

भारतसरकाररक्षामंत्रालय
रक्ष्या अनुसंधान एवं विकास संघटन
वैमानिकीय विकास संस्थापनबैंगलोर
न्यू तिप्पसन्द्रा बैंगलूर, - 560 075

Tel no: 080-2505 7335/7841/7840

Fax no: 080-2505 7843

e-mail : mmdtec@ade.drdo.in, headmmd@ade.drdo.in



Government of India, Ministry of Defence
Defence Research & Development Organisation
Aeronautical Development Establishment
New Thippasandra, Bangalore -560075
Tel no: 080-2505 7335/7841/7840
Fax no: 080-2505 7843
e-mail : mmdtec@ade.drdo.in, headmmd@ade.drdo.in

Date:24/08/2021

Online Invitation of Bids

Invitation of Online Bids for **Design of Aeromechanical Systems for UAV.**

Tender / Request for Proposal (RFP) Reference No. **210051/ADE/MM/A/TB/22ATT098.**

- Online Bids** are invited for supply of items listed in Part V of this RFP as per **Two Bid System**. The online bid (both techno-commercial and price bid) should be uploaded by the bidder before the due date and time.
- The documents may be downloaded from Defence e-Procurement site <https://defproc.gov.in>**
- The address and contact number for seeking clarification regarding this RFP are given below:

i)	All queries to be addressed to	: The Director ADE, Bangalore
ii)	Postal address :	: New Thippasandra, Bangalore – 560075.
iii)	Name & designation of the contact Officer	: Rajendran S, Technical Officer 'B'(Commercial) Saugata Tribedi, Scientist 'F' (Technical)
iv)	Telephone number(s) of the contact Officer	: 080-2505 7335/7835 (Commercial) 080-2505 7232 (Technical)
v)	Fax number(s) :	: 080-2505 7843
vi)	e-mail ID of contact Officer	: mmdtec@ade.drdo.in
- This RFP is divided into **VII** parts as follows:
 - Part I (A)** contains **General Information and Instructions for the Bidders** about the RFP such as the time, online submission and opening of Bids, Validity period of Bids, etc.
Part I (B) contains Tender Acceptance Letter to be filled by Bidder and uploaded in cover 1.
 - Part II (A)** contains **Standard Terms and Conditions of RFP**, which will form part of the Contract/Supply Order (herein after referred as the Contract) with the successful bidder(s).
Part II (B) contains instructions for online submission of Bids.
 - Part III** contains **Special Terms and Conditions** applicable to this RFP and which will also form part of the Contract with the successful Bidder(s).
 - Part IV** contains **Vendor Qualification Criteria**.
 - Part V** contains **Details of the Store(s)/Service(s) Required** e.g. Technical Specifications, Delivery Period, Mode of Delivery, Consignee details etc.
 - Part VI** contains Evaluation criteria of bids
 - Part VII** contains **Format of Price Bid**. Price bid needs to be filled and uploaded as per Supplied Format only.
- This RFP is being issued with no financial commitment and the Buyer reserves the right to change or vary any part thereof or foreclose the instant procurement at any stage. The Buyer also reserves the right to disqualify any vendor, should it be necessary, at any stage on grounds of National Security.
- Vendors are advised to submit online offers in advance, last day submission may lead to technical issues due to net traffic or issues on website.
- You may contact The Director, ADE, New Thippasandra, Bangalore for any grievance related to bidding condition, bidding process and/or rejection of bid. With regard to bidding condition, this shall be done in writing at least seven days in advance of the stipulated date of submission of bid.**

Yours sincerely,

(Rajendran S, TO B)
For & on behalf of President of India

Part I (A) – General Information and Instructions

- 1.1 Pre-bid Conference:** Not Applicable.
- 1.2 Last Date and Time for Uploading the Bids:** On **08/09/2021** (dd/mm/yy) at 10:30Hrs. The online Bids (both Techno-Commercial and Price bid, in case of two bids system) should be uploaded by the due date and time. The responsibility to ensure this lies with the Bidder.
- 1.3 Location of the Tender Box:** Online submission only (for receipt of documents such as EMD (Bid Security), Tender Fee, Earnest Money for Integrity Pact and signed Integrity Pact document (if applicable) /Technical Brochure, catalogues if any, other than techno-commercial and financial bids being submitted in electronic mode).
- 1.4 Manner of Uploading the Online Bids:** Bids (both Techno-Commercial and Price bid, in case in case of two bids system) is required to be submitted online on DPP-portal <https://defproc.gov.in>). Bids sent by Post/ FAX or e-mail will not be considered.
- 1.5 Time and Date for Opening of Bids:** Bids will be opened online on **09/09/2021** (dd/mm/yy) at 10:30Hrs. If due to any exigency, the due date for opening of the bids is declared a closed holiday, the bids will be opened on the next working day at the same time or on any other day/time, as intimated by the Buyer.
- 1.6 Place of Opening of the Bids:** e-tender cell, Security Office, Raman gate, ADE, Bangalore. Bids will be opened online only.
- 1.7 Marking of Bids:** Envelope containing documents such as EMD, Tender Fee, Earnest Money for Integrity Pact and signed Integrity Pact document (if applicable) / Technical Brochure, if any, must be clearly marked with Tender Reference No. and Date of opening.
- 1.8 Procedure for Submission of Bid:** Bids would be submitted as per standard online e-procurement procedure for **Two Bid System**. The original tender fee, EMD instrument (if applicable), Earnest Money for Integrity Pact and signed Integrity Pact document (if applicable) / Technical Brochure, if any should be sent in an envelope duly marked with tender reference no. and addressed to Director, on or before **“Bid submission end date and time”**. In case **Original tender fee and EMD instrument** (if applicable) are not received on or before **“techno-commercial bid opening date and time”**, bid of such bidders will summarily be rejected.
- 1.9 Forwarding Of Bids:** Bids should be submitted by Bidders online only , under the firm’s memo / letter pad inter alia furnishing details like GSTIN number, Bank address with NEFT Account if applicable, etc. and complete postal and email address of firm’s office failing which the bid would not be considered.
- 1.10 Clarification Regarding Contents of the RFP:** A prospective bidder who requires clarification regarding the contents of the bidding documents shall notify to the Buyer in writing about the clarifications at least 07 (Seven) days prior to the date of opening of the Bids. Copies of the query and clarifications by the purchaser will be sent to all prospective bidders who received the bidding document from the lab and would be posted on the website.
- 1.11 Submission of offer:** Firms need to quote only in Indian Rupees.
- 1.12 Validity of Bids:** The Bids should remain valid for **180 days (Two Bid System)** from the date of Opening of the Bids.
- 1.13 Modification and Withdrawal of Bids:** If a bidder intends to modify or withdraw his Bid after online submission, it can be done through selection of appropriate option available on the DPP Portal.
- 1.14 Bid Security / Earnest Money Deposit:**
- Exemption from submission of EMD:**
The following organizations/ firms are exempted from submission of EMD:
- i) Bidders registered with DRDO, Min of Defence and NSIC
 - ii) DPSUs, Other Govt. Organizations.
 - iii) KVIC, Kendriya Bhandar/ NCCF
 - iv) Micro and Small Enterprises (MSEs) as per their registration:
 - v) Startups as recognized by Dept. of Industrial Policy and Promotion (DIPP).

Such bidders would be required to furnish the relevant documents in their Techno-Commercial bid in support of the claim.

For other bidders or the bidders not willing to submit documents required for exemption: Bidders may submit a Bid securing declaration accepting that if they withdraw or modify their Bids during the period of validity, or if they are awarded the contract and they fail to sign the contract, or to submit a performance security before the deadline defined in the request for bids document, they may be suspended for the period up to 2 years from being eligible to submit bids for contracts with any of the procuring entities of DRDO.

Note: The bidder should submit EMD declaration in the company letter head duly signed and stamped by the authorized person along with technical bid

- 1.15 Clarification Regarding Contents of the Bids:** During evaluation of the bids, the Buyer may, at his discretion, ask the bidders for clarification(s) on the Bid(s). The request for clarification will be given in writing. No clarification on the initiative of the bidder will be entertained after opening of bid.
- 1.16 Rejection of Bids:** Canvassing by the Bidder in any form, unsolicited letter and post tender correction may invoke summary rejection and punitive action. Conditional bids will be rejected. Non-compliance of applicable General Information will disqualify the Bid.
- 1.17 Unsolicited Bids:** Unsolicited offers received as a result of e-publishing in limited bidding/single bidding/proprietary bidding mode would not be considered for the instant procurement but the response would be given to the Vendor Registration Committee for consideration for future procurements.
- 1.18 Unwillingness to Quote:** Bidders unwilling to quote should ensure that intimation to this effect reaches before the due date and time of opening of the Bid, failing which the defaulting Bidder may be de-registered for the range of items in this RFP, as per the policy in vogue.
- 1.19** Bids of debarred/blacklisted firms will not be considered for evaluation.
- 1.20 Document to be submitted with Techno-commercial Bid :**
The following documents are to be furnished by the Bidder in **Cover-1** along with Techno Commercial Bid as per the tender document:
- 1.20.1** Signed and Scanned copy of appropriate valid company registration certificate or partnership deed (if applicable), experience certificate as required, PAN No and Tender Acceptance Letter as per Part I (B).
- 1.20.2** Signed and scanned copy of previous three years Income-tax/GSTIN /Affidavit of partnership firm. If not applicable kindly upload a pdf document indicating Not Applicable.
- 1.20.3** Scanned copy of instrument used to provide Tender Fee or Proof of Registration with DRDO/MOD/ NSIC etc.
- 1.20.4** Signed and Scanned Copy of the Make and model of all the systems, sub systems and additional items as mentioned in the Techno Commercial Bid.
- 1.20.5** Signed and Scanned Copy of legal Agency Agreement/100% Subsidiary Certificate/Registration as an Agent (if applicable). If not applicable kindly upload a pdf document indicating Not Applicable.
- 1.20.6** Scanned Copy of Proforma of End User Certificate for Export License (if applicable). If not applicable kindly upload a pdf document indicating Not Applicable.
- 1.20.7** ***Provide the list of item/systems/components and their country of origin with your technical bid for evaluation.***
- 1.21 Price Bid to be uploaded in Cover-2.** Schedule of price bid in the form of BOQ_XXX.xls.

(Technical Officer 'B')

Part I (B) – Tender Acceptance Letter (e-Procurement)

(To be filled by Bidder and uploaded with technical bid in two bid system)
(To be given on Company Letter Head)

Date: __/__/2021

To,

The Director
Aeronautical Development Establishment,
Bangalore -560075

Sub: Acceptance of Terms & Conditions of Tender

Tender Reference No & ID :

Tender ID :

Name of Tender/Work: _____

Dear Sir,

1. I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely: _____ as per Your advertisement, given in the above mentioned website(s).
2. I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like annexure(s), schedule(s), etc.), (duly filled Compliance table attached) which will form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.
3. The corrigendum(s) issued from time to time by your department/ organizations related to this tender too have also been taken into consideration, while submitting this acceptance letter.
4. I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.
5. I / We do hereby declare that our firm/company has not been blacklisted / debarred by any Govt. Department/Public Sector undertaking.
6. I / We certify that all information furnished by the our firm/company is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/organization shall without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including punitive action.

Yours Faithfully,
(Signature of the Bidder, with Official Seal)

Sl. No.	Part of RFP	Compliance para/sub para of RFP (Yes/No)	Reason for compliance/Non-Compliance (If any)	Remarks

Part II (A) – Standard Terms and Conditions

The Bidder is required to give confirmation of their acceptance of the Standard Terms and Conditions of the RFP mentioned below which will automatically be considered as part of the Contract concluded with the successful Bidder as selected by the Buyer. Failure to do so may result in rejection of the Bid.

- 2.1 Effective Date of the Contract: (Acceptance of Contract)** In case of placement of a supply order, the date of acceptance of the Supply Order would be the effective date. The firm should check the supply order and convey acceptance of the same within seven days of its receipt. If such an acceptance or communication conveying firm's objection to certain parts of the supply order is not received within the stipulated period, the supply order will be deemed to have been fully accepted by the firm. In case a contract is to be signed by both the parties, the Contract shall come into effect on the date of signatures of both the parties on the Contract (Effective Date) or as agreed during negotiations. The performance of the Contract shall commence from the Effective Date of the Contract/Supply Order.

Note: If any discrepancy is there, it should be brought to the notice within 07 days from the date of Contract/Supply Order else it will be presumed as Contract/Supply Order is accepted.

- 2.2 Law:** The Contract shall be considered and made in accordance with the laws of the Republic of India and shall be governed by and interpreted in accordance with the laws of the Republic of India.

- 2.3 Arbitration:** All disputes or differences arising out of or in connection with the Contract shall be settled by bilateral discussions. Any dispute, disagreement or question arising out of or relating to the Contract or relating to product or performance, which cannot be settled amicably, shall be resolved by arbitration in accordance with any one of the following provisions:

Option : 01 For Defence PSUs: The case of arbitration shall be referred to the Secretary Defence (R&D) for the appointment of arbitrator(s) and proceedings.

Option : 02 For Central Public Sector Enterprises (CPSEs): In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs) and DRDO, such disputes of difference shall be taken up by either party for resolution through Administrative Mechanism for Resolution of CPSEs Disputes (AMRC) as per provisions of Department of Public Enterprises OM No. 4(1)/2013-DPE (GM)/FTS-1835 dated 22-05-2018.

Option : 03 For Other Firms: The case of arbitration may be conducted in accordance with the rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said rules in India. However, the arbitration proceedings shall be conducted in India under Indian Arbitration and Conciliation Act, 1996 as amended

Or

The case of arbitration may be referred to International Centre for Alternative Dispute Resolution (ICADR) for the appointment of arbitrator and proceedings shall be conducted in accordance with procedure of Indian Arbitration and Conciliation Act, 1996, as amended

Or

The case of arbitration may be conducted in accordance with the rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said rules in India. However, the arbitration proceedings shall be conducted in India under Indian Arbitration and Conciliation Act, 1996 as amended.

- 2.4 Penalty for Use of Undue influence:** The Seller undertakes that he has not given, offered or promised to give, directly or indirectly, any gift, consideration, reward, commission, fees, brokerage or inducement to any person in service of the Buyer or otherwise in procuring the Contract 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 of India for showing or forbearing to show favour or disfavour to any person in relation to the Contract or any other contract with the Government of India. Any breach of the aforesaid undertaking by the Seller or anyone employed by him or acting on his behalf (whether with or without the knowledge of the Seller) or the commission of any offers by the Seller or anyone 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, 1986 or any other Act enacted for the prevention of corruption shall entitle the Buyer to cancel the contract and all or any other contracts with the Seller and recover from the Seller the amount of any loss arising from such cancellation.

A decision of the Buyer or his nominee to the effect that a breach of the undertaking had been committed shall be final and binding on the Seller. Giving or offering of any gift, bribe or inducement or any attempt at any such act on behalf of the Seller towards any officer/ employee of the Buyer or to any other person in a position to influence any officer/employee of the Buyer for showing any favour in relation to this or any other contract, shall render the Seller to such liability/ penalty as the Buyer may deem proper, including but not limited to termination of the contract, imposition of penal damages, forfeiture of the Bank Guarantee and refund of the amounts paid by the buyer.

2.5 Agents / Agency Commission: If Applicable.

The Seller confirms and declares to the Buyer that the Seller has not engaged any individual or firm, whether Indian or foreign whatsoever, to intercede, facilitate or in any way to recommend to the Government of India or any of its functionaries, whether officially or unofficially, to the award of the contract to the Seller; nor has any amount been paid, promised or intended to be paid to any such individual or firm in respect of any such intercession, facilitation or recommendation. The Seller agrees that if it is established at any time to the satisfaction of the Buyer that the present declaration is in any way incorrect or if at a later stage it is discovered by the Buyer that the Seller has engaged any such individual/firm, and paid or intended to pay any amount, gift, reward, fees, commission or consideration to such person, party, firm or institution, whether before or after the signing of this contract, the Seller will be liable to refund that amount to the Buyer. The Seller will also be debarred from entering into any contract with the Government of India for a minimum period of five years. The Buyer will also have a right to consider cancellation of the Contract either wholly or in part, without any entitlement or compensation to the Seller who shall in such an event be liable to refund all payments made by the Buyer in terms of the Contract along with interest at the rate of 2% per annum above (i) Prime Lending Rate of State Bank of India for Indian bidders, and (ii) London Inter Bank Offered Rate (LIBOR) for the foreign bidders. The applicable rates on the date of opening of tender shall be considered for this. The Buyer will also have the right to recover any such amount from any contracts in vogue with the Government of India.

Or

The Seller confirms and declares in the Techno-Commercial bid that they have engaged an agent, individual or firm, for performing certain services on their behalf. The Seller is required to disclose full details of any such person, party, firm or institution engaged by them for marketing of their equipment in India, either on a country specific basis or as a part of a global or regional arrangement. These details should include the scope of work and responsibilities that have been entrusted with the said party in India. If there is noninvolvement of any such party then the same also be communicated in the offers specifically. The information is to be submitted as per the format at **DRDO.SA.01**. Without prejudice to the obligations of the vendor as contained in various parts of this document, appointment of an Agent by vendors will be subjected to the following conditions: The Seller confirms and declares in the Techno-Commercial bid that they have engaged an Agent, individual or firm, for promotion of their product.

In such case, following details are to be submitted in the

- i) Details of all Agents will be disclosed at the time of submission of offers and within two weeks of engagement of an Agent at any subsequent stage of procurement.
- ii) The Seller is required to disclose termination of the agreement with the Agent, within two weeks of the agreement having been terminated.
- iii) Buyer /MoD reserves the right to inform the Seller at any stage that the Agent so engaged is not acceptable whereupon it would be incumbent on the Seller either to interact with Buyer / MoD directly or engage another Agent. The decision of Buyer /MoD on rejection of the Agent shall be final and be effective immediately.
- iv) All payments made to the Agent 12 months prior to tender submission would be disclosed at the time of tender submission and thereafter an annual report of payments would be submitted during the procurement process or upon demand of the Buyer / MoD.
- v) The Agent will not be engaged to manipulate or in any way to recommend to any functionaries of the Govt. of India, whether officially or unofficially, the award of the contract to the Seller or to indulge in corrupt and unethical practices.
- vi) The contract with the Agent will not be a conditional contract wherein payment made or penalty levied is based, directly or indirectly, on success or failure of the award of the contract.
- vii) On demand, the Seller shall provide necessary information/inspection of the relevant financial documents/information, including a copy of the contract(s) and details of payment terms between the Seller and the Agent engaged by him.
- viii) If the equipment being offered by the Seller has been supplied /contracted with any organisation, public/private in India, the details of the same may be furnished in the technical as well as commercial offers. The Sellers are required to give a written undertaking that they have not supplied/is not supplying the similar systems or subsystems at a price lower than that offered in the present bid to any other Ministry/Department of the Government of India and if the similar system has

been supplied at a lower price, then the details regarding the cost, time of supply and quantities be included as part of the commercial offer. In case of non disclosure, if it is found at any stage that the similar system or subsystem was supplied by the Seller to any other Ministry/Department of the Government of India at a lower price, then that very price, will be applicable to the present case and with due allowance for elapsed time, the difference in the cost would be refunded to the Buyer, if the contract has already been concluded.

Following details are also to be submitted in the Techno-Commercial bid:

- (a) Name of the Agent
- (b) Agency Agreement between the Seller and the agent giving details of their contractual obligation
- (c) PAN Number, name and address of bankers in India and abroad in respect of Indian agent
- (d) The nature and scope of services to be rendered by the agent and
- (e) Percentage of agency commission payable to the agent

- 2.6 Access to Books of Accounts:** In case it is found to the satisfaction of the Buyer that the Bidder/Seller has violated the provisions of Para 4 and/or Para 5 above to obtain the Contract, the Bidder/Seller, on a specific request of the Buyer, shall provide necessary information/ inspection of the relevant financial documents/information/Books of Accounts.
- 2.7 Non-disclosure of Contract Documents:** Except with the written consent of the Buyer/ Seller, other party shall not disclose the Contract or any provision, specification, plan, design, pattern, sample or information thereof to any third party.
- 2.8 Handling of Classified Information by Indian Licensed Defence Industry:** Any classified document/information/ equipment being shared with Indian Licensed Defence Industries will be protected/ handled to prevent unauthorized access as per provisions of Chapter 5 of Security Manual for Indian Licensed Defence Industries issued by MoD (Department of Defence Production).
- 2.9 Withholding of Payment:** In the event of the Seller's failure to submit the Bonds, Guarantees and Documents, supply the stores/goods and conduct trials, installation of equipment, training, etc. as specified in the Contract, the Buyer may, at his discretion, withhold any payment until the completion of the Contract.
- 2.10 Liquidated Damages:** The Buyer may deduct from the Seller, as agreed, liquidated damages at the rate of 0.5% per week or part thereof, of the basic cost of the delayed stores which the Seller has failed to deliver within the period agreed for delivery in the contract. LD can also be levied on the Seller on the basic cost of the stores supplied partially within the scope of the order/ contract that could not be put to use due to late delivery of the remaining stores. The maximum quantum of LD would be 10% of the total order value."
- 2.11 Termination of Contract:** The Buyer shall have the right to terminate the Contract in part or in full in any of the following cases :
- 2.11.1** The store/service is not received/rendered as per the contracted schedule(s) and the same has not been extended by the Buyer Or
 - 2.11.2** The delivery of the store/service is delayed for causes not attributable to Force Majeure for more than <03 > months after the scheduled date of delivery and the delivery period has not been extended by the Buyer.
 - 2.11.3** The delivery of store/service is delayed due to causes of Force Majeure by more than 06 months provided Force Majeure clause is included in the contract and the delivery period has not been extended by the Buyer.
 - 2.11.4** The Seller is declared bankrupt or becomes insolvent.
 - 2.11.5** The Buyer has noticed that the Seller has violated the provisions of Para 2.4 (Use of Undue Influence) and/or Para 2.5 (Employment of Agent) above to obtain the Contract.
 - 2.11.6** As per decision of the Arbitration Tribunal.
- 2.12 Notices:** Any notice required or permitted by the Contract shall be written in English language and may be delivered personally or may be sent by FAX/email or registered pre-paid mail/ airmail, addressed to the last known address of the party to whom it is sent.
- 2.13 Transfer and Sub-letting:** The Seller has no right to give, bargain, sell, assign or sublet or otherwise dispose of the Contract or any part thereof, as well as to give or to let a third party take benefit or advantage of the Contract or any part thereof without written consent of the Buyer.
- 2.14 Use of Patents and other Industrial Property Rights:** The prices stated in the Contract shall be deemed to include all amounts payable for the use of patents, copyrights, registered charges, trademarks and payments for any other Industrial Property Rights. The Seller shall indemnify the Buyer against all claims

from a third party at any time on account of the infringement of any or all the rights mentioned in the previous paragraphs, whether such claims arise in respect of manufacture or use.

The Seller shall be responsible for the completion of the supplies including spares, tools, technical literature and training aggregates irrespective of the fact of infringement of the supplies or any or all the rights mentioned above.

2.15 Amendments: No provision of the Contract shall be changed or modified in any way (including this provision) either in whole or in part except when both the parties are in written agreement for amending the Contract.

2.16 Taxes and Duties :

i) General

- (a) If the quoted prices exclude GST / Local Tax or any other Statutory Duties/Taxes, the same must be specifically stated with applicable rates. In the absence of same, it will be presumed that the prices include all such charges and no claim for the same will be entertained.
- (b) If reimbursement of any Duty/Tax is intended as extra over the quoted prices, the Bidder must specifically say so. In the absence of any such stipulation it will be presumed that the prices quoted are firm and final and no claim on account of such duty/tax will be entertained after the opening of tenders.
- (c) If a Bidder chooses to quote a price inclusive of any duty/tax and does not confirm that duty/tax so included is firm and final, he should clearly indicate the rate of such duty/tax and quantum of such duty/tax included in the price. Failure to do so may result in ignoring any request for change of duty/tax at a later date due to any reason whatsoever.
- (d) Any addition to duty/tax and change in any duty/tax upward/downward as a result of any statutory variation in duty/tax taking place within contract terms shall be allowed to the extent of actual quantum of such variation of duty/tax paid by the supplier. Similarly, in case of downward revision in any duty/tax, the actual quantum of reduction of such duty/tax shall be reimbursed to the Buyer by the Seller. All such adjustments shall include all reliefs, exemptions, rebates, concession etc., if any, obtained by the Seller.
- (e) TDS as per Income Tax Rules will be deducted and a certificate to that effect will be issued by the Buyer/ Buyer's paying authority.

ii) Customs Duty: Not Applicable.

iii) Goods and Services Tax (GST) :

- (a) DRDO is a public funded research institution and has been given provision of concessional GST payment, under Notification No. 47/2017-Integrated Tax (Rate) dtd 14 Nov 2017 & Notification No. 45/2017-Central Tax (Rate) dtd 14 Nov 2017 as amended as per the description of stores and Conditions thereon.
- (b) The successful bidder would be issued Concessional GST Certificate, if applicable, by the Buyer under the said notification as decided during tender negotiation and to be issued to Firm/Vendor before invoice raising for procurement of goods against the Contract.
- (c) Bidders may note that Concessional GST Certificate would be issued ONLY in favour of beneficiary of the Contract.
- (d) Unless otherwise specifically agreed to in terms of the Contract, the Buyer shall not be liable for any claim on account of fresh imposition and/or increase of GST on raw materials and/or components used directly in the manufacture of the contracted stores taking place during the pendency of the contract.
- (e) Bidders are advised to specifically mention the rate of GST payable in spite of issuance of concessional GST Certificate to facilitate correct evaluation of quotes. In the absence of such explicit declaration regarding % of tax rate, it would be deemed that quoted prices include applicable GST.

iv) Local Taxes :

Normally, materials to be supplied to Government Departments against Government Contracts are exempted from levy of Town Duty, Terminal Tax and other levies of local bodies. The local Town/Municipal Body regulations at times, however, provide for such exemption only on production of such exemption certificate from any authorised officer. Seller should ensure that stores ordered against contracts placed by this office are exempted from levy of Town Duty,

Terminal Tax or other local taxes and duties. Wherever required, firm should obtain the exemption certificate from the Buyer, to avoid payment of such local taxes or duties.

In case where the Municipality or other local body insists upon payment of these duties or taxes, the same should be paid by the Seller to avoid delay in supplies and possible demurrage charges. After the issue of exemption certificate by the Buyer, the Seller may get the reimbursement from the local authority. In case of any difficulty, the receipt obtained for such payment should be forwarded to the Buyer without delay together with a copy of the relevant act or by-laws/notifications of the Municipality of the local body concerned to enable this office to take up the case for refund with the concerned bodies if admissible under the said acts or rules.

- 2.17 Denial Clause:** Denial clause informs Seller that the Buyer reserves the right to admit additional payment due to upward revision of statutory levies beyond the original delivery schedule in case Seller fails to deliver the goods as per schedule. Variations in the rates of statutory levies within the original delivery schedule will be allowed if taxes are explicitly mentioned in the contract/supply order and delivery has not been made till the revision of the statutory levies. Buyer reserves the right not to reimburse the enhancement of cost due to increase in statutory levies beyond the original delivery period of the supply order/contract even if such extension is granted without imposition of LD.
- 2.18 Pre-Integrity Pact Clause:** Not Applicable.
- 2.19 Independent External Monitors (IEM):** Not Applicable.
- 2.20 Undertaking from the Bidders:** Bidder/firm/company/vendor will submit an undertaking that in the past they have never been banned / debarred for doing business dealings with Ministry of Defence/Govt. of India/any other Govt. organisation and that there is no enquiry going on by CBI/ED/any other Govt. agency against them.
- 2.21 Liability Clause :**
- 2.21.1** Any damage caused to the property or suffered by the personnel of Buyer during the execution of Contract shall remain the liability of the Buyer. Such liability shall be fixed on Seller in case of grossly negligent act or omission on the part of Seller.
 - 2.21.2** This provision is limited to the relations between the Parties. It is without prejudice to the rights and actions to which the victims of damage, or any Social Security Organizations could prevail themselves legally.
 - 2.21.3** Either party would provide reasonable assistance to resolve the claim of other Party to mitigate loss or damage.
 - 2.21.4** Neither, the Seller shall be liable to the Buyer, nor shall the Buyer be liable to the Seller for any immaterial, punitive, indirect, special, incidental, or consequential loss or damage. This will hold good irrespective of whether such liability is based or claimed to be based on any breach of a Party's obligation under the Contract, or any negligent act or omission of a Party, its employees, servants, appointed representatives, sub-contractor or professional consultants, or such liability arises otherwise out of or in connection with the Contract.
 - 2.21.5** The Buyer shall not be liable for any compensation in any manner to the Seller for whatsoever reason.
 - 2.21.6** The Seller shall be liable to the Buyer for any compensation in any manner for whatsoever reasons for a sum not exceeding value of the Contract.
- 2.22 Risk and Expense Purchase:** In case Seller fails to honor the contractual obligations within the stipulated delivery period and as amended, Buyer may procure the said contracted goods/services through a fresh supply order/contract and the defaulting Seller has to bear the excess cost incurred, if any.

Technical Officer B

Part II (B) – Instructions for Online Bid Submission

- 1 The bidders are required to submit soft copies of their bids electronically on the Defence e-Procurement Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the Defence e-Procurement Portal, prepare their bids in accordance with the requirements and submitting their bids online on the Defence e-Procurement Portal.
- 2 More information useful for submitting online bids on the Defence e-Procurement Portal may be obtained at: <https://defproc.gov.in>.
- 3 **Registration**
 - 3.1 Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (**URL: <https://defproc.gov.in/nicgep/app>**) by clicking on the link “Online bidder Enrollment” on the Defence e-Procurement Portal which is free of charge.
 - 3.2 As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
 - 3.3 Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the Defence e-Procurement Portal.
 - 3.4 Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.
 - 3.5 Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse
 - 3.6 Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.
- 4 **Searching For Tender Documents :**
 - 4.1 There are various search options built in the Defence e-Procurement Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the Defence e-Procurement Portal.
 - 4.2 Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective ‘My Tenders’ folder. This would enable the Defence e-Procurement Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
 - 4.3 The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.
- 5 **Preparation Of Bids**

Bidder should take into account any corrigendum published on the tender document before submitting their bids.

 - 5.1 Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
 - 5.2 Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in

reducing size of the scanned document.

- 5.3** To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use “My Space” or “Other Important Documents” area available to them to upload such documents. These documents may be directly submitted from the “My Space” area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

6 Submission of bids :

- 6.1** Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
- 6.2** The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- 6.3** Bidder has to select the payment option as “offline” to pay the tender fee / EMD as applicable and enter details of the instrument.
- 6.4** Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.
- 6.5** Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
- 6.6** The server time (which is displayed on the bidders’ dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
- 6.7** All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 6.8** The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 6.9** Upon the successful and timely submission of bids (ie after Clicking “Freeze Bid Submission” in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
- 6.10** The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

7 ASSISTANCE TO BIDDER

7.1 Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.

7.2 For any technical related queries please call at 24 x 7 Help

Desk Number. 0120-4200 462, 0120-4001 002, 0120-4001 005, 0120-6277 787.

International Bidders are requested to prefix +91 as country code.

Email Support:

For any Issues or Clarifications relating to the published tenders, bidders are requested to contact the respective Tender Inviting Authority.

Technical - support-eproc (at) nic (dot) in.

Policy Related - cppp-doe (at) nic (dot) in.

Note: For latest updated information about online e-procurement system please refer Defence e-Procurement website.

Technical Officer B

Part III – Special Terms and Conditions

The Bidder is required to give confirmation of their acceptance of Special Terms and Conditions of the RFP mentioned below which will automatically be considered as part of the Contract concluded with the successful Bidder as selected by the Buyer. Failure to do so may result in rejection of Bid submitted by the Bidder.

3.1 Apportionment of Quantity: Not Applicable.

3.2 Performance Security Bond: The successful bidder may be required to submit Performance Security Bond either in the form of **electronic Military Receivable Order (e-MRO)** or in the form of Fixed Deposit Receipt (FDR)/ Bank Guarantee (BG), in favour of The Director ADE Bangalore for an amount equal to **3%** of the contract value (inclusive of taxes and duties) at the time of acceptance of tender for safeguarding the Buyer's interest in all respects during the currency of the contract. The Bond submitted in the form of Fixed Deposit Receipt (FDR) / Bank Guarantee (BG) should be valid up to sixty days beyond the accepted delivery date. In case the execution of the contract is delayed beyond the contracted period and the Buyer grants the extension of delivery period, with or without liquidated damages, the Seller must get the Bond revalidated, if not already valid. The specimen of bond can be provided on request.

Indemnity bond: Indemnity bond will be accepted from Government Departments/ DPSUs/ PSUs in lieu of BG in favour of director ADE, Bangalore.

Note: The Performance Security Bond will be forfeited by the Buyer, in case the conditions regarding adherence to delivery schedule and/or other provisions of the Contract/ SO are not fulfilled by the Seller.

3.3 Option Clause: Not Applicable.

3.4 Repeat Order Clause: Not Applicable.

3.5 Tolerance Clause: Not Applicable.

3.6 Purchase Preference Clause: Purchase preference will be granted to the nominated agencies for the specified quantity as per the policy of Govt. of India in vogue as per Public Procurement (Preference to Make in India), order 2017 as amended and Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 as amended.

3.6.1 The minimum local content as per provisions of **Public Procurement (Preference to Make in India), order 2017 dated 15 June 2017 for the subject procurement as per part IV of RFP.** The local supplier at the time of tender, bidding or solicitation shall be required to provide self-certification that the item offered meets the minimum local content and shall give details of the location(s) at which the local value addition is made.

3.6.2 In case of procurement for a value in excess of Rs.10 crores, the local supplier shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.

3.7 Transfer of Technology (ToT): Not Applicable.

3.8 Permissible Time Frame for Submission of Bills: To claim payment (part or full), the Seller shall submit the bill(s) along with the relevant documents within 30 days from the completion of the activity/supply.

3.9 Payment Terms :

The payment will be made as per the following terms, on production of the requisite documents:

Milestone based payment will be released within 30 days through CDA (R&D), Bangalore after satisfactory completion of job/service and on receipt of job completion certificate from the user.

The firm has to execute the job with total 984 man months for 24 months duration as mentioned in Annexure - A. Equated Payments will be made on submission of invoice with work completion certificate (to be duly vetted by concerned ADE officer) for all milestones (1 to 8).

The work and payment are based on milestones as given in table below (as per Annexure – A).

The firm has to depute engineers with domain expertise and relevant experience to ADE. The work may be executed in the ADE premises.

S.NO	Milestone	Duration	Payments
1.	Mile Stone – 1**	TO + 3* month	1/8 th of PO Value
2.	Mile Stone - 2**	TO + 6* months	1/8 th of PO Value
3.	Mile Stone – 3**	TO + 9* months	1/8 th of PO Value
4.	Mile Stone - 4**	TO + 12* months	1/8 th of PO Value
5.	Mile Stone - 5**	TO + 15* months	1/8 th of PO Value
6.	Mile Stone - 6**	TO + 18* months	1/8 th of PO Value
7.	Mile Stone - 7**	TO + 21* months	1/8 th of PO Value
8.	Mile Stone - 8**	TO + 24* months	1/8 th of PO Value

*-This is a typically estimated effort in terms of month based on ADE experience but only quantitatively and qualitatively finished work as stated in every milestone is criteria for Job Completion Certificate and related payments.

** - The order of milestones can be changed based on ADE experience and ADE has right to short close the work after any milestone completion based on project constrains (PDC).

3.10 Advance Payments: Not Applicable.

3.11 Part Supply and *Pro rata* Payment: Applicable (**As per Para 3.9, Part III of RFP**).

3.12 Mode of Payment: It will be mandatory for the Bidders to indicate their bank account numbers and other relevant e-payment details to facilitate payments through ECS/NEFT mechanism instead of payment through cheque, wherever feasible.

3.13 Documents to be furnished for Claiming Payment

- i) Ink-signed copy of Contractor's Bill.
- ii) Ink-signed copy of Commercial Invoice / Seller's Bill.
- iii) Bank Guarantee for Advance, if applicable.
- iv) Guarantee/ Warranty Certificate, if applicable.
- v) Performance Warranty Bond/ Indemnity Bond, if applicable.
- vi) Details for electronic payment viz. Bank name, Branch name and address, Account Number, IFS Code, MICR Number (if these details are not already incorporated in the Contract).
- vii) Copy of the Contract and amendments thereon, if any.
- viii) Self certification from the seller that the GST received under the contract would be deposited to the concerned taxation authority
- ix) Job Completion Certificate from the user (JCC).
- x) ESI & EPF challan with individual details, salary statement with individual signature (If applicable).

3.14 Exchange Rate Variation (ERV) Clause: Not Applicable.

3.15 Force Majeure Clause: Force majeure clause allows a party to suspend or terminate the performance of its obligation when certain circumstances beyond their control arise, making performance inadvisable, commercially impracticable, illegal or impossible. The provision may state that the contract is temporarily suspended, or that it is terminated in the event of force majeure continues for a prescribed period of time. The standard text of this clause is as under.

- 3.15.1** Neither party shall bear responsibility for the complete or partial non-performance of any of its obligations, if the non-performance results from such Force Majeure circumstances as Flood, Fire, Earth Quake and other acts of God as well as War, Military operations, blockade, Acts or Actions of State Authorities or any other circumstances beyond the parties control that have arisen after the conclusion of the present contract.
- 3.15.2** In such circumstances the time stipulated for the performance of an obligation under the Contract is extended correspondingly for the period of time commensurate with actions or circumstances and their consequences.
- 3.15.3** The party for which it becomes impossible to meet obligations under the Contract due to Force Majeure conditions, is to notify in written form to the other party of the beginning and cessation of the above circumstances immediately, but in any case not later than 10 (Ten) days from their commencement.
- 3.15.4** Certificate of a Chamber of Commerce (Commerce and Industry) or other competent authority or organization of the respective country shall be considered as sufficient proof of commencement and cessation of the above circumstances.
- 3.15.5** If the impossibility of complete or partial performance of an obligation lasts for more than 6 (six) months, either party hereto reserves the right to terminate the Contract totally or partially upon giving prior written notice of 30 (thirty) days to the other party of the intention to terminate without any liability other than reimbursement on the terms provided in the agreement for the goods received.
- 3.16 Buy-Back:** Not Applicable.
- 3.17 Export License:** Not Applicable.
- 3.18 Free Issue of Material (FIM):** Not Applicable.
- 3.19 Terms of Delivery:** The delivery of services shall be on FOR ADE, Bangalore basis.
- 3.20 Packing and Marking Instructions:** Not Applicable.
- 3.21 Inspection Instructions:** Approval of technical work carried out by vendor will be by ADE Design Team.
- Inspection Authority:** The Inspection will be carried out by a representative of the ADE duly nominated by the Director.
- 3.22 Acceptance:** The acceptance of the all milestone activities/deliverables will be the through vetting and approval by ADE design team.
- 3.23 Franking Clause:** Not Applicable.
- 3.24 Claims:** The quantity claims for deficiency of quantity / or the quality claims for defects or deficiencies in quality noticed during the inspection shall be presented within 45 days of completion of inspection.
- 3.25 Warranty Clause:** Not Applicable.
- 3.26 Product Support:** Not Applicable.
- 3.27 Annual Maintenance Contract (AMC) Clause:** Not Applicable.
- 3.28 Price Variation (PV) Clause:** Not Applicable.
- 3.29 Intellectual Property Rights (IPR):** The rights of Intellectual Property, developed under the Contract, will be the property of ADE, Bangalore Govt. of India.
- 3.30 Training:** Not Applicable.
- 3.31 Insurance:** Not Applicable.
- 3.32 Installation & Commissioning:** Not Applicable.
- 3.33 Registration:** It is advised to register yourself in ADE by submitting application for registration in the prescribed format. Which is available on request, If you are already registered as above, please furnish the details thereof.
- 3.34 Minimum Order Quantity:** Not Applicable.
- 3.35 Fall Clause:** Not Applicable.

3.36 Certificate in respect of Fall Clause: Not Applicable.

3.37 General: No correspondence/discussions will be entertained on the subject unless specifically called for by ADE after opening of the tenders for technical discussions/price negotiations. Any violation of this will render the quotation invalid and the firm is liable to be blacklisted. Director reserves the right to call for techno- commercial/price negotiation. The company should depute competent authorized representative for discussions/negotiations whenever called for and he shall be competent to take on the spot decisions. Drawing/specification must be returned along with your quotation/regret letter.

3.38 Purchase order will be placed on the vendor offering the lowest quote (Basic Cost with Taxes) and meets all the technical & commercial requirements as per the RFP

3.39 The Director, ADE reserves the right to accept or reject any or all offers in part or in full without assigning any reasons and also will not be responsible for any postal delays.

3.40 The commercial terms and conditions are summarized at Appendix 'A' of this tender document. Same needs to be filled signed and uploaded along with technical bid.

Technical Officer B

PART IV- Vendor Qualification Criteria

The broad criteria for qualifications of bidders should be in the following terms:

Sl.no	Criteria	Unit	Decision Criteria
1	Requirement of Previous Experience		
	The firm must have executed at least one airframe design related activities in ADE/any DRDO Lab/ADA/HAL/NAL or any reputed private aerospace company like Boeing, Airbus etc.	Yes/No	Yes

Important Note:

- i. **Only bidders who qualify as “LOCAL SUPPLIERS (either as class - I or class -II local suppliers)”** as per Government order No. **No. P-45021/2/2017-PP (BE-II) dated 16 Sep 2020 issued by Govt. of India, Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (Public Procurement Section), New Delhi [Subject: Public procurement (preference to Make in India), Order 2017-Revision]** are eligible to participate in the tender. A certificate for meeting the above criteria to be provided by the vendor along with the technical bid.
- ii. Any bidder from such countries sharing 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 the Competent Authority as provided in Govt. of India order (Public Procurement No. 1) vide F.No. 6/18/2019-PPD dated 23 Jul 2020. A certificate in compliance for the same to be submitted by the vendor along with technical bid.

Technical Officer B

Part V – Essential Details of Items/Services Required

5.1 Schedule of Requirements: List of items / services required are as follows –

Name/Description of Item(s)/Service(s)	Qty. required
Design of Aeromechanical Systems for UAV	1 Job

5.2 Technical Details:

Annexure - A

DESIGN OF AEROMECHANICAL SYSTEMS FOR UAV

1. Introduction:

ADE is involved in the design and development of UAV. In this regard, it is planned to carry out design of aeromechanical systems as per scope listed below in section 2.

2. Scope of Work:

The scope of work is categorized into following areas as below:

1. Structural Design Activities
2. Aero Activities
3. Propulsion System Activities
4. Structural Testing Activities
5. General System Activities (Aircraft Thermal Management, Hydraulic System, and Dynamic System Including Landing Gear Activities)
6. Electromagnetic Studies
7. Composite Fabrication Activities
8. Structural Assembly Activities

2.1 Structural Design Activities: The detailed structural design activities are tabulated below

SL No	STRUCTURAL DESIGN ACTIVITY
1	Airframe System requirement Document
2	Material and Process
2.1	Selection of Metallic Materials and Process - Component/Zone Wise
2.2	Selection of FRP Materials and Process – Component Wise by specifying availability by Design Allowable, Knock down factors, Allowable Strain and Document
2.3	Definition of Stealth Material
3	Loads
3.1	Flight Envelope for Estimation of rate, Accelerations etc.,
3.2	Combination of Mass and CG cases
3.3	Identification of Load Cases
3.4	Design Limit Load Factor (Flight)
3.5	Flight Load Envelope with BM and TM (Potato plots)
3.6	Flight Load Document
3.7	Ground Loads Estimation and Document
3.8	Engine Mount Loads and Document
3.9	Weapon Release Loads and Document
3.10	Ground Handling Loads and Document
4	Structural Design Criteria Document
4.1	Selection and definition of Design Standards
4.2	Factor of Safety
4.3	Knock Down Factors
4.4	Fitting Factor
4.5	All necessary Airworthiness requirements for Structural Design
5	Conceptual Structural Design
5.1	Airframe Product Structure Definition
5.2	Structural Modularity
5.3	Definition of Load Transfer path and Structural Joints
5.4	Preliminary Structural Layout

SL No	STRUCTURAL DESIGN ACTIVITY
5.5	Weapon Bay Sizing with door configuration
5.6	Landing Gear Bay with doors configuration
5.7	Engine Fitment Concept with Document
5.8	Engine Bay with Shroud
5.9	Identification of Lifting and Jacking points - Module wise
5.10	Digital Mock-Up Model
5.11	Systems Layout
5.12	Fuel Tank Layout
5.13	Conceptual Design Document
5.14	Mass, CG and MOI Estimation
6	Preliminary Structural Design
6.1	Identification of Critical Load cases
6.2	NLG-Bulkhead Design and Analysis
6.3	MLG-Bulkhead Design and Analysis
6.4	Center Fuselage -Wing root Joint Design
6.5	Center Wing Root fitting bulkhead and Analysis
6.6	Engine Mount Design and Analysis
6.7	Weapon Bay Shear Wall Design and Analysis
6.8	Shear wall for NLG and MLG Bay
6.9	Wing Spars Design
6.10	Wing Skin Design
6.11	Fuel Tank in Center Wing Design
6.12	Fuel Tank in Wings Design
6.13	Longerons Design and Analysis
6.14	Fuselage Joints Design and Analysis
6.15	Control Surface Design and Analysis including Hinges
6.16	Static Aero elasticity - Loads, Derivatives, Divergence, Control Reversal Speed, Control Effectiveness Data
6.17	Dynamic Aero elasticity - Flutter Speed
6.18	Effect of Engine Vibration at LRU Locations

SL No	STRUCTURAL DESIGN ACTIVITY
6.19	Center Wing Analysis for all Critical Load cases
6.20	OB Wings Structural Analysis for all Critical Load cases
6.21	Nose Cone Structural Analysis for all Critical Load cases
6.22	Tail Cone Structural Analysis for all critical load cases and Thermal Analysis
6.23	Fuel Tank Slosh Analysis - Both Fuselage and Wing Tanks
6.24	All other Shear Walls Design, other than above mentioned
6.25	Wing Tip
6.26	Implementation of RAS/RAM into Preliminary Design
6.27	Design Provisions for Manufacturing and Assembly References
6.28	Radome Design for Conformal Antenna
6.29	Design implementation for Lightning Protection for Full Aircraft including Fuel Tanks
6.30	Fatigue Life Estimation of Airframe
6.31	Documentation for Each Activity
7	Detail Structural Design
7.1	Identification of Aero Grade Fasteners B75:B97
7.2	Fuselage-Wing Root fitting Detail Design and Analysis
7.3	Fuselage Detail Design and Analysis
7.4	Fuel Tank Detail Design with Sealant and Seal caps, Baffles etc., with a fitment Scheme in case of Separate tanks
7.5	Weapon Bay Structural Detailing
7.6	MLG Attachment Detail Design
7.7	NLG Attachment Detail Design
7.8	LG Bay Door Design and Analysis
7.9	Weapon Bay Door Design, Mechanisms and Analysis
7.10	Engine Assembly Scheme Detail Design with Document
7.11	Engine Mount Detail Design and Analysis
7.11	Nozzle attachment to Airframe - Design and Analysis
7.12	Detail Design of Control Surface Attachment
7.13	All Detailing for LRU Mounting Scheme with Fitment Document
7.14	Determination of Access Covers and Hatch Panels

SL No	STRUCTURAL DESIGN ACTIVITY
7.15	Design and Analysis of all Access Covers and Hatch Panels
7.16	Structural Assembly Sequence for all Modules
7.17	Detailing of Lifting and Jacking points
7.18	Structural Assembly Design of Center Fuselage
7.19	Structural Assembly Design of OB wings
7.20	Structural Assembly Design of Nose cone and Tail cone Modules
7.21	Detail Design of Attachment/Interface of all Modules
7.22	Complete Assembly Design Scheme
7.23	Identification of all required Gaskets, Sealants etc.,
7.24	Detail Design for Lighting Protection
7.25	Detail Design for RAS Implementation
7.26	Metallic Surface Treatment Document
7.27	Paint, Primer Details with Document
7.28	Complete Structural Analysis after Detail Design for all Critical Load cases
7.29	Generation of Manufacturing Drawings with Production Standards
7.30	Structural Test Plan for Static, GVT and SCT
7.31	Structural Test Methodology
7.32	FE Model update for Flutter speed after GVT
7.33	DAL Approval with CEMILAC
7.34	All Documentation

2.2 Aero Activities

The detailed scope of work is given below

a) CAD model generation for various UAV Configurations:

- (i) Generation of airframe external shapes from airfoil profile and platform geometry
- (ii) CAD model generation for various control surfaces like elevon, elevator, aileron, rudder, spoiler. Multiple models to be generated for each control surface based on the deflection requirements as provided by ADE
- (iii) Generation of intake shapes from cross section profiles

- (iv) Intake cowl design and smooth blending with airframe
- (v) Simplification of landing gear geometry and integration with airframe
- (vi) Simplification of weapon bay geometry and integration with airframe
- (vii) Modification of airframe external shapes based on design inputs from ADE
- (viii) CAD modeling with different store arrangements
- (ix) CAD cleanup of all geometry to suit CFD analysis by removing multiple surface, curves, closure of gaps and holes, maintaining surface continuity, smoothening of sharp edges etc.,
- (x) All CAD activities to be carried out using CATIA V5

b) Mesh generation for CFD analysis of UAV:

- (i) Generation of volume mesh using Delaunay or suitable algorithm in consultation with ADE
- (ii) Prism layers to be generated to capture the boundary layer
- (iii) Export the mesh to formats as required by the CFD Solver
- (iv) Mesh to be generated for different configurations like intakes, elevon deflections, spoiler deflections, different store arrangements, landing gear, air data boom, etc. as per the requirement of ADE
- (v) Mesh size, growth rate, prism growth rate, density zones to be arrived in consultation with ADE
- (vi) All meshes generated have to adhere to standard quantity indices with skewness, warping, and aspect ratio as per best practices and in consultation with ADE
- (vii) Mesh generation to be carried out using ICEMCFD software
- (viii) Documentation of mesh generation methodology to be carried out

c) CFD analysis of UAV configurations:

- (i) Pre-processing using HiFUN / CFD++/ Fluent /STAR CCM CFD solver including setting up the problem , providing appropriate boundary conditions like Pressure farfield, wall, intake pressure outlet etc.,

- (ii) The analysis conditions like Mach no, angle of attack, angle of sideslip, intake pressure outlet and farfield pressure and number of iterations to be run will be provided by ADE
- (iii) The flow solver details like turbulence models, discretization schemes, CFL ramping to be decided in consultation with ADE
- (iv) Submission of case in the High performance cluster provided by ADE
- (v) Monitoring of solution to check for divergence or oscillations of solution
- (vi) Extraction of wall data and volume data from HPC servers
- (vii) Preparation of subroutine using scripts to extract the required data from the solution and for data visualization
- (viii) Tabulation and plotting for outputs like force and moment coefficients, mass flow rates, distortion coefficient, trajectory for different simulations using MATLAB / EXCEL
- (ix) Extensive post-processing of the results using TECPLOT/ PARAVIEW which includes velocity vector plot, streamline plots, pressure contours, span wise force distribution, cp distribution over airfoil sections, extraction of pressure data at appropriate locations etc.,
- (x) Report generation for CFD analysis of the configurations

d) Air load generation of UAV:

- (i) Generation of V-n diagram and Flight envelopes using MIL-8861 or FAR-23 standards
- (ii) Estimation of trim conditions at the corner point of the envelopes and estimation of trim angle of attack, speed and control deflections
- (iii) Extraction of pressure data from CFD for all the corner points
- (iv) Preparation of subroutines for estimation of Δp from pressure data of CFD
- (v) Smoothing of CFD pressure data to remove spikes and wiggles
- (vi) Plotting and tabulation of air load for different conditions
- (vii) Generation of low fidelity UAV model using AVL / openVSP / Aerologic
- (viii) Estimation of air load from low fidelity analysis and comparison with RANS CFD
- (ix) Report generation of air load as per ADE requirements
- (x) All the inputs required will be provide by ADE

- (xi) All analysis to be carried out using MATLAB and MS-EXCEL

(e) Wind tunnel data processing and generation of aero data for UAV:

- (i) Analysis of wind tunnel data for various conditions of alpha, beta, control deflections and Mach number
- (ii) Plotting the wind tunnel data to study the basic characteristics, control effectiveness for elevon, elevator, spoiler rudder etc.,
- (iii) Smoothening of wind tunnel data using ADE inputs
- (iv) Extraction of major aerodynamic characteristics like C_{L0} , C_{D0} , K , $C_{L\alpha}$, $C_{M\alpha}$, $C_{y\beta}$, $C_{n\beta}$, $C_{L\delta}$, $C_{l\delta}$, $C_{y\delta}$, $DC90$, $IDCL$ and other aerodynamic parameters of interest from wind tunnel test data
- (v) Comparison of wind tunnel test data with design data and CFD data
- (vi) Generation of basic data from Wind tunnel tests with appropriate corrections as given by ADE
- (vii) Generation of delta data for various control surfaces like elevon, elevator, spoiler rudder etc.,
- (viii) Generation of check case and application rule for using the aero data
- (ix) Preparation of Aero data report with data table and graphs as required by ADE

(f) Performance estimation for UAV:

- (i) Analysis of aerodynamic data and engine deck data
- (ii) Point performance estimation to estimate level flight performance, turn performance, climb performance, takeoff and landing performance
- (iii) Mission performance estimation for various aircraft missions
- (iv) Sensitivity Analysis of weight, thrust and drag on the aircraft performance
- (v) Performance estimation to be carried out for various configuration as given by ADE
- (vi) Preparation of Aero Performance report with data table and graphs as required by ADE
- (vii) Generation of necessary subroutines for performance evaluation in consultation with ADE

2.3 Propulsion System Activities: The following are the Propulsion system activities

CAD modeling of various shape of 2D nozzle, Engine starting system component and Fuel system component
Preparation of drawing for 2D Nozzle , Engine starting system and Fuel system component
Fuel system analysis for fuel availability in various phase of flight in CATIA/Flow master
CAD Modeling of engine ground handling trolley and engine starting trolley
Geometry cleaning for mesh generation
Mesh generation for Nozzle CFD analysis
CFD analysis of various shape of nozzle
Preparation of test setup for fuel system Bench testing
Support for bench testing of fuel system
Co-ordination with vendor for fabrication of propulsion system and ground handling system
Inspection and testing of propulsion system component at vendor place prior to delivery
CFD and fuel system analysis for design modification
Integration of propulsion system in UAV
Support for Integrated testing of propulsion system in airframe
Support for UAV flight testing at tarmac
Preparation of SOP and ATP document for propulsion system
Preparation of test plan and test report
Post run and post flight analysis

2.4 Structural Testing Activities: As per details in section 3

2.5 General Systems Activities: As per details in section 3 (Aircraft Thermal Management, Landing gear and hydraulics)

2.6 Electro-magnetic Studies

The process to be followed is briefly described below. The work package involves grid generation for full aircraft/different components of aircraft for different configurations. ADE anticipates about 24 aircraft configurations to be simulated. On an average less than two months, one configuration grid generation has to be completed.

2.6.1 Requirements Generation

1. ADE would give the required CAD model of the aircraft as input
2. Supplier would study the CAD model given before generating the grid
3. During the course of the study the supplier is encouraged to ask all the related queries clearly understanding the requirement(s). ADE would give the required inputs to the supplier's project team during the inception phase of the project

2.6.2 Grid generation

1. ADE would assist the Supplier in generating the grid of the aircraft for the first iteration
2. Supplier shall generate the grid for the rest of the iterations
3. After the grid generation, Supplier has to do the check the grid for its quality. Supplier shall get the grid verified by the Acquirer. After the verification of the results, the Supplier shall go ahead with report generation

2.6.3 Responsibility

2.6.3.1 ADE's Responsibility

- i) The generation of inputs and requirements
- ii) Provide required Software tools and Hardware resources
- iii) Orientation/familiarization of the work
- iv) Periodical review (technical & contractual) and records of discussion
- v) Monthly review shall be conducted by ADE. Supplier team to participate
- vi) Acceptance of the deliverables as per the milestones and clearance for relevant payments

2.6.3.2 Supplier's Responsibility

- i) The supplier shall generate the grid for the aircraft/components of aircraft, interact with ADE personnel for inputs and requirements.
- ii) Check the grid for skew elements, aspect ratio etc.
- iii) The work carried out as a part of the project to be submitted as a report.
- iv) Supplier's team shall be positioned at ADE and shall carry out the tasks with active participation from ADE.
- v) Periodical reviews will be conducted by ADE. Supplier shall make technical presentation on the progress on fortnightly basis.

2.7 Composite Fabrication Activities: As per Section 3

2.8 Structural Assembly Activities: As per section 3

3. Milestone and Deliverables:

There are total 08 Milestones with each 03 months and total duration of design of aero-mechanical systems is 24 months. The time definition of each milestone is given below

T0= Within 07 days from the date of Supply Order

T1= Date of Completion of Milestone-1 = T0 + 03 Months

T2= Date of Completion of Milestone-2 = T0 + 06 Months

T3= Date of Completion of Milestone-3 = T0 + 09 Months

T4= Date of Completion of Milestone-4 = T0 + 12 Months

T5= Date of Completion of Milestone-5 = T0 + 15 Months

T6= Date of Completion of Milestone-6 = T0 + 18 Months

T7= Date of Completion of Milestone-7 = T0 + 21 Months

T8= Date of Completion of Milestone-8 = T0 + 24 Months

The milestones and the deliverables for each milestone are given below.

Milestone	Scope of Work/Deliverables	Man Months	Skill Requirements
Milestone -1	<p><u>Structural Design Activities</u></p> <ul style="list-style-type: none"> • Generation of NMG • Product Structure Generation and DMU • Conceptual Structural Design • Structural Modularity with lifting and jacking points • Accessibility and concept design for manufacturability • Engine Integration concept • Weapon bay layout with doors • Fuel tank layout • Nozzle and Air intake integration • Systems Layout • Estimation of Mass, CG and MOI • Generation of Flight Load Envelope • Material Selection for preliminary structural design • Generation of design criteria document • Design allowable document • Technical Reports for the above activities 	<p>63 (T1= T0 + 3 Months)</p>	<p>12 Man months with minimum 7 years of work experience and 18 Man months with minimum 5 years of work experience and 30 Man months with minimum 3 years of work experience in the listed area with B.E/B.Tech in Aeronautical/Mechanical engineering with knowledge in CATIA, MSC Nastran, Hypermesh, ADAMS software</p> <p>Work Experience should be in the areas mentioned in the Scope of the work – Structural Design Activities.</p> <p>And</p> <p>3 Man months with minimum 3 years of work experience with B.E./B.Tech in IT/Computer Science</p>

	<u>Aero Activities</u> <ul style="list-style-type: none"> • CAD Model generation – 30 nos • CAD clean-up for CFD • Mesh generation – 30 nos • Preprocessing for RANS CFD - 30 nos • RANS CFD for aerodynamics characterization • Store separation CFD analysis • CFD data extraction - 100 nos • CFD data post processing – 10 nos • CFD Report preparation • Automation of grid generation and CFD analysis for optimization 	9 (T1= T0 + 3 Months)	9 Man months with minimum 3 years relevant work experience with B.E/B.Tech /M.E/M.S/M.Sc(Engg) in Aeronautical engineering with experience in the areas mentioned in Milestone 1
	<u>Propulsion System Activities</u> <ul style="list-style-type: none"> • CAD modeling of various shape of 2D nozzle, Engine starting system component and Fuel system component • Preparation of drawing for 2D Nozzle , Engine starting system and Fuel system component 	9 (T1= T0 + 3 Months)	9 Man months with minimum 3 years of work experience in specified area in Milestone 1 with B.E/B.Tech in Aeronautical/mechanical /Automobile/Production engineering with tool experience in CATIA, CFD Mesh generation, Ansys Fluent and Matlab
	<u>Structural Testing activities</u> <ul style="list-style-type: none"> • Realization of self-reacting frame for actuator performance • Documentation for design and analysis of said hardware 	6 (T1= T0 + 3 Months)	6 Man months with minimum 3 years of work experience in modelling, design/analysis with B.E/B.Tech in Aeronautical/Mechanical engineering

	<p style="text-align: center;"><u>General System Activities</u></p> <p>Aircraft Thermal Management Activities:</p> <ul style="list-style-type: none"> • Thermal analysis of aircraft <p>Hydraulic System, and Dynamic System Including Landing Gear Activities:</p> <ul style="list-style-type: none"> • Identification of analysis type and parameters 	<p style="text-align: center;">9 (T1= T0 + 3 Months)</p>	<p>9 Man months with minimum 3 years of experience in the following areas</p> <ol style="list-style-type: none"> Experience in thermal analysis at aircraft level Experience in development of layout for coolant/air supply in aircraft Experience in integration of cooling system in aircrafts Experience in analysis of dynamic systems Experience in ADAMS and FEA software Experience in Design & Analysis of hydraulic systems Experience in AMESYM or equivalent software <p><u>Qualification</u> Essential Qualification: BE/B.Tech – Mechanical Engg.) (Desirable Qualification: ME/M.Tech – Mechanical Engg.)</p>
	<p style="text-align: center;"><u>Electro-Magnetic Studies</u></p> <p>Grid generation of 6 different configurations of aircraft/system/sub-systems at L-Band and subsequently, Report preparation</p>	<p style="text-align: center;">9 (T1= T0 + 3 Months)</p>	<p>9 Man months with minimum 3 years aerospace experience in the following areas</p> <ul style="list-style-type: none"> • Experience in cleaning up geometry using CATIA • Experience in 2D structured and unstructured grid generation using Hypermesh or other grid generation software • Experience in 3D structured, unstructured, and layered grid generation using Hypermesh or other grid generation software

	<p><u>Composite Fabrication Activities</u></p> <p>Support in preparing layer wise laser projecting markers and Prepreg cutting markers for Spars, ribs and skins to develop design for manufacturing validation of prototype box section (with stealth features)</p>	<p>3 (T1= T0 + 3 Months)</p>	<p>3 Man months with minimum 2 years of experience with B.E./B.Tech in aerospace/mechanical engineering. Tool Experience in CATIA and other CAD/CAM software</p>
	<p><u>Structural Assembly Activities</u></p> <ul style="list-style-type: none"> • Support in integration of Aircraft structural components, Sub-assemblies and assemblies. • Assist in CG measurement • Ensure all the parts are assembled with proper fasteners, methods as per drawing • Document preparation 	<p>3 (T1= T0 + 3 Months)</p>	<p>3 Man months with minimum 3 years of experience with B.E./B.Tech in aerospace/mechanical engineering with knowledge about Jigs, Fixtures, drawing symbols, aircraft parts manufacturing process, drawing reading, and assembly processes.</p>
	<p><u>Project related Activities</u></p> <ul style="list-style-type: none"> • Support in project related activities • Document preparation and handling 	<p>12 (T1= T0 + 3 Months)</p>	<p>12 Man months with B.E./B.Tech in aerospace/mechanical engineering</p>

Milestone -2	<p><u>Structural Design Activities : Preliminary Structural Design-1</u></p> <ul style="list-style-type: none"> • NLG-Bulkhead Design and Analysis • MLG Bulkhead Design and Analysis • Center Fuselage -wing root joint Design • Center Wing Root fitting bulkhead and Analysis • Engine Mount Design and Analysis • Weapon Bay Shear Wall Design and Analysis • Shear wall for NLG and MLG Bay • Wing Spars Design • Wing Skin Design • Fuel Tank design in Center Wing • Fuel Tank Design in Wings • Longerons Design and Analysis • Fuselage Joints Design and Analysis • Control Surface Design and Analysis including hinges 	63 (T2 = T0 + 6 Months)	<p>12 Man months with minimum 7 years of work experience and 18 Man months with minimum 5 years of work experience and 30 Man months with minimum 3 years of work experience in the listed area with B.E/B.Tech in Aeronautical/Mechanical engineering with knowledge in CATIA, MSC Nastran, Hypermesh, ADAMS software</p> <p>Work Experience should be in the areas mentioned in the Scope of the work – Structural Design Activities.</p> <p>And</p> <p>3 Man months with minimum 3 years of work experience with B.E./B.Tech in IT/Computer Science</p>
--------------	---	----------------------------	---

	<u>Aero Activities</u> <ul style="list-style-type: none"> • CAD Model generation – 30 nos • CAD clean-up for CFD • Mesh generation – 30 nos • Preprocessing for RANS CFD - 30 nos • RANS CFD for aerodynamics characterization • Store separation CFD analysis • CFD data extraction - 100 nos • CFD data post processing – 10 nos • CFD Report preparation • Automation of grid generation and CFD analysis for optimization 	9 (T2 = T0 + 6 Months)	9 Man months with minimum 3 years relevant work experience with B.E/B.Tech /M.E/M.S/M.Sc(Engg) in Aeronautical engineering with experience in the areas mentioned in Milestone 2
	<u>Propulsion System Activities</u> <ul style="list-style-type: none"> • Fuel system analysis for fuel availability in various phase of flight in CATIA/Flow master • CAD Modeling of engine ground handling trolley and engine starting trolley 	9 (T2 = T0 + 6 Months)	9 Man months with minimum 3 years of work experience in specified area in Milestone 2 with B.E/B.Tech in Aeronautical/mechanical /Automobile/Production engineering with tool experience in CATIA, CFD Mesh generation, Ansys Fluent and Matlab
	<u>Structural Testing activities</u> <ul style="list-style-type: none"> • Realization of test rig for airframe static test • Documentation for design and analysis of said hardware 	6 (T2 = T0 + 6 Months)	6 Man months with minimum 3 years of work experience in modelling, design/analysis with B.E/B.Tech in Aeronautical/Mechanical engineering

	<p style="text-align: center;"><u>General System Activities</u></p> <p>Aircraft Thermal Management Activities:</p> <ul style="list-style-type: none"> Thermal analysis of aircraft <p>Hydraulic System, and Dynamic System Including Landing Gear Activities:</p> <ul style="list-style-type: none"> Identification of analysis type and parameters 	<p style="text-align: center;">9 (T2 = T0 + 6 Months)</p>	<p>9 Man months with minimum 3 years of experience in the following areas</p> <ol style="list-style-type: none"> Experience in thermal analysis at aircraft level Experience in development of layout for coolant/air supply in aircraft Experience in integration of cooling system in aircrafts Experience in analysis of dynamic systems Experience in ADAMS and FEA software Experience in Design & Analysis of hydraulic systems Experience in AMESYM or equivalent software <p><u>Qualification</u></p> <p>Essential Qualification: BE/B.Tech – Mechanical Engg.) (Desirable Qualification: ME/M.Tech – Mechanical Engg.)</p>
	<p style="text-align: center;"><u>Electro-Magnetic Studies</u></p> <p>Grid generation of 6 different configurations of aircraft/system/sub-systems at L-Band and subsequently, Report preparation</p>	<p style="text-align: center;">9 (T2 = T0 + 6 Months)</p>	<p>9 Man months with minimum 3 years aerospace experience in the following areas</p> <ul style="list-style-type: none"> Experience in cleaning up geometry using CATIA Experience in 2D structured and unstructured grid generation using Hypermesh or other grid generation software Experience in 3D structured, unstructured, and layered grid generation using Hypermesh or other grid generation software

	<u>Composite Fabrication Activities</u> Support in preparing layer wise laser projecting markers and Prepreg cutting markers for Spars, ribs and skins to develop design for manufacturing validation of prototype wing section (with stealth features)	3 (T2 = T0 + 6 Months)	3 Man months with minimum 2 years of experience with B.E./B.Tech in aerospace/mechanical engineering. Tool Experience in CATIA and other CAD/CAM software
	<u>Structural Assembly Activities</u> <ul style="list-style-type: none"> • Support in integration of Aircraft structural components, Sub-assemblies and assemblies. • Assist in CG measurement • Ensure all the parts are assembled with proper fasteners, methods as per drawing. • Document preparation 	3 (T2 = T0 + 6 Months)	3 Man months with minimum 3 years of experience with B.E./B.Tech in aerospace/mechanical engineering with knowledge about Jigs, Fixtures, drawing symbols, aircraft parts manufacturing process, drawing reading, and assembly processes.
	<u>Project related Activities</u> <ul style="list-style-type: none"> • Support in project related activities • Document preparation and handling 	12 (T2 = T0 + 6 Months)	12 Man months with B.E./B.Tech in aerospace/mechanical engineering

Milestone -3	<p><u>Structural Design Activities : Preliminary Structural Design-2</u></p> <ul style="list-style-type: none"> • Static Aeroelasticity - Loads, Derivatives, Divergence, Control reversal speed, Control Effectiveness Data • Dynamic Aeroelasticity - Flutter Speed • Effect of Engine vibration of LRU locations • Center Wing Analysis for all critical load cases • OB Wings Structural Analysis for all critical load cases • Nose cone Structural Analysis for all critical load cases • Tail Cone Structural for all critical load cases and Thermal Analysis 	63 (T3 = T0 + 9 Months)	<p>12 Man months with minimum 7 years of work experience and 18 Man months with minimum 5 years of work experience and 30 Man months with minimum 3 years of work experience in the listed area with B.E/B.Tech in Aeronautical/Mechanical engineering with knowledge in CATIA, MSC Nastran, Hypermesh, ADAMS software</p> <p>Work Experience should be in the areas mentioned in the Scope of the work – Structural Design Activities.</p> <p>And</p> <p>3 Man months with minimum 3 years of work experience with B.E./B.Tech in IT/Computer Science</p>
	<p><u>Aero Activities</u></p> <ul style="list-style-type: none"> • CAD Model generation – 30 nos • CAD clean-up for CFD • Mesh generation – 30 nos • Preprocessing for RANS CFD - 30 nos • RANS CFD for aerodynamics characterization • Store separation CFD analysis • CFD data extraction - 100 nos • CFD data post processing – 10 nos • CFD Report preparation • Automation of grid generation and CFD analysis for optimization 	9 (T3 = T0 + 9 Months)	<p>9 Man months with minimum 3 years relevant work experience with B.E/B.Tech /M.E/M.S/M.Sc(Engg) in Aeronautical engineering with experience in the areas mentioned in Milestone 3</p>

	<p><u>Propulsion System Activities</u></p> <ul style="list-style-type: none"> • Geometry cleaning for mesh generation • Mesh generation for Nozzle CFD analysis • CFD analysis of various shape of nozzle 	<p>9 (T3 = T0 + 9 Months)</p>	<p>9 Man months with minimum 3 years of work experience in specified area in Milestone 3 with B.E/B.Tech in Aeronautical/mechanical /Automobile/Production engineering with tool experience in CATIA, CFD Mesh generation, Ansys Fluent and Matlab</p>
	<p><u>Structural Testing Activities</u></p> <ul style="list-style-type: none"> • LRU Dynamic qualification / Resonance test • Documentation for test instrumentation and test data analysis reports 	<p>6 (T3 = T0 + 9 Months)</p>	<p>6 Man months with minimum 3 years of work experience in modelling, design/analysis with B.E/B.Tech in Aeronautical/Mechanical engineering</p>
	<p><u>General System Activities</u></p> <p>Aircraft Thermal Management Activities:</p> <ul style="list-style-type: none"> • Configuration design and feasibility studies • Identifications of subsystems for procurement <p>Hydraulic System, and Dynamic System Including Landing Gear Activities:</p> <ul style="list-style-type: none"> • Modelling of the dynamic systems • Modelling of the hydraulic systems 	<p>9 (T3 = T0 + 9 Months)</p>	<p>9 Man months with minimum 3 years of experience in the following areas</p> <ol style="list-style-type: none"> Experience in thermal analysis at aircraft level Experience in development of layout for coolant/air supply in aircraft Experience in integration of cooling system in aircrafts Experience in analysis of dynamic systems Experience in ADAMS and FEA software Experience in Design & Analysis of hydraulic systems Experience in AMESYM or equivalent software <p><u>Qualification</u> Essential Qualification: BE/B.Tech – Mechanical Engg.) (Desirable Qualification: ME/M.Tech – Mechanical Engg.)</p>

	<p style="text-align: center;"><u>Electro-Magnetic Studies</u></p> <p>Grid generation of 6 different configurations of aircraft/system/sub-systems at S-Band and subsequently, Report preparation</p>	<p style="text-align: center;">9 (T3 = T0 + 9 Months)</p>	<p>9 Man months with minimum 3 years aerospace experience in the following areas</p> <ul style="list-style-type: none"> • Experience in cleaning up geometry using CATIA • Experience in 2D structured and unstructured grid generation using Hypermesh or other grid generation software • Experience in 3D structured, unstructured, and layered grid generation using Hypermesh or other grid generation software
	<p style="text-align: center;"><u>Composite Fabrication Activities</u></p> <p>Support in preparing layer wise laser projecting markers and Prepreg cutting markers for Spars, ribs and skins to develop design for manufacturing validation of prototype box section (with stealth features)</p>	<p style="text-align: center;">3 (T3 = T0 + 9 Months)</p>	<p>3 Man months with minimum 2 years of experience with B.E./B.Tech in aerospace/mechanical engineering. Tool Experience in CATIA and other CAD/CAM software</p>
	<p style="text-align: center;"><u>Structural Assembly Activities</u></p> <ul style="list-style-type: none"> • Support in integration of Aircraft structural components, Sub-assemblies and assemblies. • Assist in CG measurement • Ensure all the parts are assembled with proper fasteners, methods as per drawing. • Document preparation 	<p style="text-align: center;">3 (T3 = T0 + 9 Months)</p>	<p>3 Man months with minimum 3 years of experience with B.E./B.Tech in aerospace/mechanical engineering with knowledge about Jigs, Fixtures, drawing symbols, aircraft parts manufacturing process, drawing reading, and assembly processes.</p>
	<p style="text-align: center;"><u>Project related Activities</u></p> <ul style="list-style-type: none"> • Support in project related activities • Document preparation and handling 	<p style="text-align: center;">12 (T3 = T0 + 9 Months)</p>	<p>12 Man months with B.E./B.Tech in aerospace/mechanical engineering</p>

Milestone -4	<p><u>Structural Design Activities : Preliminary Structural Design-3</u></p> <ul style="list-style-type: none"> • Static Aeroelasticity - Loads, Derivatives, Divergence, Control reversal speed, Control Effectiveness Data • Dynamic Aeroelasticity - Flutter Speed • Effect of Engine vibration of LRU locations • Center Wing Analysis for all critical load cases • OB Wings Structural Analysis for all critical load cases • Nose cone Structural Analysis for all critical load cases • Tail Cone Structural for all critical load cases and Thermal Analysis • Fuel Tank Slosh Analysis-Both fuselage and wing tanks • All other Shear walls design other than mentioned above • Wing Tip • Implementation of RAS/RAM into preliminary design • Design provisions for manufacturing and assembly references • Radomes Design for Conformal Antenna • Design implementation for lightening protection including fuel tanks for full aircraft • Fatigue Life estimation of airframe • Documentation for each activity 	<p>63 (T4 = T0 + 12 Months)</p>	<p>12 Man months with minimum 7 years of work experience and 18 Man months with minimum 5 years of work experience and 30 Man months with minimum 3 years of work experience in the listed area with B.E/B.Tech in Aeronautical/Mechanical engineering with knowledge in CATIA, MSC Nastran, Hypermesh, ADAMS software</p> <p>Work Experience should be in the areas mentioned in the Scope of the work – Structural Design Activities.</p> <p>And</p> <p>3 Man months with minimum 3 years of work experience with B.E./B.Tech in IT/Computer Science</p>
--------------	---	-------------------------------------	---

	<u>Aero Activities</u> <ul style="list-style-type: none"> • V-n diagram and flight envelope generation • Extraction of pressure data from CFD – 30 nos • Generation of air load for all points of flight envelope • Air load report preparation • CAD Model generation – 10 nos • CAD clean-up for CFD • Mesh generation – 10 nos • Preprocessing for RANS CFD - 10 nos • RANS CFD for aerodynamics characterization • Store separation CFD analysis • CFD data extraction – 150 nos • CFD data post processing – 5 nos • CFD Report preparation 	9 (T4 = T0 + 12 Months)	9 Man months with minimum 3 years relevant work experience with B.E/B.Tech /M.E/M.S/M.Sc(Engg) in Aeronautical engineering with experience in the areas mentioned in Milestone 4
	<u>Propulsion System Activities</u> <ul style="list-style-type: none"> • Preparation of test setup for fuel system Bench testing • Support for bench testing of fuel system 	9 (T4 = T0 + 12 Months)	9 Man months with minimum 3 years of work experience in specified area in Milestone 4 with B.E/B.Tech in Aeronautical/mechanical /Automobile/Production engineering with tool experience in CATIA, CFD Mesh generation, Ansys Fluent and Matlab
	<u>Structural Testing Activities</u> <ul style="list-style-type: none"> • Element / feature level/sub-component level tests • Documentation test instrumentation and test data analysis reports 	6 (T4 = T0 + 12 Months)	6 Man months with minimum 3 years of work experience in modelling, design/analysis with B.E/B.Tech in Aeronautical/Mechanical engineering

	<p style="text-align: center;"><u>General System Activities</u></p> <p>Aircraft Thermal Management Activities:</p> <ul style="list-style-type: none"> • Configuration design and feasibility studies • Identifications of subsystems for procurement <p>Hydraulic System, and Dynamic System Including Landing Gear Activities:</p> <ul style="list-style-type: none"> • Modelling of the dynamic systems • Modelling of the hydraulic systems 	<p style="text-align: center;">9 (T4 = T0 + 12 Months)</p>	<p>9 Man months with minimum 3 years of experience in the following areas</p> <ol style="list-style-type: none"> Experience in thermal analysis at aircraft level Experience in development of layout for coolant/air supply in aircraft Experience in integration of cooling system in aircrafts Experience in analysis of dynamic systems Experience in ADAMS and FEA software Experience in Design & Analysis of hydraulic systems Experience in AMESYM or equivalent software <p><u>Qualification</u> Essential Qualification: BE/B.Tech – Mechanical Engg.) (Desirable Qualification: ME/M.Tech – Mechanical Engg.)</p>
	<p style="text-align: center;"><u>Electro-Magnetic Studies</u></p> <p>Grid generation of 6 different configurations of aircraft/system/sub-systems at S-Band and subsequently, Report preparation</p>	<p style="text-align: center;">9 (T4 = T0 + 12 Months)</p>	<p>9 Man months with minimum 3 years aerospace experience in the following areas</p> <ul style="list-style-type: none"> • Experience in cleaning up geometry using CATIA • Experience in 2D structured and unstructured grid generation using Hypermesh or other grid generation software • Experience in 3D structured, unstructured, and layered grid generation using Hypermesh or other grid generation software

	<p><u>Composite Fabrication Activities</u></p> <ul style="list-style-type: none"> Support in preparing layer wise laser projecting markers and Prepreg cutting markers for design for manufacturing validation of prototype serpentine air intake (with stealth materials) 	<p>3 (T4 = T0 + 12 Months)</p>	<p>3 Man months with minimum 2 years of experience with B.E./B.Tech in aerospace/mechanical engineering. Tool Experience in CATIA and other CAD/CAM software</p>
	<p><u>Structural Assembly Activities</u></p> <ul style="list-style-type: none"> Support in integration of Aircraft structural components, Sub-assemblies and assemblies. Assist in CG measurement Ensure all the parts are assembled with proper fasteners, methods as per drawing. Document preparation 	<p>3 (T4 = T0 + 12 Months)</p>	<p>3 Man months with minimum 3 years of experience with B.E./B.Tech in aerospace/mechanical engineering with knowledge about Jigs, Fixtures, drawing symbols, aircraft parts manufacturing process, drawing reading, and assembly processes.</p>
	<p><u>Project related Activities</u></p> <ul style="list-style-type: none"> Support in project related activities Document preparation and handling 	<p>12 (T4 = T0 + 12 Months)</p>	<p>12 Man months with B.E./B.Tech in aerospace/mechanical engineering</p>

Milestone -5	<p><u>Structural Design Activities : Detail Structural Design-Phase-1</u></p> <ul style="list-style-type: none"> • Identification of aerograde fasteners • Fuselage-Wing Root fitting detail design and analysis • Fuselage joints detail design and Analysis • Fuel Tank detail design with sealant and seal caps, baffles etc with a fitment scheme in case of separate tanks • Weapon Bay Structural detailing • MLG Attachment detail design • NLG Attachment detail design • LG Bay door design and analysis 	<p>63 (T5 = T0 + 15 Months)</p>	<p>12 Man months with minimum 7 years of work experience and 18 Man months with minimum 5 years of work experience and 30 Man months with minimum 3 years of work experience in the listed area with B.E./B.Tech in Aeronautical/Mechanical engineering with knowledge in CATIA, MSC Nastran, Hypermesh, ADAMS software</p> <p>Work Experience should be in the areas mentioned in the Scope of the work – Structural Design Activities.</p> <p>And</p> <p>3 Man months with minimum 3 years of work experience with B.E./B.Tech in IT/Computer Science</p>
--------------	--	-------------------------------------	--

	<u>Aero Activities</u> <ul style="list-style-type: none"> • V-n diagram and flight envelope generation • Extraction of pressure data from CFD – 30 nos • Generation of air load for all points of flight envelope • Air load report preparation • CAD Model generation – 10 nos • CAD clean-up for CFD • Mesh generation – 10 nos • Preprocessing for RANS CFD - 10 nos • RANS CFD for aerodynamics characterization • Store separation CFD analysis • CFD data extraction – 150 nos • CFD data post processing – 5 nos • CFD Report preparation 	9 (T5 = T0 + 15 Months)	9 Man months with minimum 3 years relevant work experience with B.E/B.Tech /M.E/M.S/M.Sc(Engg) in Aeronautical engineering with experience in the areas mentioned in Milestone 5
	<u>Propulsion System Activities</u> <ul style="list-style-type: none"> • Co-ordination with vendor for fabrication of propulsion system and ground handling system • Inspection and testing of propulsion system component at vendor place prior to delivery 	9 (T5 = T0 + 15 Months)	9 Man months with minimum 3 years of work experience in specified area in Milestone 5 with B.E/B.Tech in Aeronautical/mechanical /Automobile/Production engineering with tool experience in CATIA, CFD Mesh generation, Ansys Fluent and Matlab
	<u>Structural Testing activities</u> <ul style="list-style-type: none"> • Design and analysis of load transfer mechanism for airframe static test 	6 (T5 = T0 + 15 Months)	6 Man months with minimum 3 years of work experience in modelling, design/analysis with B.E/B.Tech in Aeronautical/Mechanical engineering

	<p style="text-align: center;"><u>General System Activities</u></p> <p>Aircraft Thermal Management Activities:</p> <ul style="list-style-type: none"> • Detailed design of feasible configurations • Development of prototype <p>Hydraulic System, and Dynamic System Including Landing Gear Activities:</p> <ul style="list-style-type: none"> • Modelling of the dynamic systems • Modelling of the hydraulic systems • Analysis and review of all the systems 	<p>9 (T5 = T0 + 15 Months)</p>	<p>9 Man months with minimum 3 years of experience in the following areas</p> <ol style="list-style-type: none"> Experience in thermal analysis at aircraft level Experience in development of layout for coolant/air supply in aircraft Experience in integration of cooling system in aircrafts Experience in analysis of dynamic systems Experience in ADAMS and FEA software Experience in Design & Analysis of hydraulic systems Experience in AMESYM or equivalent software <p><u>Qualification</u> Essential Qualification: BE/B.Tech – Mechanical Engg.) (Desirable Qualification: ME/M.Tech – Mechanical Engg.)</p>
	<p style="text-align: center;"><u>Electro-Magnetic Studies</u></p> <p>Grid generation of 6 different configurations of aircraft/system/sub-systems at C-Band and subsequently, Report preparation</p>	<p>9 (T5 = T0 + 15 Months)</p>	<p>9 Man months with minimum 3 years aerospace experience in the following areas</p> <ul style="list-style-type: none"> • Experience in cleaning up geometry using CATIA • Experience in 2D structured and unstructured grid generation using Hypermesh or other grid generation software • Experience in 3D structured, unstructured, and layered grid generation using Hypermesh or other grid generation software

	<p><u>Composite Fabrication Activities</u></p> <ul style="list-style-type: none"> Support in preparing layer wise laser projecting markers and Prepreg cutting markers for design for manufacturing validation of prototype serpentine air intake (with stealth materials) 	<p>3 (T5 = T0 + 15 Months)</p>	<p>3 Man months with minimum 2 years of experience with B.E./B.Tech in aerospace/mechanical engineering. Tool Experience in CATIA and other CAD/CAM software</p>
	<p><u>Structural Assembly Activities</u></p> <ul style="list-style-type: none"> Support in integration of Aircraft structural components, Sub-assemblies and assemblies. Assist in CG measurement Ensure all the parts are assembled with proper fasteners, methods as per drawing. Document preparation 	<p>3 (T5 = T0 + 15 Months)</p>	<p>3 Man months with minimum 3 years of experience with B.E./B.Tech in aerospace/mechanical engineering with knowledge about Jigs, Fixtures, drawing symbols, aircraft parts manufacturing process, drawing reading, and assembly processes.</p>
	<p><u>Project related Activities</u></p> <ul style="list-style-type: none"> Support in project related activities Document preparation and handling 	<p>12 (T5 = T0 + 15 Months)</p>	<p>12 Man months with B.E./B.Tech in aerospace/mechanical engineering</p>

Milestone -6	<p><u>Structural Design Activities : Detail Structural Design-Phase-2</u></p> <ul style="list-style-type: none"> • Weapon Bay door design, mechanisms and analysis • Engine Assembly Scheme Detail design with document • Engine mount detail design and analysis • Nozzle attachment to airframe -design and analysis • Detail design of control surface attachment • All detailing for LRU mounting scheme with Fitment document • Determination of access covers and hatch panels • Design and analysis of all access panels and hatch covers 	63 (T6 = T0 + 18 Months)	<p>12 Man months with minimum 7 years of work experience and 18 Man months with minimum 5 years of work experience and 30 Man months with minimum 3 years of work experience in the listed area with B.E/B.Tech in Aeronautical/Mechanical engineering with knowledge in CATIA, MSC Nastran, Hypermesh, ADAMS software</p> <p>Work Experience should be in the areas mentioned in the Scope of the work – Structural Design Activities.</p> <p>And</p> <p>3 Man months with minimum 3 years of work experience with B.E./B.Tech in IT/Computer Science</p>
	<p><u>Aero Activities</u></p> <ul style="list-style-type: none"> • Analysis of wind tunnel data • Smoothing of wind tunnel data • Comparison of wind tunnel data with design data • Wind tunnel report preparation • Generation of aero data from wind tunnel data • Preparation of aero data report 	9 (T6 = T0 + 18 Months)	<p>9 Man months with minimum 3 years relevant work experience with B.E/B.Tech /M.E/M.S/M.Sc(Engg) in Aeronautical engineering with experience in the areas mentioned in Milestone 6</p>

	<u>Propulsion System Activities</u> <ul style="list-style-type: none"> • CFD analysis of various shape of nozzle • Preparation of test setup for fuel system Bench testing. • Support for bench testing of fuel system • CFD and fuel system analysis for design modification 	9 (T6 = T0 + 18 Months)	9 Man months with minimum 3 years of work experience in specified area in Milestone 6 with B.E/B.Tech in Aeronautical/mechanical /Automobile/Production engineering with tool experience in CATIA, CFD Mesh generation, Ansys Fluent and Matlab
	<u>Structural Testing activities</u> <ul style="list-style-type: none"> • Documentation for design and analysis of said hardware 	6 (T6 = T0 + 18 Months)	6 Man months with minimum 3 years of work experience in modelling, design/analysis with B.E/B.Tech in Aeronautical/Mechanical engineering
	<u>General System Activities</u> Aircraft Thermal Management Activities: <ul style="list-style-type: none"> • Detailed design of feasible configurations • Development of prototype Hydraulic System, and Dynamic System Including Landing Gear Activities: <ul style="list-style-type: none"> • Modelling of the dynamic systems • Modelling of the hydraulic systems • Analysis and review of all the systems 	9 (T6 = T0 + 18 Months)	9 Man months with minimum 3 years of experience in the following areas <ol style="list-style-type: none"> Experience in thermal analysis at aircraft level Experience in development of layout for coolant/air supply in aircraft Experience in integration of cooling system in aircrafts Experience in analysis of dynamic systems Experience in ADAMS and FEA software Experience in Design & Analysis of hydraulic systems Experience in AMESYM or equivalent software <u>Qualification</u> Essential Qualification: BE/B.Tech – Mechanical Engg.) (Desirable Qualification: ME/M.Tech – Mechanical Engg.)

	<p align="center"><u>Electro-Magnetic Studies</u></p> <p>Grid generation of 6 different configurations of aircraft/system/sub-systems at C-Band and subsequently, Report preparation</p>	<p align="center">9 (T6 = T0 + 18 Months)</p>	<p>9 Man months with minimum 3 years aerospace experience in the following areas</p> <ul style="list-style-type: none"> • Experience in cleaning up geometry using CATIA • Experience in 2D structured and unstructured grid generation using Hypermesh or other grid generation software • Experience in 3D structured, unstructured, and layered grid generation using Hypermesh or other grid generation software
	<p align="center"><u>Composite Fabrication Activities</u></p> <ul style="list-style-type: none"> • Support in preparing layer wise laser projecting markers and Prepreg cutting markers for design for manufacturing validation of prototype serpentine air intake (with stealth materials) 	<p align="center">3 (T6 = T0 + 18 Months)</p>	<p>3 Man months with minimum 2 years of experience with B.E./B.Tech in aerospace/mechanical engineering. Tool Experience in CATIA and other CAD/CAM software</p>
	<p align="center"><u>Structural Assembly Activities</u></p> <ul style="list-style-type: none"> • Support in integration of Aircraft structural components, Sub-assemblies and assemblies. • Assist in CG measurement • Ensure all the parts are assembled with proper fasteners, methods as per drawing. • Document preparation 	<p align="center">3 (T6 = T0 + 18 Months)</p>	<p>3 Man months with minimum 3 years of experience with B.E./B.Tech in aerospace/mechanical engineering with knowledge about Jigs, Fixtures, drawing symbols, aircraft parts manufacturing process, drawing reading, and assembly processes.</p>
	<p align="center"><u>Project related Activities</u></p> <ul style="list-style-type: none"> • Support in project related activities • Document preparation and handling 	<p align="center">12 (T6 = T0 + 18 Months)</p>	<p>12 Man months with B.E./B.Tech in aerospace/mechanical engineering</p>

Milestone -7	<p><u>Structural Design Activities : Detail Structural Design-Phase-3</u></p> <ul style="list-style-type: none"> • Structural Assembly sequence for all modules • Detailing of lifting and jacking points • Structural Assembly design of Center Fuselage • Structural Assembly design of OB wings • Structural assembly design of Nosecone and Tailcone modules • Detail design of attachment/interface of all modules • Complete Assembly design scheme • Identification of all required gaskets, sealants etc • Detail design for lighting protection • Detail design for RAS implementation 	63 (T7 = T0 + 21 Months)	<p>12 Man months with minimum 7 years of work experience and 18 Man months with minimum 5 years of work experience and 30 Man months with minimum 3 years of work experience in the listed area with B.E./B.Tech in Aeronautical/Mechanical engineering with knowledge in CATIA, MSC Nastran, Hypermesh, ADAMS software</p> <p>Work Experience should be in the areas mentioned in the Scope of the work – Structural Design Activities.</p> <p>And</p> <p>3 Man months with minimum 3 years of work experience with B.E./B.Tech in IT/Computer Science</p>
	<p><u>Aero Activities</u></p> <ul style="list-style-type: none"> • CAD Model generation – 30 nos • CAD clean-up for CFD • Mesh generation – 30 nos • Preprocessing for RANS CFD - 30 nos • RANS CFD analysis • Store separation CFD analysis • CFD data extraction – 250 nos • CFD data post processing – 10 nos • Report preparation 	9 (T7 = T0 + 21 Months)	<p>9 Man months with minimum 3 years relevant work experience with B.E./B.Tech /M.E/M.S/M.Sc(Engg) in Aeronautical engineering with experience in the areas mentioned in Milestone 7</p>

	<p><u>Propulsion System Activities</u></p> <ul style="list-style-type: none"> Integration of propulsion system in UAV Support for integrated testing of propulsion system in airframe. 	<p>9 (T7 = T0 + 21 Months)</p>	<p>9 Man months with minimum 3 years of work experience in specified area in Milestone 7 with B.E/B.Tech in Aeronautical/mechanical /Automobile/Production engineering with tool experience in CATIA, CFD Mesh generation, Ansys Fluent and Matlab</p>
	<p><u>Structural Testing Activities</u></p> <ul style="list-style-type: none"> Various structural testing of Integrated UAV 	<p>6 (T7 = T0 + 21 Months)</p>	<p>6 Man months with minimum 3 years of work experience in modelling, design/analysis with B.E/B.Tech in Aeronautical/Mechanical engineering</p>
	<p><u>General System Activities</u></p> <p>Aircraft Thermal Management Activities:</p> <ul style="list-style-type: none"> Testing and data compilation Report preparation concluding on the configuration and conclusion from the prototype tests <p>Hydraulic System, and Dynamic System Including Landing Gear Activities:</p> <ul style="list-style-type: none"> Analysis and review of all systems Document generation for consolidating the results (all systems) 	<p>9 (T7 = T0 + 21 Months)</p>	<p>9 Man months with minimum 3 years of experience in the following areas</p> <ol style="list-style-type: none"> Experience in thermal analysis at aircraft level Experience in development of layout for coolant/air supply in aircraft Experience in integration of cooling system in aircrafts Experience in analysis of dynamic systems Experience in ADAMS and FEA software Experience in Design & Analysis of hydraulic systems Experience in AMESYM or equivalent software <p><u>Qualification</u></p> <p>Essential Qualification: BE/B.Tech – Mechanical Engg.) (Desirable Qualification: ME/M.Tech – Mechanical Engg.)</p>

	<p align="center"><u>Electro-Magnetic Studies</u></p> <p>Grid generation of 12 different configurations of aircraft/system/sub-systems at X-Band, and subsequently, Report preparation.</p>	<p align="center">9 (T7 = T0 + 21 Months)</p>	<p>9 Man months with minimum 3 years aerospace experience in the following areas</p> <ul style="list-style-type: none"> • Experience in cleaning up geometry using CATIA • Experience in 2D structured and unstructured grid generation using Hypermesh or other grid generation software • Experience in 3D structured, unstructured, and layered grid generation using Hypermesh or other grid generation software
	<p align="center"><u>Composite Fabrication Activities</u></p> <p>Design support for manufacturing of prototype airframe</p>	<p align="center">3 (T7 = T0 + 21 Months)</p>	<p>3 Man months with minimum 2 years of experience with B.E./B.Tech in aerospace/mechanical engineering. Tool Experience in CATIA and other CAD/CAM software</p>
	<p align="center"><u>Structural Assembly Activities</u></p> <ul style="list-style-type: none"> • Support in integration of Aircraft structural components, Sub-assemblies and assemblies. • Assist in CG measurement • Ensure all the parts are assembled with proper fasteners, methods as per drawing. • Document preparation 	<p align="center">3 (T7 = T0 + 21 Months)</p>	<p>3 Man months with minimum 3 years of experience with B.E./B.Tech in aerospace/mechanical engineering with knowledge about Jigs, Fixtures, drawing symbols, aircraft parts manufacturing process, drawing reading, and assembly processes.</p>
	<p align="center"><u>Project related Activities</u></p> <ul style="list-style-type: none"> • Support in project related activities • Document preparation and handling 	<p align="center">12 (T7 = T0 + 21 Months)</p>	<p>12 Man months with B.E./B.Tech in aerospace/mechanical engineering</p>

Milestone -8	<u>Structural Design Activities : Detail Structural Design-Phase-4</u> <ul style="list-style-type: none"> • Metallic surface treatment document • Paint, Primer details with Document • Complete Structural analysis after detail design for critical load cases • Structural Test Plan for Static, GVT and SCT • Structural Test methodology • FE model update for flutter speed after GVT • All documentation • Generation of Manufacturing Drawings with production standards • Generation of Manufacturing documents/process documents • Concept of Tool and fixture design 	63 (T8 = T0 + 24 Months)	<p>12 Man months with minimum 7 years of work experience and 18 Man months with minimum 5 years of work experience and 30 Man months with minimum 3 years of work experience in the listed area with B.E./B.Tech in Aeronautical/Mechanical engineering with knowledge in CATIA, MSC Nastran, Hypermesh, ADAMS software</p> <p>Work Experience should be in the areas mentioned in the Scope of the work – Structural Design Activities.</p> <p>And</p> <p>3 Man months with minimum 3 years of work experience with B.E./B.Tech in IT/Computer Science</p>
	<u>Aero Activities</u> <ul style="list-style-type: none"> • Analysis of aerodynamic and engine deck data • Generation of subroutines for level flight, turn, climb, take-off and landing performance • Point performance estimation for 3 Configurations • Mission Performance estimation for 3 Configurations • Report preparation 	9 (T8 = T0 + 24 Months)	<p>9 Man months with minimum 3 years relevant work experience with B.E./B.Tech /M.E/M.S/M.Sc(Engg) in Aeronautical engineering with experience in the areas mentioned in Milestone 8</p>

	<p><u>Propulsion System Activities</u></p> <ul style="list-style-type: none"> • Preparation of SOP and ATP document for propulsion system. • Preparation of test plan and test report. • Post run and post flight analysis 	<p>9 (T8 = T0 + 24 Months)</p>	<p>9 Man months with minimum 3 years of work experience in specified area in Milestone 8 with B.E/B.Tech in Aeronautical/mechanical /Automobile/Production engineering with tool experience in CATIA, CFD Mesh generation, Ansys Fluent and Matlab</p>
	<p><u>Structural Testing Activities</u></p> <ul style="list-style-type: none"> • Comparison of test result • Documentation for all the Testing related activities 	<p>6 (T8 = T0 + 24 Months)</p>	<p>6 Man months with minimum 3 years of work experience in modelling, design/analysis with B.E/B.Tech in Aeronautical/Mechanical engineering</p>
	<p><u>General System Activities</u></p> <p>Aircraft Thermal Management Activities:</p> <ul style="list-style-type: none"> • Testing and data compilation • Report preparation concluding on the configuration and conclusion from the prototype tests <p>Hydraulic System, and Dynamic System Including Landing Gear Activities:</p> <ul style="list-style-type: none"> • Analysis and review of all systems • Document generation for consolidating the results (all systems) 	<p>9 (T8 = T0 + 24 Months)</p>	<p>9 Man months with minimum 3 years of experience in the following areas</p> <ol style="list-style-type: none"> Experience in thermal analysis at aircraft level Experience in development of layout for coolant/air supply in aircraft Experience in integration of cooling system in aircrafts Experience in analysis of dynamic systems Experience in ADAMS and FEA software Experience in Design & Analysis of hydraulic systems Experience in AMESYM or equivalent software <p><u>Qualification</u></p> <p>Essential Qualification: BE/B.Tech – Mechanical Engg.) (Desirable Qualification: ME/M.Tech – Mechanical Engg.)</p>

	<p align="center"><u>Electro-Magnetic Studies</u></p> <p>Grid generation of 12 different configurations of aircraft/system/sub-systems at Ku-Band, and subsequently, Report preparation</p>	<p align="center">9 (T8 = T0 + 24 Months)</p>	<p>9 Man months with minimum 3 years aerospace experience in the following areas</p> <ul style="list-style-type: none"> • Experience in cleaning up geometry using CATIA • Experience in 2D structured and unstructured grid generation using Hypermesh or other grid generation software • Experience in 3D structured, unstructured, and layered grid generation using Hypermesh or other grid generation software
	<p align="center"><u>Composite Fabrication Activities</u></p> <ul style="list-style-type: none"> • Design support for manufacturing of prototype airframe 	<p align="center">3 (T8 = T0 + 24 Months)</p>	<p>3 Man months with minimum 2 years of experience with B.E./B.Tech in aerospace/mechanical engineering. Tool Experience in CATIA and other CAD/CAM software</p>
	<p align="center"><u>Structural Assembly Activities</u></p> <ul style="list-style-type: none"> • Support in integration of Aircraft structural components, Sub-assemblies and assemblies. • Assist in CG measurement • Ensure all the parts are assembled with proper fasteners, methods as per drawing. • Document preparation 	<p align="center">3 (T8 = T0 + 24 Months)</p>	<p>3 Man months with minimum 3 years of experience with B.E./B.Tech in aerospace/mechanical engineering with knowledge about Jigs, Fixtures, drawing symbols, aircraft parts manufacturing process, drawing reading, and assembly processes.</p>
	<p align="center"><u>Project related Activities</u></p> <ul style="list-style-type: none"> • Support in project related activities • Document preparation and handling 	<p align="center">12 (T8 = T0 + 24 Months)</p>	<p>12 Man months with B.E./B.Tech in aerospace/mechanical engineering</p>

4. Selection of Engineer's Team:

ADE may interview the firm engineers who will be responsible in execution of the technical activities as per Annexure-A.

FIRM ENGINEERS:

The team of firm engineers working for the proposed work must have one team leader in the following area

1. Structural Design Activities
2. Aero Activities
3. Propulsion System Activities
4. Structural Testing Activities
5. General System Activities (Aircraft Thermal Management, Hydraulic System and Dynamic System Including Landing Gear Activities)
6. Electromagnetic Studies
7. Composite Fabrication Activities
8. Structural Assembly Activities

The engineers must have required working experience in the area as mentioned in the scope of work. Engineers should have responsibility to take the team technically, administratively. Engineers will directly report to ADE coordinator.

General Terms and Conditions:

1. The design work may be executed by vendor's personnel within ADE's Premises using ADE's systems& infrastructure. The firm is not required to supply any equipment or raw material for the job. Jobs shall be executed according to the instructions and work sheets issued by the instructor or authorized officer on time bound basis.
2. Attendance will be monitored (either on register physical signature or biometric basis and minimum 8.5 hours working is mandatory on all working days.
3. On urgent need basis (if required), team may have to work on weekly offs/holidays. Suitable compensatory off will be provided for the same. The vendor/contractor concerned will also be required to produce a Police Verification certificate for having checked and cleared the character and antecedents of all the personnel who may be detailed by them to work inside ADE premises. An attested copy of the valid Passport of the individual concerned is also acceptable in lieu of the Police Verification certificate.
4. The vendor is responsible for incurring expenditure for any injury caused to their personnel who may be detailed to work at ADE, Bangalore and also during transit to the work places. ADE will not be responsible for any injury/death of deployed man power during the execution of design work.
5. In case of any change in the person(s) deployed in course of execution of the contract, vendor must ensure at least 2 weeks overlap between the outgoing and incoming person(s) in order to facilitate knowledge transfer process.
6. The offer must fulfill entire requirement of ADE and part supply is not permitted.
- 7. The vendor has to sign a formal Non-Disclosure Agreement with ADE before commencement of the job.**
8. ADE reserves the right to terminate the contract on following conditions
 - a. Not meeting timeline targets as defined above
 - b. Unannounced leave of employees (if they work in ADE premises)
 - c. Not adhering above terms
 - d. Discretion of Director ADE
9. Vendor must be responsible for any breach of rules including security rules; information pilferage, usage of electronic/memory devices like thumb drives/CD/DVD/mobile phones etc., inside ADE premises etc.

TIME SCHEDULE:

- i. The work will commence within 7 days from the date of PO.

5.3 Bidders are required to furnish clause by clause compliance of specifications bringing out clearly the deviations from specification, if any. Bidders are advised to submit compliance statement for the technical parameters separately in the following format along with the Techno-Commercial Bid:

Para of RFP specifications (item-wise)	Specifications of item offered	Compliance to RFP specifications – whether Yes / No Remarks	Remarks (In case of non-compliance, deviation from RFP to be specified in unambiguous terms. In case of compliance, catalogue/brochure reference, if available, to be indicated)

For Commercially-Off-The-Shelf (COTS) items, it is mandatory to enclose/ provide Catalogue/technical brochure to support the claims of compliance.

5.4 Delivery Period: Expected Delivery Period for supply of rendering services would be **24 months or the PDC date of Project which is earlier** from the Date of commencement of technical work by vendor and **vendor should commence outsourced technical activities within 07 working days from the date of PO**. Please note that the Contract can be cancelled unilaterally by the Buyer in case items are not received within the contracted delivery period. Extension of contracted delivery period with/ without LD clause will be at the sole discretion of the Buyer.

5.5 Consignee details:

Name	:	Director ADE
Address	:	New Thippasandra, Bangalore-560075
Contact details	:	(080)2505 7335/7841/7840, Fax No. :(080) 2505 7843 e-mail: mmdtec@ade.drdo.in, headmmd@ade.drdo.in

(Technical Officer B)

Part VI – Evaluation criteria of bids

6.1 Evaluation and acceptance Criteria of Bids: The bid will be considered and selected based on instructions contained in Part I and Part II of the RFP for further evaluation of bids as per sequence given below :

6.1.1 Techno-Commercial Bid Evaluation: Bids will be evaluated based on vendor qualification requirement as per Part IV of RFP, if applicable, and bids of the qualified bidders will be considered for further evaluation as mentioned in Part V of the RFP.

Note: Any quotation received with cost included in Technical bid would be liable for rejection.

6.1.2 Price Bid Evaluation: The Price bid of those bidders whose Techno-Commercial bid (if applicable) has been accepted will be opened and comparative statement will be prepared. The best acceptable bid will be decided upon the lowest price quoted by the particular Bidder as per the Price Format given at Part VII of the RFP.

6.2 Procedure for Cost Comparison: The basis for comparison of cost in different situations would be as follows:

- a) The financial bids of the qualified bidders will be compared on the basis of price quoted in the price bid format of the RFP/Bid document.
- b) **Total Cost for Indian bidders:** All the cost of the deliverables (FOR destination basis – consignment to Buyer's premises) and services including statutory levies, taxes and duties on final product which are to be paid extra as per actuals. Custom Duty on input materials will not be loaded in their total cost, if such duties are exempted under existing Notifications.
L1 will be based on the total cost of Lot unless specifically mentioned line items in the RFP.
- c) If the competition is only among Indian bidders, the financial comparison should be considered on the basis of FOR destination prices excluding statutory levies, taxes and duties payable on final product.
- d) If there is any discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price will prevail and the total price will be corrected accordingly.
- e) If there is any discrepancy between words and figures, the amount in words will prevail for calculation of price.
- f) The best acceptable bid will be considered further for placement of the Contract after price negotiation as decided by the Buyer.

Technical Officer B

Part VII – Price Bid Format

7.1 Price Bid Format: The Price Bid Format as per online BOQ (uploaded) to be filled by Bidder:

Note:

1. **Vendor should quote as per online BOQ only otherwise bids will be rejected.**
2. **Any quotation received with cost included in Technical bid would be liable for rejection.**

(Technical Officer B)

Appendix 'A'

(Refer Para 3.40 of part III)

COMMERCIAL TERMS AND CONDITIONS – ADE

Firms are requested to indicate their acceptance for under mentioned

Standard Commercial Terms & Conditions of ADE.

Our Quotation No. _____ & Date _____

<u>SI NO.</u>	<u>Commercial Terms</u>	<u>ADE Terms</u>	<u>Confirmation of vendors to ADE Terms</u>	
1.	Currency	In Indian Rupees Only	Yes/No	<input type="checkbox"/>
2.	Payment	As per Para 3.9, Part III of RFP.	Yes/No	<input type="checkbox"/>
3.	Terms of Service	F.O.R. ADE , Bangalore	Yes/No	<input type="checkbox"/>
4.	Delivery schedule	As mentioned in Tender documents (If not, indicate your Delivery Schedule).	Yes/No	<input type="checkbox"/>
5.	Validity of quote	180 days from the date of opening of the tender	Yes/No	<input type="checkbox"/>
6.	Goods and Service Tax (GST)	Indicate % of GST with supporting documents (As mentioned in Para 2.16, Part II of RFP).	_____% Yes/No	<input type="checkbox"/>
7.	Performance Security Bond	As per Para 3.2, part III of RFP.	Agreed/ Not Agreed	<input type="checkbox"/>
8.	Liquidated Damage (LD)	As per Para 2.10, Part II of RFP.	Agreed/ Not Agreed	<input type="checkbox"/>
9.	Registration with MSME/SSI/NSIC, if any	(If yes upload valid registration certificate with technical bid).	Yes/No	<input type="checkbox"/>
10.	Registration with ADE & Registration No. & Date.			<input type="checkbox"/>
11.	Registration No. with other DRDO Lab's/Other Govt. Organisation			<input type="checkbox"/>
12.	Copy of Registration Certificate Enclosed			<input type="checkbox"/>
13.	Make In India Declaration Form	Make In India Declaration Form Appendix B.	Submitted/ Not submitted	<input type="checkbox"/>
14.	Ordering Information [Order to be placed on]	(Indicate Name, Address of the firm, Contact No. and Email Id).		

Note: Vendors are requested to submit this format duly completed with their seal and signature along with their quotation. Non submission of this format may lead to rejection of your offer.

Note:

- N-1 :** Those bid received without Make In India Declaration Form is liable for rejection of bid without any notice.
- N-2 :** I/We certify that in the past we have never been banned/debarred for doing business dealings with Ministry of Defence/Govt. of India/ any other Govt. organisation and that there is no enquiry going on by CBI/ED/any other Govt. agency against us.
- N-3 :** If the vendors are not registered with ADE/other Govt. organisation it is advised to get registered with ADE. For registration contact Smt. Justepher Xavier (Store Officer 'B') Ph. No. 080-2505 7332/7346.
- N-4 :** It is mandatory to register in GeM Portal for release of OAL/PO .If the vendors are not registered with GeM Portal, it is advised to get registered with GeM immediately.
Web URL: <https://mkp.gem.gov.in/registration/signup#!/seller>.

Mail Id: helpdesk-gem [at]gov[dot]in; **Toll free Number:**1800-419-3436;1800-102-3436.

Make In India Declaration Form

A certificate in company's letterhead to be provided for compliance to the make in India

Sl. No	Clause	Remark of vendor
1	Only bidders who qualify as "LOCAL SUPPLIERS (either as class - I or class -II local suppliers)" as per Government order No. No. P-45021/2/2017-PP (BE-II) dated 16 th Sep 2020 issued by Govt. of India, Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (Public Procurement Section), New Delhi [Subject: Public procurement (preference to Make in India), Order 2017-Revision] are eligible to participate in the tender.	
2	Any bidder from such countries sharing 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 the Competent Authority as provided in Govt. of India order (Public Procurement No. 1) vide F. No. 6/18/2019-PPD dated 23 Jul 2020.	
3.	<i>Provide the list of item/systems/components and their country of origin with your technical bid for evaluation</i>	
4.	Total foreign content as Percentage (%) _____ of the bid basic value	
<p>Note: For Bids more than 10 crores provide a certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or chartered accountant in respect of suppliers other than companies giving the percentage of local content.</p>		

(Signature of the Bidder, with Official Seal)