

Design of passive underground structure for storage of fresh food in high altitude

High altitude regions like Ladakh hold great strategic importance due to sharing of the border with neighbouring nations. As a result, the focus of military deployment is heavily concentrated in the regions. To fulfill the food and nutritional requirement of troops deployed in Ladakh, fresh vegetables & fruits are procured from local farmers and transported by air and road from other parts of the country. A lot of fresh food is spoiled in sub-zero temperatures during winters due to lack of adequate storage facilities. This results in heavy expenditure with deterioration in the quality of the fresh food.

Energy requirement is the main concern in the design of an adequate storage facility in high altitude conditions. In order to cater to this issue, DIHAR has developed the design of a passive underground structure for the storage of fresh vegetables and fruits that utilizes geothermal energy to maintain the adequate temperature inside the store when the outside temperature goes up to -25°C . The required humidity is also regulated inside the structure according to the stored varieties of vegetables and fruits.

On the basis of a study on various quality (physical and biochemical) parameters, it has been observed that certain vegetables and fruits can be stored from November to March/April without compromising the quality. Designs of simulated structures of different capacities have also been extended from the existing structure. The design details along with structural drawings will be provided under the ToT.

Interested industries are requested to submit their financial bid in sealed envelope, along with relevant documents as per the list in appendix-A, through one of the following agencies only, to DRDO before the bid ending date:

S. No	Name of the Agency	Point of Contact
1	<p>National Research Development Corporation Address :20-22, Zamroodhpur Community Centre, Kailash Colony Extn. New Delhi - 110048</p> <p>Tel : +91-11-29240401 to 29240407 Fax: +91-11-29240409 / 29240410 General E-mail : write2[at]nrdc[dot]in</p>	<p>Shri Rajendra Gondane Sr. Manager (Business Development) National Research Development Corporation 20-22, Zamroodhpur Community Centre, Kailash Colony Extn. New Delhi - 110048 INDIA</p> <p>Mobile : +91-9910496554 EPABX : +91-11-29240401-07 (Extn. 444) Fax : +91-11-29240409 -10 Email : rgondane[at]nrdc[dot]in Website : www[dot]nrdcindia[dot]com</p>
2	<p>PHD Chamber of Commerce and Industry Address: PHD House, 4/2 Siri Institutional Area, August Kranti Marg, New Delhi 110016</p> <p>Tel : 91-11-26863801-04, 49545454 Fax : 91-11-26855450, 49545451 Website : www.phdcci.in E-mail : phdcci[at]phdcci[dot]in</p>	<p>Shri Nasir Jamal Joint Secretary PHD Chamber of Commerce & Industry Address: PHD House, 4/2 Siri Institutional Area, August Kranti Marg, New Delhi 110016 INDIA</p> <p>Mobile : +91-9810185714, 8210343267 Phone : +91-11-49545454, 49545400 Extn : 279 Fax : +91-11-26855450</p>
3	<p>Confederation of Indian Industry (CII) Address: The Mantosh Sondhi Centre 23, Institutional Area, Lodi Road, New Delhi - 110 003 (India)</p> <p>Tel : 91 11 45771000 / 24629994-7 Fax : 91 11 24626149 E-Mail : info[at]cii[dot]in Website : www.cii.in</p>	<p>Shri Amit Kumar Deputy Director – Defence & Aerospace Society of Indian Defence Manufacturers (SIDM) C/o Confederation of Indian Industry (CII) Address: 3rd Floor, IGSSS, 28 Institutional Area, Lodhi Road, New Delhi – 110003 INDIA</p> <p>Mobile : +91-9990059163 Phone : +91-11-45772062 Fax : +91-11-45772022 Email : amit[dot]kumar[at]cii[dot]in Website : www.sidm.in</p>

4	<p>The Associated Chambers of Commerce and Industry of India (ASSOCHAM) 4th Floor, YMCA Cultural Centre and Library Building, 01, Jai Singh Road, New Delhi - 110001</p> <p>Phone: 46550555 (Hunting Line) Fax: 01123347008/9 Website :www[dot]assochem[dot]org</p>	<p>Ms Kavita Sharma Addl Director and Head - Energy and Infra Mobile : 09871801002 Tele: 0091-11-23347040 Email: kavita[dot]sharma[at]assochem[dot]com Website : www.assochem.org </p>
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List of Supporting Documents to be Attached / Enclosed

- (a) Memorandum and Articles of Association (Should be incorporated as per Indian Companies Act, as amended time to time)
- (b) Certificates of registration as a manufacturing unit, if any.
- (c) Audited Balance Sheet for the preceding three years.
- (d) Income Tax returns for the preceding three year period
- (e) Details of shareholding/ownership pattern especially foreign partners/ shareholders, foreign employees, directors, etc. The company must adhere to the prevailing Govt of India policies and regulations on Foreign Direct Investment (FDI)/DIPP norms as applicable.
- (f) Annual budget for R&D during last three years.
- (g) Numbers and details of IPR or patents, etc., held by the company.
- (h) Number of technically or professionally qualified personnel.
- (i) Record of past performance (e.g., Supply orders executed against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).
- (j) Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise.
- (k) List of Testing and Support equipment's
- (l) ISO/ ISI certification or any other certification
- (m) Relevant clearances form the authorities/ ministries (if any)
- (n) Capacity and capability to undertake developmental work and to accept attendant financial and commercial risks.
- (o) Capacity/capability to market the product through the marketing network, sales and service network, reliability to maintain confidentiality.
- (p) PESO and DPIIT license for explosive handling if ToT is for high energy Material, explosives, propellants, and component/ system dealing with it etc.
- (q) Under taking form company seeking ToT that none of its Directors, Independent Directors, non-executive Directors, Key management personnel are involved in any corrupt practices, unfair means and illegal activities.
- (r) Details of the industrials license for defence manufacturing be provided by the industry seeking ToTs.