

03. SCOPE OF SUPPLY AND TECHNICAL SPECIFICATIONS

1 SCOPE OF SUPPLY AND SERVICES

Variations and/or deviations from specification, if any, shall be illustrated clearly in detail. Complete technical specification details shall also provide together with following.

1.1 CODES AND STANDARDS

- a) API Standard 650 (*Welded tanks for oil storage*), 12th Edition, March 2013
- b) API Standard 653 (*Tank Inspection, Repair, Alteration and Reconstruction*), 5th Edition, November 2014
- c) API 2000 (*Venting Atmospheric and Low-pressure Storage Tanks*), 7th Edition, March 2014
- d) API RP 2003 (*Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*), 8th Edition, September 2015
- e) NFPA 77 (*Recommended Practice on Static Electricity*)
- f) Aluminum Design Manual 2020 published by Aluminum Association
- g) EN 10204 (*Metallic products. Types of inspection documents*)
- h) NFPA 30 (*Flammable and Combustible Liquids Code*)
- i) NFPA 11 (*Standard for Low-, Medium-, and High-Expansion Foam*)
- j) Any Other Standards referred by the above standards.

1.2 SCOPE OF SUPPLY BY CPSTL

3.2.1 Tank Physical measurement reports (Plumbness and Roundness) will be supplied to the contractor.

3.2.2 Construction Utilities

- i. Electricity and drinking water that would be supplied to the contractor to undertake this work would be charged from the contractor as per meter/estimate. The prospective contractor is required to indicate his requirements of power from the CPSTL in his offer for evaluation purposes.
- ii. The electrical power supply is available to the contractor subjected to following conditions.
 - a. CPSTL shall provide only the power supply tapping point with a meter at the nearest switch room.
 - b. Contractor shall supply and install his own feeder cables and power distribution board required for the work site from the tapping point.
 - c. The maximum power CPSTL shall supply is 63A, 400V, 50Hz, 3 Phase.
 - d. The electricity charge shall be deducted from the Final Bill of the Contractor.
 - e. A fixed charge of Rs. 3,000/= one-off payment and a consumption charge as per applicable tariff rate for the concerned period shall be deducted as the electricity charge.
 - f. Engineer shall estimate the bill on above basis in occasions the power supply is provided without a meter.

- iii. A metered water connection may be supplied by CPSTL for repair work on the request of the contractor and charger will be applied according to applicable tariff system. Cost for the connection, maintenance and disconnection will be added to the contractor cost. It is contractor's responsibility to ensure that sufficient amount and flow rate are available for construction work and arrange pumping and piping requirements as CPSTL is not bound to fulfill such requirement. In such case, the contractor has to maintain his own water source for the work.

1.3 SCOPE OF SUPPLY BY THE SUPPLIER

3.3.1 Design, Manufacture, Supply, Installation, Testing and Commissioning of Aluminium Internal floating roofs

Design, Manufacture, Supply, Installation, Testing and Commissioning of Aluminium Internal floating roofs on floats having their deck above the liquid, supported by closed pontoon compartments for buoyancy as per API STANDARD 650 12th Edition, March 2013, Appendix H Section H.2.2 e inside the Fixed Roof Tank to minimize breathing losses and thereby reduce the overall Hydrocarbon evaporation loss from the tank.

3.3.2 Specification

	Item	Description
Tank Details		
i.	Tank Nos.	TK-09 and TK-10
ii.	Tank Diameter	31 m
iii.	Tank Capacity	10,000 m ³
iv.	Tank Safe Filling Height	14.28 m
v.	Tank Filling Rate (Max.)	1,250 m ³ /h
vi.	Tank Emptying Rate (Max.)	1,000 m ³ /h
vii.	Product used	Petrol
viii.	Product Density	725~785 kg/m ³ (at 15°C)
ix.	Operating Temperature	10°C to 40 °C
Internal Floating Roof		

	Item	Description
Specifications shall be comply with the above “3.1 Codes and Standers” unless otherwise specified below.		
x.	Internal Floating Roof Design	API 650 12 th Edition, March 2013. Appendix H
xi.	Type of Internal Floating Roof	<ul style="list-style-type: none"> • API 650 12th Edition, March 2013. Appendix H Section H.2.2 e • Metallic internal floating roofs on floats have their deck above the liquid, supported by closed pontoon compartments for buoyancy. These roof decks are not in full contact with the liquid surface and are typically constructed of aluminum alloys. • All components are to be fabricated and packaged to fit through a 30” tank shell manway. • All components are to be prefabricated to the greatest extent possible to minimize or eliminate field location, position and alignment of components
xii.	Materials	<p>Pontoons, Structural components, Deck plates, Penetrations including Gauging and Sampling Devices shall be mainly constructed by Aluminium.</p> <p>However all materials used shall be comply with API 650 12th Edition, March 2013. Appendix H, Section H.3</p>
xiii.	Buoyancy Requirements	<p>As per API 650 12th Edition, Appendix H, Section H.4.2.1.</p> <p>All internal floating roof design calculations shall be based on the product specific gravity 0.7.</p>
xiv.	Peripheral Seals	<p>Vapor Mounted Dual Lipped Flexible Wiper Rim Seal</p> <p>Seal Material : Fluoropolymers, Urethane, Fluoroelastomers, or Buna-N-Vinyl</p>
xv.	Deck Drains	Provide

	Item	Description
xvi.	Internal Floating Roof Penetrations including Gauging and Sampling Devices	<ul style="list-style-type: none"> • A vapor-tight rim (or skirt), extending at least 150 mm (6 in.) above the liquid and extending at least 100 mm (4 in.) into the liquid at the design flotation level and, shall be provided around both the internal floating roof periphery and around all internal floating roof penetrations (columns, ladders, stilling wells, manways, open deck drains and other roof openings) except for deck drains. • The internal floating roof shall be provided with and/or accommodate gauging and sampling devices. • Sampling devices on the deck of the floating roof shall be installed beneath the fixed-roof hatch (as specified for this purpose) and, unless designed as a gauge pole (extending up to the fixed roof), shall have a funnelled (tapered) cover to facilitate use from the roof of the tank. • Vertical tank accessories including columns, gauge poles and ladders shall penetrate the IFR through a gasketed well and shall be sealed with a factory cut sliding cover with a wiper. • All such devices on the floating roof shall be installed within the plumbness tolerance.
xvii.	Foam Dam	Required
xviii.	Anti-Static System	<ul style="list-style-type: none"> • All conductive parts of the internal floating roof shall be electrically interconnected and bonded to the outer tank structure. • Minimum two flexible multi-strand Austenitic Stainless Steel cables having minimum diameter 4mm shall be installed from the external tank roof to the internal floating and positioned uniformly distributed among the IFR area.
xix.	Internal Floating Roof Supports	<ul style="list-style-type: none"> • Two Position Aluminium legs with Austenitic stainless Steel spacer. <ul style="list-style-type: none"> • Maintenance Height = 2.2 m from the Deck plate to Tank Bottom plate • Operational Height = 1.55 m from the Deck sheet to Tank Bottom plate
xx.	Anti-Rotation System	<ul style="list-style-type: none"> • Four or more seal centring cables shall be provided with cable tensioning mechanism and provisions to adjust cable tension. • Anti-rotation system shall be constructed using Austenitic Stainless steel components.

	Item	Description
		<ul style="list-style-type: none"> • Anti-Rotation Cable shall be Air Craft Type (wire rope) with adequate flexibility and tensile strength made up of multiple twisted wire strands. • Minimum Cable diameter shall be 8 mm. • Attachments of Anti rotation cables to tank roof and tank bottom plate shall be done by IFR Contractor and attached locations shall be power tool cleaned and painted as per the existing paint system.
xxi.	Fasteners, Joining compounds, adhesives etc.	<ul style="list-style-type: none"> • Only austenitic type stainless steel hardware shall be used to join aluminium components to each other or to carbon steel. • Bolted, threaded, and riveted joints can be used with the prior approval of CPSTL. • Use of any joint sealing compound, insulating material, polymer, elastomer, or adhesive shall be preapproved by the CPSTL.
xxii.	Pressure-Vacum Vents	<ul style="list-style-type: none"> • Pressure-Vacuum Vents shall be provided on Floating Roof
xxiii.	Maximum and Minimum Operating levels of Internal Floating Roof	<ul style="list-style-type: none"> • The floating roof Manufacturer shall provide the design flotation level (liquid surface elevation) of the internal floating roof at which the pressure/vacuum relief vents will begin to open (to facilitate the Purchasers' determination of minimum operating levels). • The internal floating roof Manufacturer shall provide information defining the internal floating roof and seal dimensional profile for the Purchasers' determination of the maximum normal operating and overflow protection liquid levels (considering tank fixed-roof support, overflow slots or any other top of shell obstructions).
xiv.	Overflow Protection Slots	<ul style="list-style-type: none"> • Emergency overflow slots shall be provided. • It shall be sized to discharge at the pump-in rates for the tank.
xv.	Access to Internal Floating Roof Deck	<ul style="list-style-type: none"> • At least 2 nos. internal floating roof deck manhole shall be provided for access to and ventilation of the tank when the floating roof is on its supports and the tank is empty. • The manhole shall have a nominal opening of 600 mm (24 in.) or larger and shall be provided with a bolted or secured and gasketed manhole cover. The manhole neck dimensions shall meet the requirements of H.4.1.4 and H.4.1.5.

	Item	Description
		<ul style="list-style-type: none"> Two ladders shall be provided to access from tank bottom to Internal floating roof deck when Internal floating roof is resting on its supports. The ladder shall be attached to Internal floating roof and it shall not be attached to tank bottom.
xxvi.	Tank Plumbness and Roundness	<ul style="list-style-type: none"> CPSTL provide Tank Plumbness and Roundness Inspection Reports to the Contractor. Contractor shall inspect reports and verify that the floating roof and seals will operate properly. Any defects, projections, obstructions or tank tolerance limits (exceeding those defined in 7.5 of this standard), which would inhibit proper internal floating roof and seal operation, that are identified by the internal floating roof contractor shall be reported to the CPSTL.
xvii.	Pontoons	Test for leaks by field joint assembler.
xxviii.	Deck seams and other joints	Vapour-tight and shall be tested for leaks by field joint assembler.
xxix.	Internal Floating Roof Initial Flotation Test	<ul style="list-style-type: none"> Test Media : Product (Petrol) Test Performed by CPSTL and contractor shall witness the test for correct floatation and appearance of a damp spot on the upper side of the part in contact with the liquid shall be considered evidence of leakage.

3.3.3 Supply of commissioning spare parts.

3.3.4 Minimum one (01) year warranty from the date of commissioning for the Internal Floating Roof supplied and installed.

3.3.5 Third party inspection of material test certificates, shop fabrication and testing of each internal floating roof by a reputed third-party inspection company approved by CPSTL, witnessed by two CPSTL engineers at the manufacturer's shops and submission of third party inspection report to CPSTL. *Material Test certificates shall be in accordance with EN 10204 type 3.2.*

3.3.6 Supply of tools, equipment and any other required materials for the inspection and testing.

3.3.7 Supply of as built detailed drawings, all test certificates, and duly furnished manufacturing data sheets along with the internal floating roofs.

- 3.3.8 Supply of installation, operation, maintenance and spare parts manuals in English Language.
- 3.3.9 Internal Floating Roofs components suitably protected for transportation and suitable for abnormal weather conditions .
- 3.3.10 Supply of Internal Floating Roof erection procedure.
- 3.3.11 Supply of procedure for observing any seal damage during operations.
- 3.3.12 Supply of food, accommodation, internal transportation, any other local expenses for two CPSTL Engineers witnessing the testing and inspection at the manufacture's testing facility. Chargers for return air tickets and visa for CPSTL Engineers will be borne by CPSTL.
- 3.3.13 Training of CPSTL maintenance crew for preventive maintenance, trouble shooting and repairing at the workshop of CPSTL, Sri Lanka.
- 3.3.14 Calibration
After successful completion of tanks calibration is to be attended. The calibration and tabulations shall conform to API 2550, ASTM 1220. The tank calibration is to be carried out using one of the following methods by a third-party company acceptable to CPSTL.
- i. MPMS Ch. 2.2B – Calibration of Upright Cylindrical Tanks using the Optical Reference Line Method (ORLM)
 - ii. MPMS Ch. 2.2C – Calibration of Upright Cylindrical Tanks using the Optical Triangulation Method (OTM)
 - iii. MPMS Ch. 2.2D - Calibration of Upright Cylindrical Tanks using the Internal Electro Optical Distance Ranging Method (EODRM)
 - iv. MPMS (Manual of Petroleum Measurement Standards)
- 3.3.15 The name and address of the 3rd party calibration company should be given in the bid for evaluation purposes.
- 3.3.16 Calibration of the tanks and submission of calibration charts and soft copies in the form of spread sheets.
- 3.3.17 The Contractor shall submit three sets of certified calibration tables to the Engineer on or before successful completion of the work.

1.4 SCOPE OF WORK BY CPSTL

- 3.4.1 Necessary modification for the tanks to install internal floating roof in fixed roof tanks which shall be attended by other party.
- 3.4.2 Only one modified Tanks will be released for the installation of IFR at an instance.
- 3.4.3 Next tank will be released for IFR installation approximately within ninety (90) days from the completion, testing and commissioning of the previous tank. IFR Installation period for each tank will be thirty (30) days from site handing over.

1.5 SUPPLIERS' SCOPE OF WORK

- 3.5.1 Design, Manufacture, Supply, Installation, Testing and Commissioning of Aluminium Internal floating roofs on floats having their deck above the liquid, supported by closed pontoon compartments for buoyancy as per API STANDARD 650 12th Edition, March 2013. Appendix H Section H.2.2 e inside the Fixed Roof Tank (Refer Table No. 01 for details) to minimize breathing losses and thereby reduce the overall Hydrocarbon evaporation loss from the tank.
- 3.5.2 The Bidder shall also carry out the jobs that are not specifically mentioned in this specification here but required for successful completion of the job in all respects as per the standards, drawings and codes. Loading, handling and transportation of all materials from supply point/store at work site/Contractor's store as per the requirement of the job.
- 3.5.3 It is desired that the provision of Aluminium Internal Floating Roof shall have minimum impact on safe filling capacity of the Tank.
- 3.5.4 Bidder shall study the attached existing tank drawings and confirm suitability of their Internal Floating Roofs for the intended tanks.

Signature of the Bidder: **Date:**.....

(Common Company Seal)