set weight information, deliver the premix of 1.5kg in 3kg capacity container from three-way valve and gets closed after dispensing exact quantity. Recirculation must take place during this process to maintain homogeneity of the premix. These containers are removed and an empty container is placed manually until the 80kg premix is exhausted. Interlock shall be provided if any case container not placed properly below the three-way valve system should raise the alarm that container not placed properly.

d) Premix system Start-up:

1. Switch on the external display.
2. Ensure lifting table at bottom Position.
3. Check Calibration of the weighing scale (capacity: 5kg) using standard weights before weighing premix.
4. Tare the weigh Scale.
5. Enter the weight of Premix to be weighed in PC (entered weight to be recognized by weigh scale).

e) Mixing Operation:

1. Ensure that the bench is down to the floor.
2. Place the 80kg premix filled container of 100 kg capacity manually on bench, firmly tie by using a belt provided and then position below the premixing station mixer.
3. The bench is brought up in multiple steps (using proximity sensors) by linear actuator and geared motor to a predetermined height such that the gap between stirrer blade and bottom of 80kg premix filled container is minimum.
4. Once the bench reaches to the specified height, stirring starts automatically. Homogeneity of the premix is achieved approximately after 15 minutes of mixing.

f) Safety Lock: The operation can be brought to ‘hold’ mode at any stage just through HMI

g) Dispensing 1.5 kg premix:

The homogeneous mixture obtained after 20 minutes of premix mixing is taken out by using gear pump with provision of inlet and outlet hoses for material circulation. This activity is carried out while stirring operation is taking place so as to ensure homogeneity of premix. This operation continues till all the material in the 80kg of premix container are batched out as 1.5kg premix and filled in 3kg capacity premix containers.

2.2.3. Technical Specifications for IR1 Premix station

a) Premix Station (Aprx. Size: Height 2400 mm x Width: 900 mm x Depth 1300 mm)

- Main frame & moving frame for holding stirrer, gear motor for up & down movement and limit switches to monitor the movement of moving frame.
- Material of construction: Cast iron / Carbon steel fabricated.
- Quantity: 1 No.

b) Premix container with lid:

- Size: Inner dimension: 445 mm dia. x 615 mm height; Outer height: 645mm (i.e. bottom frame height: 30mm)
- Purpose: Storage of IR-1 premix
- Material of construction: SS 304
- Quantity: 2 Nos.
- Compatible with the agitator of premixing station
- Provision for handling the drum as per drawing
- Pre-mix container shall be provided with positive-lock arrangement
- Lid lock sensor to be provided

c) Agitator/ stirrer for premixing station

- Purpose: To mix the 80 kg premix
- Viscosity of IR1 premix: 4000-10000 Centipoise
- Material of Construction: SS304 (with provision for easy removal and re-fitting)
- Drive: Electrically operated (3 phase)
- Quantity: 2 Nos. (1 Working + 1 Standby)
- Stirrer Make: Customized by supplier
- Motor Make: Siemens/standard brands
- Motor capacity: 4 HP or better

Note: *1) Gear pump suction may preferably be considered through the center of the agitator shaft for maximum premix delivery*

2) Hollow shaft of adequate size may preferably be considered for the premix agitator/ stirrer in order to maximize the premix delivery with suitable arrangement

3) One separate regulating valve shall be provided at the outlet of the gear pump in order to enable priming

d) Bench lifting Arrangement

- Purpose: Lift the bench with 80kg premix container (Linear actuator with Gear box)
- Drive: AC Drive for slowly lifting the 80kg container
- Stroke Length: 450mm Max
- Material of construction: Cast Iron
- Make: Greens Tech or other Standard brands
- Model Type: Chain & Sprocket as spares will be supplied
- Quantity: 1 (Working unit only; Spare not required)
- Position sensors: Shall be provided for 6 stage (minimum) lifting

e) Gear pump

- Purpose: Re-circulate and extract the 1.5kg from 80kg premix container
- Type: Gear Pump
- Pump flow rate: 50 LPM or higher capacity for uninterrupted dispensing of IR1 slurry
- Viscosity: 4000-10,000 Centipoise
- Material of Construction: High alloy Steel /Metal coated alloy/ Stainless Steel (Having high wear and tear resistance)
- Drive: Electrically operated
- Quantity: 2 Nos. (One main and One as spare)
- One SS ball valve of suitable size shall be provided near pump outlet for priming
- Make: Standard brands

f) Recirculation hoses

- Purpose: Re-Circulate the Premix material
- Model: IN302-1 Flanged End, metal braided hoses
- Type: 20mm, Pneumatically Operated

g) Three-way valve

- Purpose: To dispense the exact quantity of IR1 premix material or recirculation of IR1 premix material
- Operation: Valve commanding shall be from HMI/ SCADA
- Type: Specially designed with pneumatically operated (through solenoid) coarse and fine feeding of premix

h) Premix weigh controller

- Purpose: weigh the premix for 1.5kg
- Capacity: 5 kg
- Accuracy: ± 0.2%
- Pan Size: 300X300mm
- Load cell: C2 certified calibration
- Material of construction (tray): SS 304

- Quantity: 1 No.
- Readability/ least Count: 1 gm
- Indicator cum transmitter: With vibration filters using Wave Saver Technology
- Photo sensor to be provided for container positioning

2.2.4. IR-1 Final Mixing Station (Aprx. Size: Height 2000 mm x Width: 1200 mm x Depth 800 mm) – 4 nos.

The system proposed shall be modular in construction and expandable in future. This system should mix the accurately weighed premix thoroughly with curator and accelerator during their additions independently. Final mixing involves addition of requisite quantity of curator and accelerator in a container filled with 1.5kg of premix and mixing them thoroughly for a specified duration after individual chemical addition. This system should have a provision to run in discrete and auto mode. Provision to be given to select the mode of operation by user through HMI provided in the final mix station. Provision to enter the quantity of curator and accelerator to be provided. Duration of mixing of IR1 premix before Curator addition (t_1), after curator mixing (t_2) and after accelerator mixing (t_3).

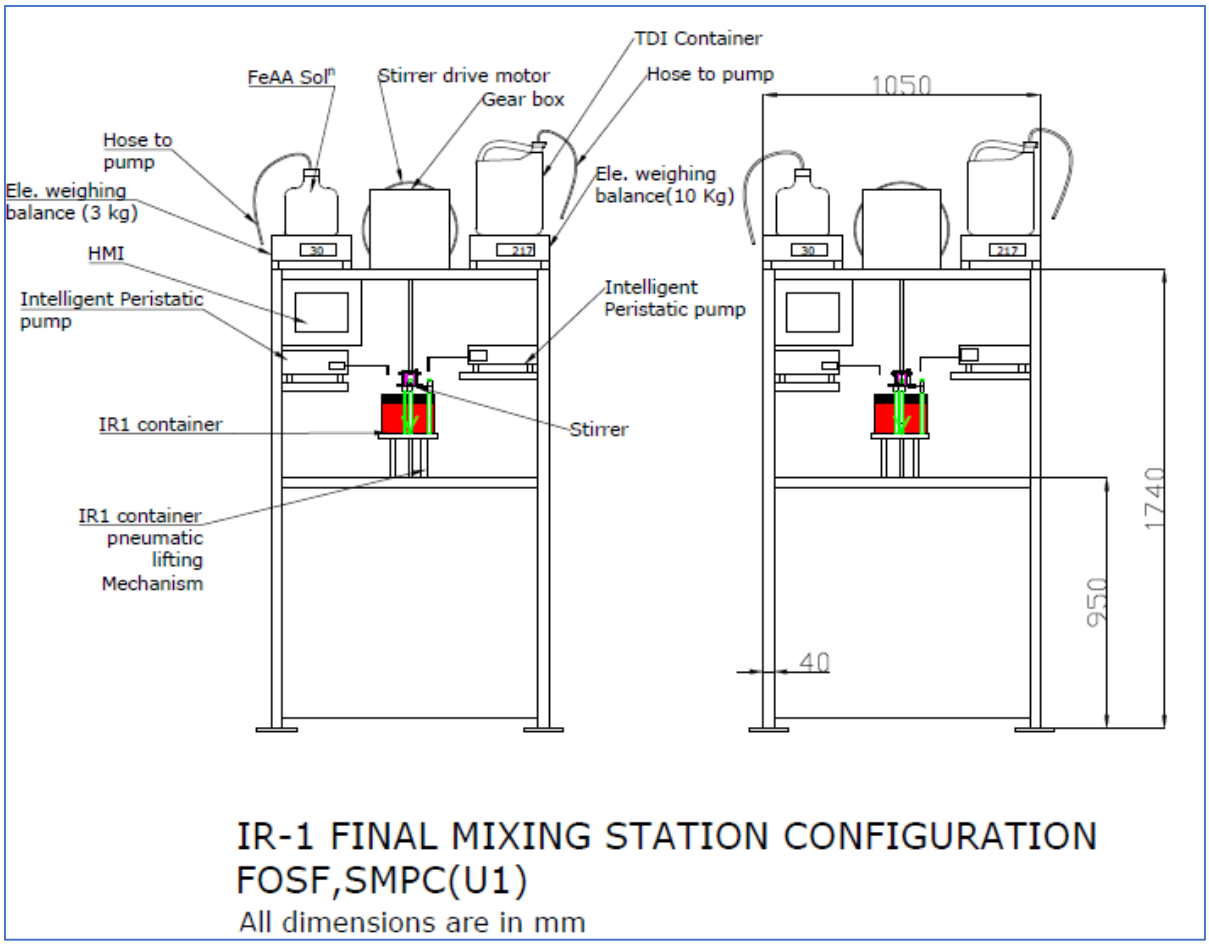


Fig. 4: IR-1 Final Mix Station



Fig. 5: Existing IR1 Final Mix System (For understanding only)

2.2.5. Subsystems & Operations performed at final mix station

a) Positioning the premix container:

Container with 1.5kg of premix is placed manually on the final mix station platform and position it in line with center of the stirrer. Provision for locking the container by pneumatic mechanism to be provided. A 'push' button is provided for bringing the platform with container up to stirrer such that the clearance between stirrer blade and bottom of the container is minimum.

b) Up – Down Cylinder:

This pneumatic cylinder enables the container movement up and down by lifting so as to maintain minimum gap between the stirrer blade and bottom of the container.

c) Stirrer:

Once the container reaches the position with required gap, the stirrer connected to arm of final mix station starts automatically. This operation is required before and after addition of ingredients like curator and accelerator. For addition of curator and accelerator stirrer automatically stop and once

addition completed after acknowledgement from HMI, stirrer start to rotate at previous set RPM. To set RPM of stirrer knob to be provided on HMI unit.

d) Curator and Accelerator:

Curator and Accelerator are stored in two containers and positioned on two separate load cells (Curator load cell: 10 kg. & accelerator load cell: 3 kg). This is to ensure/ cross verify the quantity dispensed from each peristaltic pump against the specification. An intelligent peristaltic pump attached to outlet of each container of curator and accelerator would control the flow of chemical and discharges them independently as per the program sequence. The dispensed chemical from outlet of the pump is directly collected in the IR1 final mix container and mixing takes place as programmed.

e) Final Mixing Operations:

1. The container with 1.5kg premix is placed on the platform and brought up to stirrer position by pneumatic system through HMI to a level having minimum clearance (say 3-5mm) between stirrer blade and bottom of the container.
2. Stirring of premix should start automatically now for a predefined time period.
3. Intelligent peristaltic pump delivers required predefined quantity of curator chemical automatically to premix plastic container through Viton rubber hose
4. Mixing after addition of curator for a specified period of time
5. Intelligent peristaltic pump delivers required predefined quantity of accelerator chemical automatically
6. Mixing after addition of accelerator for a specified period of time
7. Cross verification of the dispensed quantity (provision to display net dispensed quantity to be provided) of curator/ accelerator to be carried out with the available load cells (10 kg for curator & 3 Kg for accelerator)
8. Now the final mix operation is completed. The container shall be dispatched to segment processing platform manually.

Technical specifications for final mix station

f) 3 kg container to hold 1.5 kg premix material

- Shall be provided by user.

g) Curator storage container

- Shall be provided by user.

h) Accelerator storage container

- Shall be provided by user.

i) Up-Down pneumatic cylinder (for Final Mix Station)

- Type: Pneumatic cylinder

- Purpose: Lift the 3.0 kg capacity container having 1.5kg IR-1 premix
- Stroke Length: 250 mm maximum
- Bore diameter: 25 mm
- Rod diameter: 10 mm
- Material of construction: Aluminium
- Mounting: Foot Mounting
- Make: Festo or other standard make
- Model Number: DNC-25-250-PPV-A
- Attachment: SS 304 Tray
- Quantity: 1 No. (for each final mix station)

j) Agitator/ stirrer for final mixing station

- Drive: electrically operated
- Material of construction: SS304 (with provision for easy removal and re-fitting)
- Quantity: 1 No. with drives (for each final mix station)
- Container closure lid on the stirrer rod with the provision for curator and accelerator dispensing shall be provided

k) Peristaltic Pump (Intelligent type)

- Purpose: To Pump Curator and Accelerator from the respective storage containers
- Approximately 350-375 ml in 15 sec (for curator)
- Approximately 50-75 ml in 15 sec (for accelerator)
- Accuracy required: ± 1ml (for both curator and accelerator)
- Quantity: 2 nos. (1no: Curator; 1no: Accelerator) for each final mix station
- Flow rate: 0.1 ml to 1000 ml/min
- (0.1 ml to 500 ml/min with 5 mm I.D. Tubing)
- (0.1 ml to 600 ml/min with 6 mm I.D. Tubing)
- Speed: 1 to 199.9 RPM
- Set (batch) volume: 0 to 1000 ml
- Accuracy: +/- 1 %
- Supply: 230v, 50 Hz AC
- 4A Power cord with 3 pin plugs
- Compatible with PLC
- Each final mix station shall be provided with 100 m of silicon rubber VITON tube

l) Weighing controller for Curator and Accelerator

- Capacity: 3kg and 10kg Load cell capacity with display unit
- Accuracy: ± 0.2 %
- Pan Size (for curator): 250mm x 250mm
- Pan Size (for accelerator): 150mm x 150mm
- Material of construction (tray): SS304

- Load cell: C2 certified calibration
- Quantity: 1 Nos. 3kg & 1 Nos. 10 kg (for each final mix station)
- Readability: 1 gm
- Indicator: With vibration filters using Waver Saver Technology

m) SS Covering / Paint and Finish

i) All the exposed, uninsulated carbon steel surfaces shall be painted with surface preparation, Primer coat, Intermediate coat, Final coat of required Dry Film Thickness (DFT) & SS (pre-polished) covering for components (like Final mix system) that are required to be protected.

ii) All motor parts exposed directly to atmosphere shall be finished and painted to produce neat and durable surface which would prevent rusting and corrosion. The equipment shall be thoroughly degreased, sharp edges and scale removed and treated with one primer and finished with two coat of grey enamel paint. The grade of paint shall be chosen such that it will withstand the maximum temperature to which components painted will be subjected to. Insulation shall be given tropical and fungicidal treatment for successful operation of the motor in hot humid and tropical climate.

iii) Pre and final mix stations shall be provided with SS (pre-polished) covers suitably to give fine aesthetics

n) Drawings approval

Party shall prepare as-built drawings (Mechanical, Electrical and Instrumentation) of the entire system and obtain prior approval before proceeding with manufacturing/ fabrication

3. Electrical System for IR1 Pre-Mix and Final Mix Stations

Scope of Work

a) Electrical System of IR comprises the following:
   i) Design, fabrication and supply(SITC) of electrical system for pre-mix (01 no) and final mix (04 Nos) stations.
   ii) Design and supply Erection testing and commissioning of required VFD and PLC based speed controlled induction motors, peristatic pumps, local operating stations and other required electrical switchgears.
   iii) Installation commissioning and testing of electrical system of the same.
   iv) Selection which are communication compatible to PLC& SCADA system selected and configuration of VFD drives suitable motors selected for the above stations.
   v) Supply of items as per the technical specifications given.
   vi) Programming of VFD drives suitable to process requirement and detailed operation requirement will be mentioned under VFD section
   vii) Panel wiring, assembly, pre-delivery inspection.
   viii) Operation Qualification trials in fully automatic mode/discrete Mode.

b) The scope of work also includes the following activities.
   i) Installation, cable laying, interfacing with VFD drives with motors and associated systems viz. limit switches, MFM, DPM, AOP etc.
   ii) Procurement and Installation of all systems mentioned in attached BOM
   iii) FAT and SAT of the System.
   iv) Submission Test certificates, final as built diagrams (03 sets) VFD programming manuals etc.

3.1. Premix Station-01 Number

3.1.1. Electrical system of premix station

The premix station consists of following systems

a. VFD cum switch gear panel
b. VFD based Stirrer motor
c. VFD based Dispenser motor
d. VFD based Up/down motor
e. Local operating station(LOS)1 with HMI (HMI details covered in ICS chapter)
f. Tower lamp (RYG) and Hooter system.

3.1.2. Premix Station VFD panel shall consist of following items (01 no)

Sl. No.	Description	Rating	Qty.	Preferable Makes
	INCOMER:	To be arrived by		
1	35KA,3Pole,MCCB with LSIG Protection with adjustable, shunt trip coil (240V AC) & Rotary		1	ABB/Siemens/Schneider

	operating Handle with inbuilt ON/OFF & Trip indication lamps.	vendor		
2	Control Transformer		1	Gauss/kappa/AE
3	3P MPCB for control transformer incomer		1	ABB/Siemens/Schneider/L&T
4	2P MCB for control transformer outgoing		1	
5	RYB, Incomer on/off trip indications		1set	Siemens/Schneider
6	Microprocessor based ELR with CBCT		1	Prok Dvs
7	Multifunction meter with communication compatible with PLC/SCADA		1	Siemens/Schneider/L&T
	OUTGOINGS:			
8	STIRRER MOTOR FEEDER 1&2: (main and spare) power rating to be arrived by vendor (Minimum motor power rating shall be 3.7kw/5HP)			
9	3P, SDF with semiconductor fuses of suitable rating for stirrer VFD		02 set	Siemens /Eaton /L&T
10	VVVF Drive for stirrer motor (VFD rating shall be next higher power/current rating of the motor)		1 No	ABB/Siemens
11	VFD ON, OFF, Trip Indication lamps		1 No	Siemens/ Schneider
12	Advanced operating panel(AOP) for programming, monitoring of VFD		1 No	ABB/Siemens
13	VFD main, Redundant changeover switch with necessary power contactors logic		1set	Siemens/ Schneider
14	VFD 1 & 2 selected indication		2nos	Siemens/ Schneider
	DISPENSER MOTOR FEEDER 3: power rating to be arrived by vendor			
15	3P, SDF with semiconductor fuses of suitable rating for each VFD		1 set	Siemens /Eaton /L&T
16	VVVF Drive for Dispenser motor (VFD rating shall be next higher power/current rating of the motor)		1 No	ABB/Siemens
17	VFD ON, OFF, Trip Indication lamps		1set	Siemens/ Schneider
18	Advanced operating panel(AOP) for programming, monitoring of VFD		1 No	ABB/Siemens
	UP/DOWN MOTOR FEEDER 4: power rating to be arrived by vendor			
19	3P, SDF with semiconductor fuses of suitable rating for each VFD		1 set	Siemens /Eaton /L&T
20	VVVF Drive for Up/Down motor (VFD rating shall be next higher power/current rating of the motor)		1 No	ABB/Siemens
21	VFD ON, OFF, Trip Indication lamps		1 set	Siemens/ Schneider

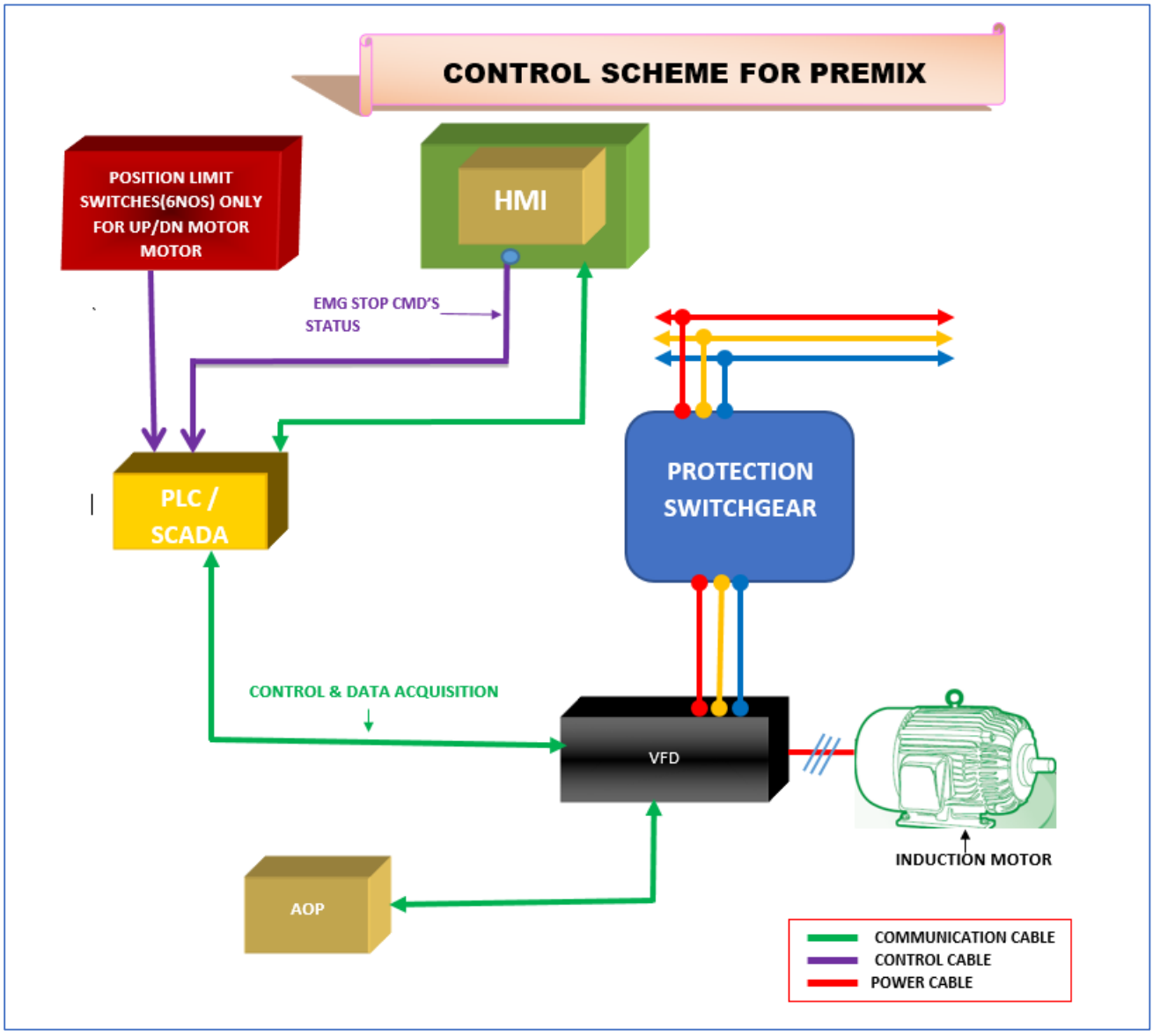
22	Advanced operating panel(AOP) for programming, monitoring of VFD		1 No	ABB/Siemens

3.2. Control philosophy

There are two modes of operation and the mode selection shall by means of Auto/Discrete at HMI located at LOS 1.

A. Auto mode: In auto mode all the operations shall be carried out in auto sequence control via HMI ON/OFF control and speed set point

B. Discrete mode: In Discrete mode the operations shall be carried out individually by using HMI (located at LOS 1) ON/OFF control and speed set point.



3.3. Local operating station I (LOS-I)

The LOS I shall consist the following provisions and switch gears

S.no	Description of item	Qty	Remarks
1	Emergency stop mushroom PB	01no	Shall trip each station incomer MCCB& status to PLC
2	HMI Screen	01 no	

3.4. Operating condition of Tower lamp(RYG) and Hooter system (shall be operated through interposing relay and PLC DO)

Tower lamp shall consist of following indication lamps and the operating truth table is as shown

	Lamp Description	Stirrer on condition	Stirrer Off condition	Process On hold
1	Red indication	Glow	No glow	No glow
2	Yellow indication	No glow	No glow	Glow
3	Green indication	No glow	Glow	No glow

The Hooter system shall give alarm whenever process start and shall be acknowledged in HMI for both auto and discrete mode.

3.5. General specifications for VFD cum Switchgear panel, LOS-I

a. The LOS-I shall be mounted on Dispensable pump pedestal with necessary support, and VFD cum Switchgear panel shall be floor mounted type.
b. All panels are metallic enclosures and shall be dust and vermin proof.
c. Doors shall be fitted with concealed hinge to ensure 130 degree opening.
d. Lock shall be of 7mm Triangular Bit Lock insert with key
e. Panel Should comply to IP54. Partial doors, Covers are PU Foamed (mixture of polyol and isocyanate) integrated to ensure IP54 of Ingress Protection.
f. All contacts / terminals of the switchgear components shall be wired to the terminal block.
g. Detachable, split gland plates of 3mm thick sheet steel shall be provided for panels both in the top and bottom.
h. The panels shall have Powder Coating with SIEMENS Grey RAL 7032 / 7035 over the exterior side of the panel.
i. VFD cum Switchgear panel structure shall be mounted on a rigid base frame of ISMC 100 channel. The design shall ensure that the weight of the components is adequately supported without deformation or loss of alignment during transit or during operation.

j. Each feeder shall be provided with suitable name plate showing feeder name with rating as given in the bill of quantities table. Name plates should be made of aluminum black enamel painted and names should be engraved and screw fixing type. Inscription shall also be provided for illuminated push buttons, meters, operating handles and panel opening lock
k. Provision shall be made for lifting and handling of panel by eyebolts
l. Panel lighting shall be provided and it shall be LED lamps only. The same needs to be controlled with panel door open / close limit switch
m. Provision for connection to the plant earth grid shall be provided at both the ends of the panel.
n. Provision for connection to the plant earth grid shall be provided at both the ends of the panel.
o. Panel Control wiring shall be carried out with minimum 1.5 Sq. mm sizes of 660/ 1100V grade multi strand single core copper flexible wires.
p. Tube Insulated copper lugs shall be used for terminating the control wires.
q. Party shall engage panel manufacturer, obtain and submit GA Drawing, power and control circuit drawings, including selection of switchgear ratings, control drawing, Bill of material for Dept. Approval prior to start of fabrication.
r. The panel shall undergo functional checks, HV test, Dielectric strength checks, Dimensional checks and other qualification tests as per standards at panel manufacturer works in the presence of the Department.
s. The panels shall be designed for operation in high ambient temperature up to 50°C, high relative humidity up to 95% and tropical atmospheric condition.
t. Rubber mats of 2m X 1m, 11 kV grade shall be provided for the complete length of all the panels (the panels which are in the scope of supplier) both in front and back side such that persons stand on rubber mats during maintenance.
u. The vendor shall supply documents consisting of as built drawings (MCC power & control drawings, cable schedule), catalogue of all bought out electrical items, VFD Parameterization Details.
v. Panel cubical keys, Handles, interlock keys, are to be handed over to department during supply.
w. The party should incorporate all changes / modifications / rectifications suggested by Department after verifying Drawings and bill of materials.
x. Any specification deviations required on technical grounds or non-availability of specified items have to be brought to the department notice; changes in these regards shall only be acceptable with the approval of the department
y. Any item not specified but required for satisfactory functioning and integration of the total system to be considered and included by the party and demonstrating the total functionality of the system as specified is the responsibility of the party.
z. Panel shall be front operated indoor cubicle type floor mounting suitable for operation on 3-Phase, 4 wire 415V ± 10%, 50Hz ± 3% AC supply.

aa. The panel should be designed, manufactured and tested in accordance with IS 8623(Pt1), IS 13947(Pt4/Sec1) and as per the specifications issued by us.

bb. Enclosure symmetrical frame construction (minimum 9-fold profile) of rolled hollow sections made up from 1.6mm Thickness sheet with holes on a 25mm DIN pitch pattern.

cc. Detachable, split gland plates of 3mm thick sheet steel shall be provided for panels both in the top and bottom.

dd. All live parts shall be shrouded with non–deteriorating insulating barrier to prevent against accidental contact.

ee. Inter connections between MPCB, MCCB, contactors, Drives, Filters etc., in respective feeders shall be carried out with suitable rated wires.

ff. The dimensions of VFD cum switchgear panel for pre-mix station shall be less than 2m height 0.5m depth and 0.8 m width to accommodate switch gears and instrumentation

gg. Panel entry shall be bottom only.

hh. Vendor has to supply and laying all outgoing cables in suitable metal cable tray system.

3.6. Specification of stirrer, Dispenser motor & Up/down motors and VFD

a) The Stirrer motor should be preferably of 750 rpm (synchronous) with suitable gearbox to achieve the specified RPM (70) at the blades.

b) The power rating of Stirrer motor shall be selected in such way that the blades shall be capable of mixing slurry even it is in more viscous condition.

c) The Stirrer motor is powered through VFD for fine end rpm control, however the operating frequency of drive should be kept above 5Hz for meeting rpm at the blades to have better performance of the motor and VFD.

d) All motor capacity should be selected such that current drawn shall not exceed 80% of rated current at full load.

e) Detailed specification of motor and VFD are as follows.

1.	Preferred Makes of motor	ABB/Siemens/Kirloskar/Crompton Greaves/Bharat Bijili/CEMP/ Marathon or equivalent with IS/IEC Standards
2.	RPM	Max 750 RPM preferable for Stirrer motor, Max 1500rpm for dispenser and Up/Down motor.
3.	Motor capacity	Design calculations to be submitted towards arrival of motor power rating and approval to be obtained. Motor power rating shall be next higher rating to the calculated rating.
4.	Motor type	3 Phase Induction Motor
5.	Operating Voltage	415 V ± 10 %, 3 Phase

6.	Operating Frequency	50 Hz ± 5 %
7.	Duty class	Continuous S1
8.	Insulation class	F and temperature rise limited to class B
9.	Connector	Copper conductor cable terminated using gland.
10.	Remarks	The motor shall be suitable for inverter duty operations.
11.	All the motor ratings given are based on internal mechanical design, However, the final requirement is to achieve the specified speed and operational requirements. So the party should ensure the ratings are adequate/suitable and any change required may be adopted with department approval. Ensuring smooth functioning of all components as a system is the responsibility of the party and any change required in this regard to be brought to the notice of department and to be implemented with approval of department.	
SPECIFICATIONS OF VFD :		
1.	Preferred Makes	Siemens/ABB
2.	Main voltage	380-480 V, 3-Phase
3.	Input Frequency	48-63 Hz
4.	Output rating	One size higher standard Drive rating of selected motor full load rating i.e VFD rating shall be next higher power/current rating of the motor)
5.	Overload capacity	150 % for 60 sec
6.	Communication	The communication shall easy compatible to selected PLC/SCADA system.
7.	Digital inputs	6 No's programmable (minimum)
8.	Analog inputs	2 No's programmable (0-10 V, 0-20mA, and -10 to +10 V) (minimum)

9.	Relay outputs	9 No's programmable (minimum)
10.	Analog outputs	2 No's programmable (0-20 mA)/(4-20 mA) (minimum)
11.	Safety guidelines	IEC 61800
12.	Ambient Temperature	Max. 50 ^{0}C
13.	Control requirement	The drive shall be capable to start, stop and for inch operation of the motor. There shall be a provision for speed adjustment of blades through VFD by using soft commands via PLC/HMI. The start, stop and acceleration should not cause any considerable jerk. The VFD shall operate with soft commands via communication in auto mode.
14.	Choke or filter	Input / Output Chokes Shall Be Provided If Required
15.	Operator Panel	Advanced Operator Panel (AOP) of Siemens make or operator panel of ABB make shall be mounted on panel cubicle door for VFD Parameterization and monitoring of drive parameters.
16.	Protections	Protection against input/output phase loss/phase short circuit, under/over voltage, di/dt, inverter protection, heat sink protection etc.,

3.7. Final mix Stations-04 Numbers

3.8. Electrical system of final mix station

Each final mix station consists of following systems

g. VFD cum switch gear panel
h. VFD based Stirrer motor
i. Accelerator pump system
j. Curator pump system
k. Local operating station(LOS2) with HMI
l. Tower lamp(RYG)and Hooter system.

Each final mix Station VFD panel shall consist of following items (Station 1, 2, 3&4 total 4 nos.)

Sl. No.	Description	Rating	Qty.	Preferable Makes
	INCOMER:			

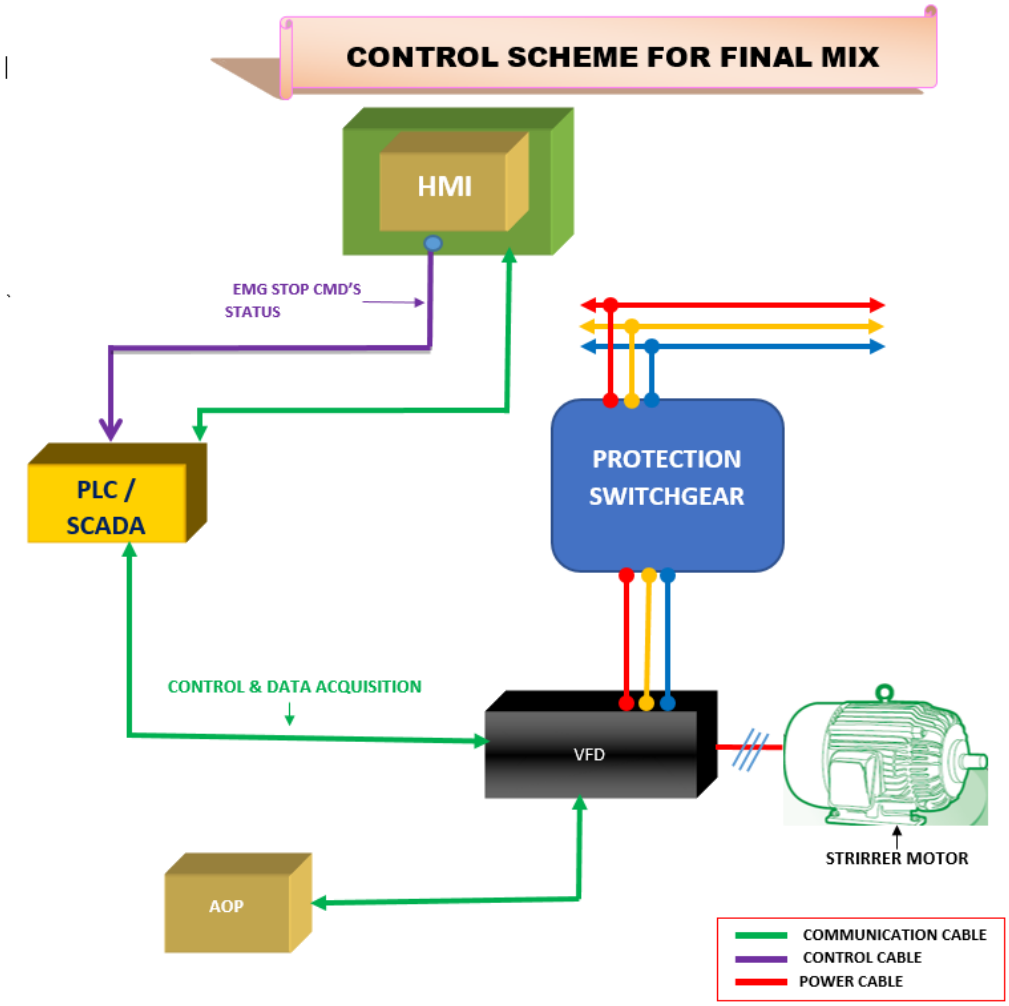
1	35KA,3Pole,MCCB with LSI Protection with adjustable, shunt trip coil (240V AC) & Rotary operating Handle with inbuilt ON/OFF & Trip indication lamps.		1	ABB/Siemens/Schneider/L&T
2	RYB, Incomer on/off trip indications		1set	Siemens/Schneider
3	Microprocessor based ELR with CBCT		1	Prok Dvs
4	Multifunction meter with communication compatible with SCADA		1	Siemens
	OUTGOINGS:			
5	STIRRER MOTOR FEEDER 1: power rating to be arrived by vendor			
6	3P, SDF with semiconductor fuses of suitable rating for stirrer VFD		01 set	Siemens /Eaton /L&T
7	VVVF Drive for stirrer motor (VFD lower rating shall be next higher power/current rating of the motor)		1 No	ABB/Siemens
8	VFD ON, OFF, Trip Indication lamps		1 No	Siemens/ Schneider
9	Advanced operating panel(AOP) for programming, monitoring of VFD	To be arrived by vendor	1 No	ABB/Siemens
	ACCELERATOR PUMP FEEDER 2: power rating to be arrived by vendor(INTELLIGENT TYPE)1phase			
10	3P MPCB for accelerator pump suitable to rated current		1 no	ABB/Siemens/Schneider/L&T
11	2P MCB			ABB/Siemens/Schneider/L&T
12	Power contactor		1 no	Siemens
13	ON, OFF, Trip status shall be taken to PLC as DI		1set	
14	15/5A switch cum socket mounted near to pump control unit		1 No	Reputed make
	CURATOR PUMP FEEDER 3: power rating to be arrived by vendor(INTELLIGENT TYPE) 1Phase			
15	2P MCB		1No	ABB/Siemens/Schneider/L&T (or) Equivalent
16	3P MPCB for Curator pump		1 1no	
17	Power contactor		1 no	Siemens
18	ON, OFF, Trip status shall be taken to PLC as DI		1set	Siemens/ Schneider
19	15/5A switch cum socket mounted near to pump control unit		1 No	Reputed make

3.9. Control philosophy

There are two modes of operation and the mode selection shall by means of Auto/Discrete at HMI located at LOS 1.

A. Auto mode: In auto mode all the operations shall be carried out in auto sequence control via HMI ON/OFF control and speed set point

B. Discrete mode: In Discrete mode the operations shall be carried out individually by using HMI (located at LOS) ON/OFF control and speed set point.



3.10. Local operating station (LOS2,3,4&5) (4 nos.)

Each LOS shall consist the following provisions and switch gears and mounted on each station

S.no	Description of item	Qty	Remarks
1	HMI SCREEN	01no	
2	Emergency stop mushroom PB	01no	Shall trip each station incomer MCCB& status to PLC

3.11. Operating condition of Tower lamp (RYG) and Hooter system (shall be operated through necessary interposing relay and PLC DO)

Tower lamp shall consist of following indication lamps and the operating truth table is as shown

	Lamp Description	Stirrer on condition	Stirrer Off condition	Process On hold
1	Red indication	Glow	No glow	No glow
2	Yellow indication	No glow	No glow	Glow
3	Green indication	No glow	Glow	No glow

The Hooter system shall give alarm whenever process start and shall be acknowledged by means of HMI both auto and Discrete mode.

3.12. General specifications for VFD cum Switchgear panel, LOS

a. The LOS shall be mountable to final mix unit and VFD cum Switchgear panel shall be mounted backside bottom of final mix unit.
b. All panels are metallic enclosures and shall be dust and vermin proof.
c. Doors shall be fitted with concealed hinge to ensure 130 degree opening.
d. Lock shall be of 7mm Triangular Bit Lock insert with key
e. Panel Should comply to IP54. Partial doors, Covers are PU Foamed (mixture of polyol and isocyanate) integrated to ensure IP54 of Ingress Protection.
f. All contacts / terminals of the switchgear components shall be wired to the terminal block.
g. Detachable, split gland plates of 3mm thick sheet steel shall be provided for panels both in the top and bottom.
h. The panels shall have Powder Coating with SIEMENS Grey RAL 7032 / 7035 over the exterior side of the panel.
i. The design shall ensure that the weight of the components is adequately supported without deformation or loss of alignment during transit or during operation.
j. Each feeder shall be provided with suitable name plate showing feeder name with rating as given in the bill of quantities table. Name plates should be made of aluminum black enamel painted and names should be engraved and screw fixing type. Inscription shall also be provided for illuminated push buttons, meters, operating handles and panel opening lock
k. Panel lighting shall be provided and it shall be LED lamps only. The same needs to be controlled with panel door open / close limit switch
l. Provision for connection to the plant earth grid shall be provided at both the ends of the panel.
m. Panel Control wiring shall be carried out with minimum 1.5 Sq. mm sizes of 660/ 1100V grade multi strand single core copper flexible wires.

n. Tube Insulated copper lugs shall be used for terminating the control wires.
o. Party shall engage panel manufacturer, obtain and submit GA Drawing, power and control circuit drawings, including selection of switchgear ratings, control drawing, Bill of material for Dept. Approval prior to start of fabrication.
p. The panel shall undergo functional checks, HV test, Dielectric strength checks, Dimensional checks and other qualification tests as per standards at panel manufacturer works in the presence of the Department.
q. The panels shall be designed for operation in high ambient temperature up to 50°C, high relative humidity up to 95% and tropical atmospheric condition.
r. Rubber mats of 2m X 1m, 11 kV grade shall be provided for the complete length of all the panels (the panels which are in the scope of supplier) both in front and back side such that persons stand on rubber mats during maintenance.
s. The vendor shall supply documents consisting of as built drawings (power & control drawings, cable schedule), catalogue of all bought out electrical items, VFD Parameterization Details.
t. Panel cubical keys, Handles, interlock keys, are to be handed over to department during supply.
u. The party should incorporate all changes / modifications / rectifications suggested by Department after verifying Drawings and bill of materials.
v. Any specification deviations required on technical grounds or non-availability of specified items have to be brought to the department notice; changes in these regards shall only be acceptable with the approval of the department
w. Any item not specified but required for satisfactory functioning and integration of the total system to be considered and included by the party and demonstrating the total functionality of the system as specified is the responsibility of the party.
x. Panel shall be front operated indoor cubicle type floor mounting suitable for operation on 3-Phase, 4 wire 415V ± 10%, 50Hz ± 3% AC supply.
y. The panel should be designed, manufactured and tested in accordance with IS 8623(Pt1), IS 13947(Pt4/Sec1) and as per the specifications issued by us.
z. Enclosure symmetrical frame construction (minimum 9-fold profile) of rolled hollow sections made up from 1.6mm Thickness sheet with holes on a 25mm DIN pitch pattern.
aa. Detachable, split gland plates of 3mm thick sheet steel shall be provided for panels both in the top and bottom.
bb. All live parts shall be shrouded with non–deteriorating insulating barrier to prevent against accidental contact.
cc. Inter connections between MPCB, MCCB, contactors, Drives, Filters etc., in respective feeders shall be carried out with suitable rated wires.
dd. The dimensions of VFD cum Switchgear panel for final mix station shall be less than 0.8 m height,1 m width and 0.85 m depth and final mix station (2.0 m height, 1.2 m width and 0.80 m depth) backside area can be used for accommodating final mix switchgears and instrumentation system also.

ee. Final mix station power has to be tapped from nearby (5 mtr away) available MCCB DB with suitable cable

ff. Vendor has to supply and laying all outgoing cables in suitable metal cable tray system

3.13. Specification of stirrer motor and VFD

a) The Stirrer motor should be preferably of 750 rpm (synchronous) with suitable gearbox to achieve the specified RPM (130) at the blades.

b) The Stirrer motor is powered through VFD for fine end rpm control, however the operating frequency of drive should be kept above 5Hz for meeting rpm at the blades to have better performance of the motor and VFD.

c) All motor capacity should be selected such that current drawn shall not exceed 80% of rated current at full load.

d) Separately excited, cooling fan for stirrer motor which rotates full speed irrespective of motor speed is desirable.

Detailed specification of motor and VFD are as follows.

1.	Preferred Makes of motor	ABB/Siemens/Kirloskar/Crompton Greaves/Bharat Bijili/CEMP/ Marathon or equivalent with IS/IEC Standards
2.	RPM	Max 750 RPM preferable for Stirrer motor,
3.	Motor capacity	Design calculations to be submitted towards arrival of motor power rating and approval to be obtained. Motor power rating shall be next higher rating to the calculated rating.
4.	Motor type	3 Phase Induction Motor
5.	Operating Voltage	415 V ± 10 %, 3 Phase
6.	Operating Frequency	50 Hz ± 5 %
7.	Duty class	Continuous S1
8.	Insulation class	F and temperature rise limited to class B
9.	Connector	Copper conductor cable terminated using gland.
10	Remarks	The motor shall be suitable for inverter duty operations.
11	All the motor ratings given are based on internal mechanical design, However, the final requirement is to achieve the specified speed and operational requirements. So the party should	

	ensure the ratings are adequate/suitable and any change required may be adopted with department approval. Ensuring smooth functioning of all components as a system is the responsibility of the party and any change required in this regard to be brought to the notice of department and to be implemented with approval of department.	
SPECIFICATIONS OF VFD :		
1.	Preferred Makes	Siemens/ABB
2.	Main voltage	380-480 V, 3-Phase
3.	Input Frequency	48-63 Hz
4.	Output rating	One size higher standard Drive rating of selected motor full load rating i.e VFD rating shall be next higher power/current rating of the motor)
5.	Overload capacity	150 % for 60 sec
6.	Communication	The communication shall easy compatible to selected PLC/SCADA system.
7.	Digital inputs	6 No's programmable (minimum)
8.	Analog inputs	2 No's programmable (0-10 V, 0-20mA, and -10 to +10 V) (minimum)
9.	Relay outputs	9 No's programmable (minimum)
10	Analog outputs	2 No's programmable (0-20 mA)/(4-20 mA) (minimum)
11	Safety guidelines	IEC 61800
12	Ambient Temperature	Max. 50 ^{0}C
13	Control requirement	The drive shall be capable to start, stop and for inch operation of the motor. There shall be a provision for speed adjustment of blades through VFD by using soft commands via PLC The start, stop and acceleration should not

		cause any considerable jerk. The VFD shall operate with soft command via communication in auto mode/discrete mode.
14	Choke or filter	Choke/Filter of suitable rating to limit THD if required.
15	Operator Panel	Advanced Operator Panel (AOP) of Siemens make or operator panel of ABB make shall be mounted on panel cubicle door for VFD Parameterization and monitoring of drive parameters.
16	Protections	Protection against input/output phase loss/phase short circuit, under/over voltage, di/dt, inverter protection, heat sink protection etc.,

3.14. DATA LOGGING AND DISPLAY OF DATA

There shall be provision to display of following data as per mentioned table in both premix and final mix stations HMI.

PREMIX STATION SCADA DISPLAY PARAMETRES					
S.NO	DESCRIPTION	DATA TYPE	ADDRESS	FEEDER	
1	MOTOR OUTPUT CURRENT	ANALOG	COM	STIRRER	
2	MOTOR OUTPUT FREQUENCY	ANALOG	COM	STIRRER	
3	MOTOR OUTPUT VOLTAGE	ANALOG	COM	STIRRER	
4	MOTOR OUTPUT RPM	ANALOG	COM	STIRRER	
5	STIRRER SHAFT RPM	ANALOG	COM	STIRRER	
6	VFD HEALTHY	DIGITAL	COM	STIRRER	
7	VFD TRIP	DIGITAL	COM	STIRRER	
8	MOTOR OUTPUT CURRENT	ANALOG	COM	UP/DN MOTOR	
9	MOTOR OUTPUT FREQUENCY	ANALOG	COM	UP/DN MOTOR	
10	MOTOR OUTPUT VOLTAGE	ANALOG	COM	UP/DN MOTOR	
11	MOTOR OUTPUT RPM	ANALOG	COM	UP/DN MOTOR	
12	VFD HEALTHY	DIGITAL	COM	UP/DN MOTOR	
13	VFD TRIP	DIGITAL	COM	UP/DN MOTOR	
14	MOTOR OUTPUT CURRENT	ANALOG	COM	DISPENS PUMP	
15	MOTOR OUTPUT FREQUENCY	ANALOG	COM	DISPENS PUMP	
16	MOTOR OUTPUT VOLTAGE	ANALOG	COM	DISPENS PUMP	

17	MOTOR OUTPUT RPM	ANALOG	COM	DISPENS PUMP	
18	VFD HEALTHY	DIGITAL	COM	DISPENS PUMP	
19	VFD TRIP	DIGITAL	COM	DISPENS PUMP	
20	INCOMNG VOLTAGE AVERAGE	ANALOG	PAC	PANEL	
21	STATUS OF ESTOP	DIGITAL	ESTOP	PANEL	
22	SPARE	ANALOG		PANEL	
23	SPARE	ANALOG		PANEL	
24	SPARE	DIGITAL		PANEL	
25	SPARE	DIGITAL		PANEL	

EACH FINAL MIX STATION SCADA DISPLAY PARAMETRES

S.NO	DESCRIPTION	DATA TYPE	ADDRESS	FEEDER	
1	MOTOR OUTPUT CURRENT	ANALOG	COM	STIRRER	
2	MOTOR OUTPUT FREQUENCY	ANALOG	COM	STIRRER	
3	MOTOR OUTPUT VOLTAGE	ANALOG	COM	STIRRER	
4	MOTOR OUTPUT RPM	ANALOG	COM	STIRRER	
5	STIRRER SHAFT RPM	ANALOG	COM	STIRRER	
6	VFD HEALTHY	DIGITAL	COM	STIRRER	
8	VFD TRIP	DIGITAL	COM	STIRRER	
9	INCOMNG VOLTAGE AVERAGE	ANALOG	PAC	PANEL	
10	STATUS OF ESTOP 1	DIGITAL	ESTOP	PANEL	
11	STIRRER MOTOR ON	DIGITAL	COM	STIRRER	
12	STIRRER MOTOR OFF	DIGITAL	COM	STIRRER	
13	SPARE	ANALOG		PANEL	
14	SPARE	DIGITAL		PANEL	

3.15. SPECIFICATION OF SWITCHGEARS FOR BOTH PREMIX AND FINAL MIX STATIONS

	MCCB	
1.	Maximum rated current (In max)	Standard Rating Incomer Feeder- 150% Rated Current Motor Loads-150% Rated Current Other loads-125% Rated Current

2.	Rated short circuit breaking capacity Ics(=Icu)	35kA for incomers and main feeder switches
3.	Rated insulation voltage Ui	1000V
4.	Rated operational voltage Ue	690V
5.	Adjustable Settings	Adjustable LSIG Protection features for Main Incomer and adjustable LIG Protections for outgoings
6.	Standard	Circuit breakers shall comply with the following standards: IEC 60947-2 IEC 60947-1 Isolating features in accordance with IEC 60947-3
7.	Over current release features	Overload protection (L-tripping), Short time delay short circuit protection(S-tripping), Instantaneous short-circuit protection (i-tripping), Neutral conductor protection (N-tripping), Earth fault tripping. Load monitoring, short circuit protection and overload protection switchable to I2t.
8.	Auxiliary releases	Shunt trip, closing coil, Signalling switch
9.	Model	Latest series meeting the above specification
10.	Make	ABB/Siemens/Schneider/L&T (or) Equivalent
11.	Specifications of Switch Gear – MPCB	
12.	Maximum rated current (In max)	Standard rating higher than 120% of the name plate current.
13.	Rated short circuit breaking capacity Ics(=Icu)	25kA or higher

14.	Adjustable Settings	Adjustable over load protection & instantaneous short circuit protection
15.	Standard	IEC60947-2, IEC60947-4-1
16.	Releases	Relay Function
17.	Aux Contacts	1NO + 1NC
18.	Add ons	Additional 1NO+1NC, short circuit signaller with 1NO+1NC (Preferable)
19.	Model	Latest series meeting the above specification
20.	SPECIFICATIONS OF SWITCH GEAR – MCB	
21.	Maximum rated current (In max)	Standard rating higher than 120% of the calculated maximum current.
22.	Rated short circuit breaking capacity Ics(=Icu)	10kA or better
23.	Rated operational voltage Ue	415V
24.	Standard	Circuit breakers shall comply with the following standards: IEC 60898-1 or IS 8828
25.	Curve	C Curve for highly inductive loads
26.	Model	Latest series meeting the above specification
27.	Make	As per List of suggested makes sr.no 10.0
28.	SPECIFICATIONS OF SWITCH GEAR – CONTACTOR	
29.	Maximum rated current (In max)	Standard rating higher than 200% of the calculated maximum current. AC3 current rating at 415V to be considered. AC4 for inching operational requirements

		AC1 for resistive loads
30.	Rated short circuit breaking capacity Ics(=Icu)	50KA or better
31.	Rated operational voltage Ue	415V
32.	Control Coil Voltage	230V AC
33.	Standard	IEC 60947, IS13947
34.	Aux Contacts Required	2NO + 2NC (minimum)
35.	Model	Latest series meeting the above specification
36.	Make	M/s Siemens
37.	SPECIFICATIONS OF SWITCH GEAR – AUX CONTACTOR	
38.	Control Coil Voltage	230V AC
39.	Standard	IEC 60947, IS13947
40.	Aux Contacts Required	4NO + 4NC
41.	Model	Latest series meeting the above specification
42.	Make	M/s Siemens
43.	SPECIFICATIONS OF EARTH LEAKAGE RELAY	
44.	Detail	Microprocessor based Earth Leakage Relay with CBCT of Resin Cast
45.	Model	MPEL-02
46.	Current Range	30 mA – 3000 mA
47.	Current Range Setting	18 steps
48.	Tripping time	0 – 5 sec

49.	Auxiliary Voltage	85 – 275 V AC	
50.	CBCT Type and Size	Resin cast Circular	
51.	Contact rating	8A, 250V AC / 8A 30V DC 2 C/O Contacts	
52.	Mounting	Flush	
53.	Dimensions	96 mm x 96 mm x 70 mm (W x H x D)	
54.	Make	Prok DVs	
55.	SPECIFICATIONS OF MULTI-FUNCTION METER		
56.	The MFM shall be able to retrieve following parameters		
57.	Multi-function Meter Incomer Feeder	Incomer MCCB On/Off Status By using DI in MFM	Voltage L-L, L-N, Current Per phase, Neutral conductor current Active power Per phase and total Power factor Per phase and total Frequency THD voltage Per phase THD current Per phase
58.	SPECIFICATIONS OF POWER AND CONTROL CABLES		
59.	Type	Copper conductor	
60.	Size	Minimum size of Power cable – 4mm2. Minimum size of screened Control cable – 1.5mm2.	
61.	Insulation	LT insulation class 1100 V XLPE insulation IS:7098 sheath are of HR PVC / FRLS / LSZH	
62.	Preferable Makes– 1.1 kV LT Power Cable	CCI / Universal / Finolex / Polycab / IGUS / Gloster / Lapp / KEI / Havells	

63.	Preferable Makes – 1.1 kV LT PVC Control Cable	Finolex / RR Kabel / Gloster / Lapp / KEI / Havells / Polycab / IGUS

3.16. CABLE TRAYS FOR BOTH PREMIX AND FIANL MIX

a) GI Metal Cable trays shall be provided for carrying cable laid inside the facility. Power cables and control cables shall be laid separately in different cable trays
b) Supply and installation of Cable tray is in the scope of the party.

3.17. LIST OF CABLES FOR BOTH PREMIX AND FIANL MIX

a) The quantity of Power & control cables required to meet various interfacing field elements is specified below.

The details are indicative and party shall meet extra cable requirements in case of requirement.

b) The size of the cable should be decided based on the expected highest load in the cable adding 50% cushion.

Calculations arriving the cable sizing should be submitted for approval. Any other cable not listed below but

required for completion of the system/proper working of the system shall be provided by the party without any

additional cost.

S.NO	Cable source and destination	Anticipated Length (m)	
PREMIX STATION			
1	VFD PANEL TO PREMIX STATION	20 MTR	
2	VFD PANEL TO DISPENSER STATION	20 MTR	
3	INCOMER DB TO VFD PANEL	3MTR	
FINAL MIX STATION EACH			
1	INCOMER DB TO FM1,2,3,4 POWER INCOMER	15+15+15+15 MTR	

4. Electronics, Instrumentation and Control System

The EICS Automation proposal for IR1 new project consists of following parts

4.1. Scope of Automation
4.2. Functional Requirements
4.3. Technical requirements
4.4. General terms and conditions
4.5. Technical Specifications and Annexures

4.1. SCOPE of Automation

4.1.1. Supply, Installation, Interfacing, commissioning and testing of Instrumentation & Control System, for five (5) independent process stations, each equipped with a dedicated Micro/Compact/IO-inbuilt PLC and HMI for operation, all 5 PLCs integrated with a common SCADA System for monitoring, Control, data acquisition, alarm management, and Report Generation and interfacing with the corresponding VFD.

4.1.2. Single set of Micro/Compact/IO-inbuilt PLC and HMI for all the 4 Final mix stations and 1 premix station

4.1.3. The scope comprises of following;

- Preparation of detailed engineering drawings
- Supply of items as per datasheets
- Panel wiring, assembly, pre-delivery inspection
- HMI, PLC & SCADA application Programme development
- Packing, forwarding, transportation, unloading at site
- Installation of Instrumentation & Control System and Electrical Systems, interfacing with associated systems viz. field instruments, weighing controller, peristaltic pump., testing & commissioning for the automatic operation of all the five numbers of Mixing stations is in the scope of this contract.

4.1.4. System configuration, 10kg weighing controller elsewhere specified in the document should be interfaced for logging and controlling of the weighted materials.

4.1.5. The scope of supply includes the field devices such as Temperature sensor, Process Transmitter, Proximity switches, valve, Load cells, Weighing Controller, junction boxes if required, I/O Modules, Micro /Compact PLC, and SCADA, work stations, power supplies, PLC racks, control consoles, network switches, cables etc. Detailed specifications and other documents are enclosed

4.1.6. The party should supply and interface the control system with all field elements. The scope of the supplier starts from fixing of field devices, laying of cable to field junction boxes and interfacing to PLC I/O modules with necessary interface elements and connecting to HMI and SCADA through switches.

4.1.7. The process automation system should acquire data from various types of field instruments, weighing systems, VFD etc., with necessary interfaces (hardwired /communication bus) and execute the control as per sequence given in user requirement document (URD) satisfying the necessary interlocks, provide remote operation through HMI, SCADA and where ever required in local control station.

4.1.8. For SCADA PC placement a separate cubical desk will be provided by depart at free of cost to vendor, however supply of SCADA, license and PC is in the scope of party.

4.1.9. Supply of hardware related to Controllers with necessary accessories (interfacing circuitry, cables, relays etc.,) maintenance spares and associated systems and sub-systems etc.

4.1.10. Supply of the necessary Operating system, Application software development tools / environments, standard libraries for process control applications, software packages and supporting tools for the Controller, HMI, SCADA and interface components.

4.1.11. All the installation material required for system commissioning like cable glands, cable trays (Aluminium), lugs, terminal blocks & internal wirings required for realizing the above scope of works are in the scope of Party. Party shall obtain approval prior to procurement of the above items for its make & Model.

4.1.12. All Hardware & Software shall be STATE-OF-THE-ART at the time of delivery.

4.1.13. All the quantities mentioned are indicative and the exact quantity may vary based on the site conditions and process requirements. Supply of any other items which is not explicitly mentioned in the document, but required for meeting the complete functional requirement of the system has to be provided by the supplier without any additional cost.

4.1.14. Preliminary design of the proposed system architecture with associated interfaces must be provided prior to detailed design.

4.1.15. Detailed design of system architecture, power supply distribution, panel internal general arrangements, IO Module allocation, IO module wiring to field devices with interface modules.

4.1.16. Bidder shall obtain clearance for panel engineering drawings, I/O wiring schemes and technical specifications of all the items from Department prior to the commencement of supply, erection and commissioning activities.

4.1.17. The following equipment/ services are not in the scope of the contract: Power Control Centre (PCC), UPS, Instrumentation & power earth pits.

4.1.18. However, UPS power is to be extended to the Instrumentation and Control system from elsewhere in the plant which is approximately 400m away. Supply of 400m cable, earth excavation, laying and termination is in the scope of party.

4.2. Functional Requirements

The Process Automation System for IR1 (Pre-Mix Station and Final Mix Station) shall automate, monitor, control, and record the complete process through dedicated PLC-based control systems, HMIs, and a centralized SCADA/Data Acquisition and Control System (DACS). The system shall perform the following functions:

4.2.1. Process Monitoring & Control

- The process Automation is to be carried out as per the URD, which will be given by the Department after the award of contract.
- The HMI shall provide graphical process mimic screens for complete monitoring and operation of the process.
- The HMI shall provide a password-protected, multi-level user management system with configurable user profiles such as Administrator, Engineer, and Operator.
- The operator shall be able to:
    i. Start, Stop, Reset and Pause the process.
    ii. Select Auto and Discrete operating modes.
    iii. Execute automatic process sequences.

- Operate individual equipment/subsystems in Auto/Discrete mode, subject to safety interlocks.
- Monitor real-time process parameters, equipment status, alarms, and system health.
- The HMI shall display communication status of PLC, remote I/O, weighing systems, and SCADA.
- The load cell controller at premix and final mix station must interface with selected PLC & HMI and meet the accuracy requirements as mention in the mechanical document.
- All pressure transmitter and temperature transmitters logging can be provided

4.2.2. Emergency Shutdown & Safety

- A hardwired Emergency Stop (E-Stop) push button shall be provided at each station. (see electrical section)
- Activation of the E-Stop shall immediately stop all process operations and place the system in a safe state.
- Safety interlocks shall prevent unsafe operation of equipment.
- Process restart after an emergency stop shall require operator acknowledgement and reset.

4.2.3. Pre-Mix Station Functions: The Pre-Mix HMI shall provide facilities for:

- Stirring of the resin container.
- Display of actual resin weight.
- Dispensing operator-defined quantities of resin with high weighing accuracy.
- Discrete and automatic control of the dispensing sequence.
- Display of equipment running, healthy, fault, and completion status.
- Alarm indication for abnormal operating conditions.
- The HMI and local load cell indicator and Emergency Stop (E-stop) can be integrated into same local panel for the convenient operation of the user
- The premix station needs 6 different stages for the stirrer VFD to operate at different speed & for particular time at each stage as per user requirement. To achieve this the premix station can be configured/equipped with 6 proximity sensors integrated to PLC

4.2.4. Final Mix Station Functions: The Final Mix HMI shall provide facilities to:

- Enter the required quantity of Curator and Accelerator.
- Display target weight and actual dispensed weight.
- Start, Stop and Cancel dispensing operations.
- Configure mixing time and mixing sequence.
- Automatically control intelligent peristaltic pumps for accurate dispensing.
- Monitor pump running status, fault status, and completion status.
- Generate alarms for dispensing deviations, communication failures, or equipment faults.

4.2.5. Alarm Management

- The system shall generate visual and audible alarms for abnormal process conditions.
- All alarms shall be time-stamped and recorded.
- Alarm acknowledgement and alarm history shall be available through the HMI and SCADA.

4.2.6. Reporting in SCADA PC

- The system shall maintain batch-wise production records.

- During operation, all critical process parameters, equipment status, alarms, events, and batch information shall be continuously displayed and logged in the SCADA PC.
- The Report screen shall allow retrieval of batch information by selecting from Date/Time and to Date/Time.
- Reports shall include: Batch Number, Recipe details (where applicable) Target quantity, Actual quantity, Mixing time, Batch start/end time, Operator name, Alarm/events during the batch

4.3. Technical requirements

Supply of Automation Hardware

- Supply of Micro PLCs with required CPU, communication ports, and I/O modules as per the annexure-1
- Supply of Bill of materials as per requirements attached in annexure-2
- Supply of operator 12-inch HMIs for each station.
- Supply of Industrial SCADA workstation/software.
- Supply of managed/unmanaged industrial Ethernet switches.
- Supply of communication field sensors, accessories, power supplies, relays, terminals, and interface modules.
- Supply of cables & tray for all field elements, PLC panel wiring, 3rd party device integration, HMI and VFD integration is in supplier scope

The following table gives the requirements tentatively

Parameter	Quantity required (Number)	Purpose
Compact PLC unit and its accessories	5	For premix and final mix
DI 16 channel	12	For premix and final mix
DO 8 channel	12	For premix and final mix
AI 8 channel	12	For premix and final mix
HMI 12 inch	5	For premix and final mix
SCADA PC	1	Entire IR1 mix
8 port Managed network switch	6	For premix and final mix

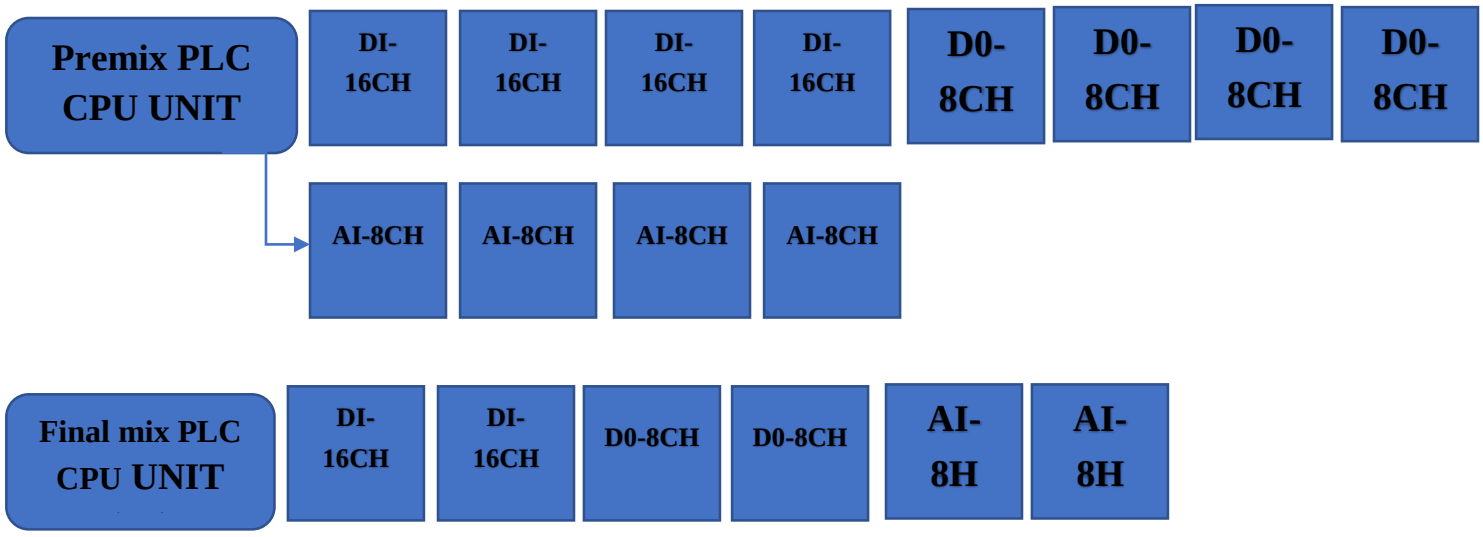
PLC and IO Console

- The premix PLC and its IO can be accommodated in a separate panel.
- The Final mix PLC unit and its corresponding IO can be accommodated under the mechanical structure as shown



Fig.5: IR1 Final Mix System (For understanding only)

Final mix



Tentative PLC Modular setup

PLC Installation and Programming

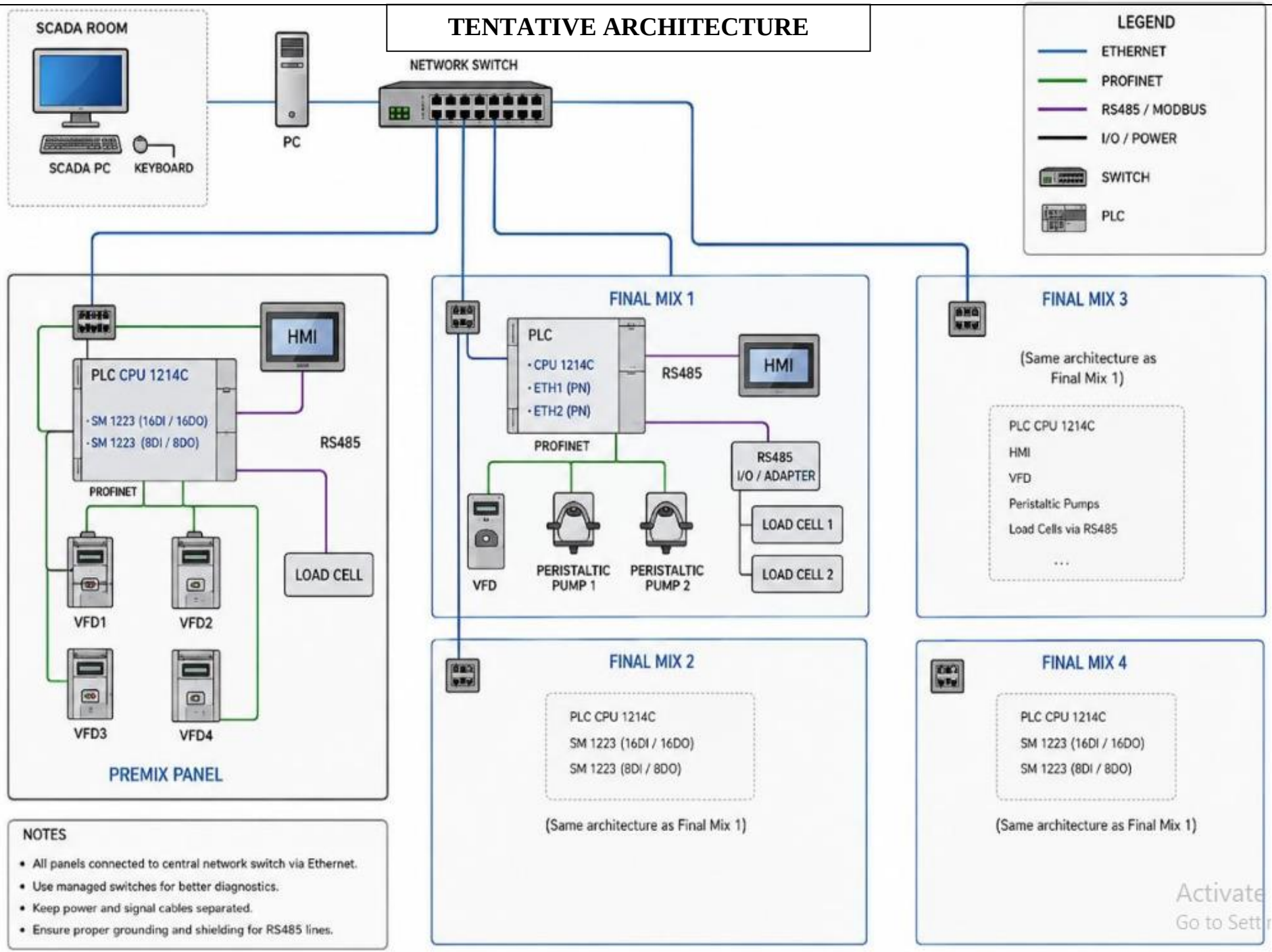
- Supply, installation, testing and commissioning of micro PLC components like CPU's, communication modules, Power supply modules, I/O modules, sensor/transmitter IO link modules, 3rd party interface devices, Motor VFD modules, MCC interface modules and associated PLC accessories all must support Profinet/profibus/or equivalent interface.
- Development of PLC application software and HMI interface for each station.
- Sequential logic, interlocks, permissive, alarms and automatic/Discrete modes.
- Development of communication between all PLCs, HMI and the SCADA system.
- Necessary safety features and interlocks to be provided to ensure the safety of operator and the safety of premix and final mixing stations the alarms or safety actions shall be implemented either from hard-wired switches or process deviations.
- All Digital output modules from PLC can be considered through interposing relay (24VDC)

HMI and SCADA Development

- Development of graphical process screens of minimum 10 number for each HMI station.
- Process monitoring and operation, Alarm annunciation and acknowledgement in all HMI stations.
- Development of a SCADA system common for all five stations.
- Data acquisition from all PLCs, Alarm and event management and Report generation.
- All VFD speed control/adjustment can be achieved through HMI
- System diagnostics and communication status monitoring.

Documentation: Submission of complete documentation including: System architecture, PLC hardware configuration, Network architecture, Software Design document, SOP and I/O List

TENTATIVE ARCHITECTURE



NOTES

- All panels connected to central network switch via Ethernet.
- Use managed switches for better diagnostics.
- Keep power and signal cables separated.
- Ensure proper grounding and shielding for RS485 lines.

Activate
Go to Sett

- PLC shall be provided with Profinet/profibus interface or equivalent ports to interface with VFD driven motors for commanding the electrical equipment's and monitoring of their electrical health parameters as described in Electrical Section. Ring network in Profinet/ Ethernet communication to MCC and VFD shall be provided.
- Separate Local Area Network interface cards for PLC, HMI and to SCADA PC shall be provided.
- HMI & SCADA Systems:
    i. A centralized SCADA system shall be provided for real-time operation, monitoring, data acquisition and logging, alarm management, diagnostics, reporting, and engineering of all 5 stations i.e. Pre-Mix and 4 Final Mix stations.
    ii. Communication between all PLCs, the SCADA PC, and HMIs shall be through a redundant Industrial Ethernet network.
    iii. Dedicated HMIs shall be provided at the Pre-Mix Station and each of the four Final Mix Stations for local operation. All process control shall be performed through the respective local HMIs, while the SCADA shall provide centralized supervision and data acquisition.
    iv. The Bidder shall provide all necessary software licenses for the SCADA PC, Engineering Station, Thin Client HMI, and third-party communication drivers. The SCADA shall support approximately 1024 process tags, including third-party devices, diagnostics, simulation, scaling, and internal tags.
    v. The SCADA/HMI shall support automatic sequence monitoring, process status indication, failure diagnostics, process pause/resume, emergency stop indication, and sequence tracking as defined in the approved Sequence of Operation and URD.
    vi. The SCADA/HMI shall provide user-friendly alarm messages, warning pop-ups, operator guidance, and context-sensitive diagnostic information.
- All field instruments shall be factory calibrated against standards traceable to NIST (or equivalent national/international standards). Valid calibration certificates shall be submitted to the Purchaser. Instrument installation details, including sensor locations, cable/conduit routing, and termination arrangements, shall be submitted for Purchaser approval prior to installation.

4.4. General Terms and conditions

- The Bidder shall obtain Purchaser approval for panel engineering drawings, GA drawings, I/O lists, wiring diagrams, network architecture, and technical specifications before commencing procurement, manufacturing, installation, or commissioning.
- Any hardware, software, accessories, licenses, cables, connectors, or miscellaneous items not explicitly specified but required for complete, safe, and reliable operation of the system shall be deemed within the Bidder's scope without additional cost.
- Major bought-out items such as PLC, SCADA, networking equipment, and software shall be reviewed and validated by the respective OEM. Any incompatibility, interface, or performance issues identified during execution shall be rectified by replacement or modification at no additional cost.

- The Bidder shall provide OEM-certified training for five Purchaser engineers covering PLC, SCADA, communication networks, diagnostics, interfacing, programming, operation, and maintenance.
- The Bidder shall submit FAT procedures for approval and arrange all required test facilities. FAT shall include verification of:
    i. Bill of Materials
    ii. Functional performance
    iii. Compliance with specifications
    iv. PLC/SCADA software
    v. Communication networks
    vi. I/O simulation
    vii. Load and burn-in tests
    viii. Diagnostics
    ix. Alarm, event, historical logging, and report generation
- The following shall be offered for FAT inspection:
    i. PLC & SCADA systems
    ii. Engineering Station and HMIs
    iii. Control panels and consoles
    iv. 24 VDC power supplies
    v. Network equipment
    vi. All cables
- Installation shall commence only immediately after receipt and acceptance of the items at SHAR
- The Bidder shall submit SAT procedures for approval. SAT shall include:
    i. Bill of Materials verification
    ii. Functional and performance tests
    iii. End-to-End I/O checks
    iv. Calibration verification
    v. PLC & SCADA validation
    vi. Communication and diagnostics verification
    vii. Alarm, event, historical logging and reporting
    viii. Trial runs under normal and abnormal operating conditions
- During the warranty period, the Bidder shall provide unlimited breakdown support, and replacement/repair of defective hardware or software at no additional cost.
- The Bidder shall submit three soft copies and one hard copy of:
    i. As-built drawings
    ii. Software (PLC, HMI & SCADA) projects and source files
    iii. Test procedures and FAT/SAT reports
    iv. Final BOM with make and model
    v. Technical catalogues and datasheets
    vi. Warranty certificates
    vii. Software licenses, passwords, and license keys
    viii. Backup of complete application software
    ix. Any other documents required for operation and maintenance
- The following items are excluded from the Bidder's scope unless otherwise specified:
    i. Earth pits

ii. Telephone systems
iii. Wireless communication systems

- One color laser printer cum scanner shall be supplied for printing reports, trends, alarms, and historical records.

4.5. TECHNICAL SPECIFICATIONS

SCADA PC

Description	Specifications
Manufacturer	HP / DELL
Processor	Intel i9 or more.
Hard disk capacity	1TB SATA HDD.
Memory (RAM)	32 GB ECC DDR4 RAM or Latest
Drive controller	Integrated or add-on SATA controller.
Network Interface card	2 x 1Gbps.
Removable media	Blue ray disc drive.
Graphics	8 GB graphics card with quad HDMI.
Cables	HDMI cables are to be provided.
Expansion slots	One slot for graphics and two slots free.
I/O ports and connectors	4 Nos. USB
Power supply	230V AC, 50Hz Indian power cords to be supplied.
Operating system	Licensed version of Windows 11 (64 bit) or latest (Compatible with SCADA version).
Software to be supplied and loaded on system.	MS Office 2016 or latest. Licensed and Latest version of 'adobe acrobat' read & write software. System management, drivers and utilities software to be provided.
Monitor	27" - LED Supported resolution 1920x1080 and above.
Keyboard	Standard qwerty full stroke type
Optical Mouse	Standard with scroll.
CDs for all software & drivers	Required.
Quantity	1 Nos.

PLC Specifications

Compact PLC Technical Specifications	
SL.No.	Type: Compact Modular PLC
1	Power Supply: 24 V DC
2	Built-in Digital Inputs: Minimum 14 × 24 V DC
3	Built-in Digital Outputs: Minimum 10 × 24 V DC (Transistor)
4	Built-in Analog Inputs: Minimum 2 × 0–10 V
5	User Program Memory: Minimum 150 KB
6	Load Memory: Minimum 4 MB
7	Retentive Memory: Minimum 14 KB
8	Process Image: Minimum 1024 bytes Input and 1024 bytes Output
9	Ethernet Communication: Minimum 1 × PROFINET (10/100 Mbps RJ45)
10	Expansion Capability: Minimum 8 Signal Modules (SM), Minimum 3 Communication Modules (CM), Minimum 1 Signal Board (SB)
11	High-Speed Counters: Minimum 6 channels (up to 100 kHz)
12	Pulse Outputs (PTO/PWM): Minimum 4 channels (up to 100 kHz)
13	Operating Temperature: 0°C to +55°C minimum (or better)
14	Relative Humidity: Up to 95%, non-condensing
15	Certifications: CE, UL, RoHS
16	Industrial Communication Protocols: profinet, Modbus TCP/IP, OPC UA (where supported)
17	Integrated PROFINET Controller and Device
18	Online diagnostics and firmware upgrade through Ethernet
19	Password protection and access-level security
20	SD/Memory Card support for program backup and restore
21	Integrated PID Controller and Integrated Motion Control
22	Native Integration with HMI, Drives, and SCADA

Preferred Make: **Siemens or equivalent**
Preferred Model: **SIMATIC S7-1200 CPU 1214C DC/DC/DC (or approved equivalent meeting all the above specifications).**

SCADA software

Description	Essential Specifications
Manufacturer	WinCC 7.5 or TIA portal or equivalent
SCADA package	Basic + 1024 tags with run time and configuration.
Type	Data acquisition, Control & Process monitoring.
Operating system	Windows latest edition
Graphical user interface	Man-Machine Interface (MMI)/ Human Machine Interface (HMI)
License	Supply of Run-time licenses suitable for operator and HMI stations including all related.
Quantity	1

Field Operator Station – HMI

Parameter	Specification
Screen Size	12 inch
Display Type	TFT LCD
Aspect Ratio	Widescreen
Resolution	1280 × 800 pixels
Active Display Area	261.1 × 163.2 mm
Colors	65,536 (16-bit)
Product	SIMATIC HMI KTP1200 Basic PN or equivalent
Order No.	6AV2123-2MB03-0AX0
Series	Basic Panel (2nd Generation)
Engineering Software	WinCC Basic / TIA Portal or equivalent
Communication	PROFINET (Ethernet)
Baud Rate	10/100 Mbps
Program Memory	Minimum 512 MB
Data Memory	Minimum 256 MB

Parameter	Specification
Operating Voltage	24 V DC
Mounting	Panel Mount
USB Memory Stick	Supported
Quantity	6 (5 +1 spare)

Specification of 24 V DC power supply (DCPS)

Description	Essential Specification
Make	Siemens or equivalent
Input voltage	230V AC±10%,50Hz
Output voltage	Nominal output voltage 24 V DC ±1 % Setting range of the output voltage with (U Set) 18 V DC ... 29.5 V DC (> 24 V DC, constant capacity restricted)
Output current	20A
Output power	480 W
Typical response time	< 0.6 s
Residual ripple	< 30 mVPP (with nominal values)
Efficiency	> 93 % (for 230 V AC)
Quantity	10

Non-contact temperature sensor

Description	Essential Specification
output	4-20 mA
Temperature Range	-20 to +100 °C
Accuracy	±1% of reading or ±1°C, whichever is greater
Repeatability	± 0.5% of reading or ± 0.5°C, whichever is greater
Supply Voltage	6 V DC to 28 V DC
Response Time	240 ms (90% response)
Quantity	8 number

Specification of the Network switch

Description: 8 channel managed Layer 2 IE Switch 8x 10/100 Mbit/s RJ45 ports, diagnostics LED, redundant power supply, temp. range 0 °C to+60 °C

Quantity: 6 number

Photo sensor for object detection (plastic container)

Description: A capacitive sensor or IR type plastic object detector for ±5mm target which can be compatible to integrate with PLC

Tentative Bill of materials and quantity

S.No	Premix BOM	Qty
1.	Main Panel (Combined for both electrical and instrumentation)	1
2.	Local Panel near dispense system (H600*W700*D150)	1
3.	SMPS TRIO - 24VDC 20A	2
4.	Oring Module TRIO2 - DIODE 24VDC / 2*20A	1
5.	PLC CPU	1
6.	PLC IO Module –DI 16 channel prefer	4
7.	PLC IO Module-DO 8 channel prefer	4
8.	PLC IO Module-AI 8 channel prefer	4
9.	16 channel relay board for DO modules	2
10.	RS485 Adapter card	1
11.	12 inch HMI	1
12.	230V Relay 2NO+2NC	4
13.	Pressure transmitter (0-10 bar)	1
14.	Ethernet Switch-8 Port	1
15.	10 KG Load cell	1
16.	Load cell Indicator and Transmitter	1
17.	Metal Proxy Sensor 12mm	6
18.	Photo sensor for 1.5 kg container sensing	1
19.	Non-contact temperature sensor	1
20.	Lid closure proximity sensor at premix	1
21.	Laser color printer	1

S.No	Final Mix BOM for One Station	Qty
1.	PANEL : 2000 (H)x1200(W)x400 (can utilize mechanical structure)	1
2.	SMPS TRIO - 24VDC 20A	2
3.	Oring Module TRIO2 - DIODE 24VDC / 2*20A	1
4.	PLC CPU Module	1
5.	PLC IO Module – DI 16 channel	2

6.	PLC IO Module – DO 8 channel	2
7.	16 channel relay board for DO modules	1
8.	RS485 Adapter card	1
9.	12" HMI	1
10.	Ethernet Switch 8 Channel - Rail Mount	1
11.	Non-contact temperature sensor	1
12.	Load cell Transmitter	2

Note: Above BOM is for one station only. However, items shall be supplied for four final mix stations as per the tender document.

S.No	Spares	Station	Qty
1.	Compact PLC	Premix & Final mix	1
2.	12-inch HMI	Premix & Final mix	1
3.	Pressure transmitter	Premix & Final mix	1
4.	Photo sensor	premix	1
5.	Non-contact temperature sensor	Premix	1
6.	Other electronic and Panel accessories	Premix & Final mix	As per PO

PREFERRED MAKES

Name of the Item	Preferred Makes
PLC & IO Modules	SIEMENS or equivalent
SCADA	TIA PORTAL SIEMENS or equivalent
Network Switch for Automation network	SIEMENS/antaira or equivalent
SCADA work station	HP / Dell or equivalent
PLC CPU Power supply	Siemens or equivalent
24 V DCPS	Siemens /Aplab or equivalent
Pressure Transmitter	Rosemount/ Honeywell/ Siemens
Panels & Junction boxes	Rittal or equivalent
Power, Signal Cables & Control Cables	Lapp /Uniflex / Thermocables / Delta / Paramount cables
Terminal Blocks/Fuse TBs	Pheonix/Wago
Armoured CAT6 / 7 cable	D link or equivalent
Pneumatic Solenoid valves	Gemu/Asco/Festo
Non-contact temp measurement sensor	Calex/Wika/Rosemount/ Siemens/eurotherm

Factory Acceptance Test (FAT)
(Pre-delivery inspection at bidder's site)

And

Site Acceptance Test (SAT)
(After installation at Department's site)

- Factory Acceptance Test (FAT) procedure document (verification of BOM, functional checks, compliance to specifications, load test, software testing, diagnostics data, alarms and report generation check etc.,) shall be submitted to department for review and approval.
- The following items will be inspected by department at factory before dispatch (FAT), necessary test set up and test equipment's shall be arranged by supplier:
  - Premix station and Final mix stations
  - Pumps & stirrers
  - All panels, Junction boxes & instruments.
  - PLC & SCADA systems assembled as per system configuration
  - 24V DC power supply modules.
  - Operation of 1 premix & 4 final mix stations as per the approved sequence.
- The complete premix and final mix operational trials shall be carried out during FAT
  - Operation of Premix (1 station), Final mix (4 stations) as per the approved sequence and shall meet the timing requirement specified.
  - Simulation of all possible failure modes/ safety interlocks and trials on contingency procedures shall be carried out.
  - Trials with dummy material and actual IR-1 materials shall be carried.
  - Chemical and materials for trials will be provided by department and not in the scope of bidder.
- SAT (Site Acceptance Test) procedure document shall be shall be submitted to department for review and approval

S.no	Description	Test shall be carried out
i.	Premix station:	Factory acceptance test a) Individual component performance b) No load / Dry run test. (Drum loading, lifting, stirrer mixing, batching) c) Different mixing duration at constant RPM when different stirrer heights immersed in IR1 premix during drum lifting. d) Trial run with (water and IR1 premix) Site acceptance test: e) Individual component performance f) No load / Dry run test. (Drum loading, lifting, stirrer mixing, batching) g) Different mixing duration at constant RPM when different stirrer heights immersed in IR1 premix during drum lifting. h) Trial run with IR1 premix (Premix loading, mixing, recirculation, batching and final weighment) i) Premixed & weighed material has to be evaluated for Homogeneity test- Solid content %
ii.	Final mix station:	Factory acceptance test

		a) No load / Dry run test. b) Functioning of PLC, software and sub system c) All station operation in discrete and auto mode with IR1 chemicals (Chemicals addition, Mix sequence & mix cycle) Site acceptance test (After Erection, commissioning) a) Functioning of PLC and software and sub system b) No load / Dry run test (Mix sequence & mix cycle) all stations. c) After fixing all the process parameter all the four station performance checks. d) Trial run with IR1 premix, Curator & accelerator (Performance of IR1 final mix system) e) Final mix qualification: Flow trial, mechanical properties & porosity sample evaluation. f) Peristaltic pump performance and accuracy compared with feed container weighing system. g) Station wise interlocks. h) Demonstration of failure cases with contingency
iii.	Electrical system	Factory Acceptance Test (FAT): a) HV test, IR test, functional checks, performance checks of all in built safety systems like OL, SC, earth fault tripping etc shall be carried out at factory, necessary arrangements shall be prepared by bidder. b) Communication capability for all the switch gears, intelligent modules, VVVF drives, MF meters are to be demonstrated for its functionality as per the department requirement. Site Acceptance Test (SAT): a) All the feeders need to be tested as per the tender configuration and functionality. b) Similarly, for VVVF Drive, functionality to be ensured for both status and command as exercised based on the department requirement. c) Any relevant qualification test as per the procedure followed during testing of i-MCC panels at SDSC SHAR.

BILL OF MATERIALS

Table-2. BOM of Mechanical System

Mechanical systems		
S.no.	Item	Qty. (nos.)
	Premix mix station – 1 no.	
1.	Mechanical structure for premix station (As per the drawing: Fig.6)	01
2.	Premix processing drum (as per the given dimensions)	01
3.	Premix Stirrer Electric motor	01
4.	Premix stirrer Gear box	01
5.	Stirrer (3 bladed) (as per attached drawing. Fig. 7)	01
6.	Premix bench lifter (Screw jack) with electric motor	01
7.	Gear Pump with electric motor (for premix dispensing)	01
8.	3-Way Recirculation valve	01
9.	Air cylinder for premix (25 mm stroke)	01
10.	Weighing balance with load cell 5 kg. (For IR1 premix dispensing)	01
11.	Pressure gauge (0-16 bar)	02
12.	Pressure switch (0-10 bar)	01
13.	Air FRL unit; 10 Bar	01
	Final mix station – 4 nos.	
1.	Mechanical structure for Final mix stations (As per the drawing: Fig. 4)	04
2.	Pneumatic cylinder-1 (Container Up/down)	04
3.	Pneumatic cylinder-2 (Container Hold/ Release)	04
4.	Electric motor with gear box (for stirrer)	04
5.	Stirrer for final mix as per Fig.8	04
6.	Intelligent Peristaltic pumps (Curator & Accelerator)	08
7.	Weighing balance with load cell 10 kg. (For Curator)	04
8.	Weighing balance with load cell 3 kg. (For Accelerator)	04
9.	Pressure gauge (0-16 bar)	04
10.	Pressure switch (0-10 bar)	04
11.	Air FRL unit; 10 Bar	04
12.	Silicone Rubber/ Viton hose OD:8 mm X ID: 5 mm (400 metres)	01
	Spares List	
13.	Stirrer (3 bladed) (as per attached drawing. Fig. 7)	01
14.	Stirrer for final mix as per Fig.8	01
15.	Gear Pump (for premix dispensing)	01
16.	3-Way Recirculation valve	01
17.	Pneumatic cylinder for premix	01
18.	Weighing balance with load cell 5 kg. (For IR1 premix dispensing)	01
19.	Pressure gauge (0-16 bar)	02
20.	Pressure switch (0-10 bar)	01
21.	Pneumatic cylinder-1 (Container Up/down)	02
22.	Pneumatic cylinder-2 (Container Hold/ Release)	02
23.	Pressure gauge (0-16 bar)	02
24.	Pressure switch (0-10 bar)	02

Table 3. BOM of Electrical System

Sl. No.	Electrical System	Qty (lot)
1	Electrical drives, MCC panel containing necessary power supply, protection and control system for stirrer, peristaltic pumps and for any other system if required, Electrical cables, Contactors, Starters along with required accessories to interface with PLC for remote monitoring & operations. (As per the specifications under heading: 3, Electrical System For IR1 Pre-Mix And Final Mix Stations)	1

Table 4. BOM of Instrumentation & Control System

Sl. No	EICS	Qty (lot)
1.	As per the specifications under heading:4, EICS System	1

Table.5. OVERALL SCOPE OF THE BIDDER

Party has to comply the following requirements as per the below table as part of the tender document

Sl.NO	Description	Vendor compliance
1	Party shall supply Premix Station-1 no. & Final Mix Station-4 nos. with associated Mechanical, Electrical, Instrumentation & Control System Equipment as per the tender specifications	
2	Party shall prepare as-built drawings (Mechanical, Electrical and Instrumentation) of the entire system and obtain prior approval before proceeding with manufacturing/ fabrication	
3	Party shall get/ obtain clarifications from the indenter on the system configuration, functional requirement (mechanical, electrical & Instrumentation), safety interlocks and simulation of failure modes	
4	Party shall offer for PDI for carrying out FAT including functional checks of the (premix & final mix) systems for demonstrating process trails using dummy material/ IR1 (IR1 material will be supplied by the department)	
5	Party shall transport the items to the site damage-free with proper packing	
6	Party shall carry out erection, testing, process qualification trails using IR1 and commissioning as part of SAT	
7	Party shall provide necessary training to operational, electrical and instrumentation teams on the operations and maintenance of the systems	
8	Party shall provide critical spares as per the tender document	
9	Party shall comply BOM and all the requirements as mentioned in the tender doc.	

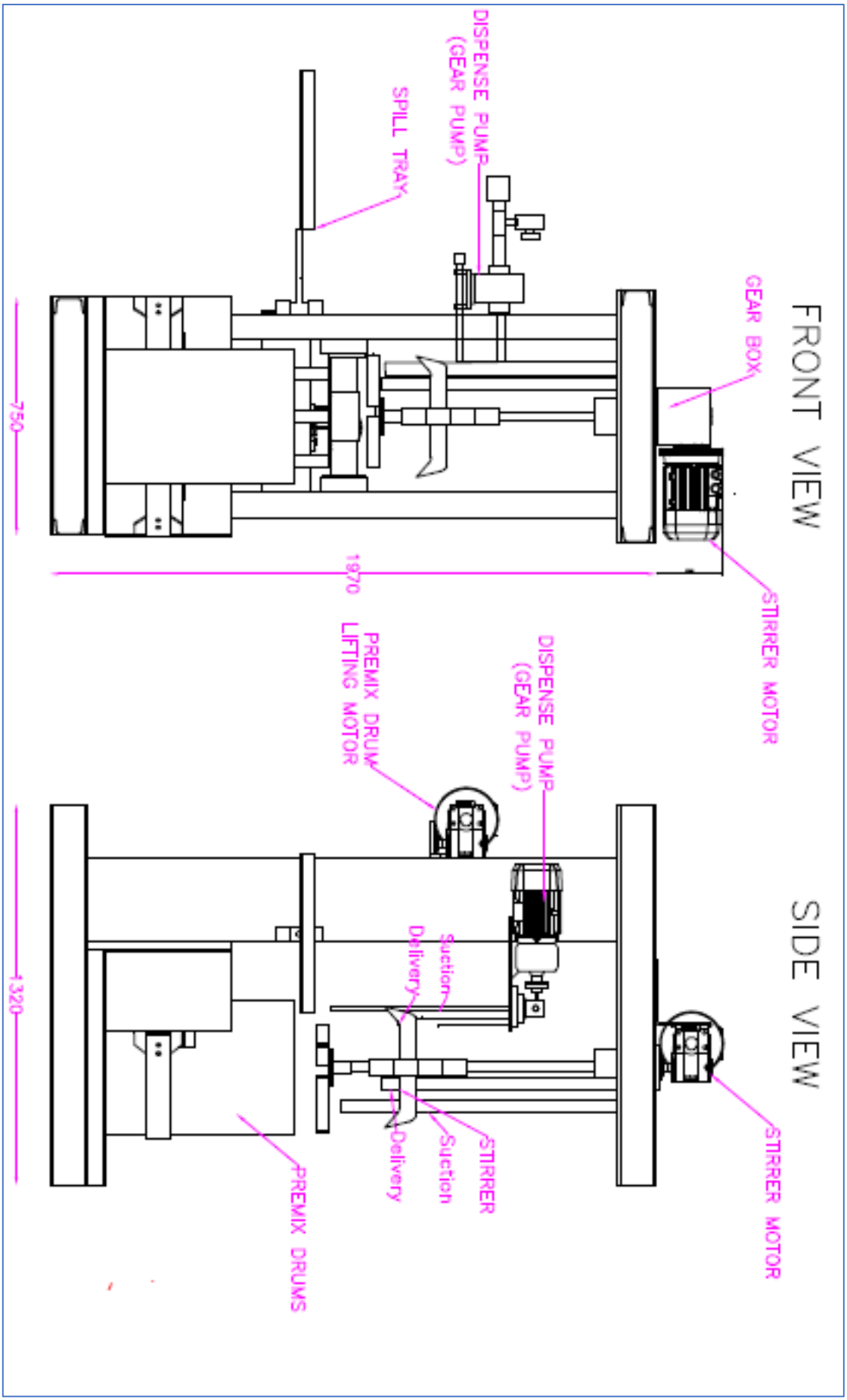


Fig. 6: IR1 Pre-Mix System

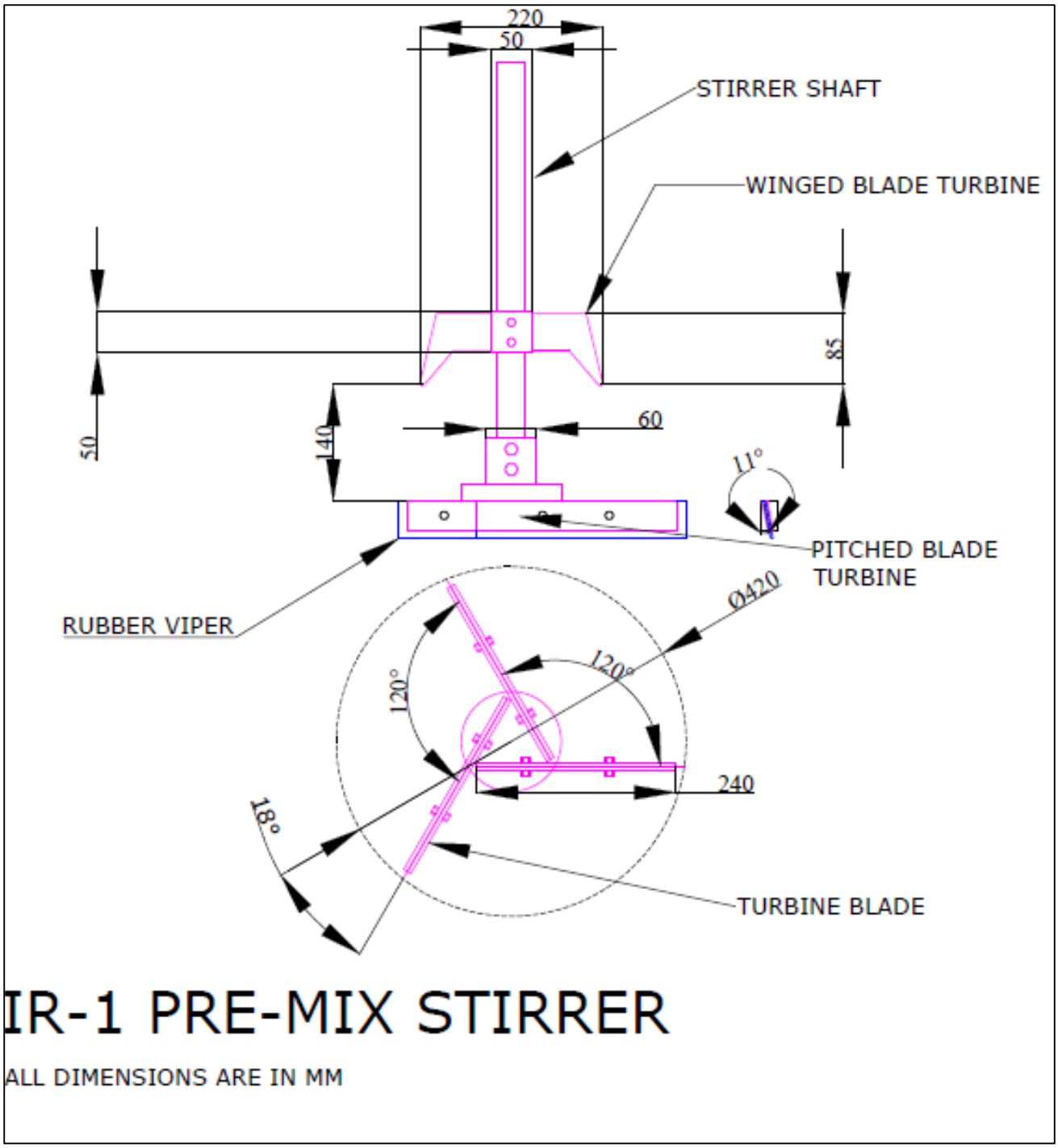


Fig.7: Premix stirrer

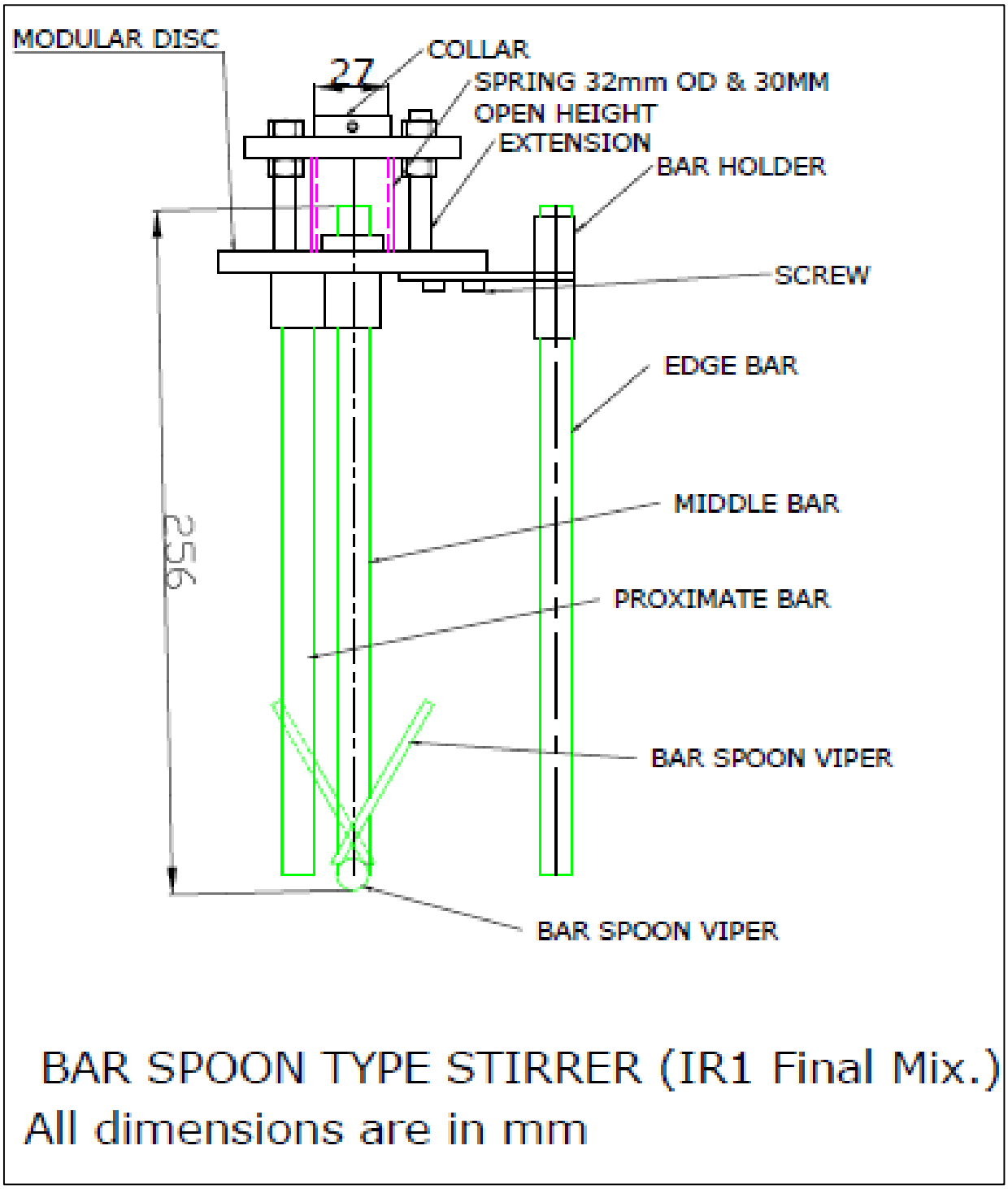


Fig.8: Final Mix stirrer

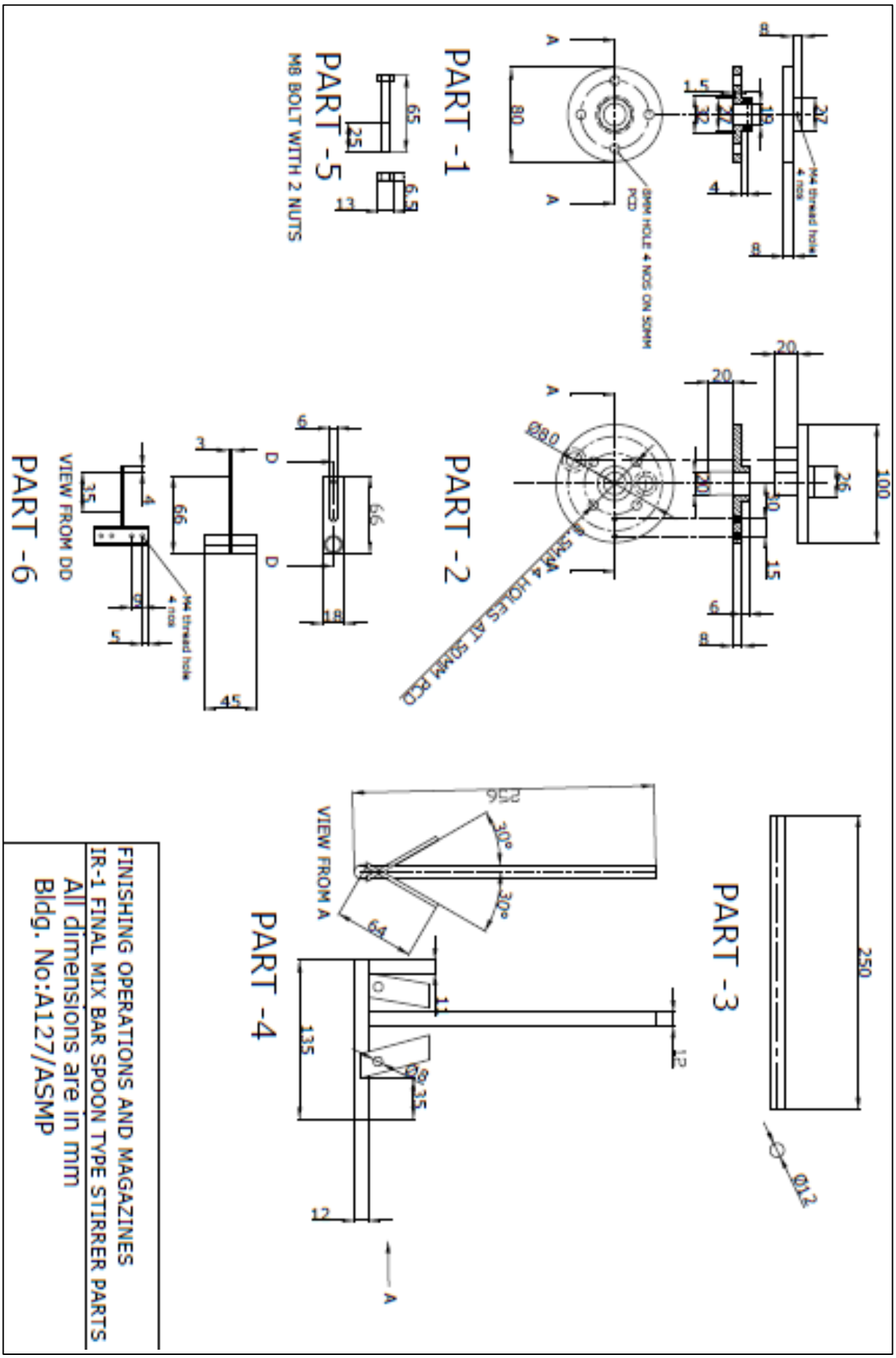


Fig.9: Final Mix stirrer part drg.

Bid-Qualification criteria (Annexure-1):

- Bidders shall meet the following bid-qualification criteria. Offer of the bidders which are not meeting the following criteria will not be considered for evaluation.
- Bidders who are qualifying/meeting following technical and financial capabilities are eligible to participate in the bid for IR-1 Automation system for premix and final mix operations. Bidder shall furnish all the details with documentary proof and submit the same along with quotation. Bids of the parties which are not meeting the following criteria will not be considered for evaluation and will be rejected without seeking any further clarifications.
- Technical Qualification Requirements:
- The bidder should meet the following technical qualifying requirements and shall submit relevant certificates/data to establish his credentials along with the technical bid.

Technical & Financial Qualification Requirements

Sl. No.	Criteria / Requirement	Reply / Eligibility from M/s….
Technical Qualification Requirements: The bidder should meet the following technical qualifying requirements and shall submit relevant certificates/data to establish his credentials along with the technical bid.		
1.	The bidder shall be a well-established and registered firm with minimum 3 years' experience in the Supply, fabrication, installation & commissioning of Automated batching or mixing system.	
2.	The Bidder shall have dedicated Design/ Engineering, software development, and erection/commissioning teams. Organization chart shall be submitted along with the Bid.	
3.	Bidder shall have in-house facility (working area- minimum Length 10-meter x width 5 meter) for carrying out FAT for premix and final mix stations.	
4.	Bidder shall submit self-declared letter that they are not black listed by any Govt. department/ PSU and also not supplying any equipment/component that has been manufactured by OEM/ 3rd party that is Blacklisted by any Government Department in India or any Government Globally as per GFR2017 Clause 144 (x) and neither do they get the products manufactured from any of the above companies, else they are liable to be disqualified irrespective of the models offered.	
5.	Offers of those bidders covering full scope of the work as per the requirements indicated in this document only will be considered for evaluation.	

6.	If the bidder is outsourcing any part (Electrical/ Instrumentation) scope of the work, then the sub-vendor details with documentary evidence(s) as mentioned above (Sl.no. 1) shall be submitted for the outsourced portion. However, full scope of the tender shall not be outsourced, offers of such bidders will be rejected.	
7.	Considering the reliability, previous performance and maintainability of the equipment, wherever possible preferred makes are indicated. If Bidder offers any other makes, the same will be evaluated for technical compatibility for accepting/approving the make/model.	Bidder to indicate Make
Financial Qualification Requirements: The bidder should also meet the following financial qualification requirements:		
1.	(a)Purchase orders (PO) covering supply and installation scope executed for the past five years ending 31-03-2026 for similar nature of works as mentioned in this tender document One PO not less than Rs.50 lakhs OR Two PO each not less than Rs. 35 Lakhs. (b)P.O/ work order and Satisfactory Work completion certificate by the end user/ Invoice for the same shall be submitted without which offer will not be considered.	
2.	The bidder/firm should have an average annual turn-over of not less than Rs.50 lakhs during the last three financial years ending 31-03-2025 duly furnishing the audited annual financial statements.	
3.	IT/ TDS certificate shall be submitted for last 3 years ending 31-03-2025.	

Annexure-2: Technical Compliance

Sl. No.	To be complied by the Supplier	Compliance (Yes/ No)
1.	Bidder has to read & understand the instructions to the bidders, for bid submission and general terms & conditions of this tender.	
2.	Bidder has to read & understand the technical and unpriced commercial part and priced commercial part terms & conditions of this tender.	
3.	Bidder has to read & understand the Delivery schedule of this tender.	
4.	Bidder has to read & understand the Taxes and Duties, Risk coverage, warranty, Arbitration and Force majeure (FM) terms & conditions of this tender.	
5.	Bidder has to read & understand the Packing & forwarding, Placement of PO, Payment terms and Mode of Payment terms and conditions of this tender.	
6.	Bidder has to read & understand the Inspection& acceptance terms and conditions of this tender.	
7.	Bidder has to read & understand the Instructions to Bidders & General Conditions in the table of contents of this tender.	
8.	Bidder has to read & understand the scope of supply of IR-1 Automation System for Premix and Final Mix operations as part of this tender.	
9.	Bidder has to read & understand the technical specifications as per the tender document	
10.	Bidder has to read & understand the technical specifications of electrical system.	
11.	We are adhering to time specified in the data submission after the award of contract.	
12.	Bidder has to read & understand the warranty period of 12 months	
13.	Bidder shall submit the mechanical system drawings, control system configuration diagram, electrical system diagrams for approval.	
14.	Bidder has read and understood the quality assurance plan document as per **Annexure-3**	
15.	Bidder shall submit this tender document with his official seal & signature in all pages of tender document.	

Annexure-3: Quality Assurance Plan (Indicative)

Sl. No.	Component/ Stage	Characteristic sought for	Type of check	Extent of check	Ref. Std./ acceptance norms	Acceptance norms	Test performed by	Processing agency (Vendor)	Verifying agency (SDSC-SHAR)
Instrumentation systems									
1	PLC, SCADA & PC (MMI)	as per the tender specification	visual, functional check with hot standby feature	100%	OEM supplied Data sheet & test certificates	as per specification	Manufacturers / vendor	verification	witness & review
2.	Panels, JB	Physical Inspection	Visual	100%	GA drawing	as per specification	Manufacturers / vendor	Verification	witness & review
3	Field instruments (Sensors &	as per the tender specification	Visual& functional/ calibration checks	100%	OEM supplied Data sheet & test certificates	as per specified accuracy	Manufacturers / vendor	Perform	witness & review
4	Mechanical structures	as per the tender specification	Material test certificate, WPS (welding	100%	GA drawing/ reports	as per specification	Manufacturers / vendor	Verification	witness & review

Note: The above QAP provided for reference. Party shall make detailed QAP for systems and all sub systems. The same shall be submitted to department for review and approval

Annexure-4: Deviations List

Sl. No.	Tender specifications	Deviation	Reason for deviation

Annexure-5

Price Bid Schedule for Supply, Installation, Testing & Commissioning of IR-1 Automation System for Premix and Final Mix operations at Inhibition Facility in SMPC UNIT-I as per Technical Specifications and terms & conditions given in Tender

Tender No. & Date:

Bidder's Quotation No. & Date:

Note:

1. *Bidder shall also submit the un-priced Format along with Techno – Commercial Bid by mentioning "Quoted" against each item. The same shall be uploaded along with technical specification.*
2. *Disclosing price figures here in Techno-commercial bid leads to rejection of offer. Price figures shall be disclosed in financial bid only.*
3. The price bid should be submitted only as per the given below format. No row shall be left blank. Indicate "NA" in case the item is "not applicable".
4. Price shall be submitted on-line covering all the below components. Any un-filled price bid is likely to get rejected.

Bidder shall submit following un-priced format:

S. No.	Description	Quantity	Party's Confirmation
1.	Basic Price for supply of IR-1 Automation System for Premix and Final Mix operations as per tender document	1 lot	
2.	Erection, Testing and Commissioning of IR-1 Automation System for Premix and Final Mix operations at Department Site as per tender document.	1 lot	
3.	GST for Sl. No.: 1 & 2	% of supply value	
4.	Total Value including taxes & duties		

Date:

Signature & Office Seal of the bidder