

**GOVERNMENT OF PAKISTAN**  
**HEADQUARTERS NATIONAL LOGISTICS CORPORATION**  
**INVITATION TO TENDER FOR SUPPLY OF**  
**LPG BOWZERS AT HEADQUARTER LOGISTICS SERVICES (KARACHI)**  
**INSTRUCTION TO TENDERERS - WORDS OF CAUTION**

1. **Participation of Tender**. The tender can be participated by manufacturers/ importers/ Assemblers of LPG Bowzers who are authorized representatives of OEMs.
2. **Eligibility / Bid Qualification Criteria**. The bidder must prove his eligibility by completing the Bid Qualification Criteria as listed in **Annex 'A'**.
3. **Special Conditions**
  - a. Offer should also accompany complete technical details of the LPG Bowzer, as per **Annex 'B'**.
  - b. Offers must be accompanied by the schedule to tender duly completed / signed by authorized executive of the firm without which the offer will not be entertained.
  - c. ADR Certification Req by OGRA & UN ECE105 travel type approval, NHA, OGRA and Ministry of Energy certifications should be provided.
  - d. The offer must include following as responsibility of the contractors: -
    - (1). Commissioning of the equipment.
    - (2). Warranty as per requirement of NLC/ OEM provided up to international standards.
    - (3). Technical Brochure (English).
    - (4). Software (English Version).
    - (5). After sales support in terms of spares and maintenance.
  - e. The offer should also accompany complete technical data of the stores. Any change in technical offer and final contract specification sheet would render the supplier liable to forfeit use of bid security and cancellation of order unless permitted by the purchaser during technical evaluation.

- f. Prices should be quoted on FOR Sost and FOR Karachi basis.
- g. Offer must accompany the schedule to this tender (NL-2) duly completed.
- h. Collaboration of License/ Certificates by OEM.
- i. Location of manufacture/ Supplier / Manufacturing facility be attached.
- j. NLC reserves the right to reject all bids at any time prior to the acceptance or to increase/ decrease the quantity during or before finalization of contract.
- k. For local supplier/ manufacturer only those firms can participate who are on the active tax payer list of FBR.
- l. Certificate from the OEM that all major assemblies / components (including tyres) fitted with quoted equipment are from same origin/ region.
- m. OEM to also certify that no Indian made assembly/ part has been fitted in the equipment or component/ spare used in the major assembly of the main equipment.
- n. Financial quoted (duly sealed) for each of the equipment e submitted in a separate envelope.
- o. Maintenance schedule requiring change of consumable parts be also submitted with each equipment/ technical offer with price list of those consumable parts.
- p. Maintenance services for two year.
- q. Firm will carry out inspection and maintenance of the equipment after every quarter and will sign a certificate to the serviceability effect of the equipment during the warranty period.
- r. Offer through fax/ email will not be accepted.
- s. Offer not received as per NLC requirement is liable to be rejected at any stage of the tender.
- t. Quoted LPG Bowser to strictly comply with safety standards/NFPA and OGRA directives issued from time to time and must comply with prescribed weight limits of National Highway Authority (NHA). Specifically, the maximum allowable weight for LPG Bowser is 58.5 MT (30 MT LPG at 85%)

with a 6-axle (Tendem-Tridem) configuration. Suppliers to certify that bowzers are manufactured in accordance with approved standards inter-alia including ASME BPVE (Section VIII), PD-5500, BS-5500, GB-5100, BS-EN 12493 etc. for Tank Sheet thickness, Safety valves and other essential components while ensuring through inspections and testing to meet safety and quality requirements. Any observation or failure in compliance shall result in disqualification/rejection of bid. Additionally, quoted LPG bowzer shall strictly adhere to limit of prescribed weight to axle ratio of NHA.

- u. The total required quantity is **40 bowzers**; however, firms may quote for a minimum quantity of **10 bowzers**, and partial quantities will be accepted to expedite delivery in view of the urgent operational requirement.

**Note:-** Offers not complying with the above special instructions in addition to other conditions will NOT be entertained.

4. **Rejection of Bid.** A bid will be rejected under following circumstances: -
  - a. Bids not qualifying the qualification criteria as mention in **Annex 'A'**.
  - b. Offers not accompanied with complete technical detail of LPG Bowzers.
  - c. Non responsive bid to any single required criteria / specification.
  - d. Late submission of tender from given date & time.
  - e. Offers not complying with the special instructions (para 3) in addition to other conditions.
5. **Specifications.** Specifications of LPG Bowzers is attached at **Annex 'B'**. The bid should essentially conform to the required specifications.
6. **Submission of Tender.** The original copy of the tender is to be enclosed in double cover. (i) Technical Offer (ii) Commercial Offer, separately. Inner envelopes should be properly sealed and mentioning Tender Enquiry Number and date of opening, while the outer envelope should mention only address of this office. All the requirements of LPG Bowzers as per "**Annex B**" must be attached with Technical offer.
7. **Date and Time for Submission of Tender**
  - a. Tender must reach at HQ NLC, HARDING ROAD, RAWALPINDI, by the date and time specified in tender notice by hand or by post.
  - b. Tender must be dropped in the tender box before given time.

- c. NLC will not be responsible for delay occurring in post.
8. **Price**
- a. The firms should quote all **FOR Sost and FOR Karachi** basis.
  - b. Local cost for inspections and government regulatory approval be mentioned separately.
  - c. The final price should be inclusive of all **taxes and charges etc.**
  - d. The price should be quoted in figures and words.
  - e. Additional information, if any, must be linked with entries on the Schedule to Tender.
  - f. Prices quoted should be firm and final.
  - g. Tax exemption (if any) may be provided with the tender documents.
  - h. Firm will also submit proof of submission of 0.25% stamp duty as per Stamp Duty Act 1899, which is already imposed by Govt of Pakistan against total value of the contract.
9. **Validity of Offers**. The validity period of quoted rates must be indicated and should be at least 60 x days from the date of opening the tender without any condition, extendable for further processing of the case, if required.
10. **Delivery Schedule**. Firm will start delivery/shipment within 120 x days after award of contract/issuance of Letter of Intent (whichever is earlier) and complete within 6 months.
11. **Inspections**
- a. **Post qualification Inspection**. Post qualification of facility will be carried out for evaluation of quality, design capability, production capacity, qualified engineers, customer base financial capability and international certifications such as ASME, ADR etc. For this purpose, visit of facility will be carried out.
  - b. **Stage Inspection**. Inspection of LPG Bowzers will be carried out at factory by 3-5 members team of NLC during production at factory.
  - c. **Pre-Shipment Inspection**. Inspection of LPG Bowzers will be carried out at factory by 3-5 members team of NLC before shipment.
  - d. **Third Party Inspection**. Third party inspection by firms attached at **Annex 'D'** will be accepted. Preferably same 3<sup>rd</sup> party may be engaged to carryout inspection in Pakistan as OGRA (Government of Pakistan) requirement (para-17 below).

- e. **Final Inspection.** Before taking over by consignee at Karachi port/ Inland port (Imported) or firm's premises (local).
12. **Terms of Payment**
- a. 30% Advance against advance bank guarantee.
  - b. 40% on delivery of equipment.
  - c. 30% after acceptance and issuance of CRV.
13. **Tender Fee and Bid Security.** Bid security Rs.1,000,000/- and Tender Fee i.e Rs. 2,000 in the shape of bank draft in favor of **National Logistics Corporation HQ Main Account** must be attached with technical offer.
14. **Performance Bank Guarantee**
- a. Performance Bank guarantee valuing 5% of Contract value must be provided / deposited by the successful firm for award of contract, within 15 days from the signing of the contract / issuance of Letter of Intent (whichever is earlier) and valid till one month after warranty period. It shall be in form of Bank Guarantee from a Pakistani scheduled bank of "AA" rating.
15. **Export Licenses.** The Supplier shall be responsible for obtaining export licenses from Country of Origin as required. Any delay in shipment caused due to export license shall not be considered "FORCE MAJEURE". Additional cost / Liquidated damages etc shall be borne by the Supplier.
16. **Certificate of ADR Compliance.** In accordance with the requirements to Accord Dangerous Router (ADR) - Dangerous Goods Transportation who cross the border, LPG bowzers manufactured in accordance with ADR regulations sect 9.2 must have UN/ECE 105 type approval. A certificate of ADR compliance for each LPG Bowzer at time of delivery will be provided by the supplier from the OEM.
17. **OGRA Certification.** The bowzers will operate in Pakistan and abroad. The supplier needs to acquaint himself with the relevant regulatory provisions stipulated by OGRA Pakistan. Among other provisions additional 3rd party inspection for imported bowzers, approval from OGRA and Ministry of explosives and any other provision will be responsibility of supplier. Cost in local currency (PKR), if any, will be given separately in the financial quote.
18. **Stamp Duty.** Firm will deposit 0.25% amount against total value of the contract. The stamp duty is imposed by Government of Pakistan as per Stamp Duty Act 1899 and it is responsibility of contractor/firm to deposit stamp duty.

19. **Late Delivery.** Late Delivery charges will be imposed @ 1% per month on total cost of contract with effect from original delivery date.
20. **Warranty Period.** The **warranty period** of equipment will be **minimum two year** or more as specified by the OEM starting from the date of CRV.
21. **Risk and Expense.** Failure to supply the goods quoted or failure to meet the commitment made regarding delivery schedule, specifications etc. will authorize HQ NLC to purchase the items at firm's risk and cost.
22. **Arbitration.** Any bidder feeling aggrieved by any act of procuring agency after submission of his bid and prior to award of the contract may lodge a written complaint to procurement agency under PPRA Rule - 48.
23. **Force Majeure.** The supplier will not be held responsible for any delay occurring in the supply of contracted stores due to event of force majeure such as Act of God, War, Riots, Civil Commotion's Strikes, lock out or disturbance directly affecting the supply over which the supplier has no control. In such an event the contractor shall inform the Purchaser within 15 days of the happening in writing. Non-availability of raw material for the manufacture of stores or the export permit for the export of the contracted stores from the country of its origin shall not constitute Force Majeure.
24. **Comparison Chart.** Firms will also attach comparison chart along with their offer on following lines: -

| NLC Specification | Firms Specification | Complied with or Not with comments / explanations and alternate provision |
|-------------------|---------------------|---------------------------------------------------------------------------|
|                   |                     |                                                                           |

25. **Evaluation.** Technical offer of bidder found eligible and qualified as per **Annex "A"** will be evaluated, as per criteria of **Annex "B"**. Financial offer of technically approved bidders will be opened and evaluated on the basis of price, after order confirmation.
26. **Contact and Cut-off Date for Bid Clarification.** For any clarification, please contact on following e-mail address till \_\_\_\_\_ **2026**: -

Assistant Manager Procurement  
[akif.ali@nlc.com.pk](mailto:akif.ali@nlc.com.pk)  
 HQ NLC Harding Road Rwp

General Manager Procurement  
HQ NLC

**HEADQUARTERS NATIONAL LOGISTICS CORPORATION****GENERAL CONDITIONS GOVERNING CONTRACT**

1. Tender will be opened at HQ NLC HARDING ROAD NEAR AFIRM RAWALPINDI at Date and Time mentioned in the websites.
2. Tender will be submitted in accordance with **PPRA Rule 27(b)** i.e Single Stage - Two Envelope Procedure.
3. Detail of LPG Bowzers required to be procured as per specifications attached at **Annex “B”**: -

| Description                                          | Specification  | Quantity  | Location                  |
|------------------------------------------------------|----------------|-----------|---------------------------|
| <b>LPG Bowzers<br/>Usable Capacity<br/>30 M Tons</b> | Att at Anx, B, | <b>40</b> | <b>Karachi /<br/>Sost</b> |

**\*Note:**

- a. Quantity may decrease.
- b. **The total required quantity is 40 bowzers; however, firms may quote for a minimum quantity of 10 bowzers, and partial quantities will be accepted to expedite delivery in view of the urgent operational requirement.**
- c. Detail of LPG Bowzers (As Per Specs) should be attached.

General Manager Procurement  
HQ NLC

Address\_\_\_\_\_

Telephone\_\_\_\_\_

Code Used\_\_\_\_\_

From: \_\_\_\_\_

To:

**THE DIRECTOR GENERAL**

**NATIONAL LOGISTICS CORPORATION QMG's BRANCH**

**HARDING ROAD RAWALPINDI**

Dear Sir,

1. I/We hereby offer to supply to the Director General NLC, the stores as per detail in the Scheduled hereto or such portion thereof as you may specify in the contract at the prices given in the said schedule and agree to hold this offer open till \_\_\_\_\_. I/We shall be bound by a communication of acceptance dispatched within the prescribed time.
2. I/We hereby certify own eligibility as per Annex "A" to NL-1
3. I/We have understood the instructions to Tenders and Conditions of Contract as laid down in form NL-2 to "General Conditions Governing Contracts" and have thoroughly examined the specificity/drawing and or pattern quoted in the schedule hereto and am/are fully aware to the nature of the stores required and my/our offer is to supply stores strictly in accordance with the requirements.
4. Recommended technical manual / data are also enclosed with the offer.
5. The following pages have been added to and form part of this tender.

Your faithfully

(Signature of Tendered)

Address\_\_\_\_\_

Dated \_\_\_\_\_

Signature of witness\_\_\_\_\_

Address\_\_\_\_\_

**BID QUALIFICATION CRITERIA**

| <b>Ser</b> | <b>Check List</b>                                                                                                                                              |  |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1.         | Tender Fee                                                                                                                                                     |  |
| 2.         | Bid Security                                                                                                                                                   |  |
| 3.         | Copy of NTN / STRN and Active Tax Filer Certificate with 100% compliance                                                                                       |  |
| 4.         | Authorization Letter from OEM (if importer)                                                                                                                    |  |
| 5.         | Complete specifications of LPG Bowzers                                                                                                                         |  |
| 6.         | Comparison Chart with NLC specification and test criteria in Annex ‘B’                                                                                         |  |
| 7.         | Not Blacklisting Affidavit                                                                                                                                     |  |
| 8.         | Certificate to accept all conditions of tender w/o exception                                                                                                   |  |
| 9.         | Hierarchy of the firm along with portfolio of owner, top management and project officer with their names be attached                                           |  |
| 10.        | Bidders must have workshop, facilities and human resource in Karachi, Pakistan, for life cycle support and capacity building of user.                          |  |
| 11.        | OEM must have at least 10 years’ experience in manufacturing of LPG Bowzers and must provide documentary evidence in this connection along with customer base. |  |
| 12.        | Bidder’s minimum Turnover in last 03 financial years (\$500,000 per year).                                                                                     |  |
| 13.        | Letter from any two major LPG operators, acknowledging usage and acceptability of OEM’s built LPG Bowzers.                                                     |  |

## Technical Compliance Sheet

Supply of LPG Bowsers (tank & trailer unit) Capacity 30 M Tons (85%), along with all accessories complete in all aspects fulfilling the attached Technical Specifications comprising but not limited to following:

**Note: Technical requirements must be fulfilled in the light of scope of work attached. If brochure provided by the firm is referred in compliance column then there should a proper reference of para and page no.**

| Sr No             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Technical Compliance (Yes / No)<br>Required / alternate information should be filled duly supported by drawings documents |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>LPG Bowzer</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                           |
| 1.                | Tankers are mandatory to comply with latest editions of PD 5500, BS 5500 GB 5100, ASME Sec VIII Div – I / II, EN 12493.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                           |
| 2.                | <p>Following / equivalent details are required as per the offered design code:</p> <ul style="list-style-type: none"> <li>a. Design Code</li> <li>b. Power Piping system ASME B 31.3 or equivalent</li> <li>c. COP2 or equivalent</li> <li>d. BS 7122 or equivalent</li> <li>e. BSP or equivalent</li> </ul> <p>Compliance to following is mandatory</p> <ul style="list-style-type: none"> <li>f. NFPA 58 (The National Fire Protection Association)</li> <li>g. The mineral and industrial gases safety rules-2010, LPG rules 2001</li> <li>h. Petroleum act 1934, NHA regulations (Axle load compliance)</li> </ul> <p>OGRA regulations including but not limited to SRO - S.R.O.900(I)/2009.</p> |                                                                                                                           |
| 3.                | <b>Required approval from Ministry of Energy, NHA and OGRA will be responsibility of firm.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                           |
| 4.                | The tankers shall be inclusive of all required valves/fitting/gauging (requisite specification and list of valves is <b>attached at Anx C</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                           |
| 5.                | Maximum overall length with PM is 17.4m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                           |
| 6.                | Maximum outer width is 2.5m, excl tyres bulge & wing mirrors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                           |
| 7.                | <b>Manufacturing Facility:</b> Manufacturer's facility must have ASME or equivalent certification for manufacturing of LPG bowsers. Facility should be on panel of OGRA. (Certificates to be attached with technical bid). In case of imported LPG Bowzer, manufacturer must have an ASME or equivalent certification                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                           |
| 8.                | <p><b>Design:</b></p> <ul style="list-style-type: none"> <li>a. Bidder needs to submit approved design, verified by any of the Accredited Third Party, hired by Bidder, along with the bid. Inspector's CV and qualification certificate as per Scope of Work Point 1b will be provided.</li> <li>b. NLC reserves the right to validate / review the design. Bidder will have to comply to the suggested minor changes in design before issuance of purchase order. Otherwise NLC has the right to reject the design.</li> </ul>                                                                                                                                                                     |                                                                                                                           |
| 9.                | <b>Third Party Inspection:</b> Third Party Inspection will be carried out in case of local manufactured and imported LPG Bowzer by the pre-qualified inspectors from one of the agencies ( <b>list is attached at Anx D</b> ). Financial quote shall include price of the third-party inspection separately.                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                           |

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|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 10. | <p>Team NLC comprising of 2 to 3 members will carry out visit / inspection of the facility and production line on following occasion:</p> <ol style="list-style-type: none"> <li>During evaluation or before awarding of contract</li> <li>2x stage inspections</li> <li>Pre-shipment or pre-delivery inspection</li> </ol> <p><b>Note:</b> Administrative cost of each inspection / visit will be mentioned separately in commercial offer.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| 11. | <p>Following must be mentioned on or attached with the approved design along with background calculations. <b>Bid received without anyone of these documents /dimensions /calculations shall be rejected without any clarification.</b></p> <ol style="list-style-type: none"> <li>Name of Product</li> <li>Axle wise load distribution including front axle, drive axles and rear axles along with calculations for filled tanker</li> <li>D- value for kingpin along with calculations and literature of kingpin selected.</li> <li>Stress analysis for the piping.</li> <li>Total weight of empty tank &lt; 12.5 ton (above 12.5 ton will not be accepted)</li> <li>Total weight of empty tank &amp; trailer and filled tank &amp; trailer including all piping, under-chassis equipment, instruments and support structures</li> <li>Height of the tanker from rear as well as from front dish end.</li> <li>Length from rear most end of the tanker to kingpin center.</li> <li>Kingpin forward projection i.e., from kingpin to front dish end</li> <li>Clearance distance from Prime Mover chassis rear most end to landing legs.</li> <li>Swing clearance which is vertical distance between chassis rear most end to bowser.</li> <li>Height of center of gravity along with calculation for filled as well as for empty tanker.</li> <li>Width of the vessel (ID &amp; Thickness) as well as outer track distance. i.e., distance between outer ends of the outer tyres on bowser axle.</li> <li>Total length of the bowser (tank &amp; trailer) along with individual shells/cones/dish-ends lengths.</li> <li>Calculation that designed bowser can withstand the forces upto 3g during acceleration/deceleration as per Mineral and gas safety rules clause 105(02).</li> <li>No. of baffles, design of baffles and volume in each separation.</li> <li>Ground clearance of the bowser along with height of vessel lower end from ground.</li> <li>Complete design calculations along with literature highlighting the models of the equipment, instrument and fittings/valves.</li> </ol> |  |
| 12. | <p>The resulting weight of the barrel, suspension / chassis and Truck preferably 6x4 configuration vehicle of 340-400 HP) should not exceed NHA load limits. <b>(Prime Movers, Isuzu CYZ 390 HP and Sitrak C7H 390 HP)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 13. | <p>Directive 2010/35/EU certification will be provided by any accredited third party.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |

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|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 14.            | Product: LPG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| 15.            | Barrel manufacturing code:                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 16.            | Specific gravity: 0.53                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| 17.            | Water capacity in liters:                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| 18.            | Material of vessel:                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| 19.            | Heat treatment:                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 20.            | Temperature range: -20 C to 55 C                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 21.            | Filling limit: 29.7 to 30 ton LPG                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| 22.            | Ullage: 15%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| 23.            | Design pressure: 17.24 Bar                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 24.            | Corrosion allowance:                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| 25.            | Design Life :25 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| 26.            | Pneumatic test pressure: 8 bar                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 27.            | Hydrostatic test (as per the design code):                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 28.            | Impact Test:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| 29.            | Tanker volume calibration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 30.            | Piping: Details be provided as per <b>Anx – C</b>                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| 31.            | Calculation for stress analysis are to be provided with the bid.                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 32.            | NDT (Nondestructive Test): 100 % RT (Radiographic Testing) of weld seams, Full Penetration Joints UT (Ultrasound) and 100% MPT of nozzle joints and all nozzle to shell/head will be full penetration joints.<br>Peaking and acceptance of NDE (Nondestructive Evaluation) will be as per BS EN 12493 or equivalent.<br>All design loads as mentioned BS EN 12493 Chapter 5 or equivalent for the offered design code shall be considered.                                                    |  |
| 33.            | <b>Paint:</b> As follows:<br>(1) Sand blasting to SA 2<br>(2) Coat High build Epoxy zinc phosphate primer with 50 microns DFT (Dry Film Thickness).<br>(3) 2- Coats of Epoxy Ultra Liner Intermediate with 125 microns DFT per coat.<br>(4) 1- Coat of Polyurethane finishes with 75 microns DFT<br>(5) Logo of NLC will be required on tanker and bowzer. Design and specification will be shared on award of purchase order.                                                                |  |
| 34.            | <b>Valve box:</b> Fabrication of a valve/nozzle box; housing the piping system (incl. tool box, 2 fire extinguisher boxes and mud guards). Valve Box should be accessible through hydraulically / manually operated steel door.                                                                                                                                                                                                                                                               |  |
| 35.            | Tool box of steel to allow storage of tools                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| 36.            | <b>Hazchem Sign:</b> Product Specification Signs need to be fitted on sides and rear of the tanker. ( <b>details attached at Anx C</b> )                                                                                                                                                                                                                                                                                                                                                      |  |
| 37.            | <b>Ladder:</b> Provide a ladder to access the top of vessel.                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| <b>Trailer</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 38.            | Compliance to ECE R105 Regulations and ADR – 2007/46/EC                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| 39.            | Imported brake system as per following details: -<br>a. 4S/2M ABS ( <b>SORL/KORMEE /WABCO or equivalent</b> )<br>b. Automatic and adjustable two circuits pneumatic braking system acting on all wheels contemporaneously with half coupling (ISO palm type).<br>c. Servo distributor and emergency valve which automatically activates the brakes in case of accidental detachment from the towing vehicle.<br>d. Braking element made of brake chambers.<br>e. Parking brake pneumatic type |  |
| 40.            | a. King pin 3.5-inch Jost, capable of tracking laden tanker<br>b. Height of Fifth wheel 1250-1325mm                                                                                                                                                                                                                                                                                                                                                                                           |  |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 41. | Consisting of 3 Axles of <b>FOSHAN / FUWA</b> or equivalent with following specifications :<br>a. Each axle capable of carrying minimum 14 tons at 80 km / hr speed.<br>b. Tubular square shaped section                                                                                                                                                                                                                                                                                                                                                           |  |
| 42. | <b>Landing Gear / Legs:</b><br>Two landing jacks of reputable brands, two speed telescopic type manually operated with handle on passenger side (left hand side). Static load capacity 30 to 40 tons each leg and lifting capacity 14 tons each leg ( <b>JOST / FUWA or equivalent</b> ).                                                                                                                                                                                                                                                                          |  |
| 43. | <b>Suspension</b><br>Suspension is suitable for the intended payload as indicated. Comprising of half elliptical laminated multi flexibility leaf springs made of silicon manganese steel, compatible with axle loading. Load balanced on axles by means of equalizers. Load difference amongst the axle not to exceed by 5%. Axles are connected to the supports by traction tie rod. (Suspension should comply with design, and loading considerations including stability of a vehicle having a min. GCW as per NHA load limits)                                |  |
| 44. | Wheel rims: 1100 x 20 (10 holes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| 45. | <b>Electrical kit:</b> 1 set in line with ADR Standard.<br>Imported electrical system according to applicable quality standard 24 volt with shock absorbed lamp holder, 7 pin half coupling of ISO standard, junction box, wire harness properly clamped to chassis with insulation for severe tropical weather resistance from - 15C° to 55C° in line with ADR Standard.                                                                                                                                                                                          |  |
| 46. | <b>Tyres:</b> Size 1100 x 20, Type: Tubeless, radial, Speed symbol 152/148L @120 psi, Load indices (Single/Dual) =3500/3100 minimum, All position tyre, Suitable for Pakistan roads conditions and environment, Date of manufacturing not more than one year old, (13 Nos) with 2 Nos. spare wheels storage rack arrangement. attached (recommended tyres brand are mentioned in tender document.                                                                                                                                                                  |  |
| 47. | <b>Bumpers:</b> All requisite; rear, front and side with safety signs. All main bumpers to have under run protection.                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 48. | Side Guards need to be provided on both sides of the tanker for protecting from pedestrians and two wheelers etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| 49. | <b>Mud guards:</b> made of Iron with rubber mud flaps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| 50. | <b>Drive Away Protection:</b> Drive Away Protection System need to be provided for parked vehicle                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| 51. | <b>Warranty</b> for minimum 2 years from the date of acceptance in Pakistan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| 52. | <b>Training:</b> Comprehensive training for operations and maintenance be proposed for the entire crew and technicians. Training package should be OEM certified.                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| 53. | <b>Life Cycle Support of Bowzer and Trailer:</b> Life support include following:<br>a. Repair and Maintenance Services Facility and mechanism, especially supported by a workshop in Karachi.<br>b. Mechanism of warranty compliance through repair and supply of spare parts / assemblies immediately to ensure zero down time; warranty settlement will be done in its course and will not hamper operations.<br>c. Measuring, maintenance and special tools and equipment for operations with their purpose will be listed and provided along with the bowzers. |  |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <ul style="list-style-type: none"> <li>d. Manufacturer to offer free of cost fast moving spares with Bowzer and Trailers for 2 year. List to be attached with the offer.</li> <li>e. Manufacturer's price list of all spares / assemblies be provided with prices in FE, Pak Rs, applicable duties and offered discount.</li> <li>f. Certificate guaranteeing availability of spares for the next 10 years in Pakistan be provided.</li> <li>g. Life cycle cost, including mandatory change lubricants, filters, expendables, likely change parts/ assemblies and repairs be provided for 5 years. Source and cost in Pakistan be provided.</li> <li>h. Provide the mechanism / schedule of the required inspection / periodic maintenance / tests of the bowzer and trailer to keep them operational for 10 years in Pakistan and abroad for TIR under the prevalent regulatory regimes covering entire aspects of technical, safety and operations.</li> <li>i. Service, repair, operational manuals &amp; parts catalogue manual will be provided.</li> </ul> |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

**Anx - C****PIPING, JOINTS, HAZCHEM & UNDER CHASIS DETAILS**

The relevant about the required valves, joints, under chassis and Hazchem codes are mentioned below.

**1) List of Valves**

| S No.                          | Description                                | Prod. no.  | Unit | Qty / Tank | Brand                |
|--------------------------------|--------------------------------------------|------------|------|------------|----------------------|
| <b>Filling Line</b>            |                                            |            |      |            |                      |
| 1.                             | 3" FULLY INTERNAL BACK CHECK VALVE         | A3400L6    | NOS. | 1          | REGO / Equivalent    |
| 2.                             | 3" FLANGED ANTI F/S BALL VALVE             |            | NOS. | 2          | JC / Equivalent      |
| 3.                             | 3"X3.25 DOUBLE BACK CHECK ACME VALVE + CAP | 3197C      | NOS. | 1          | REGO/ Equivalent     |
| 4.                             | 1/2" HYDROSTATIC VALVE                     | 3129K      | NOS. | 2          | REGO/ Equivalent     |
| <b>Delivery</b>                |                                            |            |      |            |                      |
| 1.                             | 3" FLANGED INTERNAL VALVE                  | A3219F600L | NOS. | 1          | REGO/ Equivalent     |
| 2.                             | PNEUMATIC ACTUATOR                         | A3219FPA   | NOS. | 1          | REGO/ Equivalent     |
| 3.                             | 3"X3.25 ACME CONNECTION + CAP              | A5769K     | NOS. | 1          | REGO/ Equivalent     |
| 4.                             | 3" FLANGED ANTI F/S BALL VALVE             |            | NOS. | 1          | JC/ Equivalent       |
| 5.                             | 1/2" HYDROSTATIC VALVE                     | 3129K      | NOS. | 1          | REGO/ Equivalent     |
| <b>Vapour return</b>           |                                            |            |      |            |                      |
| 1.                             | 2" FULLY INTERNAL E/F VALVE                | A3500P4    | NOS. | 1          | REGO/ Equivalent     |
| 2.                             | 2" FLANGED ANTI F/S BALL VALVE             |            | NOS. | 2          | JC/ Equivalent       |
| 3.                             | 1 3/4"X 1 1/4" VAPOUR ACME VALVE + Cap     | 3183AC     | NOS. | 1          | REGO/ Equivalent     |
| 4.                             | 1/2" HYDROSTATIC VALVE                     | 3129K      | NOS. | 1          | REGO/ Equivalent     |
| <b>By-Pass / Drain</b>         |                                            |            |      |            |                      |
| 1.                             | 2" FULLY INTERNAL EXCESS FLOW VALVE        | A3500P4    | NOS. | 1          | REGO/ Equivalent     |
| 2.                             | 2" FLANGED NPT ANTI F/S BALL VALVE         |            | NOS. | 2          | JC/ Equivalent       |
| 3.                             | 2" NPT PLUG                                |            | NOS. | 1          | ASTM A 105           |
| 4.                             | 1/2" HYDROSTATIC VALVE                     | 3129K      | NOS. | 1          | REGO / Equivalent    |
| <b>Other Valves / Fittings</b> |                                            |            |      |            |                      |
| 1.                             | 3" FULLY INTERNAL PRESSURE RELIEF VALVE    | A8436N     | NOS. | 2          | REGO/ Equivalent     |
| 2.                             | THERMOMETER -40 TO 50 C X 6" STEM          | J701       | NOS. | 1          | FISCHER / Equivalent |

|                            |                                                |           |      |   |                     |
|----------------------------|------------------------------------------------|-----------|------|---|---------------------|
| 3.                         | 3/4" COMBINATION VALVE + PROPANE ULLAGE GAUGE  | A2805C    | NOS. | 1 | REGO / Equivalent   |
| 4.                         | 1/4" GLYCERINE FILLED PRESSURE GAUGE           |           | NOS. | 2 | BORDON / Equivalent |
| 5.                         | 1" ROTORGAUGE                                  | 9094TSM60 | NOS. | 1 | REGO / Equivalent   |
| 6.                         | BOTTOM LEVER VALVE *                           |           | NOS. | 2 | NORGEN / Equivalent |
| 7.                         | EMERGENCY CUT OFF VALVES *                     |           | NOS. | 4 | NORGEN/ Equivalent  |
| <b>Ancillary Equipment</b> |                                                |           |      |   |                     |
| 1.                         | AIR CONTROL SYSTEM + SIGNS INCLUDING DRIVEAWAY |           | NOS. | 1 | NORGEN/ Equivalent  |
| 2.                         | EQUIPMENT BOX/SIDE IMPACT PROTECTION           |           | NOS. | 1 |                     |
| 3.                         | FIRE EXTINGUISHER BOXES                        |           | NOS. | 2 |                     |
| 4.                         | TANKER INSTRUCTION PLATE                       |           | NOS. | 1 |                     |

## 2) List of Joints

| S No | Description                                                                                                                 | Unit | Qty/Tank |
|------|-----------------------------------------------------------------------------------------------------------------------------|------|----------|
| 1    | <b>PIPE:</b><br>Pipe, Beveled end, API 5L GR. B (SMLS) As per ASME B 36.10 (SCH 80)                                         |      |          |
| 1a   | Dia. 3" Sch. 80                                                                                                             | ft   | 8        |
| 1b   | Dia. 2" Sch. 80                                                                                                             | ft   | 8        |
| 2    | <b>ELBOW</b><br>ELBOW 90o, Long Radius B. W., ASTM A-234 Gr. WPB as per ASME B16.9                                          |      |          |
| 2a   | Dia. 3" Sch. 80                                                                                                             | Nos. | 2        |
| 2b   | Dia. 2" Sch. 80                                                                                                             | Nos. | 2        |
| 3    | <b>FLANGES:</b>                                                                                                             |      |          |
| 3.1  | Flange 300# Slip-on SCH80, ASTM A-105 as per ASME B16.5                                                                     |      |          |
| 3.1a | Dia. 3"                                                                                                                     | Nos. | 6        |
| 3.1b | Dia. 2"                                                                                                                     | Nos. | 6        |
| 3.2  | Dead Flange 300#,RF, SCH80, ASTM A-105 as per ASME B16.5                                                                    |      |          |
| 3.2a | Dia. 3"                                                                                                                     | Nos. | 1        |
| 3.2b | Dia. 2"                                                                                                                     | Nos. | 1        |
| 4    | <b>Sockets</b><br>NPTF, ASTM A 105, 3000#, as per ASME B 16.11                                                              |      |          |
| 4a   | Dia. 3"                                                                                                                     | Nos. | 2        |
| 4b   | Dia. 2" x 1-1/4"                                                                                                            | Nos. | 2        |
| 5    | <b>STUDS /NUTS:</b><br>Studs with 2 Nuts, as per ASME B 16.5<br>Stud Material: A 193 Gr. B7 and Nuts Material: A 194 Gr. 2H |      |          |
| 5a   | M16 x 115                                                                                                                   | Nos. | 72       |
| 5b   | M19 x 115                                                                                                                   | Nos. | 56       |
| 5c   | M19 x 150                                                                                                                   | Nos. | 8        |

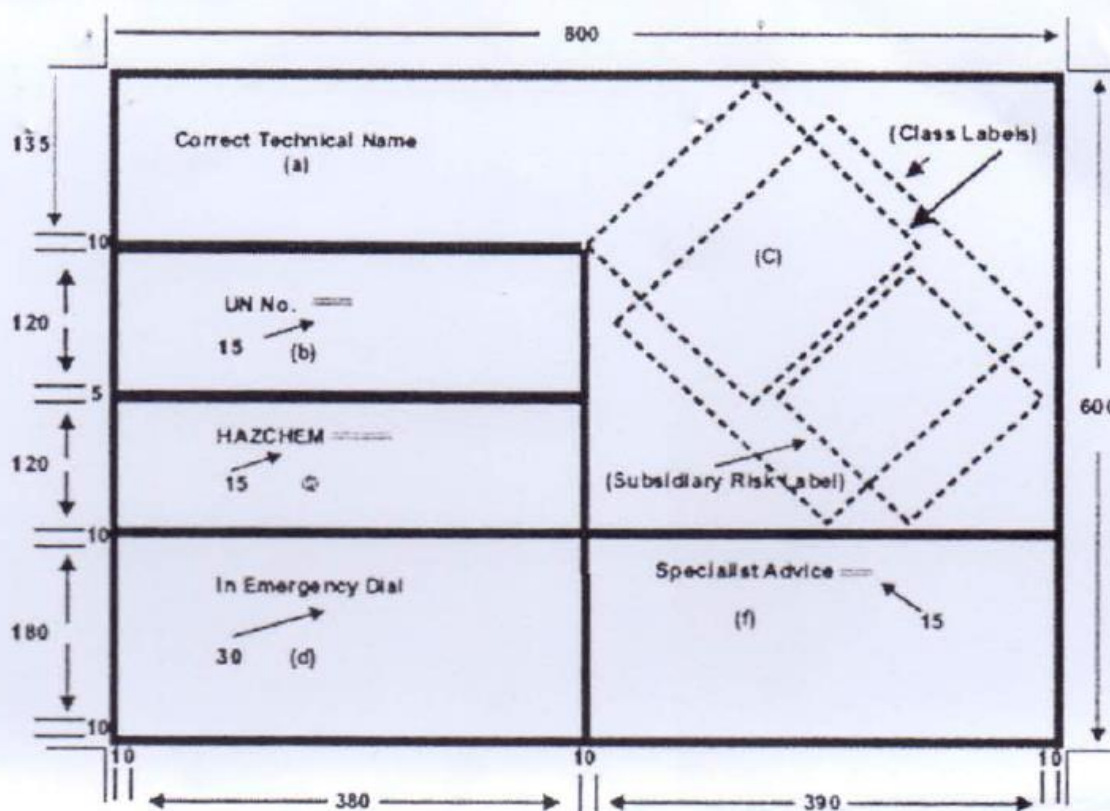
### 3) Under Chassis Details:

|    | Ancillary Equipment                           |  |      |   |        |
|----|-----------------------------------------------|--|------|---|--------|
| a. | Air control system + signs including driveway |  | NOS. | 1 | NORGEN |
| b. | Equipment box/side impact protection          |  | NOS. | 1 |        |
| c. | Fire extinguisher boxes                       |  | NOS. | 2 |        |
| d. | Tanker instruction plate                      |  | NOS. | 1 |        |

### 4) Hazchem Codes:

- ii. - Hazchem Codes (Emergency Action Codes) for LPG must be painted on all three sides of the bowzer.

#### SAMPLE FORMAT



a) Technical Name: LPG (b) UN No. 1075 (c) Hazchem: 2WE

### Anx – D

#### PRE-QUALIFIED 3<sup>RD</sup> PARTY INSPECTORS OF LPG DEPARTMENT

| S# | Company Name                               |
|----|--------------------------------------------|
| 1. | M/s ENAR Petrotech Services (Pvt.) Limited |

|    |                                                       |
|----|-------------------------------------------------------|
| 2. | M/s Uniteam (Pvt.) Limited                            |
| 3. | M/s IMTECH (Pvt.) Limited                             |
| 4. | M/s Bureau Veritas Pakistan (Pvt.) Limited            |
| 5. | M/s SGS Pakistan (Pvt.) Limited                       |
| 6. | M/s Republic Engineering Consortium Pakistan (RECP)   |
| 7. | M/s Velosi Integrity & Safety Pakistan (Pvt.) Limited |

## **SCOPE OF WORK**

The scope of work includes design, procurement, fabrication, testing and painting.

### **General Requirement & Standard**

1. Bidder should submit approved design of complete LPG Bowser (vessel and piping), verified by Accredited Third Party Inspector with the technical bid complying the following requirements: -
  - a. The scope should cover all pertinent statutory obligations including that of OGRA, Explosive department, NHA and ADR.
  - b. The person performing design review must be competent to carry out the appropriate assessments and must be a qualified inspector under the Pressure Equipment Directive (PED) 2014/68/EU (formerly 97/23/EC), ASME or equivalent as per offered design code and hold In-Service Certificate of Competency from National Board (IS). The Inspector's minimum post-certification experience of 10 years in inspection of pressure vessels and a proven record of working with the above-mentioned codes is required and his CV must be attached along with technical bid.
  - c. The NLC reserves the right to get the submitted design reviewed by an inspection agency. Bidder will be obliged to incorporate the minor design changes suggested by appointed third-party inspector after issuance of Purchase Order i.e. at the design review stage and during fabrication process.
2. Records: All records including design, Complete Manufacturer's data record/report (MDR), certificates should be submitted at the time of LPG bowser delivery.
3. The tank trailer must comply with all pertinent requirements of OGRA SRO - S.R.O.900(I)/2009, and NHA trailer standard.
4. Bowser should not contain more than one longitudinal seam (LS), ensuring the highest quality construction.
5. NLC can appoint its own Third-Party Inspection Agency, to conduct stage inspections. The manufacturer shall be obliged to facilitate NLC or appointed Third Party, regarding inspections, documentation and testing.
6. NLC reserves the right to ask for other additional information, which might lead to design changes, during the course of bidding or its subsequent clarifications, which the vendor shall be obliged to comply.

### **Bowzer**

7. The tanker should be designed on Propane however the capacity of the tanker should not exceed OGRA's regulations of 30MT of LPG having a mix of Butane: Propane of 60:40 ratio.
8. Third party approved design along with total weight of bowser (with all payloads, underchassis, equipment etc. included) weight distribution axle wise and resultant center of gravity must be submitted along with the technical bid.
9. The distance between the outer road contact points of the tyre tread on the rear axles will be greater than 90% of the height of the center of gravity of the fully laden vehicle, with all payloads that may be carried.
10. The vessel should consist of four/as per applicable code/standard, inter-linked chambers separated by vacuum rings to which baffles are attached. These baffles are dish shaped to accommodate the surge pressure inside of the vessel and at the bottom side of the baffles provide. Bolted doors for easy access during the inside maintenance of the vessel. All baffles to be provided with adequate number of mouse holes.

11. The access man-way should be provided in the lower segment of the rear dish head for easy approach during service.

### **Valve and Valve Safety**

12. All the Inlet / Outlet Nozzles should be on the centerline at the bottom of the tank and should be housed along with the Ullage valves, Pressure & Temperature gauges, in a Protection box. The box should be extended on both sides of the tank and strengthened to protect all the inside equipment from any collision or impact.
13. Apart from the Nozzle Protection box, the use of fully internal valves (inside the bowser body) on the filling, delivery, vapour return and by-pass lines added an extra safety that prevents any product release during the collision of tanker.
14. The 3" delivery valve should be pneumatically operated and can be actuated with the help of a switch provided inside the Protection box.
15. The use of fully 3" internal Pressure Relief valves with specially designed threaded internal flanges should ensure complete safety of the valves in case of roll over of the tanker during an accident. The arrangement of this internal flange system should also prevent rust trap into the valves.
16. Enable the operator to close the valve in case of any hazard, the tanker should be equipped with three Emergency switches provided in series at different locations. The operator, in no time, may press any switch nearest to his position thereby halting the delivery of LPG instantly.
17. All inlet connection points shall be fitted with a check valve and outlet pipes with excess flow valves.
18. There shall be a system of at least two independent suitable means to ensure that the vessel is not overfilled i.e. roto gauge and fixed level gauges at 25%, 50%, 75% & 85%.
19. Vessel shall be fitted with a working condition pressure gauge.
20. All the piping connections should be fitted with ½" NPT Hydrostatic Relief Valves (HRV's) to prevent development of excessive pressures during the trap of LPG inside the spools.
21. RT of piping to be performed as per code.
22. The ½" NPT (National Pipe thread) Pressure gauge and ½" NPT Fixed Level gauge should be coupled to a combination valve which is further connected to vessel next to an orifice of 1.4mm. The gauges can be removed any time for replacement without withdrawing the tanker from service.
23. The ½" NPT (National Pipe thread) thermometer should be fitted in a sealed pocket located near the bottom of the vessel so that it can also be removed for any calibration or replacement purpose without bringing the tanker out of service.
24. Drive away protection system should be installed so that during de-canting operation the trailer brake system will remain operative. Therefore, until and unless the de-canting is not finished and the door of the nozzle protection box is not shut trailer brakes will remain be operative.
25. Provision of Fire Extinguisher box should be made beside the main bumper and should be protected such to prevent it from being damaged by passing vehicles or a road accident.
26. **Paint**. Special gloss finish paint is selected keeping in view atmospheric conditions of the region which includes priming with Hi-Build Epoxy Zinc Phosphate Primer and preparing a paint base

with High Build Amine Adduct Cured Epoxy lining before giving a glossy finish with Polyurethane paint.

### **Trailer, Saddle & Attachment**

27. All trailer components are required to be of **JOST / FUWA or equivalent** (undercarriage, kingpin, suspension and landing gears / legs etc).
28. **Spare Wheel.** Two spare wheel carriers should be provided at the bottom of the vessel between the side impacts.
29. Side, rear and front under run protection shall be fitted to protect against damage from side/front/rear collision. The incorporation of side impacts on both sides of the tankers should ensure protection of pedestrians by being trapped under the tanker during road operation. The both ends of these side impacts should be bolted to the Protection box at the rear end and at the front with Landing Legs bracket. The middle portion of the side impact should be easily removed for an easy access to the spare wheel.
30. All the saddles supports, protection box frame, landing legs and King Pin mountings should be welded to the tanker vessel.
31. Coupling of the Prime Mover (supplied by Purchasing party) with the tank trailer will be the responsibility of the vendor; all necessary requirements (including but not limited to swing clearance) are to be accommodated. For clarity of swing distance and proper coupling of tank-trailer with prime mover, the diagram should incorporate the prime mover's dimensional diagram.
32. Reflector strips shall be fitted at each side of the vehicle; this shall also feature on rear by means of tape or suitable LED marker lamps complying with regulations in force.
33. Additional brake light and emergency lights at a minimum height of 1.70 meter from the ground shall be fitted to the rear of the vehicle.
34. ABS system to be installed (Rollover stability program will be preferred). Imported brake system as per following details: -
  - a. 4S/2M ABS (**SORL/KORMEE /WABCO or equivalent**)
  - b. Automatic and adjustable two circuits pneumatic braking system acting on all wheels contemporaneously with half coupling (ISO palm type).
  - c. Servo distributor and emergency valve which automatically activates the brakes in case of accidental detachment from the towing vehicle.
  - d. Braking element made of brake chambers.
  - e. Parking brake pneumatic type
35. The under-chassis of the trailer is to be properly designed (including but not limited to suspension, axle, loadings & spacing etc.) and is required to meet pertinent standards and statutory requirements. The company reserves the right to ask for the particulars (design, certificates etc) at any stage of bidding and subsequent manufacturing.
36. Earthing strips of copper to be installed on both sides of each bowser.
37. Not limited to aforementioned requirements, the tanker (tank & trailer unit) should comply with all pertinent national & international rules /standards along with local regulations & good engineering practices.