



निविदा सूचना सं. TENDER NOTICE NO. SDSC SHAR/Sr.HPS/PT/RO-VALF/08/2025-2026

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 President of India, Sr. Head Purchase and Stores, SDSC SHAR, SRIHARIKOTA invites on line quotations for the following: -

क्र.सं. Sl No	संदर्भ सं. Ref.No.	विवरण Description	मात्रा Qty.
01.	SDSC SHAR /VALF PURCHASE /2025000596 Procurement, Manufacture, Supply, Erection, Testing and Commissioning of Horizontal Sliding Doors for SAF of SLCP, Tuticorin [Public Tender - Two Part]	Procurement, fabrication, supply, handling at site of fabricated structural steel conforming to IS:2062 & IS:808 items without machining	2,10,000 Kgs.
		Procurement, fabrication, stress relieving, machining, supply at site of fabricated structural steel / Mild steel conforming to IS:2062 & IS:808 items	22,000 Kgs.
		Procurement, machining, stress relieving, supply at site of forged steel / alloy steel/ cast steel, En24-T, En-9, Hardox-400 items	16,000 Kgs.
		Procurement, Sub-assembly, supply at site of all items	1 Lot
		Erection and commissioning of total 12 nos. of Horizontal sliding door leaves including storage / handling at site, erection, testing, commissioning and carrying out performance test of HSD's	2,48,000 Kgs.
		Third party inspection charges for Horizontal Sliding Doors	1 Lot

निविदा दस्तावेजों को डाउनलोड करने की अंतिम तिथि Last Date for downloading of tender documents : 30.06.2025 at 16:00 hrs.
ऑनलाइन निविदा जमा करने की अंतिम तिथि Due Date for submission of bids online : 30.06.2025 at 16:30 hrs.
निविदाएं खोलने की नियत तिथि Due Date for opening of tenders : 01.07.2025 at 14:30 hrs.

निविदाकार के लिए निर्देश Instructions to Tenderers:

*निविदाएं ईजीपीएस के माध्यम से ही भेजी जाएं तथा कोई निविदा शुल्क लागू नहीं होगा।
Bids shall be submitted on line through EGPS only and No tender fee shall be applicable.*

- 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.
- इच्छुक निविदाकार इसरो की ई-खरीद वेबसाइट इसरो न्यू ई-प्रोक्युरमेंट www.eproc.vssc.gov.in से ई-निविदा डाउनलोड और अपनी निविदा ई-खरीद पोर्टल पर ऑनलाइन जमा कर सकते हैं। डाक / वाहक / स्वयं द्वारा प्राप्त निविदाओं पर विचार नहीं किया जाएगा। / Interested tenderers can download the e-tender from ISRO e-procurement website ISRO NEW E-PROCUREMENT www.eproc.vssc.gov.in and submit the offer on line in the e-procurement portal. Offers sent physically by post/courier/in person will not be considered.
- निविदा दस्तावेज इसरो की वेबसाइट www.isro.gov.in इसरो न्यू ई-प्रोक्युरमेंट वेबसाइट www.eproc.vssc.gov.in तथा सतीश धवन अंतरिक्ष केंद्र शार की वेबसाइट www.shar.gov.in पर भी उपलब्ध हैं। इन्हें केवल ई-खरीद पोर्टल से डाउनलोड और निविदा ऑनलाइन जमा कर सकते हैं। / Tender documents are also available on ISRO website www.isro.gov.in ISRO New e-procurement website www.eproc.vssc.gov.in and SDSC SHAR, Sriharikota website www.shar.gov.in. The same can be down loaded and offer submitted on line in the new e-procurement portal only.
- निर्धारित तिथि/समय के पश्चात प्राप्त बोलियों पर विचार नहीं किया जाएगा। / Quotations received after the due date/time will not be considered.
- निविदा दस्तावेज दिनांक 30.06.2025 को 16:00 बजे तक डाउनलोड करने के लिए उपलब्ध रहेंगे तथा निविदा ऑनलाइन जमा करने की अंतिम तिथि 30.06.2025 को 16:30 बजे तक है। निविदाएं दिनांक 01.07.2025 को 14:30 बजे खोली जाएंगी। / The tender documents are available for download upto 30.06.2025 at 16:00 hrs. and last date for submission of tenders on line 30.06.2025 at 16 30 hrs. and Tender Opening on 01.07.2025 at 14:30 hrs.
- इच्छुक विक्रेता विवरण जानने के लिए निविदा खोले जाने वाले सत्र में शामिल हो सकते हैं। निविदा के मूल्यांकन पर विचार करने के लिए उनकी उपस्थिति अनिवार्य नहीं है। / Interested vendors can attend the Bid opening sessions to know the details. Presence not mandatory to consider the quote for evaluation.
- वरि. प्रधान क्रय एवं भंडार, सतीश धवन अंतरिक्ष केंद्र श्रीहरिकोटा के पास किसी भी या सभी निविदाओं को स्वीकार / अस्वीकार करने का अधिकार है। / Sr. Head, Purchase and Stores, SDSC-SHAR, Sriharikota reserves the right to accept or reject any/or all the quotations.
- GeM ARPTS Report ID: GEM/GARPTS /09052025/234E89XCV49F

दिनांक DT:02.06.2025

भारतीय अन्तरिक्ष अनुसंधान संगठन



Indian Space Research Organisation

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

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

**Tender for Procurement, Manufacture, Supply, Erection, Testing and
Commissioning of Horizontal Sliding Doors for SAF of SLCP,
Tuticorin, Tamil Nadu**

Bids to be submitted online

Tender No.: SDSC SHAR/VALF PURCHASE/SH202500059601 dated 05-06-2025

A. Tender Details

Tender No :	SDSC SHAR/VALF PURCHASE/SH202500059601
Tender Date :	05-06-2025
Tender Classification:	GOODS
Purchase Entity :	VALF PURCHASE
Centre :	SATISH DHAWAN SPACE CENTRE SHAR SRIHARIKOTA (SDSC SHAR)

Procurement, Manufacture, Supply, Erection, Testing and Commissioning of Horizontal Sliding Doors for SAF of SLCP, Tuticorin, Tamil Nadu

GEM/GARPTS /09052025/234E89XCV49F

As per tender documents

A.1 Tender Schedule

Tender Publish Date :	05-06-2025 15:30
Bid Clarification Due Date :	16-06-2025 10:00
Bid Submission Start Date :	05-06-2025 15:59
Bid Submission Due Date :	30-06-2025 16:30
Bid Opening Date :	01-07-2025 14:30
Price Bid Opening Date :	31-07-2025 14:30

A.2 Pre-bid Meeting Details

Date :	16-06-2025 14:00
Place :	Pre-bid Meeting shall be held on 16.06.2025 (tentatively) at 14:00HRS in PPEG conference Hall vide online .

Location :	ADMIN BUILDING KEEPAKUM, SATISH DHAWAN SPACE CENTRE SHAR SRIHARIKOTA
Centre :	SATISH DHAWAN SPACE CENTRE SHAR SRIHARIKOTA (SDSC SHAR), NELLORE, ANDHRA PRADESH Pre-bid Meeting shall be held on 16.06.2025 (tentatively) at 14:00HRS in PPEG conference Hall vide online . Bidders are requested to send request to participate in bid well in advance but not later than 13.06.2025 on the following mails quoting tender number: jomin@shar.gov.in, sselvan@shar.gov.in
Details :	The link for attending the meeting shall be shared accordingly. For more details, kindly contact the following officials: 1. Jomin Jose, Purchase & Stores Officer (08623226082) 2. Senthil Selvan, Sr. Purchase & Stores Officer (08623225127)

B. Tender Attachments

NA

Instructions To Vendors

1. STANDARD TERMS & CONDITIONS

1. Tele No.08623-225174/225127/226082

Fax No.08623-225170/22-5028

e-Mail ID : hps@shar.gov.in, sselvan@shar.gov.in, jomin@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) Our GST No. is. 37AAAGS1366J1Z1.

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 + 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 made 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 and amendments thereof. 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

Your offer shall be valid for 180 days in case of 2 part / 90 days in case of single part from the date of tender opening. In case you offer validity is less than the mentioned above, the said offer is liable for rejection which may please be noted.

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. 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.08623-225174/225127

Fax No.08623-225170/22-5028

e-Mail ID : hps@shar.gov.in, sselvan@shar.gov.in, jomin@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. The offer should be valid for a minimum period of 180 days for 2 part / 90 days for single part from the date of opening.

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.

C. Bid Templates

C.1 Technical Bid - Procurement, Manufacture, Supply, Erection, Testing and Commissioning of Horizontal Sliding Doors for SAF of SLCP, Tuticorin, Tamil Nadu

1. FABRICATION AND ASSEMBLY:

Procurement, fabrication, supply, handling at site of fabricated structural steel conforming to IS:2062 & IS:808 items without machining as per specification enclosed

Document : GENERAL ASSEMBLY OF HSDS IN CLOSED CONDITION FOR SAF

Document : GENERAL ASSEMBLY OF HSDS IN OPEN CONDITION FOR SAF

Document : CHAJJA DETAILS OF HSDS FOR SAF

Document : GA OF HSD1 (RHS) FOR SAF

Document : WIRE ROPE ROUTING FOR HSD-1 (RHS)

Document : SIDE COVER DETAILS FOR HSD-1 (RHS)

Document : PLATFORM DETAILS FOR HSD- 1 (RHS)

Document : DETAILS OF HSD-1 STRUCTURE (RHS)

Document : LATERAL & VERTICAL GUIDE PATH FOR HSD-1 (RHS)

Document : DETAILS OF LATERAL GUIDE WHEEL FOR HSD-1

Document : BOTTOM DOUBLE WHEEL ASSEMBLY FOR HSD-1 (RHS)

Document : BOTTOM SINGLE WHEEL ASSEMBLY FOR HSD-1 (RHS)

Document : VERTICAL GUIDE WHEEL-2 FOR HSD-1

Document : DRIVE SYSTEM ASSEMBLY FOR HSD-1

Document : DRIVE SYSTEM SUPPORT STRUCTURE FOR HSD-1

Document : HORIZONTAL PULLEY DETAILS FOR HSD-1

Document : VERTICAL PULLEY-1 FOR HSD-1

Document : CYCLONIC LOCK TYPE-2 FOR HSD-1

Document : VERTICAL PULLEY-2 FOR HSD-1

Document : RAIL DETAILS FOR HSD-1 (RHS) SAF

Document : GA OF HSD-2 FOR SAF

Document : WIRE ROPE ROUTING FOR HSD-2

Document : SIDE COVER DETAILS FOR HSD-2

Document : PLATFORM DETAILS FOR HSD- 2

Document : DETAILS OF HSD-2 STRUCTURE

Document : HORIZONTAL & VERTICAL GUIDE PATH FOR HSD-2

Document : LATERAL GUIDE PATH FOR HSD-2

Document : VERTICAL GUIDE WHEEL-1 FOR HSD-2

Document : VERTICAL GUIDE WHEEL-2 FOR HSD-2

Document : DETAILS OF LATERAL GUIDE WHEEL FOR HSD-2

Document : DRIVE SYSTEM ASSEMBLY FOR HSD-2

Document : DRIVE SYSTEM SUPPORT STRUCTURE FOR HSD-2

Document : HORIZONTAL PULLEY DETAILS FOR HSD-2

Document : VERTICAL PULLEY-1 FOR HSD-2

Document : CYCLONE LOCK TYPE-2 FOR HSD-2

Document : VERTICAL PULLEY-2 FOR HSD-2

Document : GROUND FLOOR PLAN WITH INDICATING ELECTRICAL ITEMS

Document : FLOOR PLAN OF EL 4.4M WITH INDICATING ELECTRICAL ITEMS

Document : FLOOR PLAN OF EL 9.4M WITH INDICATING ELECTRICAL ITEMS

Document : FLOOR PLAN OF EL 17.5M WITH INDICATING ELECTRICAL ITEMS

Document : FLOOR PLAN OF EL 21M WITH INDICATING ELECTRICAL ITEMS

Document : FLOOR PLAN OF EL 27.5M WITH INDICATING ELECTRICAL ITEMS

Document : FLOOR PLAN OF EL 34.75M WITH INDICATING ELECTRICAL ITEMS

Document : FLOOR PLAN OF EL 38.5M WITH INDICATING ELECTRICAL ITEMS

Document : ELEVATION OF SAF

Document : SECTION OF SAF

Document : SCHEMATIC ELECTRICAL CIRCUIT

Document : FLOOR PLAN OF EL 24.25M WITH INDICATING ELECTRICAL ITEMS

Document : Existing Documents : RFP of HSD for SAF of SLCP

2. FABRICATION AND ASSEMBLY:

Procurement, fabrication, stress relieving, machining, supply at site of fabricated structural steel / Mild steel conforming to IS:2062 & IS:808 items as per specification

3. FABRICATION AND ASSEMBLY:

Procurement, machining, stress relieving, supply at site of forged steel / alloy steel/ cast steel, En24-T, En-9, Hardox-400 items as per specification

4. FABRICATION AND ASSEMBLY:

Procurement, Sub-assembly, supply at site of all bought-out items as mentioned in the

specification

5. FABRICATION AND ASSEMBLY

Erection and commissioning of total 12 nos. of Horizontal sliding door leaves including storage / handling at site, erection, testing, commissioning and carrying out performance test of HSD's as per specification enclosed

6. FABRICATION AND ASSEMBLY

Third party Inspection charges for Horizontal Sliding Doors

Common Specifications (Applicable for all items)

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	Procurement, Manufacture, Supply, Erection, Testing and Commissioning of Horizontal Sliding Doors for SAF	as per attached specification and drawings	Yes / No / Explain		

Supporting Documents required from Vendor

1. All relevant documents as mentioned in Annexure E1 to E11, as proof for technical evaluation

2. Signed copy of complete RFP document as a token of acceptance of PO

3. Filled up and duly signed copy of Annexure E1 to E11

4. Self-declaration indicating percentage of local content along with location of value addition

5. Turnover of last three FY

6. Udyam Certificate, if claiming MSE purchase preference

7. Copy of IT return for last three FY

8. Current Solvency Certificate for an amount of Rs. 500 lakhs

9. Completion Certificate along with copy of previous PO as token of proof of experience

10. OEM authorization certificate

11. Firm establishment certificate

12. Annexure duly filled, sealed & signed by your competent authority

5 additional documents can be uploaded by the vendor

C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	Supply, Erection, Testing and Commissioning of Horizontal Sliding Doors for SAF shall be done at SSLV launch complex, Madhavankurichi village ? 628206, Thiruchendur tk., Tuticorin dist., Tamilnadu	Yes / No / Explain	
2	The procurement intended for the bonafide use in Systems/Sub-systems of Launch Vehicle Project of Indian Space Research Organization, Government of India, Department of Space and eligible for IGST@5% as per guiding principles conveyed by the Ministry of Finance Dept. of Revenue Notification No. 25/2018-Integrated Tax (Rate) Schedule-I; Sl. No. 243B dated 31.12.2018 (Amendment to Notification No. 07/2018-Integrated Tax (Rate) dated 25.01.2018 and Notification No. 01/2017- Integrated Tax (Rate) dated: 28.06.2017)	Yes / No / Explain	
3	Please confirm here whether your quoted "UNIT PRICE" in our Price Bid is EXCLUDING GST or INCLUDING GST. ----- NOTE: If you are not explicitly stating "GST is Inclusive in basic cost" it will be treated as "GST is EXTRA and NOT included in the quoted Basic/Unit cost in the price bid". Your offer will be evaluated accordingly and GST will added over and above your quoted basic cost. (i.e. Whatever GST percentage you are quoting in your price bid will be added to your basic cost and evaluated accordingly. If you quote here vaguely as "YES/Accepted /Noted etc" it will be treated as "GST is not included in the quoted Basic/Unit cost".	Yes / No / Explain	
4	Delivery Term FOR : SSLV launch complex, Madhavankurichi (MANDATORY)	Yes / No / Explain	
5	Packing and Forwarding(P & F) charges, extra if any, please mention percentage in price-bid. Please note that in case of Two part tenders, only percentage should be mentioned otherwise those offers shall be summarily rejected.	Yes / No / Explain	

6	Freight charges, extra if any, please mention percentage in price-bid Please note that in case of Two part tenders, only percentage should be mentioned otherwise those offers shall be summarily rejected.	Yes / No / Explain	
7	Delivery Schedule: (1) Procurement, fabrication / machining, control assembly, inspection, transportation, handling and storage at site - Shall be completed within 06 months from the date of release of PO. (2) Erection, commissioning of the equipment: Within 04 months from the date of site clearance given by the buyer.	Yes / No / Explain	

	<p>Payment Term:</p> <p>FOR SUPPLY OF ITEMS INLCUDING BOUGHTOUT ITEM:</p> <p>Option-1:</p> <p>(a) 80% of supply cost payment against receipt of material at Purchasers /Department site, along with 100% GST.</p> <p>(b) 20% of supply cost after successful commissioning & acceptance by Department of equipment and system covered under contract.</p> <p>Option 2:</p> <p>a). 30% of supply cost as advance against submission of bank guarantee for an equal amount valid till Contract completion period. No interest shall be paid on such BG.</p> <p>(b). 60% of supply cost payment on prorated basis against receipt of complete material at Purchasers / Department site, along with 100% GST.</p> <p>(c). 10% of supply cost after successful commissioning of equipment & system covered under contract and acceptance by the department.</p>		
8	<p>FOR ERECTION, TESTING AND COMMISSIONING OF DOORS AT SITE:</p> <p>(a). 80% of erection cost at department site after successful assembly of the beige in all respect along with 100 % GST.</p> <p>(b). 20% of erection cost after successful commissioning, acceptance of equipment and system covered under contract by department and one trial run of bogie system at department site (rail track at department site and hauler shall be provided by department) and against.</p> <p>FOR THIRD PARTY INSPECTION CHARGES</p> <p>(a). 50% of third-party inspection charges after receipt of complete material at buyer site.</p> <p>(b). 50% of third-party inspection charges along with GST after Erection, Commissioning and acceptance of the system.</p> <p>Note: 1. If you fail to execute the Order after drawing of advance</p>	Yes / No / Explain	

	<p>payment, you should return the Advance amount in full with interest at Bank lending rate plus 2% beyond delivery period and all BG/FDR/etc. shall be forfeited.</p> <p>2. In case of delay in execution of order beyond delivery period, the seller is liable to pay interest on advance paid beyond the delivery period till the completion of scope of contract.</p> <p>3. Please clearly indicate option of your payment for supply portion. The rate of interest shall be loaded on option of advance payment by the bidder for arriving L1.</p> <p>4. Bidder is requested to clearly indicate the option of payment as per detailed above.</p> <p>More details as per para no. 22 of RFP.</p>		
9	<p>Warranty/Guarantee: Warranty/Guarantee for the offered item shall be from the date of acceptance of the item at our site for a minimum period of one year or specified in the tender document.</p>	Yes / No / Explain	
10	<p>Liquidated Damages (LD) :- In the event of the Supplier failing to complete the work within the delivery period specified in the contract agreement or in extension agreed thereto, Department shall reserve the right to recover from the Supplier as liquidated damages, a sum of 0.5 percentage per week or part thereof of the undelivered portion of the total contract price of equipment or work. However, the total liquidated damages shall not exceed 10.0 percentage of the total Contract price. The LD reckoning date shall be T plus 6 months for supply portion and T1 plus 4 months for the erection and commissioning portion of the contract.</p>	Yes / No / Explain	

11	<p>Security Deposit (SD) 3% value of the order shall be deposited with SDSC within 10 days from the date of the Purchase Order towards security deposit in the form of Bank Guarantee(BG)/ FDR/DD towards performance of the Contract valid till completion of the contract period plus sixty days towards claim period. (This will be returned by SDSC immediately on execution of the order satisfactorily as per order terms. If not, the amount will be forfeited). NOT REQUIRED FOR LANDED COST BELOW RS.5 LAKHS.</p>	Yes / No / Explain	
12	<p>Performance Bank Guarantee (PBG) You have to submit a BG/DD/FDR in lieu of PBG from a Nationalized / Scheduled Bank for 3% of the order value at the time of supply valid till the completion of warranty period plus 60 days towards claim period.</p>	Yes / No / Explain	
13	<p>Combined BG for PBG cum SD In case, if parties are unable to provide two separate BGs, i.e., one for SD & one for PBG, they can submit a combined BG for SD & PBG for 3% of the Order value valid till the completion of total contractual obligation (i.e., Supply period plus warranty period plus 60 days). Please confirm. No interest shall be paid on any BGs.</p>	Yes / No / Explain	
14	<p>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 packing.</p>	Yes / No / Explain	
15	<p>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.</p>	Yes / No / Explain	
16	<p>PART ORDER: We reserve the right to place part order based on item wise L1 offer or if MSE/MII Purchase preferences arise, if required. Please confirm acceptance for part order.</p>	Yes / No / Explain	

17	The bidder shall provide compliance to Order No. F.No.7/10/2021 PPD dated 23.02.2023 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	
18	As per the above Order, are you (the Bidder/Company/Entity) OR offering product/service is from such a Country sharing Land border with INDIA.	Yes / No / Explain	
19	<p>Make-In-India (MII) Clause: Provisions contained in Public Procurement Policy (Preference to Make in India), Order 2017 issued by DPIIT vide OM No. P-45021/2/2017-PP(BE-II) dated 16.09.2020 & directives related including latest amendments (if any) is applicable for this tender.</p> <p>You are requested to provide Self Declaration Certificate that the offered Item meets Local Content Requirement of Class 1 or Class 2 as per Make in India(MII) Policy, clearly indicating the Percentage of local content & the details of Location(s) at which value addition is made in the offered product.</p> <p>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.</p>	Yes / No / Explain	
20	Please mention in PERCENTAGE the Value addition of offered products happened in INDIA in line with Make In India Policy. (Mandatory). You have to upload MII Declaration mentioning place and percentage of value addition along with Offer.	Yes / No / Explain	

21	<p>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 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 along with UDYAM REGISTRATION 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 25% (selected by Buyer) percentage of total QUANTITY.</p>	Yes / No / Explain	
22	<p>Are you claiming MSME Preference for this tendered item/service?</p> <p>Note: You should have been the MANUFACTURER of the offered product or SERVICE Provider of the said service (in service tender) as per your MSME Registration. (If YES, valid Udyam Registration documents shall be uploaded. Otherwise your claim will not be considered. False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h))</p>	Yes / No / Explain	
23	<p>Please Select for the offered Product whether you are: (1) Manufacturer (2) Authorized Agent (3) Distributor (4) Dealer (5) Reseller (6) Others</p>	Yes / No / Explain	

24	Remarks If any, All other terms & conditions in line with attached annexures along with tender. Bidder must comply with all the terms & conditions.	Yes / No / Explain	
25	Please provide valid/currently using E-mail Id & Contact no. for seeking further clarifications if any	-	
26	Bank Guarantee against Advance Payment:: Successful Bidder has to provide if opted for advance, Advance Bank Guarantee for 30% of the value of Supply cost in prescribed format (enclosed) from a scheduled bank in Rs. 100-00 non judicial stamp paper valid till the completion of all contractual obligations (i.e. Supply, Erection, Commissioning & TPI as applicable) plus sixty days. BG will not carry any interest and it will be returned to you once the Purchase Order / Contractual obligation is successfully executed. In case of non-performance / poor performance, the BG shall be forfeited and advance payment shall be recovered from supplier with interest as per the Prime Lending Rate of RBI along with 2% penal interest from the date of release of advance payment. Note: In case of extension of delivery period, the validity of BG shall be extended accordingly.	Yes / No / Explain	

C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	P&F IN PERCENTAGE	FREIGHT PERCENTAGE	Remark
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1	FABRICATION AND ASSEMBLY: Procurement, fabrication, supply, handling at site of fabricated structural steel conforming to IS:2062 & IS:808 items without machining as per specification enclosed	210000.00 KG		-				
2	FABRICATION AND ASSEMBLY: Procurement, fabrication, stress relieving, machining, supply at site of fabricated structural steel / Mild steel conforming to IS:2062 & IS:808 items as per specification	22000.00 KG		-				

3	FABRICATION AND ASSEMBLY: Procurement, machining, stress relieving, supply at site of forged steel / alloy steel/ cast steel, En24-T, En-9, Hardox-400 items as per specification	16000.00 KG		-				
4	FABRICATION AND ASSEMBLY: Procurement, Sub-assembly, supply at site of all bought-out items as mentioned in the specification	1.00 Lot		-				

5	FABRICATION AND ASSEMBLY Erection and commissioning of total 12 nos. of Horizontal sliding door leaves including storage / handling at site, erection, testing, commissioning and carrying out performance test of HSD's as per specification enclosed	248000.00 KG		-				
6	FABRICATION AND ASSEMBLY Third party Inspection charges for Horizontal Sliding Doors	1.00 Lot		-				

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	HORIZONTAL SLIDING DOORS FOR SAF	

ANNEXURE ORDER NO.: SHAR/VAST/2025000596

**PROCUREMENT, MANUFACTURE, SUPPLY, ERECTION,
TESTING & COMMISSIONING OF
HORIZONTAL SLIDING DOORS FOR SAF OF SLC PROJECT**

SPECIFICATIONS

OWNER : INDIAN SPACE RESEARCH ORGANISATION
PROJECT : SSLV LAUNCH COMPLEX PROJECT
LOCATION : SLC SITE, TUTICORIN, TAMIL NADU



**SECOND VEHICLE ASSEMBLY BUILDING
SATISH DHAWAN SPACE CENTRE
SRIHARIKOTA - 524124.
INDIAN SPACE RESEARCH ORGANISATION**

ISSUE
R0

SPEC NO.: HSD/SAF/2025/01	SSLV LAUNCH COMPLEX PROJECT		SECTION: TITLE
	HORIZONTAL SLIDING DOORS FOR SAF		SHEET: 2 OF 2
REQUEST FOR PROPOSAL FOR HORIZONTAL SLIDING DOORS			
SPECIFICATIONS & ANNEXURES			
SECT ION	SPECIFICATION NO: TCE:7517A-D-856-001	ISSUE NO.	TITLE: REQUEST FOR PROPOSAL FOR HORIZONTAL SLIDING DOORS
SPECIFICATIONS			
A	HSD/SAF/2025/01	R0	GENERAL TERMS AND CONDITIONS OF THE CONTRACT
A1	HSD/SAF/2025/01	R0	GENERAL SPECIFICATION & PROJECT INFORMATION
B	HSD/SAF/2025/01	R0	TECHNICAL SPECIFICATIONS
C	HSD/SAF/2025/01	R0	QUALITY ASSURANCE PLAN
D	HSD/SAF/2025/01	R0	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT
ANNEXURES			
E1	HSD/SAF/2025/01	R0	SCHEDULE OF PRICES & GENERAL PARTICULARS
E2	HSD/SAF/2025/01	R0	BID QUALIFICATION CRITERIA
E3	HSD/SAF/2025/01	R0	SCHEDULE OF GENERAL PARTICULARS / VENDOR EVALUATION FORMAT
E4	HSD/SAF/2025/01	R0	CONFIRMATION OF ACHIEVING ACCURACY
E5	HSD/SAF/2025/01	R0	SCHEDULE OF DEVIATIONS FROM SPECIFICATIONS
E6	HSD/SAF/2025/01	R0	SCHEDULE OF TIME FOR MANUFACTURE, DESPATCH AND SHIPMENT TO SITE
E7	HSD/SAF/2025/01	R0	SCHEDULE OF BIDDERS EXPERIENCE & DETAILS OF PRESENT WORKS BEING EXECUTED.
E8	HSD/SAF/2025/01	R0	DATA TO BE FILLED ALONG WITH BID
E9	HSD/SAF/2025/01	R0	CHECK LIST
E10	HSD/SAF/2025/01	R0	BREAK UP DETAILS FOR BOUGHT OUT ITEMS
E11	HSD/SAF/2025/01	R0	ELECTRICAL DESIGN AND DETAILS

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	GENERAL TERMS AND CONDITIONS OF THE CONTRACT HORIZONTAL SLIDING DOORS FOR SAF	

SECTION -A

GENERAL TERMS AND CONDITIONS OF THE CONTRACT

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	GENERAL TERMS AND CONDITIONS OF THE CONTRACT HORIZONTAL SLIDING DOORS FOR SAF	SHEET: 2 OF 7

PROPOSAL DOCUMENT, CLARIFICATION AND ADDENDUM

Quotations are invited from the interested bidders for the enclosed scope of work in two-part bid. Part-1 technical & unpriced part of the work and Part-2 Priced commercial part.

Only experienced Bidders who are qualifying in bid-qualification criteria given in Section E1 only should quote.

The RFP document is organized in five sections as follows.

Section –A General Terms and Conditions of the Contract

Section –A1 General specification & Project information

Section –B Technical Specifications

Section –C Quality Assurance Plan

Section –D welding specifications for shop and site fabricated equipment

Section –E1 to E11: Annexure

Title of the proposal:

**“Procurement, Manufacture, Supply, Erection, Testing and
Commissioning of Horizontal Sliding Doors for SAF**

at

**SSLV launch complex, SSLV project office, Survey no. 260-3c,
Madhavankurichi village – 628206, Opp. To KoodalNagar,
Thiruchendur tk., Tuticorin dist., Tamilnadu**

A. PROPOSAL DOCUMENT

1. Successful Bidder shall sign & stamp each page of the tender document (RFP) as token of his acceptance and submit the same along with the technical bid.
2. Proposal documents shall remain the property of SDSC SHAR and shall not be used for any another purpose without the consent of SDSC SHAR.
3. The proposal shall be completely filled in all respects and Bid shall be tendered together with requisite information & Annexure. Any offer incomplete in any particulars is liable to be rejected.
4. The Proposal (Unpriced Techno-commercial bid) with a complete set of the required documents shall be up-loaded in E-Procurement Portal.

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	GENERAL TERMS AND CONDITIONS OF THE CONTRACT HORIZONTAL SLIDING DOORS FOR SAF	SHEET: 3 OF 7

5. The Proposals shall be submitted on-line in E-Procurement portal before the time limit for bid submission specified.

B. PREPARATION OF BIDS

1. SITE VISIT

Bidder is advised to visit & examine the site and it's surrounding to familiarize himself of the existing facilities & environment and shall collect all other information which may require for preparing & submitting the Bid and entering into the contract. Claims and objections due to ignorance of existing conditions or inadequacy of information will not be considered after submission of the Bid and during implementation.

2. VALIDITY OF OFFER

Bid shall remain valid for acceptance for a minimum period **of 120 days** from the date of technical bid opening. 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 & **conditions of Bid finalized till that time.**

3. COST OF BIDDING

All direct and indirect costs associated with the preparation and submission of bid shall be to Bidder's account and SDSC SHAR will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bid process.

4. APPLICABLE LANGUAGE/ MEASUREMENTS

The bid and all correspondences incidental to and concerning the bid shall be in the English Language. For supporting document and printing

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	GENERAL TERMS AND CONDITIONS OF THE CONTRACT HORIZONTAL SLIDING DOORS FOR SAF	SHEET: 4 OF 7
<p>literature submitted in any other language, an accurate English Translation shall also be submitted. Responsibility for correctness in translation shall lie with the Bidder. All the measurements shall be given in metric system.</p> <p>5. ARRANGEMENT OF BID</p> <p>The Bid shall be neatly presented with consecutively numbered pages. It should not contain any terms and conditions which are not applicable to the Bid. The Bid and all details submitted by the Bidder shall be signed and stamped on each page as token of acceptance, by a person legally authorised to enter into agreement on behalf of the Bidder. (Corrections / alteration, if any, shall also be signed by the same person).</p> <p>6. SCHEDULE OF PRICES</p> <p>The schedule of prices shall be read in conjunction with all the sections of proposal document. The price must be filled online in the same format of 'Schedule of Prices' in Section E1. Hard copy of Price bid shall not be sent strictly. If hard copy of price bid is received the bid will be summarily rejected and shall be uploaded only in price bid.</p> <p>No copy of price bid shall be enclosed along with technical documents. Otherwise offer will be rejected.</p> <p>7. DOCUMENTS COMPRISING THE BID</p> <p>Bids shall be arranged in the following order.</p> <p><u>7.1 Part – I: Technical and Unpriced Commercial Part</u></p> <p>Technical and unpriced commercial part shall comprise the attachments, specifying attachment number arranged in the order as follows:</p> <ol style="list-style-type: none"> Submission of bid letter. All the annexure E1 to E11 enclosed in proposal duly filled, signed and sealed (E1 & E10 unpriced copies only). Bid qualification criteria and all supporting documents. 		

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	GENERAL TERMS AND CONDITIONS OF THE CONTRACT HORIZONTAL SLIDING DOORS FOR SAF	SHEET: 5 OF 7
<p>d) 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. Bidder to clearly indicate “quoted” / “not quoted” against each sl.no in the price column in the unpriced schedule.</p> <p>b) Audited balance sheet including profit and loss account for last three financial years showing annual turnover.</p> <p>c) Latest income tax returns for last three financial year.</p> <p>d) Solvency certificate from a scheduled bank for a value not less than Rs. 5Cr and not before 6months from the date of tender closing.</p> <p>e) Description of the procedures adapted for material procurement, fabrication with deviations from technical specification and proposed design modifications.</p> <p>f) Data sheets for all the equipment & checklists enclosed in proposal duly filled, signed & stamped.</p> <p>g) Technical literature & data sheets of equipment / machinery used by him and any other document as mentioned in the proposal.</p> <p>h) Any other relevant document, bidder desires to submit.</p> <p><u>7.2 Part – II: Priced Commercial Bid</u></p> <p>Priced commercial bid shall be filled online in the price bid format. Schedule of prices also to be filled in the online format and no separate document shall be attached. Deviations in terms and conditions, assumptions, conditions, discounts etc. shall be stipulated in format specified in the portal. SDSC SHAR will not take cognizance of any such statement and may at their discretion reject such bids.</p> <p>C. BID SUBMISSION</p> <p>I. PART – I: UN PRICED TECHNO-COMMERCIAL PART OF THE BID FOR THE WORK</p> <p>Complete Techno-commercial part of the bid shall be filled online in the vendor Specified Terms’ form. Any documents related to technical literature,</p>		

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	GENERAL TERMS AND CONDITIONS OF THE CONTRACT HORIZONTAL SLIDING DOORS FOR SAF	

guarantee / warrantee certificates and any other relevant documents as per the tender shall be scanned in lower resolution format and uploaded.

The deviation statement if any, and checklist shall be filled online, without which the bid will not be considered.

II. PART – II: PRICE PART OF THE BID FOR THE WORK

Price bid shall be filled on the E-Procurement portal only.

a. SDSC SHAR may open Part – I of the bid on the due date of opening subject to meeting the minimum evaluation criteria. Price Bids (Part-II) of technically and commercially acceptable offers shall be opened at a later date.

b. SDSC SHAR reserves the right to reject any or all the Bids without assigning any reasons thereof.

c. **Any bids/offers with price details in Techno-Commercial Offer (Part –I) shall be rejected.**

D. Vendor Evaluation Format

SDSC SHAR seeks response to the given questionnaire for assimilating data which would be used for evaluating the capability of the supplier for executing the referred work. Hence, the supplier is requested to provide only genuine data and any discrepancy found at a later point of time may result in rejection of the supplier from purchase process. Furnishing of data cannot be Construed as automatic qualification for participation in the tender. Questionnaire should be signed by a responsible and authorized person of the Company / Agency.

Schedule of general particulars / vendor evaluation format shall be filled as per **Section: E3**. Schedule of Bidders experience and details of present works being executed are to be filled as per **Section: E7**.

Note: In order to consider as valid experience, it has to be supported with technical details, completion certificate and purchase order.

If warranted, department/ third party will carry out the inspection of the vendor site / site at which vendor worked / erected for evaluation of the capability and genuineness of the documents.

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	GENERAL TERMS AND CONDITIONS OF THE CONTRACT HORIZONTAL SLIDING DOORS FOR SAF	SHEET: 7 OF 7

E. DETERMINATION OF RESPONSIVENESS

SDSC SHAR will scrutinize tenders to determine whether the tender is substantially responsive to the requirements of the tender documents. For the purpose of this clause, a substantially responsive tender is one which inter-alia conforms to all the terms and conditions of the entire Tender document without any deviations and reservations. The decision of SDSC SHAR shall be final in this regard.

F. BID EVALUATION

- I. During evaluation, SDSC SHAR may request Bidder for any clarification on the bid OR additional documents.
- II. Techno-commercial discussion (pre-bid meeting) shall be arranged with Bidder in offline & online mode. Bidder shall depute his authorized representatives for attending discussions. The representatives attending the discussions shall produce authorization from his organization to attend the discussion and sign minutes of meeting on behalf of his organization. The authorized representative must be competent and empowered to settle/decide on all technical and commercial issues.
Pre bid meeting shall be organized within 10 working days from the release of tender. Intimation about pre bid meeting will be informed through our EGPS system / website.
- III. Bidder must provide the point-by-point compliance to the technical specifications along with deviations as per "Schedule of deviations" attached in **section E5**. The tender will be rejected, if the deviations are not acceptable to the Department.
- IV. Performance of Bidder in similar nature of works executed/ under execution shall be taken into consideration before selecting the Bidder for opening his price bid.
- V. The time schedule for completion is given in the Proposal document. Bidder is required to confirm the completion period unconditionally.
- VI. SDSC SHAR reserves the right to accept a bid other than a lowest and to accept or reject any bid in full or part without assigning any reasons. Such

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<p>decisions by SDSC SHAR shall bear no liability whatsoever consequent upon such decision.</p> <p>VII. The Bidder, whose bid is accepted by SDSC SHAR, shall be issued a Letter of Intent (LOI) /Purchase Order (PO) to proceed with the work. Bidder shall confirm acceptance by returning a signed copy of the LOI/PO.</p>		

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	GENERAL SPECIFICATION & PROJECT INFORMATION HORIZONTAL SLIDING DOORS FOR SAF	

SECTION -A1

**GENERAL SPECIFICATION
&
PROJECT INFORMATION**

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<p>1.0 INTRODUCTION</p> <p>Specification for “<i>Procurement, Manufacture, Supply, Erection, Testing and Commissioning of Horizontal Sliding Doors for SAF of SLC Project</i>”</p> <p>2.0 SCOPE OF WORK AND TECHNICAL SPECIFICATIONS</p> <p>The detailed scope of work and technical specifications is given in Sections B, C, D, & E of specification document. The general terms and conditions are given below.</p> <p>3.0 SUPPLIER's OBLIGATIONS & FUNCTIONS</p> <p>3.1. SPECIFICATIONS AND DRAWINGS</p> <p>The Supplier shall execute the works in compliance with the provisions of CONTRACT, good engineering practices and codes requirements.</p> <p>3.2. SUBMISSION OF TECHNICAL DOCUMENTS</p> <p>Supplier shall prepare and submit to SDSC SHAR for approval of following documents and drawings:</p> <p>3.2.1 Technical literatures & data sheets of equipment used by him.</p> <p>3.2.2 Fabrication shop layout for fabricating doors & brackets.</p> <p>3.2.3 Details of heat treatment / stress relieving equipment.</p> <p>3.2.4 Details of Turning machines / milling machines to be used for machining.</p> <p>3.2.5 Assembly Shop layout drawings suitable for control assembly of drives.</p> <p>3.2.6 Erection sequence schedule along with erection drawings.</p> <p>3.2.7 Detailed Quality Assurance Plan.</p> <p>3.2.8 No activity shall be executed unless SDSC SHAR's approval is obtained. The above documents shall be submitted in a format approved by SDSC SHAR.</p> <p>3.3. PROCUREMENT, FABRICATION & SUPPLY</p> <p>Supplier shall carry out procurement, fabrication and supply of the Horizontal Sliding Doors in accordance with the scope, technical specifications and terms & conditions of contract.</p> <p>3.4. DELIVERY AND STORAGE</p> <p>3.4.1. The Supplier shall be responsible for transporting all the equipment to site, unloading and storage.</p> <p>3.4.2. No equipment shall be delivered without obtaining dispatch clearance from SDSC SHAR.</p>		

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<p>3.4.3. All the equipment shall be properly packed to avoid any damage during transportation / handling / storage and any damage found has to be replaced free of cost.</p> <p>3.4.4. The equipment received at site shall be stored at a place assigned for this purpose.</p> <p>3.4.5. Supplier shall take proper care while storing the equipment and shall provide watch & ward at his own cost.</p> <p>4.0 INSTALLATION</p> <p>4.1. GENERAL</p> <p>4.1.1. Supplier's staff shall include adequate number of competent erection engineers with proven experience on similar works to supervise the erection works and sufficient skilled, unskilled and semiskilled labour to ensure completion of work in time.</p> <p>4.1.2. Supplier's erection staff shall arrive at site on date agreed by SLC project. Prior to proceeding to work, Supplier shall however, first ensure that required/sufficient part of his supply has arrived at site.</p> <p>4.1.3. Erection of equipment may be phased in such a manner so as not to obstruct the work being done by other Suppliers and / or operating staff who may be present at that time.</p> <p>4.1.4. During erection, Department's quality team / their engineer will visit site from time to time with or without Supplier's engineer to establish conformity of the work with specification. Any deviations, deficiencies or evidence of unsatisfactory workmanship shall be corrected as instructed by Department.</p> <p>4.1.5. Supplier shall carry out work in a true professional manner and strictly adhere to the approved drawings. Any damage caused by Supplier during erection to new or existing building / environment shall be made good at no extra cost to Department.</p> <p>4.2. RECORDS</p> <p>Supplier shall maintain records pertaining to the quality of erection work in a format approved by Department. Whenever erection work is complete, Supplier shall offer erected equipment for inspection to Department's engineer who along with Supplier's engineer will sign such records on acceptance.</p> <p>4.3. DOOR ERECTION</p> <p>4.3.1. Supplier shall carry out the works in accordance with the specific instructions given on the approved drawings, method statements, manufacturer's drawings / documents or as directed by Department. Equipment shall be erected in neat manner so that they</p>		

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<p>are level, plumb, and square and properly aligned and oriented. Tolerances shall be as established in manufactures drawings or as stipulated by Department. No equipment shall be welded or bolted, until its alignment is checked and found acceptable by Department.</p> <p>4.3.2. Supplier shall provide all supervision, labour, tools, machines, cranes, equipments, scaffolding, rigging material and incidental material such as bolts, wedges, anchors, etc. required to complete the works. Supplier shall also provide at his own cost all such consumables like oxygen - acetylene gas, welding rods, grinding wheels, temporary supports, shims etc. required to complete work.</p> <p>4.3.3. Supplier shall take utmost care while handling instruments, delicate equipment; panels etc. and protect all such equipment on erection.</p> <p>4.4. SAFETY</p> <p>Supplier shall follow all the safety regulations / codes and shall take necessary measures at his own cost for men, material during this project till completion including insurance of person working for erection at site and other statutory clearances.</p> <p>4.5. ERECTION & CONSTRUCTION POWER</p> <p>4.5.1. Arrangement of electrical power supply and all the necessary material handling equipments at SLC site shall be under scope of the successful vendor only.</p> <p>4.5.2. Material handling equipment required at site along with required manpower for the following are in the scope of contractor</p> <ul style="list-style-type: none"> • Loading or unloading of items at the identified location for temporary storage within 200 m from the erection site / SAF. • Loading, unloading and movement of stored items from the temporary storage area to the erection facility / SAF after erection clearance from department. • Material handling requirement for erection and commissioning. <p>4.6. SITE PREPARATION/CLEARANCE</p> <p>No site preparation works are planned by department for site fabrication works. Only clearance will be provided for site preparation works. Preparation of required site for fabrication and approach requirements for handling the doors shall be in scope of contractor. The site identified in such works shall be within 200m from the SAF building location.</p>		

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<p>Upon completion of work, supplier shall remove all his equipment and material from the site within one month or time mutually agreed. Supplier at all times shall keep site in clean condition and remove all unwanted material at regular intervals. In case supplier fails to remove all their equipment and material within the mutually agreed time, it is deemed that SLC Project will arrange to remove the same at Supplier's cost.</p> <p>5. ACCOMMODATION</p> <p>Accommodation will not be provided by department to Contractors. Supplier shall make their own arrangement for accommodation, transportation & canteen facility for all his staff, technicians, labour & workers.</p> <p>6. MEDICAL FACILITIES</p> <p>No medical facilities will be provided by department. Supplier shall make their own arrangement at their own expenses for medical facilities for site personnel.</p> <p>7. WORK PROGRAMME</p> <p>Supplier shall prepare a detailed programme schedule for review / approval by department. Supplier as per exigencies of work shall revise and update programme periodically.</p> <p>8. SUB-CONTRACTS</p> <p>8.1 No work shall be sub-contracted without prior approval of SLC project.</p> <p>8.2 Supplier shall be responsible for the proper execution of any sub-contract placed by him in connection with this purchase order.</p> <p>8.3 Supplier shall furnish to department the copies of all un-priced sub-orders showing promised delivery dates and places.</p> <p>9. CHANGES AND MODIFICATION TO SPECIFICATIONS, DRAWINGS AND QUALITATIVE / QUANTITATIVE REQUIREMENTS</p> <p>9.1. Supplier shall obtain approval from SLC Project before initiating the action for procurement of bought out items.</p> <p>9.2. During the fabrication review, supplier has to carryout the mutually agreed modifications to meet the overall requirement.</p> <p>10. TAXES AND DUTIES</p> <p>10.1. The tendered items as per the above subjected tender comes under "Scientific and technical instruments, apparatus, equipment, accessories, parts, components, spares, tools, mock ups and modules, raw material and consumables required for</p>		

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<p>launch vehicles and satellites and payloads” having GST @ 5% (As per Dept of Revenue IGST Notification No. 25/2018 Integrated Tax (Rate) Schedule-I; Sl. No.243B dt: 31.12.2018 (Amendment to Notifications No. 7/2018-Integrated Tax (Rate) dt: 25.01.2018. Clause A (ix) about Schedule I 243A)).</p> <p>Kindly accept to offer the item with 5% GST against End User Certificate from our Competent Authority that the items belong to the above category.</p> <p>10.2. It is the responsibility of the contractor to issue the Tax Invoice strictly as per the format prescribed under the relevant applicable GST law (CGST Act/SGST Act/UTGST Act/IGST Act). Contractor to indicate the proper GSTN Registration/ HSN code in their tax invoices.</p> <p>10.3. CGST/SGST/UTGST/IGST shall be paid at actuals against Tax Invoice but restricted to the amount and percentage in the contract.</p> <p>10.4. GST details of SDSC SHAR are given below:</p> <p style="padding-left: 40px;">Designation : Purchase and stores officer VALF</p> <p style="padding-left: 40px;">Contact no : 08623-226082</p> <p style="padding-left: 40px;">GSTIN : 37HYDF00385AIDZ</p> <p>11. STATUTORY VARIATION</p> <p>Statutory variation for CGST/SGST/UGST/IGST is applicable, provided the actual completion of services does not occur beyond the period stipulated in the order/contract or any extension (without levy of penalty). For variation after the agreed completion periods, the service provider alone shall bear the impact for the upwards revisions.</p> <p>For downward revisions, the Department shall be given the benefit of reduction in CGST/SGST/UGST/IGST.</p> <p>12. RISK COVERAGE</p> <p>The Supplier 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, 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.</p> <p>13. INCOME TAX</p> <p>Income tax at the prevailing rate as applicable from time to time shall be deducted from the supplier's bills as per Income Tax Act,1961 and the rules there-under or any re-enactment or modifications thereof TDS certificate shall be issued.</p>		

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<p>14. BANK GUARANTEE FOR SECURITY DEPOSIT, PERFORMANCE BANK GUARANTEE:</p> <p>14.1 PERFORMANCE BANK GUARANTEE (PBG): Successful vendor has to submit a BG/DD/FDR in lieu of PBG from a Nationalized / Scheduled Bank for 3% of the order value after commissioning and acceptance of HSDs valid till the completion of warranty period plus 60 days towards claim period.</p> <p>14.2 SECURITY DEPOSIT (SD) 3% value of the order shall be deposited with SDSC within 10 days from the date of the Purchase Order towards security deposit in the form of Bank Guarantee (BG)/ FDR/DD towards performance of the Contract valid till completion of the contract period plus sixty days towards claim period. (This will be returned by SDSC immediately on execution of the order satisfactorily as per order terms. If not, the amount will be forfeited).</p> <p>14.3 Combined BG for PBG cum SD In case, if parties are unable to provide two separate BGs, i.e., one for SD & one for PBG, they can submit a combined BG for SD & PBG for 3% of the Order value valid till the completion of total contractual obligation (i.e., Supply period plus warranty period plus 60 days). Note: No interest shall be payable on any bank guarantee.</p> <p>15. PACKING AND FORWARDING</p> <p>15.1 The Supplier shall arrange to have all the material suitably packed as per the standards and as specified in the contract. Unless otherwise provided for in the contract, all containers (including packing cases, boxes, tins, drums, and wrappings) used by the Supplier shall be non-returnable.</p> <p>15.2 All packing and transport charges, transit handling costs, transit risk coverage and transport fees of agents employed at the place of delivery or elsewhere, shall be deemed included in the price to be paid to the Supplier.</p> <p>16. ARBITRATION In the event of any question, dispute of difference arising under these conditions or any conditions contained in the Purchase Order or in connection with this contract, (except as to any matters the decision of which is specially provided for by these conditions) the same shall be referred to the sole arbitration of the head of the Purchase Office or some other person appointed by him, it will be no objection that the arbitrator is a Government Servant that he had to deal with matter to which the</p>		

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<p>contract relates or that in the course of his duties as Government Servant he had expressed views on all or any of the matters in disputes or difference. The award of the arbitrator shall be final and binding on the parties of this contract.</p> <p>It is Term of this contract:</p> <ol style="list-style-type: none"> a. If the arbitrator be the head of the purchase office. <ol style="list-style-type: none"> i. In the event of his being transferred or vacating his office by resignation or otherwise, it shall be lawful for his successor-in office either to proceed with the reference himself, or to appoint another person as arbitrator, or. ii. In the event of his being unwilling or unable to act for any reason, it shall be lawful for the Head of the Purchase Office to appoint another person as arbitrator: or b. If the arbitrator be a person appointed by the Head of the Purchase Office in the event of his dying, neglecting or refusing to act, or resigning or being unable to act, for any reason, it shall be lawful for the Head of the Purchase Office either to proceed with the reference himself or to appoint another person as arbitrator in place of the outgoing arbitrator. <p>Subject as aforesaid, the Indian Arbitration and Conciliation Act, 1996 and the rules there under and any statutory modifications thereof for the time being in force shall be deemed to apply to the arbitration proceedings under this Clause. The arbitrator shall have the power to the extent with the consent of the Purchaser and the Contractor the time making and publishing the award. The venue of arbitration shall be place as the purchaser in his absolute discretion may determine. Work under the Contract shall, if reasonably possible, continue during arbitration Proceedings.</p> <ol style="list-style-type: none"> c. In case order is concluded on the public Sector Undertakings, the following Arbitration Clause will be applicable. <p>In the event of any dispute or differences relating to the interpretation and application of the provisions of contracts, such dispute or difference shall be referred by either party to the Arbitration of one of the Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Bureau of Public Enterprises. The Indian Arbitration and Conciliation Act, 1996 shall not be applicable to the Arbitration under this clause. The award of the arbitrator shall be binding upon the parties to the dispute provided, however, any party aggrieved by such award may make</p>		

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<p>a further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India. Upon such Additional Secretary when so authorised by the Law Secretary whose decision shall bind the parties finally and conclusively. The parties to the dispute will share equally the cost of arbitration as intimated by the arbitrator.</p>		
<p>17. APPLICABLE LAW AND JURISDICTION</p>		
<p>The laws of India shall govern this purchase order 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 what so ever arising out of the purchase order.</p>		
<p>18. FORCE MAJEURE</p>		
<p>Should a part or whole work covered under this purchase order be delayed due to reasons of Force Majeure which shall include legal lockouts, strikes, riots, civil commotion, fire accident, quarantines, epidemic, natural calamities and embargoes the completion period for work, equipment referred to in this agreement shall be extended by a period not in excess of the duration of such Force Majeure. The occurrence shall be notified within reasonable time.</p>		
<p>19. WARRANTY</p>		
<p>The bidder shall provide 12 months warranty for the entire system for a defect liability, after final official handing over at his cost. During this period, supplier has to provide and adhere to the following:</p>		
<p>19.1. He has to attend quarterly based preventive maintenance visits and breakdown maintenance calls. All the defective components have to be replaced or rectified on one-to-one basis.</p>		
<p>19.2. Break down maintenance should be responded within 48 Hours time and shall be completed within 48 Hours after respond.</p>		
<p>19.3. Department will not provide any transport/accommodation.</p>		
<p>19.4. In case vendor failed to attend and repair the system within 7 days from the date of reporting the problem, Department will reserve right to forfeiting the BG apart from withheld of any payment payable to the vendor.</p>		
<p>20. SCHEDULE OF PRICE</p>		
<p>20.1. CONTRACT price shall include all costs of “Procurement, Manufacture, Supply, Erection, Testing and Commissioning of Horizontal Sliding Doors for SAF”, shop testing, packing, forwarding, transport to site, unloading, storage, all risk coverage,</p>		

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<p>erection, installation, testing & evaluation and commissioning of equipment including any other cost for proper and complete execution of the CONTRACT.</p> <p>20.2. CONTRACT prices shall also include all travelling expenses, living expenses, salaries, overtime, benefit and any other compensation for engineers, supervisors, skilled, semiskilled workmen, watch and ward staff, labours and other staff employed by the Supplier, cost of tools and tackles required for erection and other consumable material required, and all taxes, duties, and levies as applicable on the date of submission of bid.</p> <p>20.3. Supplier shall quote the prices similar to price bid format enclosed as Section –E1.</p> <p>20.4. Erection charges, bought out items and third-party inspection charges shall be firm and fixed even for the + 15% quantity variations also.</p> <p>20.5. The contractor shall agree for addition / deletion of the works for the same quoted unit rates and such variation is limited to $\pm 15\%$ of the ordered quantities.</p> <p>20.6. The rate quoted shall be on FOR SLC PROJECT SITE, TUTICORIN, TAMILNADU basis.</p> <p>20.7. The taxes applicable for supply and erection & commissioning shall be indicated separately in the price bid. If the offers submitted by the tenderers are 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.</p> <p>21. DISCOUNTS</p> <p>Tenderer shall not indicate any discount separately and quoted price should be after deducting the discount.</p> <p>22. TERMS OF PAYMENTS</p> <p>General guideline TERMS OF PAYMENTS are as indicted below. Any deviation to these payment terms to be brought out.</p> <p>22.1.FOR SUPPLY OF ITEMS INLCUDING BOUGHTOUT ITEMS (i.e., supply of fabrication items, supply of fabricated machined items, supply of forging machined items & supply of Bought out items)</p> <p>Option-1:</p> <p>a. 80% of supply cost payment against receipt of material at Purchasers / Department site, along with 100% GST.</p>		

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<p>b. 20% of supply cost after successful commissioning & acceptance by Department of equipment and system covered under contract and against submission of Performance bank guarantee.</p> <p style="text-align: center;">Or</p> <p>Option-2:</p> <p>a. 30% of supply cost as advance against submission of bank guarantee for an equal amount from a reputed nationalized/scheduled bank and shall be valid till Contract completion period. Format of Bank guarantee shall be obtained from Department after award of contract.</p> <p>b. 60% of supply cost payment on prorata basis against receipt of complete material at Purchasers / Department site, along with 100% GST.</p> <p>c. 10% of supply cost after successful commissioning of equipment & system covered under contract and acceptance by the department, against submission of Performance bank guarantee valid till warranty period.</p> <p>22.2.FOR ERECTION, TESTING AND COMMISSIONING OF DOORS AT SITE</p> <p>a. 80% of erection cost at department site after successful erection , testing and commissioning of all the doors in all respect, conducting functional checks and trail run (duly accepted by Department) along with 100 % GST.</p> <p>b. 20% of erection cost after successful commissioning, acceptance of equipment and system covered under contract by department and one trial run of all the doors at department site and against submission of performance bank guarantee.</p> <p>22.3.FOR THIRD PARTY INSPECTION CHARGES</p> <p>a. 50% of third-party inspection charges after receipt of complete material at purchasers / Department site.</p> <p>b.50% of third-party inspection charges along with GST after Erection, Commissioning and acceptance of the system.</p> <p>Note: Interest on advance will be loaded in cost to arrive L1</p> <p>23. DELIVERY SCHEDULE</p> <p>The realization of fabrication works within the schedule is very essential. Hence, bidders are requested to adhere to the schedules given below.</p>		

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Contractor shall follow the following schedule for executing the contract:

S.No	Description of Target	Responsibility	Target Completion Date
1	Purchase Order release	Dept.	T
2	Procurement, fabrication / machining, control assembly, inspection, transportation, handling and storage at site.	Vendor	T + 6 months
3	Department clearance for erection and commissioning.	Dept.	T1
4	Erection, Commissioning of the equipment.	Vendor	T1 + 4 months from the date of site clearance for erection

24. LIQUIDATED DAMAGES

In the event of the Supplier failing to complete the work within the delivery period specified in the contract agreement or in extension agreed thereto, Department shall reserve the right to recover from the Supplier as liquidated damages, a sum of **0.5** percentage per week or part thereof of the undelivered portion of the total contract price of equipment or work. However, the total liquidated damages shall not exceed **10.0** percentage of the total Contract price. The LD reckoning date shall be **T+6 months** for supply portion and **T1+4 months** for the erection and commissioning portion of the contract.

25. DISCLOSURE AND USE OF INFORMATION

- 25.1** If the documents supplied by SDSC SHAR are marked **“Strictly Confidential”**, supplier shall take all necessary steps to ensure the same.
- 25.2** Supplier shall guarantee that all information and data received during execution of Purchase Order from SDSC SHAR shall be classified as “confidential” within the meaning of the Official Secrets Act and will not be divulged to any third party without prior written permission of department. All drawings & documents shall be returned after execution of work.
- 25.3** No publicity of any kind whatsoever regarding this work shall be given without prior clearance from department.

26. ACCEPTANCE AND REJECTION:

On completion of the work or part of the work as specified in the contract, the representative of the Department referred to, shall check as soon as possible, but

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<p>in any event within one month of notification of readiness for acceptance that the work performed complies with the contract requirements as regards quantity and quality.</p> <p>In the event of rejection of any of the articles, whereby the Supplier feels himself aggrieved, he may within eight days of the receipt of notification of rejection and before such articles have been removed from the place of inspection, give the Department notice of objection. Such objection shall be considered by a Board of Appeals of the Department. The Department shall, without prejudice to the arbitration clause in the contract, take a decision upon presentation of the Board's findings.</p> <p>On completion of tests, the members of the Inspection Organisation of the Department or Inspection agency appointed by Department shall prepare a report, which must be countersigned by the Supplier.</p> <p>27. SUSPENSION:</p> <p>27.1 Department may notify the Supplier to suspend performance of any or all of his obligations under the Contract. Such notice will specify the reasons for suspension and the effective date of suspension. Supplier there upon shall suspend the performance of such obligations until ordered in writing to resume performance of Contract by Department.</p> <p>27.2 If Supplier's performance or his obligations remain suspended or the rate of progress is reduced, then, the time of completion will be suitably extended and all costs incurred by Supplier as a result of suspension or reduction in rate of progress will be paid to Supplier provided that the suspension or reduction in the rate of progress is not by reasons of Supplier's default or breach of Contract.</p> <p>28. CANCELLATION</p> <p>28.1 GENERAL RULE</p> <p>The Department shall have the right at any time to cancel a contract either wholly or in part by giving written notice by registered mail. From the time of receipt of the written notice, the Supplier shall undertake to observe the instructions of the Department as to the winding up of the contract both on his own part and on the part of his sub-suppliers.</p> <p>28.2 WITHOUT FAULT OF SUPPLIER</p>		

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<p>In the case of cancellation of a contract by the Department without any fault of the Supplier, the Supplier shall on receipt of Department's instructions forthwith take the necessary steps to implement them. The period to be allowed to implement them shall be fixed by the Department after conclusion with the Supplier and, in general, shall not exceed three months.</p> <p>Subject to the Supplier confirming, Department shall take over from the Supplier at a fair and reasonable price all finished parts not yet delivered to the Department, all unused and undamaged material, bought-out components and articles in course of manufacture in the possession of the supplier and property obtained by or supplied to the Supplier for the performance of the contract, except such material, bought-out components and articles in course of manufacture as the supplier shall, with the agreement of the Department, elect to retain.</p> <p>28.3 WITH FAULT OF SUPPLIER:</p> <p>The Department reserves the right, after full consideration of all relevant circumstances, including the observations of the supplier, to cancel a contract in any of the following circumstances.</p> <p>d. In the event of the Supplier's failure to meet</p> <p style="padding-left: 40px;">(i) The Technical requirements of the Supplier.</p> <p style="padding-left: 40px;">(ii) The Progress and/or delivery requirements.</p> <p>e. If the Supplier has not observed the provisions of the contract concerning the disclosure and use of information provided by the Department.</p> <p>f. If the Supplier fails to comply with the provisions of the contract concerning the equipment, supplies and technical documents made available by the Department.</p> <p>g. If the Supplier transfers his contract without the Department's authorization or concludes sub-contracts against the Department's explicit directives.</p> <p>h. In the event that Supplier unjustifiably repudiates the Contract or fails to ship or dispatch all or part of the goods ordered for reasons other than those attributed to the Department's actions or as provided in the Force Majeure clause, the Department may, by giving an appropriate notice in writing to the Supplier, fix a Date of Essence by which the Supplier must complete the dispatch in full. If the Supplier fails to do so, the Department, in addition to his right to recover Liquidated Damages in terms of the Contract, shall also have</p>		

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<p>the right to cancel this Contract and make substitute purchases from other sources. If the goods are in a partial state of fabrication, Department may have the fabrication completed by other means, in which event Supplier shall be liable to Department for the additional expenses incurred thereby, but shall not have any claim on savings, if any, in such cases.</p> <p>In the event of such cancellation, the Department shall unless otherwise specified in the contract, only pays.</p> <ul style="list-style-type: none"> - In the case of a fixed-cost contract for the supply of equipment or material. The contractual value of items delivered and accepted under the contract before receipt of notification of cancellation, or to be accepted under the special conditions of cancellation. - In the other cases. <p>A fair and reasonable price in respect of such work as has been carried out prior to the receipt by the Supplier of notification of cancellation.</p> <p>29. Fraudulent practices, bribery and corruption of Government Servants</p> <p>The contractor represents and undertakes that he has not given, offered or promised to give, directly or indirectly any amount, gift, consideration, reward, commission, fees, brokerage or inducement to any person in service of the department or otherwise in procuring the contracts or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of the contract or any other contract with the Government for obtaining a contract or showing or forbearing to shoe favour or disfavour to any person in relation to the contract or any other contract with the government. Any breach of the aforesaid undertaking by the contract or any one employed by him or acting on his behalf or for his benefit (whether with or without the knowledge of the contractor) or the commissioning of any offence by contractor or any one employed by him or acting on his behalf, as defined in chapter IX of the Indian Penal code, 1860 or the prevention of corruption Act. 1947 or any other Act enacted for the prevention of corruption shall, without prejudice to any other legal action, entitle the Department to cancel the contract either wholly or in part, and all or any other contracts with Contractor and recover from the Contractor such amount or the monetary value thereof and the amount of any loss arising from such cancellation without any entitlement or compensation to the Contractor. The Department will also have the right to recover any such amount from any contracts concluded earlier between the</p>		

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<p>contractor and the Government of India. The contractor will also be liable to be debarred from entering into any contract with the Government of India for a minimum period of five years. A decision of the Department to the effect that a breach of the undertaking had been committed shall be final and binding on the Contractor.</p> <p>30. Risk and Cost Purchase:</p> <p>Timely delivery of goods/services is of prime importance and where the vendor fails to fulfil their contractual obligations, the Procuring Entity shall be entitled, and it shall be lawful on his part, to procure Stores and/ or services similar to those ordered/cancelled, with such terms and conditions and in such manner as it deems fit at the “Risk and Cost” of the Contractor and the Contractor shall be liable to the Procuring Entity for the extra expenditure, if any, incurred or accrued by the Procuring Entity for arranging such procurement. However, the Contractor shall not be entitled to benefits if any, from such procurement.</p> <p>31. Land Boarder Sharing Deceleration</p> <p>The bidder shall provide compliance to Order No. F.No.7/10/2021 PPD dated 23.02.2023 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.</p> <p>32. Make-In-India (MII) Clause:</p> <p>Provisions contained in Public Procurement Policy (Preference to Make in India); Order 2017 issued by DPIIT vide OM No. P-45021/2/2017-PP(BE-II) dated 16.09.2020 & directives related including latest amendments (if any) is applicable for this tender. You are requested to provide Self Declaration Certificate that the offered Item meets Local Content Requirement of Class 1 or Class 2 as per Make in India (MII) Policy, clearly indicating the Percentage of local content & the details of Location(s) at which value addition is made in the offered product. 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</p>		

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etc. Minimum 50% local content for Class-1 local supplier and minimum 20% local content for class 2 local suppliers.

Bidders shall submit self-declaration indicating percentage of local content along with location of value addition in INDIA.

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<div> <div>Maximum Temperature</div> <div>: 39 deg C</div> </div> <div> <div>Design ambient temperature</div> <div>:45.0 deg C</div> </div> <div>for performance guarantee</div> <div> <div>For electrical system design</div> <div>:50 deg C</div> </div>		
<div>33.6.2 Relative humidity</div> <div> <div>Range</div> <div>:58% to 95%</div> </div> <div> <div>Design relative humidity</div> <div>:95%</div> </div> <div>for performance guarantee</div>		
<div>33.6.3 Rainfall</div> <div> <div>Annual average maximum</div> <div>:1222.7 mm</div> </div>		
<div>33.6.4 Wind Load</div> <div> <div>Basic wind speed</div> <div>:7m/s (Enhanced by a factor 1.4)</div> </div>		
<div>33.7</div> <div> <div>Seismic Data</div> <div>: As per IS: 1893 latest issue</div> </div> <div> <div>Zone</div> <div>: Zone II</div> </div>		

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SECTION -B

TECHNICAL SPECIFICATION

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<div data-bbox="240 389 440 427"> 1.0 <u>SCOPE</u> </div> <div data-bbox="338 459 1401 595"> <p>This specification covers the description of scope of work, functional requirements, technical parameters, general design, materials, construction features, interfaces, list of drawings and bought out items.</p> </div> <div data-bbox="338 627 1401 1120"> <p>The scope of the supplier shall include understanding of Horizontal Sliding Doors (hereafter referred as HSDs) and its functional requirement, submission of manufacturing & heat treatment / stress relieving methodology, procurement of raw material, fabrication, stress relieving / heat treatment, machining, assembly of sub-systems along with bought out items, shop inspection, testing at the manufacturer's works, packing, forwarding, transportation, delivery at site (SSLV Launch Complex (SLC), Tuticorin, Tamil, Nadu), handling at site, erection, testing, commissioning, performance / acceptance testing as per the enclosed specification under the supervision of ISRO & Third party Inspection agency (TPIA) and handing over of Horizontal Sliding Doors.</p> </div> <div data-bbox="240 1151 488 1189"> 2.0 <u>QUANTITY</u> </div> <div data-bbox="338 1220 1401 1303"> <p>One set of HSD for front side of SSLV Assembly Facility (SAF) consists of 2 nos. of double leaf HSD and 4 nos. of single leaf HSD.</p> </div> <div data-bbox="338 1335 1401 1420"> <p>Another set of HSD for rear side of SAF consists of 2 nos. of double leaf HSD and 4 nos. of single leaf HSD.</p> </div> <div data-bbox="338 1451 960 1489"> <p>Each door leaf will have individual drive system.</p> </div> <div data-bbox="240 1520 738 1559"> 3.0 <u>ESTIMATED TOTAL WEIGHT</u> </div> <div data-bbox="338 1590 1401 1830"> <p><i>The estimated finished weight of the system in each category in price bid format (Section - E1) is approximate only. The contractor shall agree for addition / deletion of the works and such variation is limited to $\pm 15\%$ of the order value. Offer shall be valid for $\pm 15\%$ of the order value. However, payment will be made based on the final finished drawing weight only.</i></p> </div> <div data-bbox="240 1861 995 1899"> 3.1 Fabricated structural items without machining. </div> <div data-bbox="338 1930 1401 2067"> <p>Procurement, fabrication, control assembly of door leaf structure, transportation, handling at site, erection & commissioning of structural steel / Mild steel conforming to IS:2062 & IS:808 is 210 t (approximate).</p> </div>		

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<p>Items coming under above category are Door Leaves, labyrinth sealing plates at door interfaces, sealing plates, top sealing brackets, maintenance platforms, ladders, guards, shims etc.</p> <p>3.2 Fabricated structural items with machining.</p> <p>Procurement, fabrication, stress relieving, machining, sub assembly, control assembly of drive units, transportation, handling at site, erection & commissioning of structural steel / Mild steel conforming to IS:2062 & IS:808 is 22 t (approximate).</p> <p>Items coming under above category are Guide channels, brackets for lateral guide wheels, brackets vertical wheels, brackets for track supports, brackets for cyclone locks, bearing retainers, lock plates, bearing housings, bearing retainers, base frames, pulleys brackets, drum mounting brackets, base & Striker for limit switch etc.</p> <p>3.3 Machined Special Steel components for HSDs of SAF.</p> <p>Procurement, heat treatment if required, machining, sub assembly, control assembly of drive units, transportation, handling at site, erection & commissioning of different alloy steels / forged steels / cast steels like En24-T, En-9, Alloy steel 40NiCr4Mo3, 40Cr4M03, HARD0X400 or any other steel mentioned in the BOQ etc. is 16 t (approximate).</p> <p>Items coming under above category are liners for guide channels, pivot pin, Wheels, axles, rope drum, shafts, pulleys, cyclone lock screws, couplers, spacers with special steel, through bolts, fasteners etc.</p> <p>3.4 Bought out items & Electrical work for HSDs in SAF.</p> <p>Procurement of Bought out items as per the BOQ, assembly with sub-systems, control assembly if required, procurement of 12 nos. of motors, electrical cables, junction boxes, local control panels, motor control center panels, Bearings, 12 nos. of gear boxes, lock nuts, lock washers, 24 nos. of Full gear couplings, 12 nos. of fluid couplings, wire ropes, limit switches, grease nipples, rubber, insulation etc. testing the performance of drive system and other functions of electrics, transportation, handling at site, erection & commissioning and handling over of spares mentioned in Clause no 20.0 .</p>		

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<p>4.0 <u>BACKGROUND INFORMATION / FUNCTIONAL REQUIREMENT</u></p> <p>4.1 The SAF is a RCC building of 22.6 m width, 26.5 m length and a height of 58 m and is 730 m away from Launch Pad.</p> <p>4.2 Horizontal Sliding Doors (HSDs) are used for closing the openings provided on the Front and Rear sides of the SSLV Assembly Facility (SAF). HSDs are provided to protect launch vehicle from the inclement weather conditions from outside and to maintain controlled environment inside SAF.</p> <p>4.3 The main function of HSDs is to provide clear opening for the movement of fully integrated launch vehicle along with MLS and AUT from 0.0 m to 44.4 m on the front and rear side of the SAF.</p> <p>4.4 Doors are planned to be driven by electrically operated winch drives. Cyclone locks are provided to withstand the cyclonic wind in closed condition and sealing arrangement is provided at all interfaces to arrest entry of rain water in to SAF even during cyclone.</p> <p>4.5 The doors have limit switches so as to operate the doors safely with in the desired limits.</p> <p>4.6 The doors are also provided with Phenotherm insulation since the building is air-conditioned.</p> <p>4.7 Easy accesses are provided for maintenance / approach of guide wheels and cyclone locks.</p> <p>5.0 <u>DETAILED SCOPE OF WORK / EQUIPMENT AND SERVICES TO BE PROVIDED BY SUPPLIER</u></p> <p>For Successful realization of 2 sets of double leaf HSDs and 8 nos. of single leaf HSD (1 set of double leaf HSD and 4 nos. of single leaf HSD on both, i.e., front and rear sides of SAF) the scope of supplier shall include but not limited to the following items:</p> <p>5.1 Complete understanding of functional requirements of HSD system, interfaces and thereby ensuring satisfactory operation of the system.</p> <p>5.2 Understanding of supplied drawings and preparation of part drawings, if required.</p> <p>5.3 Procurement of raw materials and bought out items with qualification.</p>		

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<p>5.4 Carrying out of fabrication as per approved fabrication drawings, stress relieving the fabricated components and machining of the items as per the drawing.</p> <p>5.5 Procurement of Electrical items like motors limits switches, cables, local control panels, motor control centre panels etc., which are required for all door operation.</p> <p>5.6 Procurement of Phenotherm insulation board as per specifications and fixing using suitable glue material. Insulation board shall be supported by suitable MS angles wherever required.</p> <p>5.7 Assembly and testing of subsystems /system such as drive units at shop along with bought out items as per approved manufacturing /fabrication drawing and bills of materials.</p> <p>5.8 Receipt of manufactured items and related materials at site, unloading, storing in specified location by tenderers' in his own custody, transportation within the site.</p> <p>5.9 Completing the door fabrication at site from the transportable modules received from shop.</p> <p>5.10 Finalizing the procedure for the erection, testing and commissioning of the sub system and the integrated HSD system to ensure all the functional requirements.</p> <p>5.11 Cleaning of embedment plates mating surface and through holes in the building by using suitable power tools.</p> <p>5.12 Mapping the location of embedment plate by survey team, aligning the bracket with embedment plate using suitable spacer plates. Providing final alignment of the spacer plates using survey team, before starting erection.</p> <p>5.13 Carrying out erection, testing and commissioning of subsystems and the integrated HSD system to ensure all the functional requirements.</p> <p>5.14 Through bolts for fixing brackets (bolt length is indicative, however, suitable length of the bolt shall be used considering required spacer thickness). All the bolts shall be minimum 8.8 grade.</p> <p>5.15 Tracks for HSD-1 as per drawings.</p> <p>5.16 Trial suiting and necessary minor corrections of the drive base frames and all brackets with embedment plates on civil building and alignment & fixing the same with embedment plate as per drawing and specification.</p>		

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<p>5.17 All tools, tackles, cranes etc for erection.</p> <p>5.18 Suitable spacer plates required for alignment of doors, drive systems, pulley brackets and lateral & vertical guide wheel brackets, etc.</p> <p>5.19 Submission of execution plan for all major actives including manufacturing, testing packaging, delivery to SLC site at Tuticorin, Tamil Nadu, erection and commissioning.</p> <p>5.20 Paint and painting of equipment, structures, supports etc. (Inclusive of Primer Coating).</p> <p>5.21 Shop inspection (in Vendor's works & at project site) after installation along with all required calibrated measuring instruments.</p> <p>5.22 All field instruments, junction boxes and Local Control Panel (LCP) along with all erection hardware & structural steel supports.</p> <p>5.23 Fabrication of supports, cable trays, flexible metal conduits etc., as required to run and terminate the cables from the nearest cable tray header to the individual equipment & providing double earthing to all electrical equipment.</p> <p>5.24 Installation, testing and commissioning of the electrical panels</p> <p>5.25 First fill of oil, grease, lubricants consumables, etc. as required during start up and commissioning operations.</p> <p>5.26 Testing, commissioning of complete HSDs and handing over.</p> <p>5.27 Arranging the third-party inspection agency to carry out the inspection works at various stages as per the approved QAP for manufacturing and testing procedures in the document are only for the general guideline of the tenderer. The tenderer shall furnish these details in their offer as required in the relevant articles of this specification.</p> <p>5.28 Preparation / Revision of Drawings if any changes made and submission of as built drawings.</p> <p>5.29 Arrangement of safe approach to different levels of the building for all the works related to erection and commissioning.</p> <p>5.30 Embedment plates required apart from the HSD drawing are to be fixed using suitable / approved anchor bolts if required.</p>		

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6.0 EQUIPMENT AND SERVICES TO BE PROVIDED BY DEPARTMENT

- 6.1** Embedment plates suiting the bracket interfaces for all brackets (Lateral guide wheel, vertical guide wheel, horizontal & vertical pulley, cyclone lock etc.) will be provided by the department.
- 6.2** Embedment plate with suitable bolts for the drive base frame shall be provided by department.
- 6.2.1** However, party has to trail suit the bracket and drive base frame with the erected embedment plate before erection.
- 6.2.2** If minor corrections are required in the brackets, base frame of drive assembly to suit the embedment plate, party has to correct the same in the bracket suitably with the approval of department.
- 6.2.3** Embedment plates for fixing approach ladders of HSD, maintenance platforms, chajja of HSD.
- 6.3** Foundation for HSD-1 front & rear bottom vertical wheel track excluding grouting.

7.0 TECHNICAL SPECIFICATION OF HSDS

There are 1 set of double leaf HSD and 4 nos. of single leaf HSD on both sides, i.e., front & rear side from EL 0.0m to EL 44.4m of SAF to get opening as mentioned in following Table.

Location	Clear opening at centre (m)	Bottom level (m)	Top level (m)
On Front & Rear Side	10.5	0.0	8.0
	5.0	8.0	44.4

Horizontal Sliding Door (HSD) is composed of the following major subassemblies / components:

- (a) Door Frame
- (b) Vertical Wheels
- (c) Lateral Guide Wheels

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- (d) Wheel Brackets
- (e) Cyclone locks
- (f) Drive mechanism comprising rope drum, wire rope, sheaves, drive unit, brake, fluid coupling etc.
- (g) Insulation
- (h) Sealing arrangement

Horizontal Sliding Doors (HSDs) are configured such that doors shall slide laterally sidewise on wheels and tracks driven by drive mechanism. All doors along with the wheel assembly integral with the door frame horizontally slide on the tracks mounted on the SAF wall.

HSD shall be a complete unit with Door leaf structure, Vertical Wheel assembly, Lateral wheel assembly, cyclone locks, drive mechanism comprising rope drum, wire rope, sheaves, drive unit, brake, all electrical etc. to make the equipment complete in all respects. The steel used for the HSD construction shall be of standard quality. All materials used shall be of recent manufacture, free from defects, mill scales, laminations, pittings, flakes, rust etc. All welds shall be free from defects like blowholes, lack of penetration, slag intrusions etc.

A brief description of the constructional features required for each of the above subassemblies / components is listed here below.

7.1 DOOR FRAME

7.1.1 Each double leaf HSD set comprises RH and LH door frames.

7.1.2 Door frame sizes for front and rear HSDs is as mentioned in following table:

7.1.3 The door frame is made of welded steel / rolled structure with built up 'C' and 'I' sections

LOCATI ON	HSDs	WIDTH (in mm)	HEIGHT (in mm)	CLEAR OPENING (in mm)	OPENING ELEVATION (in m approx.)	DRIVE LEVEL ELEVATION (in m)

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FRONT & REAR SIDE OF SAF	HSD-1 (Double leaves)	9750	8275	10500	0.0-8.0	0.0
	HSD-2 (Single leaf)	10200	8975	5000	8.0-17.0	9.4
	HSD-3 (Single leaf)	10200	8975	5000	17.0-26.0	21.0
	HSD-4 (Single leaf)	10200	8975	5000	26.0 – 35.0	27.5
	HSD-5 (Single leaf)	10200	8975	5000	35.0 -44.4	38.5

7.1.4 Each door leaf of HSD-1 overlaps the adjacent door leaf from two sides (Top & Centre) and each door of HSD-2, 3, 4 & 5 overlaps with the top and bottom door leaf by means of steel labyrinth sealing plates.

7.1.5 There shall be two steel labyrinth plates enveloping the two sides of each door frame. The spacing and placement of these labyrinth plates shall be such that there will not be any interference with the mating door to help in preventing ingress of water.

7.1.6 The gap in the two labyrinth plates shall be such that there is enough space for door deflection.

7.1.7 The face of the labyrinth in the vertical plane shall be fixed with synthetic rubber pads of 20 mm thickness using glue and fasteners.

7.1.8 To facilitate the aspects of fabrication, transportation, handling and erection of HSDs at site, the door leaf shall be made up of modules. However, to avoid major fabrications at site, vendor shall optimise number of modules.

7.2 VERTICAL WHEELS ARRANGEMENT

7.2.1 Vertical Wheel arrangement for HSD-1 comprises of pivoted double wheel assembly connected to a common bracket hinged at the bottom front side (towards opening side) and fixed wheel mounted at the bottom rear side is provided. Two vertical wheels at top for proper guiding of HSD-1 in vertical plane during door travel are to be provided as per drawing.

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<p>7.2.2 For HSD-2 to HSD-5, the vertical wheels at top and bottom are mounted on the SAF wall.</p> <p>7.2.3 There are two vertical wheels at bottom to support the self-weight of the door and two vertical wheels at top for proper guiding of HSDs in vertical plane during door travel. The wheels are spaced considering width of the door and space availability.</p> <p>7.2.4 Vertical Wheels arrangement (Top and Bottom) comprises Plain Wheel, Bracket, Axle, Taper roller bearing ('O' arrangement), bearing retainer, spacer, axle locking plate and lock nut- lock washer.</p> <p>7.2.5 Vertical wheel assembly shall be mounted on the respective wheel brackets.</p> <p>7.2.6 These wheels brackets shall be fixed onto the bracket connected to SAF front side and rear side walls.</p> <p>7.3 LATERAL GUIDE WHEELS</p> <p>7.3.1 Lateral guide wheel assembly for all HSDs comprises a pair of horizontal wheels moving inside a fabricated guide channel with track which is attached to the door leaf.</p> <p>7.3.2 Lateral guide wheels are designed to withstand the operating wind loads, lateral loads and eccentric loads.</p> <p>7.3.3 4 nos. of Lateral guide wheel assemblies shall be provided for each door leaf with each lateral guide wheel assembly comprising 2 nos. of rollers/ wheels.</p> <p>7.3.4 Lateral guide wheel assembly shall be mounted on the base frame which in turn will be mounted on the embedment plates provided on SAF walls.</p>		

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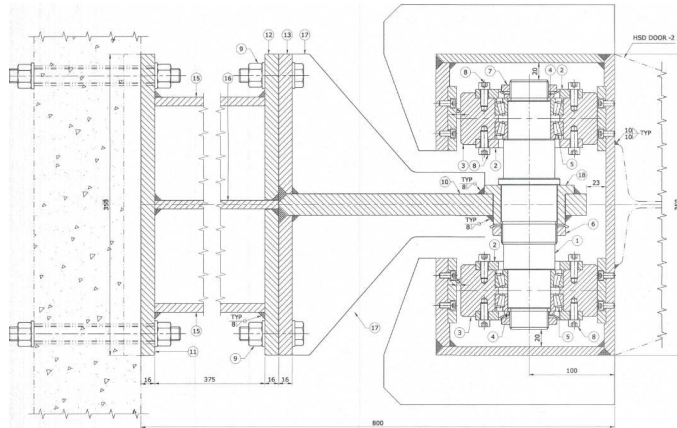


Fig. Schematic Sketch of Lateral Guide Wheel Assembly

7.3.5 Lateral guide wheel assembly comprises Plain Wheels, Bracket, Axle, Taper roller bearing ('O' arrangement), bearing retainer, spacer, axle locking plate and lock nut-lock washer.

7.4 WHEEL BRACKETS

7.4.1 Vertical wheels and Lateral guide wheels are mounted on the fabricated wheel brackets.

7.4.2 These brackets shall be stress relieved before machining.

7.4.3 Weld quality shall be radio-graphically checked

7.5 CYCLONE LOCKS

7.5.1 In order to take care of cyclonic wind load all HSDs are provided with Cyclone locks.

7.5.2 The Cyclone lock mechanism consists of a guided threaded rod and a nut block. A plate shall be provided on the door leaf at each location of the treaded rod.

7.5.3 Whenever Cyclone lock is to be used, threaded rod is manually tightened against the door and the door shall be jammed against the lateral guide wheel channel.

7.5.4 Cyclone locks shall be positioned so as to easy access during operation.

7.6 MAINTENANCE PLATFORMS

Permanent maintenance platforms of steel construction for attending wheels, pulleys, cyclone locks etc are to be provided as per the drawing.

7.7 END SEALING

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<p>The gap between the door leaf inner face and the outer wall face of the SAF is sealed by providing two rubber pads lining with minimum gap. One part of the rubber pad is fixed on the extended portion of a fabricated bracket welded to the door leaf while outer face shall be fixed to the civil wall as per drawings.</p> <p>7.8 DRIVE MECHANISM</p> <p>7.8.1 Drive mechanism of each leaf comprises electrically operated winch/ rope drum. Rope attached to the door is wound or unwound in order to operate the door i.e., door movement. Guide rope pulleys are mounted on the SAF wall and ceiling in the portal area.</p> <p>7.8.2 Drive mechanism comprises rope drum mounted on antifriction bearings, double reduction worm gear box, electro-hydraulic thruster brake and electric motor. A handle shall be provided on the input side of the gear box for manual operation of the drive-in case of power failure.</p> <p>7.8.3 Fluid coupling is provided for Overload protection.</p> <p>7.8.4 The two ends of the wire rope are routed through diverter pulleys from the ends of the door to rope drum for the opening and closing operation. The Rope drum is driven by an electric motor through a double reduction worm gear box.</p> <p>7.8.5 The door drive mechanism and the local control panels shall be located in the portal area of the nearest floor levels for easy approach and maintenance.</p>		

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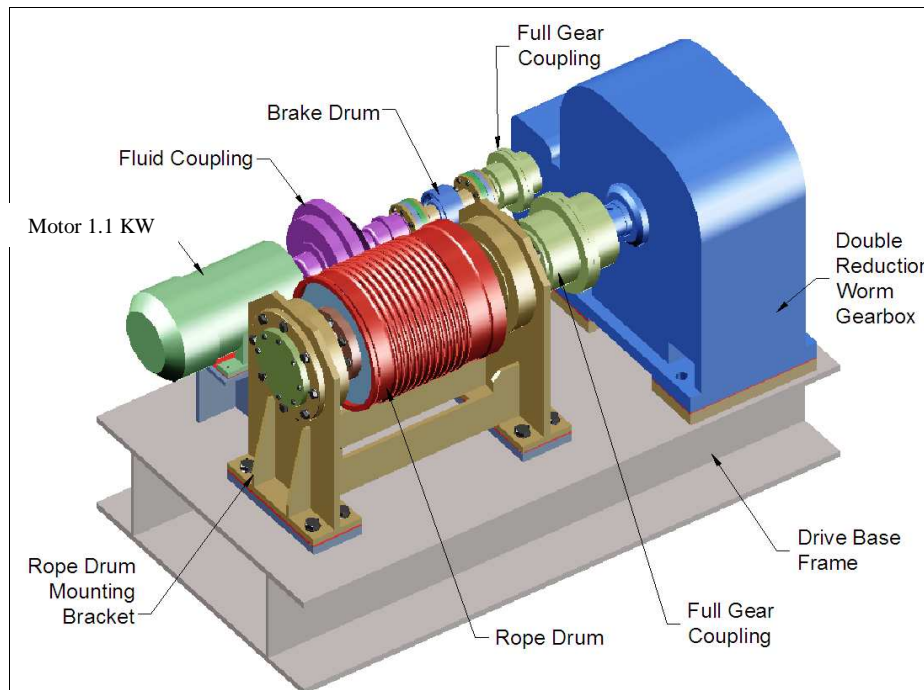


Fig.: Schematic Sketch of HSD Drive Mechanism

7.8.6 ROPE DRUM

- Material for rope drums shall be as per IS 2062 E250 Gr: B. Rope drum shall be stress relieved. Drums shall be machine grooved with grooves of a proper shape for the rope used. Grooving shall be of proper length to handle entire rope required to make the specified travel plus the two dead laps at each anchor point, without overlapping.
- Rope drum shall be ultrasonically tested.

7.8.7 WIRE ROPE

- Wire rope for drive is selected as per IS:2266-2022 with a nominal diameter of 12 mm with steel core corresponding to 1960 tensile designation and a breaking load of 101 KN and construction of 6x36 CWR (14-7+7-7-1).
- Open type thimble shall be as per IS: 2315-1978 corresponding to a nominal rope size of 12 mm at both ends.
- Wire rope shall be pre-stretched before forming into a sling.
- Two ferrules shall be provided at each end of the rope.

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<div> <div>e) Rope drum end of the wire rope shall be secured by means of lock plate and screws.</div> <div>f) The adjusting end of the rope shall be provided with a solid thimble along with mechanical splicing.</div> <div>7.8.8 PULLEYS</div> <div>a) Material for the Pulleys are as per IS 1030 (Gr 280 -520W).</div> <div>b) These are equipped with anti-friction bearings and shall be fully guarded to prevent the rope coming off. Grooves shall be machined to proper shape for the rope used.</div> <div>c) Pulleys shall be ultrasonically tested.</div> <div>7.8.9 REDUCTION GEAR BOX</div> <div>a) Double reduction worm gearbox of reduction ratio of 250:1 shall be used for all drive mechanisms.</div> <div>b) Gearboxes selection shall consider service factor of 1.5 times of output rated torque.</div> <div>c) All gears shall be of forged alloy steel preferably case hardening steels.</div> <div>d) All gear boxes shall be totally enclosed and splash lubrication system shall be provided. Gearboxes shall have sufficient heat radiation area to maintain lubricant at temperatures below maximum operating temperature.</div> <div>e) Gearboxes shall have fill and drain connections, BREATHERS, lubricant level indicator, and shall have good accessibility for checking, maintenance and oil filling.</div> <div>f) Gearbox cover shall be split horizontally at each shaft centre line and fastened and arranged so that the top half can be removed for inspection and repair without disturbing the bottom half.</div> <div>7.8.10 BRAKES</div> <div>Electro- hydraulic thruster of sufficient capacity shall be provided between drive motor and rope drum. The brakes shall apply automatically when power to drive motor is cut-off or fails. The brakes should be provided with brake release mechanism, for releasing the brake during maintenance.</div> </div>		

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<div data-bbox="229 383 588 418" data-label="Section-Header"> <h4>7.8.11 FLUID COUPLING</h4> </div> <div data-bbox="325 450 1409 537" data-label="Text"> <p>For overload protection, Fluid coupling of sufficient capacity is provided in the drive mechanism</p> </div> <div data-bbox="229 568 788 607" data-label="Section-Header"> <h4>7.8.12 AXLES, COUPLINGS AND KEYS</h4> </div> <div data-bbox="248 636 1409 1162" data-label="List-Group"> <ol style="list-style-type: none"> a) Shafts and axles shall be made of En24-T and shall have minimum YST: 640 MPa & UTS: 800 MPa. The shafts shall be of ample strength, rigidity and adequate bearing surface for intended duties. Shafts shall be accurately machined and properly supported. Shafts shall, as far as possible, be furnished straight. If shouldered, these shall be provided with fillets of ample radius or shall be tapered to avoid loss of strength and stress concentration. These shall be designed considering allowances for keys. b) All couplings shall be of steel. c) Keys and keyways shall made of En-9 and conform to IS 2048 / 2291 / 2292 / 2293 as applicable. <div data-bbox="135 1191 421 1227" data-label="Section-Header"> <h4>7.8.13 DRIVE BASE</h4> </div> <div data-bbox="266 1258 1409 1765" data-label="List-Group"> <ol style="list-style-type: none"> a) All drive mechanism elements are mounted on the fabricated drive base. b) Fabricated drive base shall be thermally stress relieved before machining. c) Embedment plate with bolts will be provided by department for fixing the drive base frame. d) However, party has to trail suit the bracket and drive base frame with the erected embedment plate before erection. e) If minor corrections are required in the base frame to suit the embedment plate, party has to correct the same in the base frame suitably with the approval of department. <div data-bbox="135 1794 614 1830" data-label="Section-Header"> <h4>7.9 MECHANICAL / END STOP</h4> </div> <div data-bbox="269 1843 1409 2036" data-label="List-Group"> <ol style="list-style-type: none"> a) Two nos. of mechanical stoppers shall be provided on Vertical wheel (Top) track in order to limit the total movement of each HSD leaf. Out of these two mechanical stoppers, each stopper shall be located on each side of the HSD leaf. b) Shall be made of mild steel confirming to E250 Gr: B, IS: 2062. </div> </div></div>		

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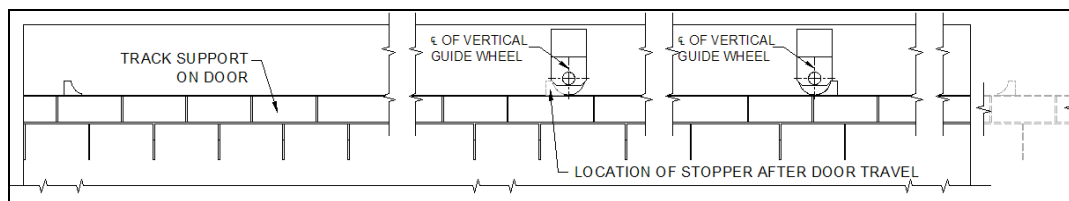


Fig: Schematic Sketch of Mechanical/ End Stoppers

7.10 GUARDS

All exposed couplings, shafts, gear wheels, pinions, drives etc. shall be safely encased and guarded.

7.11 DOOR CLADDING

Each door leaf shall be provided with cover sheet as per the drawing

7.12 INSULATION

Phenotherm insulation in board form of thickness 40mm with density of $35 \pm 2 \text{ kg/m}^3$ and thermal conductivity of $0.020 \text{ kcal/hm}^\circ\text{C}$ wrapped with aluminium sheet (200micron thick) shall be fixed inside the door leaves to maintain SAF inside temperature.

8.0 TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS FOR HSD

Specification of the electrical system is mentioned in Annexure –E11. Party shall fill up the compliance and submit along with the technical bid.

9.0 LIST OF DRAWINGS

The list of drawings of HSDs are given below:

Sl no.	Drawing No.	Description
1	10-MECH-12-7-14/A1/R1, Sh: 1 of 3	GENERAL ASSEMBLY OF HSDS IN CLOSED CONDITION FOR SAF
2	10-MECH-12-7-14/A1/R1, Sh: 2 of 3	GENERAL ASSEMBLY OF HSDS IN OPEN CONDITION FOR SAF
3	10-MECH-12-7-14/A2/R1, Sh: 3 of 3	CHAJJA DETAILS OF HSDS FOR SAF
4	10-MECH-12-7-11/A1, Sh: 1 of 17	GA OF HSD1 (RHS) FOR SAF
5	10-MECH-12-7-11/A1, Sh: 2 of 17	WIRE ROPE ROUTING FOR HSD-1 (RHS)
6	10-MECH-12-7-11/A1, Sh: 3 of 17	SIDE COVER DETAILS FOR HSD-1 (RHS)

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7	10-MECH-12-7-11/A1, Sh: 4 of 17	PLATFORM DETAILS FOR HSD- 1 (RHS)	
8	10-MECH-12-7-11/A1, Sh: 5 of 17	DETAILS OF HSD-1 STRUCTURE (RHS)	
9	10-MECH-12-7-11/A1, Sh: 6 of 17	LATERAL & VERTICAL GUIDE PATH FOR HSD-1 (RHS)	
10	10-MECH-12-7-11/A1, Sh: 7 of 17	DETAILS OF LATERAL GUIDE WHEEL FOR HSD-1	
11	10-MECH-12-7-11/A1, Sh: 8 of 17	BOTTOM DOUBLE WHEEL ASSEMBLY FOR HSD-1 (RHS)	
12	10-MECH-12-7-11/A1, Sh: 9 of 17	BOTTOM SINGLE WHEEL ASSEMBLY FOR HSD-1 (RHS)	
13	10-MECH-12-7-11/A1, Sh: 10 of 17	VERTICAL GUIDE WHEEL-2 FOR HSD-1	
14	10-MECH-12-7-11/A1, Sh: 11 of 17	DRIVE SYSTEM ASSEMBLY FOR HSD-1	
15	10-MECH-12-7-11/A1, Sh: 12 of 17	DRIVE SYSTEM SUPPORT STRUCTURE FOR HSD-1	
16	10-MECH-12-7-11/A1, Sh: 13 of 17	HORIZONTAL PULLEY DETAILS FOR HSD-1	
17	10-MECH-12-7-11/A1, Sh: 14 of 17	VERTICAL PULLEY-1 FOR HSD-1	
18	10-MECH-12-7-11/A1, Sh: 15 of 17	CYCLONIC LOCK TYPE-2 FOR HSD-1	
19	10-MECH-12-7-11/A1, Sh: 16 of 17	VERTICAL PULLEY-2 FOR HSD-1	
20	10-MECH-12-7-11/A1, Sh: 17 of 17	RAIL DETAILS FOR HSD-1 (RHS) SAF	
21	10-MECH-12-7-13/A1/R1, Sh: 1 of 16	GA OF HSD-2 FOR SAF	
22	10-MECH-12-7-13/A1/R1, Sh: 2 of 16	WIRE ROPE ROUTING FOR HSD-2	
23	10-MECH-12-7-13/A1, Sh: 3 of 16	SIDE COVER DETAILS FOR HSD-2	
24	10-MECH-12-7-13/A1, Sh: 4 of 16	PLATFORM DETAILS FOR HSD- 2	
25	10-MECH-12-7-13/A1, Sh: 5 of 16	DETAILS OF HSD-2 STRUCTURE	
26	10-MECH-12-7-13/A1, Sh: 6 of 16	HORIZONTAL & VERTICAL GUIDE PATH FOR HSD-2	
27	10-MECH-12-7-13/A1, Sh: 7 of 16	LATERAL GUIDE PATH FOR HSD-2	
28	10-MECH-12-7-13/A1, Sh: 8 of 16	VERTICAL GUIDE WHEEL-1 FOR HSD-2	
29	10-MECH-12-7-13/A1, Sh: 9 of 16	VERTICAL GUIDE WHEEL-2 FOR HSD-2	
30	10-MECH-12-7-13/A1, Sh: 10 of 16	DETAILS OF LATERAL GUIDE WHEEL FOR HSD-2	
31	10-MECH-12-7-13/A1, Sh: 11 of 16	DRIVE SYSTEM ASSEMBLY FOR HSD-2	
32	10-MECH-12-7-13/A1, Sh: 12 of 16	DRIVE SYSTEM SUPPORT STRUCTURE	

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		FOR HSD-2
33	10-MECH-12-7-13/A1, Sh: 13 of 16	HORIZONTAL PULLEY DETAILS FOR HSD-2
34	10-MECH-12-7-13/A1, Sh: 14 of 16	VERTICAL PULLEY-1 FOR HSD-2
35	10-MECH-12-7-13/A1, Sh: 15 of 16	CYCLONE LOCK TYPE-2 FOR HSD-2
36	10-MECH-12-7-13/A1, Sh: 16 of 16	VERTICAL PULLEY-2 FOR HSD-2
37	CIVIL/GF/PLAN/ELEC/2025/01	GROUND FLOOR PLAN WITH INDICATING ELECTRICAL ITEMS
38	CIVIL/EL 4.4M/PLAN/ELEC/2025/01	FLOOR PLAN OF EL 4.4M WITH INDICATING ELECTRICAL ITEMS
39	CIVIL/EL 9.4M/PLAN/ELEC/2025/01	FLOOR PLAN OF EL 9.4M WITH INDICATING ELECTRICAL ITEMS
40	CIVIL/EL 17.5M/PLAN/ELEC/2025/01	FLOOR PLAN OF EL 17.5M WITH INDICATING ELECTRICAL ITEMS
41	CIVIL/EL 21M/PLAN/ELEC/2025/01	FLOOR PLAN OF EL 21M WITH INDICATING ELECTRICAL ITEMS
42	CIVIL/EL 24.25M/PLAN/ELEC/2025/01	FLOOR PLAN OF EL 24.25M WITH INDICATING ELECTRICAL ITEMS
43	CIVIL/EL 27.5M/PLAN/ELEC/2025/01	FLOOR PLAN OF EL 27.5M WITH INDICATING ELECTRICAL ITEMS
44	CIVIL/EL 35.75M/PLAN/ELEC/2025/01	FLOOR PLAN OF EL 34.75M WITH INDICATING ELECTRICAL ITEMS
45	CIVIL/EL 38.5M/PLAN/ELEC/2025/01	FLOOR PLAN OF EL 38.5M WITH INDICATING ELECTRICAL ITEMS
46	CEPO/ARC/7114R/SSLV/SAF/ARCHI-TD05	ELEVATION
47	CEPO/ARC/7114R/SSLV/SAF/ARCHI-TD06	SECTION
48	SLC/ELEC/CIRCUIT/2025/001	SCHEMATIC OF ELECTRICAL CIRCUIT

10.0 MANUFACTURING, /ASSEMBLY, TESTING AND INSPECTION

10.1 The realisation of manufacturing and assembly of HSD -1 to HSD- 5 at front and rear sides of SAF shall be carried out in the following manner:

10.1.1 At Manufacturer's Works:

a) All mechanisms such as Drive, Pulley system, Vertical Wheel assembly, Lateral guides, Cyclone Locks etc. shall be manufactured, assembled and tested at manufacturer's work in presence of TPI & as per QAP. Testing shall be along with departmental representative.

b) If required, Doors can be fabricated at manufacturer's works and can be transported in modules to Site.

10.1.2 At Site:

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<p>a) Installation, alignment of vertical pulleys / horizontal pulleys with respect to Drive assemblies is to be checked.</p> <p>b) Doors shall be fabricated, erected and tested at site for free movement of the doors.</p> <p>10.2 <u>General instructions for fabrication and Erection are specified in the subsequent clauses.</u></p> <p>10.2.1 The fabrication of components shall confirm to provisions of IS: 800 – 2013</p> <p>10.2.2 All rolled material before being laid off shall be clean, free from bends, twist etc. and straight within tolerance allowed by IS: 1852 – 1985.</p> <p>10.2.3 For butt-weld joints, edge preparation shall be preferably done by machining and may be done by mechanically controlled gas cutting machine. Sub surfaces shall be ground cleaned and inspected before fitting/ welding.</p> <p>10.2.4 Welding shall be performed as per IS: 9595 – 1996.</p> <p>10.2.5 All welding shall be carried out by qualified and approved welders shall perform welding in accordance to ASME Sec IX.</p> <p>10.2.6 Unless otherwise specified on drawings, tolerances for fabrication shall be as per ISO: 13920.</p> <p>10.2.7 Edge preparation shall be carried out for all plates before welding.</p> <p>10.2.8 Unless otherwise specified on drawings, all butt welds shall be full penetration welds.</p> <p>10.2.9 Unless otherwise specified on drawings, all fillet welds shall be 50% of the minimum plate thickness and shall be on both sides of the plate. Also, the weld shall be continuous.</p> <p>10.2.10 Welding sequence shall be such that the distortion and residual stresses are minimised. All welds shall be deposited in proper sequence so as to balance the applied heat as far as possible. (A wandering sequence shall be used whenever necessary).</p> <p>10.2.11 The procedure to be followed by CONTRACTOR for all weld repairs shall be subject to approval by the PURCHASER.</p>		

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<p>10.2.12 Threaded joints that are to be seal welded shall be thoroughly cleaned before welding.</p> <p>10.2.13 Stress relieving shall be carried out for all fabricated components prior to its machining as applicable.</p> <p>10.2.14 All sharp corners of machined/ fabricated items shall be smoothened by deburring, hand grinding, chipping and filing.</p> <p>10.2.15 Fabricator employed at site shall have adequate machining, welding, metrology and portable NDT facilities.</p> <p>10.2.16 All fabrication work undertaken in parts shall bear distinct match marking to facilitate further identification and erection.</p> <p>10.2.17 During manufacturing, assembly, erection and commissioning bolt tightening shall be carried out using torque wrench/ impact wrench to ensure required tightening/ tension in the bolts.</p> <p>10.3 <u>Fabrication at Manufacturers Work</u></p> <p>10.3.1 Base frame of the drive mechanism shall be machined to maintain parallelism between its resting face and equipment mounting face.</p> <p>10.3.2 The components of drive mechanism viz. Motor, coupling, brake, reduction gear box and rope drum shall be assembled at manufacturer works as per assembly instructions.</p> <p>10.3.3 Drive mechanism base frame as well as structure shall have suitable provision for lifting hooks.</p> <p>10.3.4 Vertical wheel assembly, Lateral guide wheel assembly, guide pulley arrangement, cyclone locks etc. Shall be manufactured, assembled tested at manufacturers works and shall be brought to site in grease packed condition.</p> <p>10.4 <u>Fabrication at Site</u></p> <p>10.4.1 For fabrication of doors (HSD-1 to HSD-5 for front & rear sides of SAF) at site, accurately levelled floor bed shall be prepared at site</p> <p>10.4.2 Structural members of the door shall be laid on the fabrication bed. The edges of the members shall be aligned for squareness, parallelism and flatness to</p>		

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<p>required accuracy and tack welded. Following this intermediate members and bracing shall be tack welded ensuring required geometrical parameters.</p> <p>10.4.3 The structure shall be offered for stage inspection following tack welding while full welding shall be done upon inspection clearance</p> <p>10.4.4 The reference position for tracking beam (wheel track), wheel assembly, guide pulley, lateral guide wheels assembly, cyclone lock bracing etc. shall be taken after positioning the door on the floor mounted tracking beam for HSD-1 and marking shall be done ensuring proper alignment.</p> <p>10.4.5 Following this, the door shall be brought to levelled bead and tracking beam (wheel track), wheel assembly, guide pulley, lateral guide wheels assembly, cyclone lock bracing etc. shall be tack welded, inspected and full welded using supports/ fixtures wherever required.</p> <p>10.4.6 The labyrinth seal plates shall be welded in required sequence to ensure perfect sealing.</p> <p>10.4.7 After fabrication and inspection of door frame (leaf) structure, the outside face of door-frame shall be welded with cover sheet.</p> <p>10.4.8 The door shall be cleaned, degreased, grit blasted and primer painted as both inside/ outside as per painting instructions. All machined surfaces are to be protected with anti-corrosive coats. All box sections to be painted before closing.</p> <p>10.4.9 The thermal insulation sheets shall be pasted to the inside wall of the door as specified.</p> <p>10.5 <u>Requirements to be fulfilled by HSDs</u></p> <p>10.5.1 Machined parts/ brackets/ plates shall be aligned and welded on to the fabricated door frame.</p> <p>10.5.2 Misalignment of vertical wheels, lateral guide wheels and wheel tracks and channels shall be limited to ± 2 mm.</p> <p>10.5.3 Doors shall be placed in position from sides only in view of vertical labyrinth plates. Suitable erection fixtures/ structures shall be considered.</p> <p>10.5.4 Door cladding plates shall be continuous welded to make it water tight.</p>		

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<p>10.6 Water sealing labyrinth plates on the door shall be welded in place after cladding plates are welded.</p> <p>10.7 <u>Erection Sequence</u></p> <p>10.7.1 <u>Pre-requisite for erection:</u></p> <p>a) Both front and rear wall of SAF shall be completed, cleaned, building construction material removed and site shall be cleared by civil contractor.</p> <p>10.7.2 <u>Transportation & temporary placement:</u></p> <p>a) The material shall be loaded on truck/ trailer at Stores/ Fabrication yard using mobile crane, transported to SAF site and unloaded at site using mobile crane.</p> <p>b) Mobile crane of adequate capacity and boom length shall be used for handling and erecting HSD structures & drive mechanisms.</p> <p>c) After construction of SAF up to 45 m, erection of drive system shall be taken up.</p> <p>d) All necessary arrangement for material handling at SLC site shall be under vendor scope only.</p> <p>10.7.3 <u>Assembly & fabrication:</u></p> <p>Typical activities in assembly sequence are as follows</p> <p>a) All the doors shall be fabricated at site / manufacturer's works.</p> <p>b) Fabrication requirement & methodology are detailed in clause no:7 of this document.</p> <p>c) All other mechanism such as wheel & track assembly, drive assembly, pulley assembly etc. shall be fabricated, assembled & tested at shop and shall be transported to site as sub-assembly.</p> <p>d) The erection shall be taken up in subassemblies as per erection sequence.</p> <p>e) No site preparation works are planned by department for site fabrication works. Only clearance will provide for site preparation works. Preparation of required site for fabrication and approach requirements for handling, erecting the doors shall be in scope of contractor. The site identified for such works will be within 200 m from the SAF building location.</p>		

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<p>10.7.4 <u>Support structure & material handling equipment:</u></p> <ul style="list-style-type: none"> a) Mobile cranes with adequate capacity and boom length shall be used to erect HSD. b) HSD door leaf is to be lifted and erected along with Guide channels, top & bottom track support brackets and top & bottom tracks. Weight of the HSD door leaf to be erected is approximately 21 t for HSD 2 to 5 and intended crane for door erection shall have a suitable capacity with 25% margin to lift and erect to a height of 50 m elevation (approximately) with suitable operating radius. c) Suitable scaffolding, ladders, supports etc. shall be used to facilitate erection work. <p>10.7.5 <u>Erection procedure:</u></p> <p>Typical Erection Sequence shall be as follows:</p> <ul style="list-style-type: none"> a) Install and align drive system of HSDs. b) Erect, align and grout the bottom track. c) Bracket for lateral guide wheels shall be assembled with the door. d) Install and align bracket for cyclone locking system. e) Install and align all pulleys. f) Lift HSD-1 using mobile crane and place on the bottom track. g) Secure the door in position h) Align and grout lateral guide wheels, cyclonic locking system and pulley systems. i) Lay ropes and fasten in position. j) Install electrical. k) Clean and first fill all the drives. l) Check for free movement mechanically. 		

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m) Repeat the operations for other doors.

11.0 ERECTION & COMMISSIONING

11.1 Inspection and testing during/after erection shall be as per QAP.

11.2 Supplier shall submit detailed erection plan and procedure along with erection loads on building & also on parts being lifted shall be submitted for approval.

11.3 Supplier shall depute adequate qualified personnel for carrying out quality erection work at our site within schedule.

11.4 Material (lifting equipment, lifting tackles, etc) required during erection are in Bidder's scope. All lifting machines / tackles used shall be tested & certified as per standards before their usage for lifting crane.

11.5 Third Party Inspection Agency also shall be involved for final clearance & usage.

12.0 PRELIMINARY SPECIFICATIONS OF MAJOR BOUGHT OUT ITEMS

Contractor has to approval from the ISRO for specification of Bought –out items before procurement.

All bought items are to be inspected by departmental representative & TPIA before despatching to SLC site.

BOUGHT OUT ITEMS FOR HSD-1 to HSD-5 DRIVE ARRANGEMENT		
Sl.No.	Components	Specifications
1	Wire rope for door drive arrangement	Wire rope diameter: 12 mm Tensile Grade: 1960 N/mm ² Breaking strength: 101 KN Finish: Galvanised Construction: 6x36 CWR (14-7+7-7-1) Conforming to IS: 2266 – 2002 <u>Solid thimble</u> shall be as per IS: 2315-1978 corresponding to a nominal rope size of 12 mm at both ends. Two ferrules shall be provided at each end of the rope. Wire rope shall be pre-stretched before forming into a sling.

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2	Electric Motor	Type: Foot mounted Flame proof Power: 1.1 Kw RPM: 750 rpm Frame size: 100L	
3	Gear Box	Type: Double Reduction Worm Gear Box Series: AM Series Foot Mounted Reduction ratio: 250:1 Output Torque: 3350 Nm Size of Unit: A1252 Output rpm: 2.9 rpm Make: Elecon / Shanti/ GREAVES (Premium transmission) / Flender/ DB-Radicon / Sumitomo / Renold only. Other makes & Own make gearboxes are not acceptable.	
4	Coupling between Rope drum and Gear box	Type: Gear Coupling Designation: FGC3 Power @ 1000rpm 51.5 KW Torque capacity: 4920 NM	
5	Coupling b/w Brake and Gear box	Type: Gear Coupling Designation: FGC2 Power @ 1000rpm 28.5 KW, Torque capacity: 2720 NM	
6	Fluid coupling	Type: Fluid coupling with flexible coupling Size: 235, EV-85 Motor Speed: 750 rpm, Power: 1.1 Kw	
7	Brake	Type: Electro Hydraulic Thruster Break Size: K-HT-30/5, Brake Drum Diameter: 160 mm Capacity braking torque: 220 Nm	
8	Bearings for Rope drum Shaft	Make: SKF or Equivalent Type: SE510-608 Bearing: 22210 Bore: 65 mm Adapter sleeve: H307	
9	Bearings for	Make: SKF or Equivalent	

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	Brake drum Shaft	Type: SE507-606 Bearing: 22211EK Bore: 50 mm Adapter sleeve: H311	
10	Bearings for horizontal & vertical Pulley Shaft	Make: SKF or Equivalent Type: Spherical Roller Bearing Bearing no: 2220BE Bore: 40mm Outer Diameter: 80mm, Width: 23 mm Static Load capacity: 90KN Dynamic Load capacity: 96KN	
11	Bearings for Bottom single and double wheel for HSD-1	Make: SKF or Equivalent Type: Tapered Roller Bearing Bearing no: 32014X/Q-4CC Bore: 70mm Outer Dia: 110mm, Width: 25 mm Static Load capacity: 153KN Dynamic Load capacity: 101KN	
12	Bearings for Vertical Guide Wheel -1 for HSD-2 to HSD -5	Make: SKF or Equivalent Type: Tapered Roller Bearing, Bearing no: 33018X/Q-2CE Bore: 90mm Outer Dia: 140mm, Width: 39 mm Static Load capacity: 355KN Dynamic Load capacity: 216KN	
13	Bearings for Vertical Guide Wheel -2 for HSD-1 to HSD -5	Make: SKF or Equivalent Type: Tapered Roller Bearing Bearing no: 32010X/Q-3CC Bore: 50mm Outer Dia: 80mm, Width: 20 mm Static Load capacity: 88KN Dynamic Load capacity: 60.5KN	
14	Bearings for Lateral Wheel	Make: SKF or Equivalent Type: Tapered Roller Bearing,	

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		Bearing no: 32010X/Q-3CC Bore: 50mm, Outer Dia: 80mm, Width: 20 mm Static Load capacity: 88KN Dynamic Load capacity: 60.5KN
15	Door Insulation	Phenotherm board covered with aluminum sheet (200 micron thick) Density: 35 ± 2 kg/m3 as per BS:32047 Thermal Conductivity: 0.020 kcal/hm°C Thickness: 40mm approx.
16	Rubber	Nitrile Rubber Sheet reinforced

13.0 **MAKES OF BOUGHT OUT ITEMS**

All bought out items shall be procured from the approved suppliers as given below:

S/no	Item	Makes
1	Wire ropes	Usha Martin only.
2	Thruster brakes	BUBenzer, SIBRE, GALVI, Kateel, Electro Mag
3	Gear boxes	Elecon / Shanti / Greaves (premium transmission)/ DB-Radicon / Renold / Sumitomo / Flender.
4	Bearings	SKF, FAG, TIMKEN
5	Couplings	Fenner, Elecon, Shanthi, Renold
6	Fluid couplings	Pembril
7	Paints	Bombay paints, Berger paints, Asian paints, Grand poly coats.
8	FASTENERS	UNBRAKO / TVS
9	Third Party Inspection Agency	TCE / LLOYDS / MN DUSTUR / MECON / DNV
Note: As far as possible single brand components shall be used. All models used shall be of latest but at least 2 years in the market and next 10 years' service availability.		

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14.0 **CODES AND STANDARDS**

14.1 The design, materials, construction, manufacture, inspection, testing and performance of HSDs shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. The equipment shall also conform to the latest applicable Indian or equivalent standards. Other international standards are also acceptable, if these are established to be equal or superior to the listed standards. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility.

14.2 The following are some of the codes and standards relevant to this specification.

IS:2062	Hot rolled medium and High tensile Structural Steel
IS:1367 part13	Technical supply conditions for threaded fasteners Hot-dip galvanized coatings (second revision)
IS:807	Code of Practice for Design, Erection and Testing (Structural Portion) of Cranes and Hoists.
IS:3177	Code of Practice for Design of Electric Overhead Travelling Cranes and Gantry Cranes other than Steel Works Cranes.
IS:2062	Steel for general structural purpose.
IS:800	General construction in steel – Code of practice
IS:3681	Gears – Cylindrical gears – Accuracies
IS 7403: 1974	Code of Practice for Selection of Standard Worm and Helical Gear Boxes
IS 4460: Parts 1 to 3: 1995	Gears – Spur and Helical Gears – Calculation of Load Capacity
IS:1835	Round Steel Wires for Ropes
IS:6594	Technical supply conditions for steel wire ropes and strands.
IS:2266	Steel Wire Ropes for General Engineering Purposes- Specification.
IS:2363	Glossary of terms relating to wire ropes.

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IS:3973	Code of practice for the Selection, installation & maintenance of wire ropes.
IS:816	Code of Practice for Use of Metal Arc Welding for general Construction in Mild Steel.
IS:823	Code of Procedure for Manual Metal Arc Welding of Mild Steel.
IS:1181	Qualifying Tests for Metal Arc Welders (Engaged in Welding Structures other than pipes).
IS:1323	Code of Practice for Oxy-Acetylene Welding for Structural Work in Mild steel.
IS:325	Three Phase induction Motors.
IS:4029	Guide for Testing Three Phase Induction Motor.
IS:5571	Guide for selection and installation of electrical equipment in hazardous areas (other than mines).
IS:5572	Classification of Hazardous Areas (Other than Mines) having flammable gases and vapours for electrical installation.
IS 2148: 1981	Electrical apparatus for explosive gas atmospheres – Flameproof enclosures ‘D’
IS 5780: 1980	Code of practice for the Design, Construction and installation of Electrical equipment for potentially Explosive atmospheres.
IS:8239	Classification of maximum surface temperature of electrical equipments for use in explosive atmosphere.
IS:1554	Specification for PVC Insulated (Heavy Duty) electric cables.
IS:2208	HRC cartridge fuse links for voltages above 650V.
IS:2959	Contactors for voltage not exceeding 1000V AC or 1200V DC
IS:13703 Pt-1	Specification for Low voltage fuses for voltages not exceeding 1000V AC or 1500V DC.

15.0 **RELIABILITY AND QUALITY ASSUARANCE PLAN**

INSPECTION and testing shall be carried out as per QAP enclosed here with in Section-C. The Schedule of Inspections shall be strictly adhered to and shall be witnessed by Third Party Inspection Agency (TPIA) and/or Department. All the critical inspections shall be done in the presence of Third Party and Department personnel.

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<p>16.0 <u>INSPECTION AND TESTING PROCEDURES AND SCOPE OF INSPECTION</u></p> <p>16.1 Raw Material Inspection shall be carried out at the Vendor's works for compliance of the raw materials to the specified standards.</p> <p>16.2 Bought out components shall be inspected either at Vendor's works or at the Sub-contractor's premises for compliance with the Specifications.</p> <p>16.3 Fabricated components shall be inspected at the Vendor's works for compliance with the component drawings. Sub-Assemblies shall be inspected at the Vendor's works for compliance with the Sub-Assembly drawings and for performance requirements.</p> <p>16.4 Full Assembly of the HSD shall be inspected at Purchaser's premises after site assembly for compliance with the Assembly Drawings and performance requirements.</p> <p>16.5 After the award of contract, CONTRACTOR shall prepare detailed Quality Assurance Plan (QAP) for inspection & testing of all subassemblies / components of the HSDs. The QAP shall be reviewed and approved by the SDSC SHAR. Indicative QAPs for HSDS are enclosed in Section D of this specification</p> <p>16.6 The procedure to be followed for testing the accuracy requirements for HSDs shall be as specified by the PURCHASER</p> <p>16.7 All measuring and testing instruments / equipment required for carrying out all tests at VENDOR's works and at PURCHASER's site shall be provided by the Contractor.</p> <p>16.8 CONTRACTOR shall furnish calibration certificates for the instruments to be used for testing at shop and site. The calibration certificates furnished by the CONTRACTOR shall not be more than 12 months old.</p> <p>16.9 TESTING</p> <p> HSDs mainly comprises of drive mechanism and door structure (door leaf) from the point of view of testing. In order to realise successful operation of the door following testing activities shall be performed</p> <p>16.9.1 <u>Testing at Manufacturer's works</u></p>		

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<div data-bbox="229 331 1414 607"> <p>a) Drive System (No load)</p> <p>No load run test shall be carried out for the fully assembled gear box continuously for minimum 1 hour for both directions.</p> <p>The drive mechanism shall be completely assembled at manufacturer's works and shall be tested.</p> </div> <div data-bbox="229 633 1414 842"> <p>b) Test for Major Sub-assemblies</p> <p>Vertical wheel assembly, lateral guide wheel assembly, pulley assembly and cyclone lock shall be tested for proper functioning, bearing noise etc. and shall be brought to site in grease packed condition</p> </div> <div data-bbox="229 853 536 891"> <p>16.9.2 <u>Testing at Site.</u></p> </div> <div data-bbox="277 918 1414 1008"> <p>a) HSDs will be tested at site for functional checks as per the requirements for Smooth movement of doors.</p> </div> <div data-bbox="229 1037 1085 1075"> <p>17.0 <u>WARRANTEE AND PERFORMANCE REQUIREMENTS</u></p> </div> <div data-bbox="325 1120 1414 1258"> <p>The Horizontal sliding doors shall perform satisfactorily to meet the warrantee requirements stated in this specification to the entire satisfaction of the PURCHASER</p> </div> <div data-bbox="229 1272 625 1312"> <p>18.0 <u>ACCEPTANCE TEST</u></p> </div> <div data-bbox="229 1341 1414 1532"> <p>18.1 After the entire installation work has been completed, the CONTRACTOR shall make all required adjustments until all guaranteed performance requirements are met. All instruments, services required for the above tests shall be furnished by the CONTRACTOR</p> </div> <div data-bbox="229 1561 1414 1805"> <p>18.2 If the stipulated performance requirements are not fulfilled, the CONTRACTOR shall make good the deficiency by providing it in every case, by altering and/ or replacing the parts or the whole equipment / system free of charge to the PURCHASER immediately. All rejected equipment shall be removed from the site at CONTRACTOR's expense.</p> </div> <div data-bbox="229 1830 920 1870"> <p>19.0 <u>SURFACE PREPARATION AND PAINTING</u></p> </div> <div data-bbox="325 1912 1414 2002"> <p>Complete HSD structure & Drive elements shall be painted as per the instructions given below.</p> </div> <div data-bbox="325 2029 1192 2069"> <p>All the shop-fabricated items shall be grit blasted; primer painted.</p> </div>		

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<p>The site fabrication items also shall be grit-blasted and primer painted before erection.</p> <p>After completion of the erection, all the damaged primer painted area shall be rectified.</p> <p>After primer painting, the total surface shall be final painted with sufficient number of coats using acrylic aliphatic polyurethane finish paint, having a DFT of 40 microns.</p> <p>All box sections, before closing, shall be painted with primer and finish paint inside the Box.</p> <p>19.1 Preparation of surfaces</p> <p>All surfaces to be painted shall be clean, dry and free from oil, grease, dirt, dust, corrosion and weld spatters.</p> <p>Any other surface contaminant except tightly bonded residues of mill scale rust is permissible to a limit of not more than 5% of whole surface and a maximum of 10% on any particular square inch area.</p> <p>Surfaces that may become inaccessible after erection or installation or both, shall be prepared and painted while still accessible as per the same procedure mentioned.</p> <p>19.2 Grit Blasting</p> <p>The entire surface of all the fabricated materials is to be grit blasted as per near white quality of steel structures painting council (SSPC) standard of SA 2.5 of SIS 055900.</p> <p>The surface profile after blasting shall be between 37-65 microns and should be of jagged in nature.</p> <p>Hand cleaning by chipping and scraping followed by wire brushing / abrasive wheels is allowed for items where surface preparation is difficult by sand blasting after taking approvals from purchaser / TPIA. All surfaces shall be degreased using a suitable solvent to remove oil & grease and shall be dried off before painting</p> <p>19.3 Painting Scheme</p>		

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<p>Immediately after gird blasting, one coat of inorganic zinc silicate primer shall be applied to a dry film thickness (DFT) of 65 microns (minimum), followed by a final coat of 40 microns of acrylic aliphatic polyurethane finish paint. Colour code will be finalized by purchaser after award of contract.</p> <p>All paint and primer shall be of standard quality and procured from approved manufacturers. The tenderer shall provide “Elcometer” / Paint thickness measuring gauges free of charge and shall measure the thickness of paint in the presence of the representative of the purchaser at random locations selected by him.</p> <p>Machine finished surfaces shall be protected against corrosion by a rust inhibiting coating that can be easily removed prior to erection or which has characteristics that make removal unnecessary prior to erection.</p> <p>Field painting shall only be done after the structure is erected, levelled, plumbed, aligned and welded / connected in its final position, tested and commissioned. However, touch-up painting for making good to any damaged shop painting and completing any unfinished portion of the shop coat shall be carried out by the Tenderer at free of cost. The materials and specification for such painting in the field shall be in accordance with the requirements of the specification for shop painting.</p> <p>Painting shall not be done in frosty or foggy weather or when humidity is such as to cause condensation on the surfaces to be painted. Before painting of steel, which is delivered unpainted, is commenced, all surfaces to be painted shall be dried and thoroughly cleaned from all loose scale and rust.</p> <p>All field rivets, bolts, welds and abrasions to the shop coat shall be spot painted with the same paint used for the shop coat. Where specified, surfaces which will be in contact after site assembling shall receive a coat of paint (in addition to the shop coat, if any) and shall be brought together while the paint is still wet.</p> <p>Bolts and fabricated steel members, which are galvanized or otherwise treated, shall not be painted.</p> <p>Paints shall be stored under cover in airtight containers. Paints supplied in sealed containers shall be used as soon as possible once the container is opened.</p>		

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While painting the new structures, the already finished floors and structures shall not be spoilt. If there is any spillage of paint on the floors or members on the finished structures, the tenderer has to clear and provide the painting to the spoiled areas.

Paints shall be checked for shelf life to meet the requirements before application. Proper action shall be taken well in advance prior to actual usage.

19.4 Paint Specifications

- a) Primer:
 - Inorganic Zinc Silicate Primer (75 Microns):
 - Minimum shelf life of 12 months
 - Excellent abrasion resistance
- b) Intermediate coat:
 - High Build MIO Epoxy paint: 75 micron
- c) Final coat :
 - Aliphatic Polyurethane paint: 50 micron
 - As per approved manufacturer's specifications.
 - Colour code will be finalised by the department after award of contract.

20.0 SPARES

20.1 The prices of the Spares and tools are to be included in the lumpsum supply price of the total system.

Sl.no	Description	Quantity
MECHANICAL SPARES		
1	Linings for Brakes	2 Pairs
2	Oil Seals for each Fluid couplings	1 Sets
3	Oil Seals for each Gear box	1 Sets
5	Set of Gaskets of all sizes wherever applicable	3 sets
Electrical Spares		

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1.	Push button station	2 nos
2.	Limit switches	4 nos
3.	Power Connectors	Each rating 2 nos
4.	MPCB with all accessories	2 nos for each rating
5.	Indication Lamp	Each colour 2nos
6.	IS relay	one no. each for input and output

21.0 DATA TO BE FURNISHED AFTER AWARD OF CONTRACT

The supplier shall ensure the following documentation are prepared and submitted to PURCHASER for his review / record

- 21.1** Schedule of Assembly & Detailed drawings and documents to be submitted for review & approval with submission dates.
- 21.2** Quality Assurance Plan (QAP).
- 21.3** Bar chart for supply & erection schedule indicating the date of completion of various activities so as to complete execution of the contract within the time frame stipulated in the LOI / Purchase order.
- 21.4** Progress reports
- 21.5** Instrument data sheets.
- 21.6** Electrical wiring diagrams showing interlocks, controls, wiring sizes, rating of each electrical component etc. and logic diagrams.
- 21.7** Dimensioned general arrangement and section drawings of control and instrumentation panels and switchgear panel.
- 21.8** Detailed description of operating sequence and control and interlock system.
- 21.9** Erection, start-up, operation and maintenance manual complete with lubrication schedule etc.
- 21.10** As-built drawings
- 21.11** Quality Assurance documentation compiled for the project.

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21.12 The above list of documents is indicative and not exhaustive. The BIDDER / CONTRACTOR shall submit documents as specified in various sections of this specification and also as per the specific instructions of the PURCHASER.

22.0 FINAL DOCUMENTS

CONTRACTOR shall submit the copies of operation and maintenance manuals well before the despatch of the equipment. The manual shall be in sufficient detail with step-by-step instructions to enable others to inspect, erect, commission, maintain, dismantle, repair, reassemble and adjust all parts of the equipment. Each manual shall also include a complete set of approved as built drawings together with performance / rating curves / charts of the equipment, maintenance schedule and test certificates wherever applicable.

CONTRACTOR shall submit all the raw material test certificates, Ultrasonic testing of the raw material, Ultrasonic / radiography test certificates of all necessary welds. Stress relieving charts, Hardness test certificates and Dimensional inspection reports of individual components.

Quality assurance documentation compiled for the project.

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	QUALITY ASSURANCE PLAN FOR HSDs	

SECTION –C

QUALITY ASSURANCE PLAN

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	QUALITY ASSURANCE PLAN FOR HSDs								SHEET: 1 OF 7		

SL. NO.	COMPONENT/ OPERATION	CHARACTERIST ICS TO BE CHECKED	METHOD OF CHECKING	CATEGORY	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORDS	INSPECTION AGENCY			REMARKS
									VR	TP	IS	
A. MATERIAL (RAW MATERIALS & BOUGHTOUTS)												
1	Rolled plates & sections Forged steel & Castings High Yield Steel	a. Appearance	Visual	Major	100%	IS:2062	Freedom from defects like pitting, cracks, etc.	--	H	W	R	
		b. Properties	Chemical analysis & physical test	Major	100%	IS:2062	Drawing, specification	Mill test certificates/ Lab reports	H	R	R	
		c. Internal flaws	UT	Critical	100% for plates ≥20mm thick, 100% for Castings & Forgings	ASTM A435	Specification	NDT reports	H	W	R	
2	Fasteners (through bolts, high tensile bolts & nuts etc.), Wheel track liner materials	a. Quality	Visual	Major	Sample check as per relevant specification	IS:1367	a. No cracks b. Proper matching with nuts	Test certificates	H	W	R	
		b. Chemical composition & physical properties	Chemical analysis, mechanical test	Major	Sample check as per relevant specification	IS:1367	IS:1367 Part III	Manufacturer' s test certificates	H	R	R	
		c. Dimensional	Measurements	Major	Sample check as per relevant specification	IS:1367	IS:1367 Part III & XIII		H	W	R	

Legend:
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 R – Review of records & results
 W – Test/inspection to be witnessed

Signature

 For VENDOR

Signature

 For THIRD PARTY

Signature

 For ISRO

Date :

 Place:

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SL. NO.	COMPONENT/ OPERATION	CHARACTERIST ICS TO BE CHECKED	METHOD OF CHECKING	CATEGORY	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORDS	INSPECTION AGENCY			REMARKS
									VR	TP	IS	
3	Wheels, Bearings, Pulleys, Clamp, Drive systems (Gear Box, Thruster Breaks, Couplings, Plumer Blocks, Ropes, Rope Drums etc.), Electrical Components (Electric Motors, Limit Switch, LCP, Main Control panel, Power cable & Control cable etc)	Dimensional conformance	Measurements	Major	100%	As per Manufacturer’s Specification	As per Manufacturer’s Specification	IR	H	W	R	
		Performance Tests	Verification	Major	100%	As per Manufacturer’s Specification	As per Manufacturer’s Specification	IR	H	W	W	

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B. WELDING PROCEDURE, WELDER'S QUALIFICATION, ETC.												
1	Welding	WPS, Welder's & Welding operator's qualification	Test piece, Visual, Physical & NDT (RT)	Critical	100%	ASME Sec IX	ASME Sec IX	WPS, PQR & WPQ	H	W	R	
C. FABRICATION ITEMS OF HSD (Door structure, Pulley Bracket, Spacer Block, Drive Base Frame, Lateral Guide Wheel Bracket, Vertical wheel Bracket Balancers, Track support bracket with beam, Cyclone Lock etc.)												
1	Setting out / Layout / Marking / CNC programming	Layout	Measurement	Major	100%	Relevant drawings	Full scale layout to be checked before cutting	Shop register	H	W	R	
2	Fitup before welding.	Quality	Visual alignment & check of major dimensions	Major	100%	Drawings	a. proper edge preparation b. proper tack welds c. minimum gap for butt joints as per WPS d. DIN-8570	IR	H	W	R	Members requiring site welding shall be match marked at joining ends for site erection
3	Welding (fillet joints)	Profile, fillet size, overall physical appearance	Visual/ gauge, DP/ MPT after final welding	Major	100%	ASME SecVIII, Vol-1	Drawings	IR	H	W	R	100% DP test shall be carried out
4	Full penetration welding	a. Root inspection after back gouging	Visual & LPI	Major	100%	IS:3658	No cracks allowed	IR	H	W	R	
		b. Internal defects	UT / RT	Critical	Wherever asked in the drawing	ASME Sec-VIII, Vol-1	ASME Sec-VIII, Vol-1	Test report	H	W	R	

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SPEC: HSD/SAF/2025/01	SSLV LAUNCH COMPLEX PROJECT									SECTION: C	
	QUALITY ASSURANCE PLAN FOR HSDs									SHEET: 4 OF 7	

SL. NO.	COMPONENT/ OPERATION	CHARACTERISTICS TO BE CHECKED	METHOD OF CHECKING	CATEGORY	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORDS	INSPECTION AGENCY			REMARKS
									VR	TP	IS	
		c. Welding quality, surface defects	LPI / MPI	Critical	Wherever asked in the drawing	ASME Sec-VIII, Vol-1	ASME Sec-VIII, Vol-1	Test report	H	R	R	
5	Stress relieving (after complete welding)	T-T curves	T-T curve verification	Major	100%	ASME Sec-VIII, Vol-I	Drawings	T-T graph	H	R	R	
6	Dimensional inspection after welding & stress relieving	Dimensional	Measurement of major dimensions & full size shop layout checking	Major	100%	Drawing / DIN 8570	Drawings	IR	H	H	W	
D. GRIT BLASTING & PAINTING												
1	Grit blasting & painting	Paint thickness	Visual & measurement by paint thickness gauge	Major	At random for paint thickness	Drawing & specification	Drawings & specification	IR	H	W	R	
E. MACHINING ITEMS for HSD system (Rope drum, Guide Pulley, Guide Wheel , Shaft, Hinge pin, Stoper, Shear block, Baring retainers, Liner plate etc.)												
1	Machining	Overall dimensions	Measurement & visual	Major	100%	Drawing	Drawing	IR	H	W	R	
2	Drilling, etc.	Drilling & tapping	Measurement of hole size & center distances	Critical	100%	Drawing & DIN 8570	Drawing	IR	H	W	R	

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For ISRO

Place:

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SL. NO.	COMPONENT/ OPERATION	CHARACTERISTICS TO BE CHECKED	METHOD OF CHECKING	CATEGORY	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORDS	INSPECTION AGENCY			REMARKS
									VR	TP	IS	
F. SUB – ASSEMBLIES of HSD System at vendor site (Pulley and pulley bracket, Vertical wheel assembly, Lateral roller guide, Cyclone lock, Drive mechanism etc.)												
1.	SUB – ASSEMBLIES of HSD System	Level, Alignment & Free Movement	Measurement, visual & Manually movement	Critical	100 %	Drawing	Drawing	IR	H	W	W	
G. Control Assembly of door panels with cladding sheets and insulation, materials at SLC site												
1.	Control assembly works	Dimensions, Levels, Alignment, Erection of clits with fasteners	Visual & Measurement	Critical	100 %	Drawings	Drawings	IR	H	W	W	Before erection

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SL. NO	COMPONENT/ OPERATION	CHARACTERISTICS TO BE CHECKED	METHOD OF CHECKING	CATEGORY	EXTENT OF CHECK	REFERENCE DOCUMENTS	ACCEPTAN CE NORMS	FORMAT OF RECORDS	INSPECTION AGENCY			REMARKS
									VR	TP	IS	
H. ERECTION AT SLC SITE												
1.	Fabricated material inspection	Visual, dimensional, review of TC & IR	Visual & measurement	Major	100%	TS & approved drawings	TS & approved drawings	IR	H	R	R	
2.	Welding & welder qualification	WPS, Welder's & Welding operator's qualification	Test piece, Visual, Physical & NDT (RT)	Critical	100%	ASME Sec IX	ASME Sec IX	WPS, PQR & WPQ	H	W	R	
3.	Welding	Preheat / interpass / sequence of welding	Visual	Major	100%	Drawing & TS	Drawing & TS	IR	H	W	R	
4.	Complete welding	Visual, DPT, UT	Visual & UT	Major	100%	TS & drawings	TS & drawings	IR	H	W	R	
5.	Dimensional check of whole assembly	Position, level, alignment and other dimensions, clearances	Measurement & Visual	Major	100%	Drawings	Drawings	IR	H	W	R	
6.	Mapping of Embedment plate (EP) on Civil wall, assembly of wheel brackets with EP by using through bolts and alignment of the brackets with inserting suitable spacer	Position, level, alignment and other dimensions, clearances	Measurement & Visual	Major	100%	Drawings	Drawings	IR	H	W	W	
7.	Assembly and alignment of Drive system on portal area of civil building, pulley bracket assembly, wire rope routing	Position, level, alignment and other dimensions, clearances	Measurement & Visual	Major	100%	Drawings	Drawings	IR	H	W	W	
8.	Assembly and alignment of Track for HSD-1	Position, level, alignment and other dimensions, clearances	Measurement & Visual	Major	100%	Drawings	Drawings	IR	H	W	W	

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Place:

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9.	HSD Movement along the Track manually	Clearance	Visual & Measurement	Major	100%	TS & Drawings	TS & Drawings	IR	H	W	W	
10.	HSD Movement along the Track by using drive system	Clearance	Visual & Measurement	Major	100%	TS & Drawings	TS & Drawings	IR	H	W	W	

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Date :

 Place:

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	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 1 OF 17
<p>1.0 <u>SCOPE</u></p> <p>This specification shall apply to shop and site fabrication of all welded joints in carbon steel. Low alloy steel and stainless-steel equipment like pressure vessels, tank, columns and heat exchangers etc. The specification shall apply to all the joints indicated below:</p> <ul style="list-style-type: none"> (a) Butt joints produced by double sided welding which produce the same quality of deposited weld metal on both inside and outside weld surfaces. (b) Butt joints produced by single sided welding having backing strip which remains in place and full penetration butt weld without backing strip (c) Corner or those joints connecting two (2) members approximately at right angles to each other in the form of L or T (d) Partial penetration welds of the groove type which are used for connections not subjected to external loading (e) Fillet welded joints of approximately triangular cross-section joining two (2) surfaces at approximately right angles to each other and having a throat dimension at least 70% of the thinner of the parts being joined but not less than 6mm (f) Welds attaching nozzles and other connections (g) Welds which are used to join non-pressure parts like supports, lugs, brackets, stiffeners and other attachments to the vessel wall (h) Any other similar joint which is not specified above but may be encountered during fabrication <p>2.0 <u>CODES AND STANDARDS</u></p> <p>2.1 The welding equipment, welding consumables, preheating, Post weld Heat Treatment (PWHT), other auxiliary functions and welding personnel shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment are to be fabricated and installed. Nothing in this specification shall be construed to relive the VENDOR/CONTRACTOR of his responsibility. Specifically, the latest editions of the codes and standards listed below shall apply:</p> <ul style="list-style-type: none"> (a) ASME Boiler and Pressure Vessel Code (BPV Code), Section II Part C- Material Specification for Welding Rods. Electrodes, and Filler Metals (b) ASME BPV Code, Section V-Non-destructive Examination (NDE) (c) ASME BPV Code, Section VIII Division I-Rules for construction of Pressure Vessels 		

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<p>(d) ASME BPV Code, Section IX – Welding and Brazing Qualifications</p> <p>(e) American Society of Non-destructive Testing (ASNT) SNT-TC-IA, Recommended Practice</p> <p>(f) Indian Boiler Regulations (IBR)</p> <p>(g) Any other codes and standards specified in Section B, C & D of enquiry specification</p> <p>2.1.1 The codes and standards listed in para 2.1 form an integral part of this specification. In the event of conflict between this specification and the codes & standards, the more stringent shall govern.</p> <p>2.1.2 If no specific requirements are given in this specification, the requirements of the applicable code shall govern.</p> <p>3.0 <u>WELDING PROCESSES</u></p> <p>The following welding processes shall be used:</p> <p>3.1 GAS TUNGSTEN ARC WELDING (GTAW)</p> <p>3.1.1 The root pass of single-sided groove welds without backing</p> <p>3.1.2 Full penetration nozzle connection where other side is inaccessible</p> <p>3.1.3 Any butt and fillet weld on equipment with thickness 5 mm or less</p> <p>3.1.4 For all passes of butt and fillet welding of nozzles on equipment and integral piping of size 50 mm NB or smaller</p> <p>3.2 Shielded Metal-Arc Welding (SAW)\</p> <p>3.3 SUBMERGED ARC WELDING (SAW)</p> <p>Maximum weld deposit per pass shall be 12.7 mm for carbon steel (p-1) and 9.5 mm for other materials.</p> <p>3.4 Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW) processes</p> <p>3.5 Other processes such as plasma-arc and electro-slag welding may be used only with the approval of the PURCHASER and depending upon the process and application proposed. These processes may require testing in addition to that specified by the governing procedure qualification code.</p> <p>3.6 Table 1 gives recommendations for welding processes to be used for carbon, low alloy and austenitic stainless steels.</p>		

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<p>4.0 <u>WELDING CONSUMABLES</u></p> <p>4.1 The VENDOR/CONTRACTOR shall provide, at no additional cost, all the welding consumables such as electrodes, filler wires, flux, oxygen, acetylene, argon etc., in order to complete the welding in all respects. The consumables shall be from reputed and approved manufacturers. All the consumables shall be approved by the PURCHASER / TPI.</p> <p>4.2 The electrodes and filler wires shall be of the class specified in Table 1 Welding specification chart.</p> <p>4.3 Electrodes qualification test records shall be submitted for the PURCHASER'S approval. The VENDOR/CONTRACTOR shall also submit batch test certificates from the electrodes manufacturer for physical and chemical tests.</p> <p>4.4 Electrodes shall be in sealed containers and adequate care shall be taken for storage, strictly in accordance with the manufacturer's recommendations.</p> <p>4.5 Electrodes, which have been removed from the original containers, shall be kept in baking ovens as per the manufacturer's recommendations and, once these are taken out, shall be consumed within the time limits stipulated by the manufacturer. Care shall be taken in handling the electrodes to prevent any damage to the flux covering. Portable ovens shall be used for carrying the electrodes from the main oven to the field. Electrodes of different specifications shall be stored in different compartments of a baking oven to avoid mix up.</p> <p>4.6 The electrodes, filler wires and flux used shall be free from contamination such as rust, oil, grease and such foreign matter.</p> <p>4.7 Low hydrogen electrodes shall be used for weld joints in carbon steel if the wall thickness exceeds 19 mm and low alloy steel of all thickness except that non low hydrogen electrodes shall be permitted for the root pass of carbon steel only.</p> <p>4.8 If ultimate tensile strength of base material permits, E 6010 electrodes may be used for root pass of butt welds and for fillet welds in carbon steel.</p> <p>5.0 <u>WELDING QUALIFICATIONS</u></p> <p>5.1 Qualification of the welding procedures to be used and the performance of welders and welding operators shall conform to the requirements of the BPV Codes and Section IX. For equipment under the purview of IBR, these shall also meet the requirements of IBR.</p> <p>5.2 No production welds shall be undertaken until the qualification requirements are completed to the satisfaction of the PURCHASER.</p> <p>5.3 When impact testing is required by the code or by the specification, these requirements shall be met in qualifying welding procedures.</p>		

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<p>5.4 The VENDOR/CONTRACTOR shall be responsible for qualifying any welding procedure, welders and welding operators intended to be deployed. The VENDOR/CONTRACTOR shall submit the welding procedure specification (WPS) for acceptance by the PURCHASER. After approval by the PURCHASER, the procedure qualification test shall be carried out by the VENDOR/CONTRACTOR, at his own expense, duly witnessed by the TPI / PURCHASER. A complete set of test results, in specified format, shall be submitted to the PURCHASER for approval immediately after successful completion of procedure qualification test. All tests as required by the BPV code Section IX or IBR shall be carried out. The WPS shall require re-qualification, if any of the essential variables of supplementary variable is altered.</p> <p>5.5 Welders and welding operators shall be qualified in accordance with BPV code and Section IX or IBR, as applicable. The qualification shall be carried out in the presence of the PURCHASER / TPI. Only those welders and welding operators who are qualified shall be deployed on the job. For equipment under the purview of IBR, approval of the local IBR inspector shall be obtained by the VENDOR/CONTRACTOR.</p> <p>5.6 Welders and welding operators shall always keep their identification cards with them and shall produce them on demand. The VENDOR/CONTRACTOR shall issue the identity cards after the same are duly certified by the PURCHASER Welder or welding operator, who is not in possession of the identity card, shall not be allowed to work.</p> <p>5.7 The VENDOR/CONTRACTOR shall use forms as per BPV code, section IX, form QW-482, form QW-483 and form QW-484. Other forms are also acceptable subject to approval by the PURCHASER.</p> <p>5.8 Unless agreed otherwise, the VENDOR/CONTRACTOR shall advise the PURCHASER, in writing, at least three (3) weeks before any welder or welding operator is deployed on the work, the names and qualification of the proposed welders, welding operators and welding supervisors. It shall be the VENDOR/CONTRACTOR'S responsibility to ensure that all welders and welding operators employed by him or his SUB-VENDORS/SUB-CONTRACTORS at works or at site are fully qualified as required by the code. Each welder and welding operator shall qualify for all types of welds, positions and materials or material combinations he may be called upon to weld.</p> <p>5.9 Should the PURCHASER require to qualify or requalify any welder or welding operator, the VENDOR/CONTRACTOR shall make available, at no extra cost to the PURCHASER the men, equipment and materials for the tests. The cost, of testing the welds shall be borne by the VENDOR/CONTRACTOR.</p> <p>5.10 Welding supervisors shall have qualifications such as engineering degree or engineering diploma in welding technology with adequate knowledge of welding</p>		

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<p>consumables welding machines & NDE and a minimum of five (5) years of experience in supervising welding of joints.</p> <p>5.11 All welding, including the tacking up of welds shall be carried out by qualified welders and welding operators as per approved WPS. Any weld made by other than a qualified welder or welding operator or not carried out as per approved WPS shall be cut out and re-welded.</p> <p>5.12 For purpose of identification and to enable tracing full history of each joint, each welder and welding operator employed on the work shall be given a designation. The welder and welding operator's designation and the date on which the joint is made, shall be stamped near the relevant joint and on the relevant drawings also. Copies of the drawings so marked shall be furnished to the PURCHASER for record purposes.</p> <p>5.13 For each welder and welding operator, a record card shall be maintained showing the procedures for which he is qualified. These cards shall note the production welds, the date of the welding done, the type of defects produced and their frequency. The record shall be reviewed once in a week by the PURCHASER and those welders & welding operators whose work required a disproportionate amount of repair shall be disqualified from welding. Re-qualification of welders and welding operators disqualified more than three (3) times shall be entirely at the discretion of the PURCHASER. As far as possible, the qualification shall be carried out at the location (site or shop) where the actual fabrication and welding work is to be carried out.</p> <p>6.0 <u>PERPARATION FOR WELDING</u></p> <p>6.1` Surface to be welded shall be smooth uniform and free from fins, tears and other defects, which would adversely affect the quality of the weld. All welding faces and adjoining surfaces, for a distance of at least 50 mm from the edge of the welding groove or 12 mm from the toe of the fillet in the case of socket welded or fillet welded joints, shall be thoroughly cleaned of rust, scale, paint, oil or grease, on both inside and outside.</p> <p>6.2 Joints for welding shall be as per the project specifications and approved fabrication drawings.</p> <p>6.3 Butt joints shall be prepared as per ASME BPV code Section VIII Division 1, unless specified otherwise. For equipment under the purview of IBR, these shall be as per IBR. Any other end preparation which meets the WPS is acceptable.</p> <p>6.4 Internal misalignment shall be reduced by trimming but such trimming shall not reduce the finished wall thickness below the required minimum wall thickness. Trimming shall not be abrupt. It shall be tapered with a minimum slope of 1:3. Root opening of the joint shall be within the tolerance limits of the WPS.</p> <p>6.5 Welds shall be as per ASME BPV code section VIII Division 1 or in accordance with IBR for equipment under the purview of IBR</p>		

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<p>6.6 Reinforcing pads and saddles shall have a good fit with the parts to which they are attached. A tell-tale hole shall be provided on the side of any pad or saddle to reveal leakage in the weld and to allow venting during welding and heat treatment. Pad or saddle shall be added, after the branch weld has undergone satisfactory visual and NDE.</p> <p>6.7 The ends shall be prepared by machining, grinding, flame cutting or plasma cutting. Where flame cutting is used, the effect on the mechanical and metallurgical properties of the base metal shall be taken into consideration. Flame cutting of alloy steel is not advisable. If alloy steel is cut using flame, the heat affected zone shall be removed completely by grinding and/or machining. Magnetic Particle (MT) or Liquid Penetrant (PT) testing shall be carried out to ensure soundness of edges. However, flame cutting of carbon steel is permitted. Wherever practicable, flame cutting shall be carried out by machine shall be cleaned free of slag. Manual flame cutting shall be permitted only where machine flame cutting is not practicable and with the approval of the PURCHASER, and such surfaces shall be ground or dressed to a smooth finish as required by the specification and to the satisfaction of the PURCHASER. Slag, scale or oxides shall be removed by grinding to bright metal at least two (2) mm beyond the burnt area.</p> <p>6.8 Thermal cutting of carbon steel shall be performed under the same conditions of preheating and PWHT as for the welding of each class of material. However, PWHT is not required when:</p> <p>(a) The heat affected zone produced by thermal cutting is removed by mechanical means immediately after cutting. However, in any case, all remaining slag, scale or oxides shall be removed by grinding to bright metal at least two (2) mm beyond the burnt area, or</p> <p>(b) Thermal cutting is part of fabrication, manufacturing or erection sequence leading to a weld end preparation where welding immediately follows.</p> <p>6.9 Before fitting up the weld joint, the profile and dimensions of the weld end preparation shall be checked by the PURCHASER. If the specified tolerances are exceeded, this shall be corrected (with prior approval) by grinding, machining or any other method acceptable to the PURCHASER.</p> <p>6.11 Fit-ups shall be examined by the PURCHASER prior to welding the root pass.</p>		
7.0 <u>TECHNIQUE AND WORKMANSHIP</u>		
7.1 Components to be welded shall be aligned and spaced as per the requirements of the code and WPS.		
7.3 Alignment and spacing shall be achieved using suitable wires to maintain the gap. These shall be removed after tack welding. The ends to be welded shall be held using suitable clamps, yokes or other devices which will not damage the		

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<p>surfaces in any manner. It shall be ensured that welding operations do not result in distortions.</p> <p>7.4 Earthing shall be provided on the job using earthing clamps of similar material as the job. Earthing shall not be given through welding rotators.</p> <p>7.5 Tack welds at the root joint, for maintaining joint alignment, shall be made only by qualified welders or welding operators and with filler metal equivalent to that used in the root pass. Tack welds shall be fused with the root pass weld, except that those which have cracked shall be removed. Peening is prohibited on the root and final passes of a weld. The required preheat shall be maintained prior to tack welding. Means shall be made available to measure preheat temperature.</p> <p>7.6 No welding shall be carried out if there is any impingement in the weld area of rain, snow, excessive wind or if the weld area is wet.</p> <p>7.7 Irrespective of the class of steel, root runs shall be made without interruption other than for changing the electrodes or to allow the welder or welding operator to reposition himself. Root runs made in the shop may afterwards be allowed to cool by taking suitable precautions to ensure slow cooling e.g. by wrapping in a dry asbestos blanket. Welds made at site shall not be allowed to cool until the thickness of weld metal deposited exceeds one third of the final weld thickness or 10 mm, whichever is greater.</p> <p>7.8 When welding alloy steels, it is strongly recommended that interruption of welding be avoided. Where such interruption is unavoidable, either the preheat shall be maintained during the interruption or the joint shall be post heated or wrapped in dry asbestos blankets to ensure slow cooling. Before recommencing welding, preheat shall be applied again.</p> <p>7.9 Welding-on bridge pieces and temporary attachments shall preferably be avoided. Where approved by the PURCHASER, these may be used. Material of these shall be compatible with material with which they are temporarily welded. All such pieces shall be removed after welding of joints and the weld area ground flush. These areas shall be subjected to MT and PT examination. These pieces shall be welded by qualified welders & welding operators and with electrodes compatible with the parent material. The preheating requirements of material shall be applied and maintained during the welding of attachments. These temporary attachments shall be removed by grinding, chipping, sawing or by arc or flame gouging. When arc or flame gouging is used, at least three (3) mm of metal shall be left around the surface which shall be removed by grinding. This metal shall not be removed by hammering or by use of force.</p> <p>7.10 The arc shall be struck only on those parts of parent metal where weld metal is to be deposited. When inadvertent arc-strikes are made on the base metal surfaces outside the joint groove, the arc-strikes shall be removed by grinding and shall be examined by MT and PT procedures.</p>		

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<p>7.11 Oxides shall not be permitted to form during welding or heat treatment or both, on the internal surfaces which will not be subsequently cleaned. Inert gas purging is an acceptable method to prevent such oxidation. All joints in materials which contain more than 1¼ % chromium shall be purged to assure that less than 1% of oxygen is present on the joint underside before initiation of the welding. The purging operation shall be maintained for a minimum of two (2) passes.</p> <p>7.12 Argon gas used in GTAW process for shielding and purging shall be at least 99.95% pure. Purging shall be carried out at a flow rate depending on diameter until at least five (5) times the volume between dams is displaced. In no case shall the initial purging period be less than 10 minutes. After initial purging, the flow of backing gas shall be reduced to a point where only a slight positive pressure prevails. Any dams used in purging shall be fully identified and removed after welding and accounted for in order to avoid leaving them in the system. The rate of flow for shielding purposes shall be established in the procedure qualification.</p> <p>7.13 Thorough check shall be exercised to maintain the required inter-pass temperature.</p> <p>7.14 All equipment necessary to carry out the welding, for supporting the work, for preheating and PWHT including thermal insulation for retaining the heat and for the protection of the welder & welding operator shall be provided by the VENDOR/CONTRACTOR at no extra cost. All necessary precautions shall be taken during cutting and welding operations. It shall be ensured that proper ventilation is available in the welding area and adequate protective gear such as goggles, masks, gloves, protection for the ears and body are used at all times. For guidelines refer ASME standard Z49.1, "Safety in Welding and Cutting".</p> <p>7.15 After deposition, each layer of weld metal shall be cleaned with a wire brush to remove all slag, scale and defects, to prepare for the proper deposition of the next layer. The material of wire brush shall be compatible with parent material. Special care shall be taken to secure complete and thorough penetration of the fusion zone into the bottom of the weld. It is recommended that the root run be checked by MT or PT procedures for critical equipment.</p> <p>7.16 If specified, upon completion of welding, the joints shall be wrapped in dry asbestos blankets to ensure slow cooling, unless PWHT is applied immediately.</p> <p>7.17 No welding or welded parts shall be painted, plated, galvanised or heat treated until inspected and approved by the PURCHASER. Welds shall be prepared and ground in such a way that the weld surfaces merge smoothly into the base metal surface, particularly for welds which are to undergo NDE.</p> <p>7.18 Except where necessary to grind flush for NDE, reinforcement for butt welds may be provided. The height of such reinforcement shall meet the requirements of the code. The reinforcement shall be crowned at the centre and tapered on each side of the joined members. The exposed surface of the weld shall be ground where required to present a workmanlike appearance and shall be free from depressions below the surface of the joined members. The exposed surface of</p>		

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<p>the butt welds shall be free from undercuts, overlaps or abrupt ridges or valleys and shall merge smoothly into the surface at the weld toe.</p> <p>7.19 Repair of weld metal defects shall meet the requirements of the code.</p> <p>7.20 Any weld repair shall be subject to the approval of the PURCHASER.</p> <p>7.21 In the event of several unsuccessful repair attempts or if the PURCHASER feels that a satisfactory repair is not feasible, the joint shall be completely remade.</p> <p>7.22 It is preferable to use welding rectifier or DC generator for welding of ausenitic steels and while using low hydrogen electrodes.</p> <p>7.23 <u>IDENTIFICATION OF WELDS</u></p> <p>Wherever code symbol stamps are required on carbon steel and ferritic alloy steel they shall be applied directly on to the member with low stress dotted design metal die stamps or to a small stainless-steel plate especially provided for such marks. These plates shall be lightly tack welded using electrodes, of diameter three (3) mm or less, of the type specified for the material. Before making the required tack weld, the material in the immediate surrounding area shall be preheated, as required, by electric means or propane or natural gas burners. Cooling shall take place under asbestos insulation in a draft-free area. Stress relieving of these welds is not required. Steel stamping directly on the surface of alloy steel with other than low stress die stamps shall not be used.</p> <p>7.24 <u>SEAL WELDS</u></p> <p>7.24.1 Seal welding shall be carried out by qualified welders & welding operators and in accordance with approved drawings.</p> <p>7.24.2 Threaded joints that are to be seal welded shall be made without the use of thread lubricating compound. Seal weld shall cover all exposed threads.</p> <p>7.25 <u>WELD ENCROACHMENT AND MINIMUM DISTANCE BETWEEN WELDS</u></p> <p>7.25.1 Welded joints, more specifically longitudinal welds, shall be placed not closer than 50 mm to opening or branch welds, reinforcements, attachment devices or from supports etc. In case of deviation, the PURCHASER may specify additional NDE.</p> <p>7.25.2 The longitudinal welds of two adjacent components shall be staggered by at least 30°. The minimum distance between welds shall be 50 mm or eight (8) times the wall thickness, whichever is greater. Intersection of welds shall be avoided as far as possible. If such welds are present, they shall be subject to suitable NDE at the discretion of the PURCHASER.</p> <p>8.0 <u>PREHEATING</u></p>		

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<p>8.1 Preheating prior to tack welding, welding and thermal cutting shall be used as a means of crack prevention and improving weld reliability. The general requirements of PWHT also apply to preheating.</p> <p>8.2 Preheating shall be used as per the recommendations of ASME BPV Code Section VIII Division 1. For equipment under the purview of IBR, the requirement of IBR shall govern, Table 2 gives the requirements of preheating for commonly used materials.</p> <p>8.3 The preheating zone shall extend to 75 mm or a distance equal to four (4) times the material thickness, whichever is greater, beyond the edges of the weld.</p> <p>8.4 The preheat temperature shall be measured at least 75 mm away from the weld preparation.</p> <p>8.5 Where preheating is specified, welding shall continue without interruption. In case interruption cannot be avoided, preheating shall be carried out before re-commencement of welding.</p> <p>8.6 Oxy-acetylene preheating shall not be applied.</p> <p>8.7 For preheating, fuel gas/air torches, burner systems (high velocity gas or oil burners) or electrical heating may be used either locally or in a furnace. For preheating above 250°C, electric heating (resistance or inductive heating) is recommended.</p> <p>8.8 Approved temperature – indicating crayons, thermocouples or digital contact or laser pyrometers shall be used to measure preheat and inter-pass temperatures. A calibration report of the pyrometers and thermocouples shall be available.</p> <p>8.9 When the preheat temperature is 150°C or higher, the metal shall be maintained at or above the preheat temperature until the weld is completed.</p> <p>8.10 The welding of groove welds in low alloy steels of P-3 to P-5 groups with wall thickness of 19 mm or greater may only be interrupted, provided at least 10 mm of weld metal is deposited, or 25% of the welding groove is filled, whichever is greater. If the welding is interrupted prior to the above, the weld area shall be adequately covered with insulating material to ensure slow cooling. After cooling and before welding is resumed, visual examination of the weld shall be performed to assure that no cracks are formed. Required preheat shall be applied before welding is resumed.</p> <p>9.0 <u>POSTWELD HEAT TREATMENT (PWHT)</u></p> <p>PWHT shall meet the requirement of ASME BPV code Section VIII Division 1. Table 3 summaries the PWTH requirement for commonly used materials. For equipment under the purview of IBR, PWHT shall be as per IBR.</p> <p>9.1 <u>GENERAL REQUIREMENTS</u></p>		

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<p>9.1.1 A complete automatic temperature recording shall be made of preheating and stress relieving operations. Where propane gas burners or electrical resistance coils are employed, a complete temperature record of the preheating and stress relieving operation shall be made by means of a box type potentiometer. Other means of recording temperatures are permissible, subject to the PURCHASER'S approval.</p> <p>9.1.2 Stress relieving may be local or full furnace. Local stress relieving shall be performed with electric induction or electric resistance coils. Suitable gas burning equipment using natural gas or propane may be employed.</p> <p>9.1.3 At no time during a stress relieving/preheating cycle, shall any water or liquid cooling medium be employed.</p> <p>9.1.4 Where members being joined are unequal in thickness, the dimension of the heavier section shall govern the selection of width of the heated band and the duration of holding period shall be based on maximum weld thickness.</p> <p>9.1.5 For local stress relief, using electrical methods, a minimum of two (2) thermocouples tack-welded to the surface and potentiometers shall be used on the part under at least four (4) layers of asbestos paper. The hot junctions of the thermocouples shall be located on either side of the joint at least 12 mm from the edge of the joint but no farther away than 100 mm. When employing induction heating, at least six (6) turns of induction cable shall be used on each side of the weld. Induction coils shall be wrapped on top of the asbestos paper protecting the thermocouples with the first turn approximately 150 mm from the centre of the weld.</p> <p>9.1.6 Local stress relieving, using gas torches or ring burners may be employed. However, the procedure shall be limited to small items and shall be approved by the PURCHASER.</p> <p>9.1.7 The stress relieving temperature shall be maintained for a period of time proportioned on the basis of one (1) hour per 25 mm of weld thickness at the joint, but in no case less than one (1) hour.</p> <p>9.1.8 For piping joints and socket welded joints, pads, bosses, branch welds and couplings, one (1) thermocouple shall be positioned at a minimum distance of two (2) pipe wall thickness from the weld.</p> <p>9.1.9 Equipment on both sides of any joint shall be adequately supported throughout the preheating, welding and stress relieving operations to prevent distortion.</p> <p>9.1.10 All heating and cooling rates shall be maintained as per ASME BVP Code and time-temperature charts from the recorder shall be made available for review and acceptance.</p> <p>9.1.11 The VENDOR/CONTRACTOR shall submit a detailed written procedure for the PWHT for approval of the PURCHASER.</p>		

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<p>9.2 <u>CARBON STEEL</u></p> <p>9.2.1 Welded joints in carbon steel shall be stress relieved, upon completion of the welding operation, in accordance with Table 3.</p> <p>9.2.2 When local stress relief is employed, the welded joint shall be heated to a temperature of not less than 600°C. The temperature level shall be maintained between 600 and 650°C, one (1) hour per 25 mm of weld thickness but in no case less than one (1) hour. The weld area shall then be allowed to cool undisturbed in still air to a temperature not exceeding 315°C.</p> <p>9.2.3 <u>Heating and Cooling</u></p> <p>Carbon steels, after having reached their specific stress relief temperatures, may be cooled in the furnace or under wraps, i.e., leaving the induction coils or resistance heaters and insulation in place. This means that, at the stress relief temperatures, power to the furnace or heating coils may be shut off and cooling takes place in the furnace or with all insulation and coils remaining on the part. For furnace stress relief, the doors of the furnace may be opened after the power is shut off, at or below 315°C. Thermocouples controlling the temperature shall remain during the cooling cycle so that excessive cooling, if it occurs, can be observed and immediately corrected. The stress relieving coils and insulation shall only be removed after the part has cooled to below 315°C or if stress relieved in a furnace the part may be removed from the furnace and permitted to cool in still air at a temperature not below 10°C.</p> <p>9.3 <u>ALLOY STEEL</u></p> <p>9.3.1 Welds in alloy steel shall be stress relieved after the welding operation in accordance with Table 3.</p> <p>9.3.2 For full furnace stress relief of a welded assembly, the entire fabricated section shall be heated uniformly to the temperature specified. The temperature shall be maintained for a period of time proportioned on the basis of one (1) hour per 25 mm of weld thickness of the piece having the greatest weld thickness in the furnace charge, but in no case, less than one (1) hour.</p> <p>10.0 <u>ELETRODES</u></p> <p>10.1 The specification and size of the electrodes, voltages and amperages, thickness of beads and number of passes shall be as specified in the approved welding procedure or otherwise agreed in writing. Only basic coated electrodes shall be used, which will deposit weld metal having the same or higher physical properties and similar chemical composition to the members being joined. For each batch of approved brand, certificate showing compliance with the specification shall be submitted to the PURCHASER for review before being released for use. All electrodes shall be purchased in sealed containers and stored properly to prevent deterioration. As welding electrodes deteriorate under adverse conditions of storage leading to dampness in the electrode coating, they shall normally be stored in dehumidified air-conditioned rooms or in hot boxes or</p>		

SPEC NO.: HSD/SAF/2025/01	SSLV LAUNCH COMPLEX PROJECT	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 13 OF 17
<p>ovens in their original sealed containers whose temperature shall be maintained within specified limits. The conditions of electrodes shall be frequently inspected. Electrodes with damage to coating shall not be used. Electrodes shall remain identified until consumed. It is preferable to produce low hydrogen electrodes in hermetically sealed containers and preserve them without damage to the containers.</p> <p>10.2 All low hydrogen electrodes, after baking as per the manufacturer's recommendations, shall be stored in ovens kept at 80 to 100°C before being used. Recommendations of the electrode manufacturer shall be strictly followed. Until the electrodes are taken out for welding, they shall be stored in portable ovens. The electrodes shall not be exposed to open atmosphere.</p> <p>10.3 For welding of all grades of steel and alloys by the GTAW process, a 2% thoriated tungsten electrode conforming to SFA-5.12-86 EWTh-2(AWS-A5.12-80, EWTh-2) classification shall be used.</p> <p>10.4 All electrodes to be used on alloy and carbon steel shall conform to ASME BPV Code Section II part C or any other equivalent code.</p> <p>10.5 The type of electrodes used shall be only those recommended by the manufacturer for the use in the position in which the welds are to be made.</p> <p>10.6 Current and polarity shall be maintained as recommended by the electrode manufacturer.</p> <p>11.0 <u>INSPECTION AND TESTING</u></p> <p>11.1 The PURCHASER shall have free access to inspect welding or any other related operations at any time and at any stage of fabrication.</p> <p>11.2 The PURCHASER may require NDE of any weld for reasons other than those given in the specification. The responsibility for the cost of such testing shall lie with the VENDOR/CONTRACTOR.</p> <p>11.3 The VENDOR/CONTRACTOR shall inform the PURCHASER when the weld preparation and set-up for welding of various members selected by the PURCHASER are in progress so that the PURCHASER can inspect the assembly before welding starts.</p> <p>11.4 The responsibilities of the PURCHASER's representative shall in no way reduce the VENDOR/CONTRACTOR's responsibilities to ensure that the work is carried out in accordance with the specification.</p> <p>11.5 Any examination by NDE methods shall be performed before or after PWHT based on the applicable code requirements.</p> <p>11.6 For a welded branch connection and for any weld, necessary repairs and NDE shall be completed before any reinforcing pad is added.</p>		

SPEC NO.: HSD/SAF/2025/01	SSLV LAUNCH COMPLEX PROJECT	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 14 OF 17
<p>12.0 <u>EXAMINATION OF WELDS</u></p> <p>12.1 Examination refers to the quality control functions performed by the VENDOR/CONTRACTOR during fabrication, erection and testing.</p> <p>12.2 As a minimum, the following shall be examined by visual examination:</p> <ul style="list-style-type: none"> (a) Materials and components to ensure that these are as per the specification and are free from defects. If defects are noticed on “free-issue” items, these shall be brought to the notice of the PURCHASER without delay. (b) Joint preparation and cleanliness (c) Fit-up, joint clearance and internal alignment prior to joining (d) Preheating as applicable (e) Variables specified by the welding procedure, including filler material, position and electrode (f) Condition of the root pass after cleaning- external and where accessible, internal (g) Slag removal and weld condition between passes (h) Appearance of the finished joint and weld dimensions <p>13.0 <u>QUALIFICATION AND CERTIFICATION OF NDE PERSONNEL</u></p> <p>13.1 Approved and documented NDE procedure prepared by level III personnel shall be made available.</p> <p>13.2 The VENDOR's/CONTRACTOR's examining personnel shall have training and experience commensurate with the needs of the specified examinations. NDE supervisors/examiners shall be qualified at level II or above of ASME BPV Code Section V.</p> <p>13.3 The VENDOR/CONTRACTOR shall make available to the purchaser copies of certificates of qualification of the examiners he proposes to use for the PURCHASER's approval.</p> <p>14.0 <u>METHODS OF EXAMINATION</u></p> <p>The methods of examination used, viz. Ultrasonic (UT), Radiographic (RT), MT and PT shall be in accordance with ASME BPV Code Section V.</p> <p>15.0 <u>ACCEPTANCE STANDARDS</u></p>		

SPEC NO.: HSD/SAF/2025/01	SSLV LAUNCH COMPLEX PROJECT	SECTION: D SHEET: 15 OF 17
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	

15.1 Levels of acceptance of defects in welds shall be in accordance with ASME BPV Code Section VIII Division 1.

15.2 For equipment under the purview of IBR, the levels of acceptable defects shall be as per IBR.

16.0 REPAIR WELDING

16.1 All defects in welds requiring repair shall be removed by flame or arc gouging, grinding, chipping or machining. The major repairs may involve:

- (a) Cutting through the weld
- (b) Cutting out a portion of material containing the weld, or
- (c) Removing the weld metal down to the root depending upon the magnitude of the defects.

16.2 After removing the defect, the repaired portion and adjacent area shall be examined by the same NDE methods as specified for the original weld and the same acceptance criteria shall hold good.

16.3 All the repair welds shall be made using the same or other specified welding procedures as those used in making the original welds including preheating and stress relieving if originally required.

TABLE 1
WELDING SPECIFICATION CHART
FOR COMMONLY USED MATERIALS

SL. NO.	BASE MATERIAL	P NO	WELDING PROCESS		FILLER MATERIAL		NOTES
			ROOT	FILLER	ROOT	FILLER	
1.0	CARBON STEELS	1	GTAW	GTAW	ER 70S2 OR ER 70S3	ER 70S2 OR ER 70S3	
1.1	< 5 mm THICK						
1.2	>5mm AND < 19mm THICK	1	GTAW OR SMAW	SMAW OR SAW	ER 70S2 OR ER 70S3 OR E 6010	E6013 F6—EL8 OR F7—EL12	
1.3	> 19 mm THK	1	GTAW OR SMAW	SMAW OR SAW	ER 70S2 OR ER 70S3 OR E 6010	E 7018 F7—EL12	1
2.0	LOW ALLOY STEELS	4	GTAW	GTAW	ER 80S B2	ER 80S B2	
2.1	1¼%Cr ½% MO < 5mm THICK						
2.2	1¼%Cr 1% MO > 5mm THICK	4	GTAW	SMAW	ER 80S B2	ER 8016 OR E8018-B2	

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	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	

2.3	2¼%Cr 1% MO < 5mm THICK	5	GTAW	GTAW	ER 90S B3	ER 90S B3	2 TO 7
2.4	1¼%Cr 1% MO > 5mm THICK	5	GTAW	SMAW	ER 90S B3	E9015 OR E9016 OR E9018-B3	2 TO 7

NOTES

1. Low hydrogen electrodes shall be used for critical systems such as chlorine, hydrogen, caustic and similar toxic inflammable fluids and also when ever the wall thickness exceeds 19mm.
2. The argon shielding gas flow rate shall not be less than 0.34 M³/Hr.
3. For purging and shielding argon gas shall be used. However, nitrogen may be used as an alternative to argon for purging purpose only. In case of stainless steel, nitrogen may be used where corrosion resistance is not critical.
4. For fillet welds, SMAW may be used instead of GTAW for thickness above 5 mm.
5. For GTAW, electrode shall be 2% thoriated tungsten.
6. Initial purging prior to welding process shall be a minimum of five (5) times the volume between dams or ten minutes minimum whichever is higher. Where welding commences, the purge gas flow shall ensure that the gas pressure is only marginally higher than atmospheric pressure to ensure no root concavity.
7. Back purging using argon/nitrogen shall be maintained for the root run and a minimum of one (1) additional pass.
8. Electrodes and filler wires manufactured by reputed firms duly approved by the PURCHASER shall only be used.
9. Electrodes shall have at least the same or higher physical properties and similar chemical composition to the members being joined.
10. Read the table in conjunction with para 3.0

TABLE-2
PREHEAT REQUIREMENTS

SL NO.	BASE MATERIAL	P.NO	NOMINAL WALL THICKNESS, Mm	SPECIFIED MINIMUM TENSILE STRENGTH, mPa	RECOMMENDED MINIMUM PREHEAT TEMPERATURE, °C
1.	CARBON STEEL	1	<25	490	10
2.	CARBON STEEL	1	>25	490	100

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	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	

3.	LOW ALLOY STEEL- 1¼%Cr ½%M0	4	ALL	ALL	149
4.	LOW ALLOY STEEL- 2¼%Cr 1%M0	5	ALL	ALL	210

TABLE-3
POSTWELD HEAT TREATMENT REQUIREMENTS
(FOR COMMONLY USED STEEL MATERIALS)

SL. NO.	BASE MATERIAL	P.NO.	NOMIANL WALL THICKNESS mm	METAL TEMPREATURE RANGE °C
1.	CARBON STEEL	1	<32	NONE
2.	CARBON STEEL	1	>32	600 TO 650
3.	LOW ALLOY STEEL 1¼%Cr ½%M0	4 GR 1 AND 2	ALL	600 TO 650
4.	LOW ALLOY STEEL 2¼%Cr 1%M0	5A GR 1	ALL	680 TO 700

NOTES

1. In IBR systems, in carbon steels, PWHT is also required, when the carbon percentage exceeds 0.25% at the temperature range of 600+/- 20°C.
2. For all low alloy steel welds under the purview of IBR, the PWHT shall be carried out at the temperature range of 620 to 660°C for 1 ¼% Cr ½% Mo steels and at a range of 660 to 750°C for 2 ¼% Cr 1% Mo steels.
3. Solution annealing shall be carried out after welding of austenitic stainless steel as per the applicable services.
4. For equipment in carbon steels or alloy steels and meant for lethal service, PWHT of all welds shall be carried out.

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E1
	SCHEDULE OF PRICES HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 2

SCHEDULE OF PRICES & GENERAL PARTICULARS

1. Bidders shall not alter the contents of this schedule of prices. If the bidder wants any additions / alterations, these shall be brought out separately in the format as given in this schedule of prices.
2. Equipment and material to be supplied shall be in accordance with section A, A1, B, C & D of this specification.
3. The estimated finished weight of the system in each category in price bid format is approximate only. In case there is any variation in the quantities of items actually supplied and installed from the quoted quantities, the price of the same shall be adjusted based on the unit rates furnished by the bidder. The such variation is limited to $\pm 15\%$ of the order value. Offer shall be valid for $\pm 15\%$ of the order value. However, payment will be made based on the final finished drawings weight only.
4. The quoted price shall be price in Indian Rupees for Design, supply of material, manufacture, inspection and testing at manufacturer's works, packing, forwarding, transportation from place of manufacture to site, transit insurance, unloading / receipt at site, storage / handling at site, erection, testing, commissioning and carrying out performance test at site inclusive of all taxes and duties as applicable on finished products, and GST which shall be separately indicated in the price bid.
5. Total price towards Third Party Inspection (to be borne by the supplier) shall be indicated separately in the price bid.
6. Split-up of the order is not acceptable and overall L1 will be considered for placing the order.

(A) SCHEDULE OF UNIT PRICE

Sl.no	Item	Qty.	Cost in Rs.
1	Procurement, fabrication, control assembly, transportation, handling & storage at site of fabricated structural steel / Mild steel conforming to IS:2062 & IS:808 items without machining (items like Door leaves, labyrinth sealing plates, sealing plates, top sealing brackets, maintenance platforms, ladders, guards etc..) as per specification enclosed with this tender but excluding taxes and duties.	210t	
2	Procurement, fabrication, stress relieving, machining, control assembly, transportation, handling & storage at site of fabricated structural steel / Mild steel conforming to IS:2062 & IS:808 items with machining (items like guide channels, Brackets for lateral guide wheel, Brackets for vertical wheel, Brackets for track supports, brackets for cyclone locks, bearing retainer, lock plates, bearing housings, base frames, shims, pulley brackets, drum mounting brackets, base & striker for limit switch for etc..) as per specification enclosed with this tender but excluding taxes and duties.	22t	

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E1
	SCHEDULE OF PRICES HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 2 of 2

3	Procurement, fabrication / machining, heat treatment, control assembly, transportation, handling & storage at site of forged steel / alloy steel/ cast steel, En24-T, En-9, Hardox-400 items (items like liners for guide channels, Wheels, axles, rope drum, shafts, pulleys, cyclone lock screws, couplers, spacers with special steel, through bolts, fasteners etc.) as per specification enclosed with this tender but excluding taxes and duties	16 t	
4	Procurement, Sub-assembly, Control assembly, transportation, handling & storage at site of all bought-out items (like 12 nos. of electric motors, complete electrics like LCP, MCC panels, cables, glands, other electrical miscellaneous, 12 nos. of Double reduction worm gear boxes, 12 nos. of fluid couplings, 12 nos. of thrusters brakes, 24 nos. of limit switches, 24 nos. full gear couplings, insulation, grease nipples, fasteners, handing over of start-up spares as mentioned in 20 of section B etc.) mentioned in the specification.	1 lot	
5	Erection and commissioning of total 12 nos. of Horizontal sliding door leaves including storage/ handling at site, erection, testing, commissioning and carrying out performance test of HSD's as per specification enclosed with this tender but excluding taxes and duties.	1 lot	
6	Third party Inspection charges for Horizontal Sliding Doors	-	
7	Cost of complete start up spares as mentioned in Section-B, Clause 20.0	1lot	
8	Total cost (Sl No.1 + 2 + 3 + 4 + 5 + 6+7)	-	
9	GST@5%on total cost.	-	
	Total cost including GST (8+9)		

Note:

1. Cost off packing, forwarding and transportation shall be loaded to the unit rate, not to be quoted extra.
2. **Any bids/offers with price details in Techno-Commercial Offer (Part – I) shall be rejected.**

SIGNATURE

NAME :

DESIGNATION:

SEAL OF THE COMPANY DATE

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E2
	BID QUALIFICATION CRITERIA HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 2

BID QUALIFICATION CRITERIA FOR SUPPLY OF HORIZONTAL SLIDING DOORS FOR SAF

Bidders who are qualifying / meeting following Technical and financial criteria are eligible to participate in the bid for supply of Horizontal Sliding Doors for SAF. Bidder shall furnish all the information mentioned in the criteria with documentary proof and submit 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.

A. Technical Qualification Requirements:

The bidder shall meet the following technical qualifying requirements and shall submit relevant certificates to establish his credentials.

1. The Bidder shall be an organization with minimum 5 years of experience in having executed contracts for manufacture, supply, erection, testing and commissioning of heavy structural works using structural built-up sections.
2. The firm shall have successfully completed Manufacture, Installation, Testing and Commissioning of at least 1 no heavy structural work of total 200t in single workorder during last 10 years ending with 31.03.2025. Bidders have to provide relevant certificates, PO copy, Completion certificates along with the submission of bid for consideration of bid document.

OR

- The firm shall have successfully completed Manufacture, Installation, Testing and Commissioning of at least 2 nos. heavy structural work of each 100t during last 10 years ending with 31.03.2025. Bidders have to provide relevant certificates, PO copy, Completion certificates along with the submission of bid for consideration of bid document.
3. The firm should have experience in erection and commissioning of structural items at elevated heights. The firm should have erected and commissioned structural items of minimum weight 10t at a minimum height of 30m in the last 10 years ending with 31.03.2025. Bidders have to provide relevant certificates PO copy, Completion certificates along with the submission of bid for consideration of bid document.
 4. The firm shall have facilities for fabrication and handling big structural items of 10 m long and 9 m wide for fitment, alignment, welding etc.
 5. The firm should have successfully completed manufacture, and establishment of high Structures to the satisfaction of reputed third-party inspection agencies like M/sMECON, M/s M N Dastur, M/s TCE, M/s Lloyds, M/s TCE.
 6. **The firm should not have any pending purchase orders from government organization/PSU which are delayed more than 18 months from the original delivery period due to reasons attributed to the party.**

B. Financial Qualification Requirements:

1. The Bidder should have annual turnover of not less than a value of Rs. 6 cr per year in last three financial years ending with 31.03.2024.

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E2
	BID QUALIFICATION CRITERIA HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 2 of 2

2. The firm should have undertaken and successfully completed single work of heavy fabrication works not less than: Rs.5 crore value of works at least in last 10 (Ten)years.

OR

The firm should have undertaken and successfully completed of 2 nos. works of heavy fabrication works not less than: Rs. 3 crore value during last 10 (Ten)years.

3. Bidder shall submit audited statement of financial status for last three years.

C. The following documents shall be submitted along with the Techno commercial bid for prequalification of Bidder.

1. Firm establishment certificate and nature of work.
2. Details of work of similar type completed during the last ten years ending with 31.03.2025
3. Satisfactory work Completion certificates from the clients, with the work order copies
4. Performance Report (with years of service) from End users, with addresses and contact person with phone numbers.
5. Documentary evidence (Technical details &. drawings) for fulfilling special technical conditions as per the RFP document
6. Copy of audited Balance Sheets for last three years
7. IT / TDS certificates for last three years.
8. Solvency certificate from a scheduled bank for a value not less than Rs. 5Cr and not before 6months from the date of tender closing.
9. List of heavy fabrication works (for capacity 100 t and above) completed from last ten (10) years with purchase order copies.
10. List of value, and work order copies of total projects under Execution with purchase order name and address.
11. Structure and Organization chart.
12. List of personnel with qualification &. experience in the firm in the areas of design, production, quality, safety, administration etc.,
13. List of Machinery & Equipment to be used for the work.

E. Bid Selection Procedure and Process of Pre-Qualification

1. Short listing based on documents submitted, satisfying the all-eligibility criteria given above by the firm or individual along with their Bid / application. (No submission of any document as given in above list within stipulated time leads to rejection of Bid).
2. Subsequently Bidder's competency, their technical achievements and financial status will be evaluated suitable for this project. Feedbacks from Bidder's clients will be verified.
3. Visit to sites by technical team (ISRO or Third party), where Bidder has established above mentioned works.
4. If required, visit will be made to their factory/ firm by technical team (ISRO or third party) for accessing the capability of manufacturer.
5. Scrutiny of all technical specification and supply conditions mentioned in techno commercial bid.

DATE

SIGNATURE:
NAME
DESIGNATION:

SEAL OF THE COMPANY :

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E3
	SCHEDULE FOR GENERAL PARTICULARS HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 2

SCHEDULE FOR GENERAL PARTICULARS / VENDOR EVALUATION FORMAT

SR. NO.	DESCRIPTION	
1.	Name of Company	
2.	Address of Company	
3.	Type of Company (Proprietary/Pvt.Ltd/Public Ltd/Joint Venure/Consortium)	
4.	Registration number	
5.	Year of inception of the company	
6.	Registered address	
7.	Name & address of the office of the Chief Executive of the company	
8.	Name & Designation of the officer of the Bidder to whom all correspondence shall be made for expeditious technical/ commercial co-ordination. Telephone number Fax number E-mail address	
9.	Locations of the Branches of Company (if any)	
10.	Annual turn-over of the company for the last three years	
11.	IT returns for the last 3 years	
12.	Major customers (Enclose copies of the Purchase Orders)	
13.	Any customers feedback on the services which is in writing (Pl. enclose copies)	
14.	Quality certification of the company	
15.	Orders executed during last three years, (Separate sheet can be attached).	
16.	PAN Card Copy	
17.	The Profit & Loss Account details for the last 3 years which is duly audited and submitted as part of the Annual Report.	
18.	Orders executed during last three years, >100T, references are is to be mentioned. (Separate sheet can be attached).	
19.	Shop floor area covered	
20.	No. of employees (Supplier shall mention contract personnel separately) Engineers Supervisors Technicians Quality control engineers Administrative Staff.	

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT		SECTION: E3
	SCHEDULE FOR GENERAL PARTICULARS HORIZONTAL SLIDING DOORS FOR SAF		SHEET NO.: Page 2 of 2

21.	Handling facility available: Overhead / Gantry Crane details (Capacity, span lift). Mobile Cranes.	
22.	Welding / fabrication workshop (Type / capacity / quantity of machines shall be provided) MMAW machines GMAW machines Gas cutting machines Plasma cutting machines Welding Fixtures	
23.	Welding professionals: No. of Welders (MMAW), Qualification details, No. of Welders (GMAW), Qualification details, No. of Welders (TIG), Qualification details, Welders Qualified by:	
24.	Details of welding Inspection Equipment & Welding inspector available with supplier (LPT, UT, MPT, X-ray, etc)	
25.	Forming facilities available (with brief specification of each machine) Shearing Machine Cutting Machine Cutting Machine Bending Machine	
26.	Machining Facilities available (with brief specification of each machine) Turning lathe (Conventional /CNC) Milling Machine (Conventional / CNC) Gear Cutting / Hobbing Machines Drilling Machines (conventional / CNC) Cylindrical Grinding Machine (Conventional / CNC) Any other machines.	
27.	Details of inspection facilities / Instruments available (Brief description & specifications shall be provided)	
28.	If third party Inspection Services are taken for fabricating similar works give details.	
29.	Design Software's available Drafting & modelling software packages FEM software Other software Design Engineers (with qualification & experience)	
30.	Bid validity period (Min. 120 days from the date if technical bid opening)	

SIGNATURE: _____

NAME _____

DESIGNATION: _____

SEAL OF THE COMPANY DATE: _____

SPEC NO.: HSD/SAF/202 5/01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E4
	CONFIRMATION OF ACHIEVING ACCURACY HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 1

CONFIRMATION OF ACHIEVING ACCURACY

The BIDDER shall furnish performance guarantees as listed below based on the data specified in section B:

1. Misalignment of vertical wheels, lateral guide wheels and wheel tracks and channelsshall be limited to ± 2 mm.

SEAL OF THE COMPANY

SIGNATURE:
NAME
DESIGNATION:
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SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT		SECTION: E5
	SCHEDULE OF DEVIATIONS FROM SPECIFICATIONS FOR HORIZONTAL SLIDING DOORS FOR SAF		SHEET NO.: Page 1 of 1

EXCEPTIONS AND DEVIATIONS

In line with Proposal Document, Bidder may stipulate Exceptions and deviations to the Proposed conditions if considered unavoidable.

Sino	Reference in Specification		Dept. Specification	Offered Specification	Deviation
	Page no	Clause no			

NOTE:

Only deviations are to be written in the above form.

Any deviations taken by the Bidder to the stipulations of the Proposal document shall be brought out strictly as per this format and enclosed along with the bid.

Any deviations not brought out in this Performa and written elsewhere in the Proposal document shall not be recognized and the same is treated as null and void.

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.

SIGNATURE : _____

NAME : _____

DESIGNATION: _____

SEAL OF THE COMPANY

DATE : _____

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E6
	SCHEDULE FOR MANUFACTURE, DESPATCH AND SHIPMENT TO SITE HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 1

SCHEDULE FOR MANUFACTURE, DESPATCH AND SHIPMENT TO SITE

The Bidder shall indicate hereunder the time for manufacture, despatch and completion of each equipment from the date of Letter of Intent (LOI)/ purchase order (PO) as shown below

Equipment	Time for manufacture from date of LOI / PO excluding control assembly	Time for packing and ready for despatch from Works	Time for shipment to site	Total time from date of LOI / PO to Shipment to site.

The Bidder hereby undertakes to meet the above time schedule from the date of LOI/ PO

SIGNATURE :

NAME :

DESIGNATION:

SEAL OF THE COMPANY

DATE:

SPEC NO.: HSD/SAF/2025/01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E7
	HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 1

SCHEDULE OF BIDDERS EXPERIENCE

The bidder shall furnish here under a list of works executed by him to whom a reference may be made by the PURCHASER in case the PURCHASER considers such a reference necessary.

SL. NO.	Name & address of Client / Name & address of project or plant (incl. tel.no., fax no., e-mail and name & Designation of person who can be contacted.	Purchase Order / Contact no. and Date.	Brief details of equipment / system covered	Scope of services	Contract price (Rs)	Scheduled date of completion	Actual date of completion	Reasons for delay in completion, if applicable.	REMARKS

SIGNATURE :
NAME :
DESIGNATION:
COMPANY :

SEAL OF THE COMPANY

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E8
	DATA TO BE FILLED ALONG WITH BID FOR SUPPLY & COMMISSIONING OF HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 1

DATA TO BE FILLED ALONG WITH THE BID

SR. NO.	DESCRIPTION	TENDERS OFFER
1.	Confirm that the system shall be realised as per technical specification, approved manufacturing drawings, bill of material to meet the functional requirement.	Yes / No
2.	Confirm that all the electrical items (motors, limit switches, local control panels, cables, etc.) shall be procured as per specification and to be erected tested & commissioned at site.	Yes / No
3.	Confirm that all the bought-out items are to be procured as per the specification from the approved parties	Yes / No
4.	Confirm that all the bought-out items are to be inspected at the inspected by TPIA / Departmental representative at Vendors shop before reaching to manufacturer's shop	Yes / No
5.	Confirm that fabrication of all items shall be done as per IS:800 & tolerance in fabrication shall be maintained as specified in relevant drawings.	Yes / No
6.	Confirm that all sub-assemblies shall be tested for proper functioning, free running, bearing noise etc. & shall be brought to site in grease packed condition.	Yes / No
7.	Confirm that all the drive components like motor, gear box, couplings, brake, rope drum shall be assembled in machined base frame & no-load test of drive mechanism shall be carried out at shop	Yes / No
8.	Confirm that all the items shall be painted as per painting scheme.	Yes / No
9.	Erection/ testing sequence shall be submitted along with offer.	Yes / No
10.	Manufacturing schedule & Erection/ testing schedule shall be submitted along with offer.	Yes / No
11.	Resources planning shall be submitted along with offer	Yes / No
12.	Man power planning for erection/ testing shall be submitted	Yes / No
13.	Confirm that survey of all civil inserts will be carried out and based on survey reports, all sub-assemblies like guide channels, tracksupports brackets with door structure shall be erected & aligned. Also confirm that necessary packing plates will be supplied if required during erection.	Yes / No
14.	Grouting of track supports will be carriedout	Yes / No

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E8
	DATA TO BE FILLED ALONG WITH BID FOR SUPPLY & COMMISSIONING OF HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 1

SR. NO.	DESCRIPTION	TENDERS OFFER
15.	Confirm that testing and commissioning of the total system shall be carried out as per specification	Yes / No
16	Confirm that all the through bolts required for erection of sub-assemblies will be supplied.	Yes / No
16.	Confirm that QAP for fabricated items, machined items, Subassemblies shall be submitted for approval.	Yes / No
17.	Confirm that during execution of works, if required addition /deletion of the works will be carried out and such variation is limited to $\pm 15\%$ of the total order quantity	Yes / No

SIGNATURE:

NAME:

DESIGNATION:

COMPANY:

DATE:

COMPANY SEAL

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E9
	CHECK LIST FOR BID SUBMITTING OF HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 1

CHECK LIST

Sl no	Description	Response by supplier
1.	All documents related to Prequalification criteria mention in Section E2 have been met and all related documents are enclosed in technical Bid	Yes / No
2.	Are all the technical particulars as called for in the data sheets section A, A1, B, C, D&AnnexureE1 to E 11 and commercial details as called for in schedule of prices are filled up	Yes / No
3.	The detailed scope of work and technical specifications are understood and price was quoted accordingly.	Yes / No
4.	Confirmation that the quoted prices are firm and fixed till the completion of scope of work.	Yes / No
5.	Validity of Offer is 4 months (minimum).	Yes / No
6.	Vendor Evaluation Format is attached	Yes / No
7.	Delivery Schedule with milestones	Yes / No
8.	Please clearly indicated option of payment term for supply potion as per para no.22.1 of Section A1	
	Option-1 for supply potion without advance payment	Yes / No
	Option-2 for supply potion with advance payment	Yes / No
	Acceptance of departmental payment terms & conditions for erection & commissioning and TPI as mentioned in para no. 22.2 and 22.3 of section A1	Yes / No
9.	Are General terms and Conditions of Contract for Supply & Erection included in proposal acceptable?	Yes / No
10	If not acceptable, are the deviations brought out in the "Schedule of Deviations"	Yes / No
11	Are there any deviations from enquiry technical specifications?	Yes / No
12	If there are technical deviations, are these filled in "Schedule of Deviations from Tech. Specifications"?	Yes / No
13	Warranty for the fully commissioned and accepted system is 12 months	Yes / No
14	PBG of 3% as per clause 14.1 of Section-A1	Yes / No
15	SD of 3% as per clause 14.2 of Section-A1	Yes / No
16	Combined BG for SD & PBG for 3% as per clause 14.3 of Section-A1	Yes / No
17	Liquidated Damages as specified in the specification document are acceptable	Yes / No
18	Registration certificate of the company is enclosed	Yes / No
19	All the forms in AnnexureE1 to E11 are filled	Yes / No
20	Technical documents / drawings are attached along with technical bid	Yes / No
21	The firm should not have any pending purchase orders from government organization/PSU which are delayed more than 18 months from the original delivery period.	Yes / No

SIGNATURE : _____
NAME : _____
DESIGNATION: _____

SEAL OF THE COMPANY

DATE : _____

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E10
	PRICE BREAK-UP DETAILS FOR BOUGHT-OUT ITEMS FOR HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 1 of 4

BREAK-UP IS TO BE GIVEN FOR SUPPLY COST OF THE BOUGHTOUT ITEMS

Sl. No.	Components	Specifications	Unit	Qty required	Unit Cost	Total cost
1	Wire rope for door drive arrangement	Wire rope diameter: 12 mm Tensile Grade: 1960 N/mm2 Breaking strength: 101 KN Finish: Galvanised Construction: 6x36 CWR (14-7+7-7-1) Conforming to IS: 2266 – 2002 Solid thimble shall be as per IS: 2315-1978 corresponding to a nominal rope size of 12 mm at both ends. Two ferrules shall be provided at each end of the rope. Wire rope shall be pre-stretched before forming into a sling.	lot	1		
2	Electric Motor	Type: Foot mounted Flame proof Power: 1.1 Kw RPM: 750 rpm Frame size: 100L	Nos	12		
3	Gear Box	Type: Double Reduction Worm Gear Box Series: AM Series Foot Mounted Reduction ratio: 250:1 Output Torque: 3350 Nm Size of Unit: A1252 Output rpm: 2.9 rpm Make: Elecon / Shanti/ GREAVES (Premium transmission) / Flender/ DB-Radicon / Sumitomo / Renold only. Other makes & Own make gearboxes are not acceptable.	Nos	12		
4	Coupling between Rope drum and Gear box	Type: Gear Coupling Designation: FGC3 Power @ 1000rpm 51.5 KW Torque transmits: 4920 NM	Nos	12		
5	Coupling b/w Brake and Gear box	Type: Gear Coupling Designation: FGC2 Power @ 1000rpm 28.5 KW, Torque transmits: 2720 NM	Nos	12		
6	Fluid coupling	Type: Fluid coupling with flexible coupling Size: 235, EV-85 Motor Speed: 750 rpm, Power: 1.1 Kw	Nos	12		

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	PRICE BREAK-UP DETAILS FOR BOUGHT-OUT ITEMS FOR HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 2 of 4

Sl. No.	Components	Specifications	Unit	Qty required	Unit Cost	Total cost
7	Brake	Type: Electro Hydraulic Thruster Break Size: K-HT-30/5, Brake Drum Diameter: 60 mm Capacity braking torque: 220 Nm	Nos	12		
8	Bearings for Rope drum Shaft	Make: SKF or Equivalent Type: SE510-608 Bearing: 22210 Bore: 65 mm Adapter sleeve: H307	Nos	24		
9	Bearings for Brake drum Shaft	Make: SKF or Equivalent Type: SE507-606 Bearing: 22211EK Bore: 50 mm Adapter sleeve: H311	Nos	24		
10	Bearings for horizontal & vertical Pulley Shaft	Make: SKF or Equivalent Type: Spherical Roller Bearing Bearing no: 2220BE Bore: 40mm Outer Diameter: 80mm, Width: 23 mm Static Load capacity: 90KN Dynamic Load capacity: 96KN	Nos	192		
11	Bearings for Bottom single and double wheel for HSD-1	Make: SKF or Equivalent Type: Tapered Roller Bearing Bearing no: 32014X/Q-4CC Bore: 70mm Outer Dia: 110mm, Width: 25 mm Static Load capacity: 153KN Dynamic Load capacity: 101KN	Nos	24		
12	Bearings for Vertical Guide Wheel -1 for HSD-1 to HSD -5	Make: SKF or Equivalent Type: Tapered Roller Bearing, Bearing no: 33018X/Q-2CE Bore: 90mm Outer Dia: 140mm, Width: 39 mm Static Load capacity: 355KN Dynamic Load capacity: 216KN	Nos	20		

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E10
	PRICE BREAK-UP DETAILS FOR BOUGHT-OUT ITEMS FOR HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 3 of 4

Sl. No.	Components	Specifications	Unit	Qty required	Unit Cost	Total cost
13	Bearings for Vertical Guide Wheel -2 for HSD-1 to HSD -5	Make: SKF or Equivalent Type: Tapered Roller Bearing, Bearing no: 32010X/Q-3CC Bore: 50mm, Outer Dia: 80mm, Width: 20 mm Static Load capacity: 88KN Dynamic Load capacity: 60.5KN	Nos	20		
14	Bearings for Lateral Wheel	Make: SKF or Equivalent Type: Tapered Roller Bearing, Bearing no: 32010X/Q-3CC Bore: 50mm, Outer Dia: 80mm, Width: 20 mm Static Load capacity: 88KN Dynamic Load capacity: 60.5KN	Nos	192		
15	Door Insulation	Phenotherm board covered with aluminum sheet (200 micron thick) Density: 35 ± 2 kg/m3 as per BS:32047 Thermal Conductivity: 0.020 kcal/hm°C Thickness: 40mm approx.	Lot	1		

SPEC NO.: HSD/SAF/2025 /01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E10
	PRICE BREAK-UP DETAILS FOR BOUGHT-OUT ITEMS FOR HORIZONTAL SLIDING DOORS FOR SAF	SHEET NO.: Page 4 of 4

Sl. No.	Components	Specifications	Unit	Qty required	Unit Cost	Total cost
16	Track type Limit switch	As per Specification in Annexure E-11	Nos	24		
17	Rubber	Nitrile Rubber Sheet reinforced	Lot	1		
18	Start-up spares	As per Specification in Annexure E-11	Lot	1		
19	Complete electrics.	Complete electrics required for functioning of 12 nos of HSD' leaves at SAF of SLC except electric motor s& limit switches (Note: Complete electric other than spare include following items: i. Local Control Panel ii. Electrical Cables iii. Cable trays iv. Earthing related items v. Control cables etc.	-	-		
19.1		Main Electrical Panel	Nos	2		
19.2		LCP, field push button & EMG	Set	12		
19.3		Power, control cables, cable tray and earthing for complete HSD systems	Lot	1		

Note:

1. The quantity required given is tentative only. It may vary with respect to final fabrication drawings.
2. **Any bids/offers with price details in Techno-Commercial Offer (Part –I) shall be rejected.**

SPEC NO.: HSD/SAF/2025/ 01	SSLV LAUNCH COMPLEX PROJECT	SECTION: E11
	TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS HORIZONTAL SLIDING DOORS FOR SAF	SHEET: 1 OF 9

Electrical Design and Details

Sl. No.	Technical Specifications		Compliance
1.1.	Electrical motors and brakes shall be equipped with flame proof electrical systems suitable for operating in hazardous area classified as Zone 1, Gas group IIA/IIB, T4 temperature classification as per IS/IEC:60079, IS:5571, IS:5572, IS:2148, IS:5780, IS:8239 and other relevant IS standards		
1.2.	Electrical equipment environment	All Electrical equipments shall be supplied for tropical and humid climate (Temperature of 50°C & RH not less than 95%). De-rating of drive motors, power cables etc., shall be done for ambient temperature of 50°C.	
		Flame proof electrical fittings and controls shall be selected, assembled and tested as per relevant Indian/ IEC standards.	
	The Electrical equipment shall conform to the latest Indian electricity rules and regulations as regards safety requirements, earthing and other essential provisions specified therein.		
1.3.	Voltage		
a)	Power supply to panels	3 Ph, 4 Wire, 415 V AC \pm 10%, 50 Hz \pm 3%.	
b)	Control Voltage inside the Electrical Panel:	1 Ph, 2 Wire, 230 V AC for all contactors, relay, indication lamps, etc. 1 Ph, 3 Wire, 230 V AC for all lights, power sockets, etc.	
c)	Control Voltage in the Pendant push button, limit switches, indication lamps in pendant, etc:	8.9 V, Intrinsic safe module supply. Make: M/s P&F only.	
1.4.	Electric Motor		
a)	Should accept the input from DOL starter, Intermediate Duty (inching operations), Class 'F' insulation limited to class 'B', 60% CDF, min of with 300 starts per hours, IP55, or as approved by department and suitable for hazardous area mentioned above. Refer Drawing for rating.		
b)	Terminal blocks of all motors	1. Preferably on top of the motor	
		2. Wherever it is on the side of the motor, a minimum clearance of 600 mm (without affecting hook approaches) to be maintained to approach for maintenance.	
c)	Bearing	1. Type: 'ZZ' bearing.	
		2. Suitable lubrication provision to be provided.	
d)	Current drawn by the Motors	Maximum Current drawn by all motors (rating more than 2 hP) with SWL should not exceed 80 % of the full load rated current even at slower speeds.	
e)	Over load capability	150% of full load current for 2 minutes without damage or permanent deformation from zero to base speed.	
1.5.	Brakes Control	All the brakes need to be powered with suitable rated Motor Protection Circuit Breaker (MPCB)	

SPEC NO.: HSD/SAF/2025/ 01		SSLV LAUNCH COMPLEX PROJECT		SECTION: E11
		TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS HORIZONTAL SLIDING DOORS FOR SAF		SHEET: 2 OF 9
Sl. No.	Technical Specifications			Compliance
1.6.	Limit Switches	1. Lever Limit switch: Should control the Forward Travel and Reverse Travel of the door. (Qty: 2 Nos. per HSD leaf to be planned – 1 Nos. for each side)		
		2. Individual limit status need to be wired individually and it shall not be looped in series till intrinsic safe isolator point at control panel.		
1.7.	Junction Boxes			
a)	Non-Flame Proof Junction Boxes	1. non-FLP junction boxes need to be planned for inter facing of all the equipment which are powered <u>through intrinsic safe</u> supply (i.e., pendant control, limit switches, etc)		
		2. The probable locations of the JB is on the HSD		
1.8.	Push Button Stations	Push Button Station (PBS): For individual HSD		
		1. Shall be provided with Key way switch Lockable at OFF, Mush room head Emergency OFF.		
		2. Push button for control On and Off		
		3. Control ON/OFF indication lamp powered through Intrinsic Safe circuit.		
		4. Shall be provided with push buttons for controlling forward and reverse operation. Command shall be of pulsed command.		
		5. Minimum 50 % Spare Core shall be provided in PBS with respect to the used cores.		
		6. All push buttons are to be powered through intrinsic safe module only apart from other control elements like limit switch, etc.,		
		7. It has to be located near to the HSD for ease of operation.		
		Connection to pendent:		
		1.The pendant control cables are to be routed properly in suitable cable trays along the building structure.		
		2.Junction box to be positioned nearby HSD door. From this junction, all the field elements like limit switches, push buttons, etc to be connected.		
1.9.	Cables	All the cables need to laid and end-terminated as per the site requirement.		
		Following cables are mentioned for one no. of HSD panel. The same to be followed for all the floors HSDs.		
a)	Power Cables	The following area cables need to be supplied, laid and end terminated:		
		1. All the power cables shall be of 5 core only.		
		2. Minimum size shall be of 4 sq.mm.		
		3. The cable running between panel to field equipment are of 1.1 kV Grade, XLPE insulated, copper conductor, G.I. armoured cables only.		

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		TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS HORIZONTAL SLIDING DOORS FOR SAF		SHEET: 3 OF 9	
Sl. No.	Technical Specifications			Compliance	
		4. From power supply source (Electrical Panel room) at SAF of SLC Complex to HSD Panel Incomer. Refer following drawings. 1. CIVIL/GF/PLAN/ELEC/2025/01 2. CIVIL/EL 4.4M/PLAN/ELEC/2025/01 3. CIVIL/EL 9.4M/PLAN/ELEC/2025/01 4. CIVIL/EL 17.5M/PLAN/ELEC/2025/01 5. CIVIL/EL 21M/PLAN/ELEC/2025/01 6. CIVIL/EL 24.25M/PLAN/ELEC/2025/01 7. CIVIL/EL 27.5M/PLAN/ELEC/2025/01 8. CIVIL/EL 35.75M/PLAN/ELEC/2025/01 9. CIVIL/EL 38.5M/PLAN/ELEC/2025/01 10. SCHEMATIC OF ELECTRICAL CIRCUIT			
		5. From HSD panel to all the other local control panels, field equipments like motor, brakes, etc.			
		6. Power cables towards the motors and brake are to be selected as follows:			
		a. Selected / approved motor electrical kW and rated current to be selected for the voltage drop calculation.			
		b. Maximum 3% of Voltage drop only will be accepted in the selected cables with respect to the incoming voltage levels.			
		c. All the cable selection chart along with Voltage drop calculation to be submitted for review and clearance.			
b)	Control Cables	The following area cables need to be supplied:			
		1. All the control cables shall be minimum of 12 core which are running between local control panel to junction box.			
		2. The cable running between Main & LCP panel to field equipment are of 1.1 kV Grade, XLPE insulated, copper conductor, G.I. armoured cables only.			
		3. All the control cables shall be minimum of 4 core from HSD Main panel to all the EMG. OFF push button, field equipment like limit switches, local control panel, etc.			
		4. Separate control core to be considered for extending control supply to the local control panel from Main panel. Main supply towards local control panel not to be used for the control supply.			
		5. Out of used cores, 30% of core shall be kept as spare with respect to each size of the cables from Local control panel to field junction boxes.			
c)	Cable Identification	1. Cable tags indicating the source and destination to be provided for all the cables.			
		2. The ferrules shall be of ring type and of non-deteriorating material.			
d)	Inside the panel	The following cable management to be planned:			

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		TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS HORIZONTAL SLIDING DOORS FOR SAF		SHEET: 4 OF 9	
Sl. No.	Technical Specifications			Compliance	
		1. Power circuit – Minimum size: 4 Sq.mm			
		2. Control circuit – Minimum size: 1.5 Sq.mm			
		3. Signal wire (for Control Unit and Encoder module) - Maximum size: 0.5 Sq.mm			
		4. Colour coding should be followed as:			
		a. 240 V AC Phase – Grey with RED sleeve.			
		b. 240 V AC Neutral– Grey with BLACK sleeve.			
		c. 415 V AC – Black with RED, YELLOW, BLUE and / BLACK.			
		d. 8.9 V DC – Orange.			
		e. Earth cable – Green & Yellow.			
		5. All the limit switch terminals (Forward and Reverse) need to be wired up to the terminal block of the field Junction box.			
e)	Earthing	6. Interconnecting / looping of above terminals need to be carried out in the Local control panel intrinsic safe module terminals only.			
		7. Interconnecting of above terminals in the equipment's and bringing the common terminals to the Local control panel is not acceptable.			
		The following area cables/strips need to be supplied:			
		1. Earth strip (min. 25 x 6 mm) need to be supplied from Main HSD panel to individual floor level.			
		2. Rail at both the sides of the HSD needs to be earthed.			
		3. All the equipment including the mechanical structure needs to be grounded effectively with double earthing.			
2.1.	MCCB	4. Suitable bridge clamp need to be positioned near to the HSD for tapping of earth points.			
		5. Main Panel shall be provided with earthing provision at both the ends. Same shall be connected with plant earth by the supplier.			
2.2.	MCB	1. Panel - MCCB with adjustable overload, adjustable short circuit protection, adjustable ground fault and Instantaneous protection to be provided.			
		2. Panel - MCCB handle (door operated) shall have an illumination kit for indicating ON / OFF / TRIP			
2.2.	MCB	1. Individual components control shall be planned by a dedicated MCB control.			
2.3.	Cable Tray	1. Perforated G.I. cable trays need to be planned for routing the cables from the Main HSD panel to individual HSD door floor.			
		2. Necessary supports (like beam / angles, etc) for running the cable tray inside the trench (bottom of			

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		TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS HORIZONTAL SLIDING DOORS FOR SAF		SHEET: 5 OF 9
Sl. No.	Technical Specifications			Compliance
		the panel), on the wall, structure, on the crane, etc need to be supplied.		
		3. Entire length of the cable trays need to be covered with G.I. sheet cover with bolts and nuts and all bolts and nuts shall be of G.I coated.		
		4. No cables are routed without cable trays and cover anywhere from panel room to top of the crane.		
		5. The cable trays are also to be earthed with respect to the common ground.		
		6. Aluminium strip shall not be used for earthing the cable tray. Only G.I strip alone shall be used.		
2.4.	Panel			
a)	Local Control Panel (LCP)			
1.	Individual floor where HSDs are positioned, this control panel to be considered. Positioning of this LCP is indicated in the drawing. Refer following drawings. 1. CIVIL/GF/PLAN/ELEC/2025/01 2. CIVIL/EL 4.4M/PLAN/ELEC/2025/01 3. CIVIL/EL 9.4M/PLAN/ELEC/2025/01 4. CIVIL/EL 17.5M/PLAN/ELEC/2025/01 5. CIVIL/EL 21M/PLAN/ELEC/2025/01 6. CIVIL/EL 24.25M/PLAN/ELEC/2025/01 7. CIVIL/EL 27.5M/PLAN/ELEC/2025/01 8. CIVIL/EL 35.75M/PLAN/ELEC/2025/01 9. CIVIL/EL 38.5M/PLAN/ELEC/2025/01 10. SCHEMATIC OF ELECTRICAL CIRCUIT			
2.	Fuse less DOL starter to be considered in individual LCP for Motor and Brake independently.			
a.	Motor Protection Circuit Breaker (MPCB)	1. Rating shall be selected as per the type-2 co-ordination chart with respect to fuse-less feeder (motor and brake independently)		
		2. It shall have a overload and short circuit protection along with signalling switch contact.		
		3. It shall have lateral auxiliary switches with 4 contacts (Status and feedback).		
		4. 230 V shunt release with changeover contact to be provided.		
		5. Shall be supplied with front operated rotary mechanism along with door-coupling rotary operating mechanism.		
b.	Indication Lamps	1. It shall be of cluster LED provided with translucent lamp covers		
		2. Cluster LED module shall be suitable for direct operation on 230 V, 50 Hz AC.		
		3. LCP shall have the ON, OFF, EMG-OFF, Trip for over load and Trip for Short circuit.		

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		TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS HORIZONTAL SLIDING DOORS FOR SAF		SHEET: 6 OF 9	
Sl. No.	Technical Specifications			Compliance	
		4. LCP shall have the 3-phase indication lamps in the door with 4-pole MCB which shall indicate the power supply.			
c.	Emergency Pushbutton	Shall be provided with key way switch Lockable at OFF, Mush room head Emergency OFF.			
3.	Contactor				
a)	Auxiliary Contactor	1. Shall be used as intermediate contactors to the power contactors.			
		2. Suitable surge suppressor need to be supplied along with auxiliary contactor.			
		3. It shall be utilized for contact multiplication instead of add-on NO, NC contacts for power and auxiliary contactor.			
b)	Power Contactors	1. Duty: AC-4			
		2. The contactors shall be able to withstand their rated current for one second without welding / fusing of the contacts			
		3. Individual Power Contactors are to be provided for each motion (motor and brake) for controlling.			
		4. All the power contactors need to be powered viz. auxiliary contactors with suitable rating along with surge suppressor.			
		5. Any multiplication of NO, NC points – auxiliary contactor need to utilize.			
		6. NO add-on blocks will be allowed for power contactors.			
		7. Separate Power contactor to be kept for Emergency off. This shall be considered for all the HSD door feeders in the Main HSD Panel.			
		7. Power to the individual LCP to be enabled through the above power contactor (which is kept feeder wise inside the Main HSD panel).			
4.	Intrinsic Safe Relay	Input Relay:			
		1. All the field signals like push button, limit switches to be wired to this relay.			
		2. This relay shall be located in safe area (inside the local control panel) only. Make: M/s P&F			
		Output Relay:			
		1. These relays shall be used for powering indication lamps in the hazardous location.			
		2. This relay shall be located in safe area (inside the local control panel) only.			
b)	Main Electrical Panel				
a.	Individual panels shall be designed for effective utilization of inbuilt ventilation system. Preferred make of panel is M/s Rittal or President				

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		TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS HORIZONTAL SLIDING DOORS FOR SAF		SHEET: 7 OF 9	
Sl. No.	Technical Specifications			Compliance	
	Main HSD Panel (2 Nos.) – one per side of the facility, Control & Transformer– All the panels shall be maintained at same height and the proposal shall be submitted for Department Clearance before ordering the panel.				
b.	Emergency switch	1. Shall be provided with key way switch Lockable at OFF, Mushroom head Emergency OFF			
		3. Individual HSD feeder shall be provided with the same.			
		4. This switch shall control the power contactor of the feeder.			
		5. It shall be wired in series with the field Emergency pushbuttons (planned in LCP and Field push button)			
		6. When all these three (3) Emergency pushbuttons are in healthy condition, three (3) phase power supply to individual LCP to be ensured.			
c.	Painting	1. Paint shade – RAL 7032 / 7035.			
		2. Base frame – Matt black.			
		3. Mounting plate – Orange.			
d.	Indication Lamps	1. It shall be of cluster LED provided with translucent lamp covers			
		2. Cluster LED module shall be suitable for direct operation on 230 V, 50 Hz AC.			
		3. Panel shall have the 3-phase indication lamps in the metering cubicle controlled by 4-pole MCB.			
e.	Design & Construction	1. Enclosure – Indoor, Floor mounting, Front operated free standing			
		2. Frame, mounting plates, Doors & Covers – 2.0 mm Thickness CRCA			
		3. Lifting arrangements - Suitable Lifting Arrangement shall be provided for each panel on the Top on all four sides			
		4. Base frame – ISMC 100 x 50 with Matt black			
		5. Degree of protection – IP 54.			
		6. Shrouding – As per standard (to be provided inside the panel, in front of power components and power terminals).			
		7. Cable entry (Suitable for site condition)			
		8. The panels to be provided with inbuilt ventilation system.			
		9. The panels need to be provided with panel lamps (LED) along with door limit switches.			
f.	Name Plate (Panel and components)	1. Material – Transparent acrylic.			
		2. Colour of letter – white letter in black background.			

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Sl. No.	Technical Specifications			Compliance
g.	Earth busbar	1. Size – Minimum 30 X 10mm Copper with nuts, bolts & washers at each end are to be provided per panel		
		2. Necessary earth strip need to be supplied for the following		
		a. To link panel to individual HSD rail at the respective floor.		
		b. To link rail and all the electrical elements on the HSD.		
		c. To link the panel to the earth strip.		
h.	Multifunction meter	1. Panel shall be provided with Multifunction meter		
i.	Terminal blocks	1. Terminal blocks shall be of 750 Volts grade of the stud type and shrouded.		
		2. Insulating barriers shall be provided between adjacent terminals.		
		3. All the terminal blocks are grouped with respect to the following:		
		a. 230 V Power distribution (separately for phase and neutral).		
		b. 415 V Power distribution if any		
		c. Motor and brake power distribution		
		4. Short linked Terminal blocks are to be used for terminal multiplication. More than one wires need to be avoided in one terminal block.		
		5. Power & Control circuit (used for field cables) – Ring type end termination of suitable size		
		6. All the terminals needs to be provided with group markers		
		7. 25% Spare Terminals Shall be provided for both Power and Control in each Panel		
	8. Make: Connectwell / Wago / Elmex			
j.	Rubber mats	1. Rubber mats to be supplied and provided in-front of all the panels (both main and local panels) as per the designed length of panels.		
		2. Class 'A', 3.3 kV ac (rms), 2.0mm ± 10% thickness as per IS 15652/2006		
		3. Width: 1 metres. (maximum)		
4.1.	To be considered during Detailed Engineering:			
a)	Panel	1. Height of the main panel shall be not less than 2000 mm excluding the base frame of 100 mm. Overall height of the panel not less than 2100 mm.		
		2. Width of all the panels is to be maintained uniformly. Door opening and rear access will be decided based on the requirement during detailed engineering.		
		3. Enamel Danger plates shall be provided on the Panel inscribed in Hindi, Tamil and English languages as directed by department.		

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Sl. No.	Technical Specifications		Compliance
		4. Drawing pocket needs to be considered.	
b)	Interlock Scheme	1. Auxiliary Contactor level:	
		a. Hard wired interlocks for the push button command are to be provided at auxiliary contactor.	
		b. When Aux. contactor operates with respect to the motion selected, remaining Aux. contactors with respect to other motions should not be operated. Aux. contactor shall be operated only when main power contactor is in ON condition.	

SI No.	MAKE OF THE BOUGHT-OUT ITEMS		
1	Push Buttons	M/s Werner with configurable tiles	
2	All Electrical Switch gear / SMPS	M/s Siemens / ABB / Schneider	
3	Flame Proof Motors	Bharat Bijilee / Crompton Greaves	
4	Limit switches	M/s. Sterling controls / Speed-O-Control / Electromag.	
5	LT power & control cables	M/s. Lapp / Universal / Nicco / Finolex / RPG / Uniflex, M/s Polycab/Finolex/Incab/ Svarn/ Apar	
6	Panels	M/s. Rittal / M/s President	
7	Terminal Blocks	M/s. Elmex / Connectwell / Wago	
8	Junction Boxes (Non-FLP)	M/s. Rittal	
9	Intrinsic Safe Relays	M/s P&F	

SIGNATURE

NAME :

DESIGNATION:

SEAL OF THE COMPANY

DATE