





TECHNICAL REQUISITION DOCUMENT FOR TANK GAUGING SYSTEM HP02-00-IN-TRD-0005

0	13 th Nov, 2023	Issued for Purchase		D.T.T	L.V.D	N.T.S V.L.T
A	27 th Oct, 2023	Issued for IDC		D.T.T	L.V.D	N.T.S V.L.T
REV. NO.	DATE	DESCRIPTION		PREP'N	CHECK	REVIEW APPROVAL
REV. NO.	DISCIPLINE	PREPARATION	CHECK	REVIEW		APPROVAL
0	INSTRUMENT & CONTROL					
		D.T.T	L.V.D	N.T.S		V.L.T

This DOCUMENT is the property of The Branch of Top Solvent (Vietnam) Limited Liability Company – Hai Phong Terminal. Therefore, it shall not be released to any third party without permission of authorized personnel of TSV.





	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	2 of 22	
	TRD FOR TANK GAUGING SYSTEM			

TABLE OF CONTENTS

1.	DOCUMENT PURPOSE.....	3
2.	LANGUAGE AND UNITS	3
2.1.	LANGUAGE.....	3
2.2.	UNITS OF MEASUREMENT.....	3
3.	ITEMS AND QUANTITIES.....	3
4.	CONFLICTING REQUIREMENTS	3
5.	DEVIATION LIST.....	3
6.	SCOPE OF WORK AND SUPPLY	3
6.1.	SCOPE OF WORK AND SUPPLY	3
6.2.	EXCLUSIONS.....	4
7.	GENERAL REQUIREMENTS	4
7.1.	GENERAL	4
7.2.	DESIGN LIFE, AVAILABILITY AND RELIABILITY	5
7.3.	PROTECTIVE COATING AND PAINTING.....	5
7.4.	PREPARATION FOR SHIPMENT.....	5
7.5.	GUARANTEE AND WARRANTY	6
7.6.	SPARE PART.....	6
7.6.1.	Start-up and Commissioning Spares	6
7.6.2.	Two Year Spares	6
8.	INSPECTION AND TESTS	6
9.	COORDINATION MEETING	7
10.	APPLICABLE DOCUMENT	7
11.	VENDOR DATA REQUIREMENT.....	7
12.	DOCUMENT REQUIREMENTS	8
13.	ATTACHMENTS	8

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	3 of 22	
	TRD FOR TANK GAUGING SYSTEM			

1. DOCUMENT PURPOSE

This Technical Requisition defines the requirements for the design, manufacture, testing and supply of the Tank Gauging System, vendor documents, inspection & testing as described here under.

2. LANGUAGE AND UNITS

2.1. Language

All documents and drawings to be submitted shall be lettered in English language.

2.2. Units of measurement

Units of measurement for all engineering documents shall be in the System International (SI).

3. ITEMS AND QUANTITIES

Refer to MTO, project specifications and drawings.

4. CONFLICTING REQUIREMENTS

The Vendor shall notify Purchaser of any conflicts between this TRD, specifications, the related data sheets, the Codes and Standards and any other specifications noted herein. Resolutions and/or interpretation precedence shall be obtained from Purchaser in writing before proceeding with the design/manufacture.



5. DEVIATION LIST

The Vendor's quotation shall be in full conformity with Purchaser's requirements. Unless exceptions, deviations or alternatives are clearly defined and listed on the attached Purchaser's form "Deviation List" and submitted with Vendor's quotation, the requirements and conditions of this Requisition shall be deemed to be accepted by the Vendor.

6. SCOPE OF WORK AND SUPPLY

6.1. Scope of Work and Supply

This document shall be read in conjunction with applicable MTO, Specifications and Drawings.

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	4 of 22	
	TRD FOR TANK GAUGING SYSTEM			

No.	Q'Ty	Description
1.	1 Lot	Tank Gauging system as per specification and drawings.
2.	1 Lot	Engineering / Sizing Calculation
3.	1 Lot	Inspection, Certification and Testing
4.	1 Lot	- Factory acceptance test (FAT) - Site acceptance test (SAT) - Testing, commissioning and start up.
5.	1 Lot	Training at Jobsite
6.	1 Lot	Spare parts for Installation, Commissioning and Start-up
7.	1 Lot	Recommended spare parts for 2 years of normal operation (if required)
8.	1 Lot	Documentation as per VENDOR Document Requirement List (VDRL)
9.	1 Lot	Export Packing, Preservation for Long Term Storage and Preparation for Shipment
10.	1 Lot	Transportation and other related cost to transport the Goods to the Hai Phong.

6.2. Exclusions

The following are excluded from VENDOR's scope of work:

- Power supply



7. GENERAL REQUIREMENTS

7.1. General

The Package shall be strictly in accordance with the data sheets, drawings, specifications, codes, and standards specified.

Compliance by the Vendor with the provision of this specification does not relieve him of his responsibility to furnish the package/ material and accessories of a proper design to meet the specified duty and / or local codes governing health and safety.

All applicable documents mentioned below are attached with the request for inquiry. However, if the Vendor is not in possession of any of the listed or referenced Purchaser documents, it shall be Vendor's sole responsibility to obtain them from the Purchaser. Otherwise, it shall be assumed that the Vendor has received, read and understood the total contents of the documents.

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	5 of 22	
	TRD FOR TANK GAUGING SYSTEM			

All materials and parts shall be new and un-used and free from defects and imperfections that would adversely affect the life or performance of the system.

Vendor data shall include detailed design drawings and updated data sheets of each material and appurtenances. Detail design drawings shall be fully dimensioned and complete with Bill of Materials.

No fabrication would commence until Purchaser has approved the drawings.

Purchaser's approval on drawings does not relieve Vendor of compliance with applicable codes, specifications, safety design, or meeting the requirements of governmental agencies.

Any work and documentation related to facilitating design appraisal approvals and inspection from Purchaser appointed Certification Authority (CA) and QA/QC Inspector (TPI) shall also be included in Vendor's scope of supply

7.2. Design Life, Availability and Reliability

The design life of the facility and all associated equipment, components and systems is minimum 30 years.

All components which for practical, safety or cost-efficiency reasons are unable to meet the required design life shall be identified as soon as possible. Their expected service life shall be informed to Purchaser and provision made in the system design for maintenance to extend component life or routine change-out.

7.3. Protective Coating and Painting

Refer to document no. HP02-00-PI-SPC-0002 Painting Specification.

7.4. Preparation for Shipment

Equipment shall be prepared for export shipment and shall be created to provide maximum protection during shipment and extended outdoor storage.



Any equipment liable to be damaged during shipment shall be disassembled, packed separately, shipped with the unit and reassembled onsite under the supervision of Vendor's commissioning/start-up technician

Each crate shall be clearly identified in accordance with the customer's specification. As a minimum the crate shall be marked with the Purchase Order number, the item number, the shipping mass and the delivery address.

Flanged process connections shall be protected by steel cover plates bolted in place with at least 4 bolts then sealed with tape. All nozzles and branches shall be protected against damage during transportation and erection.

The equipment shall be suitably preserved to maintain in good condition throughout the phases of storage until ready to be operated.

Threaded nozzle connections shall be protected with threaded plugs. However, telltale holes in reinforcing pads shall be protected with non-hardening plastic sealant or packed with grease.

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	6 of 22	
	TRD FOR TANK GAUGING SYSTEM			

Exposed machined surfaces, including threads extending beyond the nuts, shall be protected with an easily removable rust-preventive coating.

All equipment shall be suitably protected for shipment and securely anchored during transit. Separate or loose parts shall be completely boxed with identification tag.

Tools and spare parts shall be packed in metal boxes suitable for long term storage. The boxes shall be galvanized or coated in accordance with Project requirement.

7.5. Guarantee and Warranty

The Vendor shall have final and total responsibility for the design and performance of all material supplied under this specification.

The Vendor shall replace and install without cost to the Purchaser any materials, supplies which fail under design conditions due to defects in material or workmanship if the defect is observed and/or such failure occurs within the guarantee/warranty period. Acceptance of this order will signify acceptance of all conditions of this guarantee.

The guarantee period shall be minimum 30 months from delivery date or 24 months from commercial operating date, whichever comes first.

7.6. Spare part

7.6.1. Start-up and Commissioning Spares

The Vendor shall include, as part of his bid, a detailed, price list of start-up and commissioning spares which shall be supplied as part of the original purchase package.

7.6.2. Two Year Spares

The Vendor shall include, as part of his bid, a detailed, list of recommended spare parts for two years continuous operation. These spares shall be costed for separate purchase.

8. INSPECTION AND TESTS



Inspection and tests shall be made by the VENDOR in accordance with:

[X] Test & Inspection should be carried out acc. to the above applicable codes and standards

[X] Maker's standard plan & procedure as approved by PURCHASER.

[X] Local regulation, if any

The OWNER and/or Purchase inspector shall hold a right to be present at any equipment and/or materials manufacturing stage.

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	7 of 22	
	TRD FOR TANK GAUGING SYSTEM			

9. COORDINATION MEETING

After the purchase order is placed, VENDOR shall, upon receipt of PURCHASER's notice, send a sufficient number of qualified personnel at VENDOR's cost to hold the meetings according to the following schedule:

<input checked="" type="checkbox"/> Kick-off meeting	Two (2) week(s) after the order	<input type="checkbox"/> Vendor office	<input checked="" type="checkbox"/> Purchaser's office
<input checked="" type="checkbox"/> Coordination meeting	* <u>Note 11a</u> month(s) after the order	<input type="checkbox"/> Vendor office	<input type="checkbox"/> Purchaser's office
<input type="checkbox"/> Design review meeting	_____ month(s) after the order	<input type="checkbox"/> Vendor office	<input type="checkbox"/> Purchaser's office
<input checked="" type="checkbox"/> Pre-inspection meeting	1 month(s) before Fab. start	<input type="checkbox"/> Vendor office	<input checked="" type="checkbox"/> Purchaser's office

* *Note 11a : The time period for the same to be agreed at kick-off meeting.*



10. APPLICABLE DOCUMENT

Documents listed below shall make an integral part of this material requisition:

No	Doc No	Document Title	Remark
1	HP02-00-IN-BDD-0001	Control Architecture System Block Diagram	
2	HP02-00-IN-SPC-0003	Specification for Tank gauge system	
3	HP02-00-IN-DAS-0004	Datasheets for Tank Gauging System	
4	HP02-00-PR-PID-0014	P&ID Hydrocarbon System 3	
5	HP02-00-PR-PID-0015	P&ID Chemical Solvent System 3	
6	HP02-00-PI-SPC-0002	Painting Specification	

11. VENDOR DATA REQUIREMENT

- The VENDOR shall submit the completed documents and drawings, in accordance with the "Vendor Data Requirements" in time.
- Vendor Data Requirements shall be referred to in Attachment #1.

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	8 of 22	
	TRD FOR TANK GAUGING SYSTEM			

12. DOCUMENT REQUIREMENTS



- All documents and technical data shall be in the English language. Submission shall be made under cover of a transmittal, marked for the attention of Supplier/ Vendor Data control and referencing the Company Purchase Order.
- Documents shall be full size A1, A2, A3 and A4. A0 size is not acceptable. Legible drawings at A3 size are preferred for review. Full size drawings (A1 or A2) should be submitted as final copies.
- Drawing prints larger than A4 shall be folded to A4 size, with the title block visible at the bottom right hand corner. Originals and transparencies shall be supplied rolled up and adequately protected. Documents larger than A3 to be included in manuals shall be inserted in pre-punched plastic sleeves.
- Photocopy quality shall ensure that legibility and clarity of documents is maintained.
- Manuals shall be supplied in loose-leaf hard cover binders.

13. ATTACHMENTS

Attachment #1: Vendor Data Requirement List

Attachment #2: Purchaser format



Attachment #3: MTO

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	9 of 22	
	TRD FOR TANK GAUGING SYSTEM			



ATTACHMENT #1

VENDOR DATA REQUIREMENT LIST



Item no.	VP Code	Data/Document Description	Provide with Bid	For Review	For Approval/ Construction	For Final	Remark
I		COMMERCIAL/CONTRACTUAL					
1	C01	VENDOR Data Requirement	E	E	E	*3	
2	C02	Engineering, Procurement, Manufacturing and Test Schedule	E	E	E	*3	
3	C03	Sub Contract Work Proposal		E	E	*3	
4	C04	Delivery, Handling and Packing Proposals		E	E	*3	
5	C05	Exception and Non-Conformity Form	E	E	E	*3	
6	C06	VENDOR's Sub-Orders (Un-Priced copy)					
7	C07	Warranty/Guarantee Confirmation		E	E	*3	
8	C08	VENDOR/SUB-VENDOR List	E	E	E	*3	
9	C09	Progress Reports (Weekly and Monthly)		E	E	*3	
10	C10	Project Schedule		E	E	*3	
11	C11	Control Procedures		E	E	*3	
12	C12	Engineering/Procurement/Fabrication Schedule		E	E	*3	
13	C13	Proven Design and Manufacturing Experience List	E	E	E	*3	
II		DRAWING - GENERAL					
14	D01	General Arrangement Drawings	E	E	E	*3	
15	D02	Detail/Assembly/Fabrication Drawings					
16	D03	Cross Section Drawing/Exploded View Drawings					
17	D04	Internals Drawings/ Miscellaneous Drawings		E	E	*3	
18	D05	Lifting/Transportation Drawings					
19	D06	Name Plate Drawings		E	E	*3	
20	D07	Installation & Dismantling Drawings/Procedures (As Applicable)		E	E	*3	
21	D08	System architecture	E	E	E	*3	
III		PROCESS/MECHANICAL/PIPING/ STRUCTURAL					
22	M01	Foundation Load and Anchor Bolt Location					
23	M02	Equipment Design Calculations including Transportation					
24	M03	Structural Design Calculations					
25	M04	Pipe Stress Calculations					
26	M05	Process Flow Diagrams including Heat and Mass Balance					
27	M06	Piping and Instrument Diagrams		E	E	*3	
28	M07	Process Sizing Calculations					
29	M08	Utility Calculations					
30	M09	Cause & Effect Charts					
31	M10	Equipment Datasheet including speciality items	E	E	E	*3	
32	M11	Weight Datasheet		E	E	*3	
33	M12	Skid/Module GA and Detail Drawings					
34	M13	Lifting Lug Details/ Calculations					
35	M14	Allowable Nozzle Load Calculations					

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	10 of 22	
	TRD FOR TANK GAUGING SYSTEM			



Item no.	VP Code	Data/Document Description	Provide with Bid	For Review	For Approval/ Construction	For Final	Remark
36	M15	Weight and Centre of Gravity Calculations					
37	M16	Lifting Equipment Calculations					
38	M17	Foundation Load Calculations					
39	M18	Miscellaneous Calculations					
40	M19	Skid Piping GA Drawings					
41	M20	Pipe Work Support Details					
42	M21	Valve List					
43	M22	Piping Isometrics					
IV		INSTRUMENT/ELECTRICAL					
44	J01	Panel Layout and Details					
45	J02	JB/Panel Wiring Diagrams, Loop drawings		E	E	*3	
46	J03	Instrument/Fire and Gas Installation Details/Hook-ups		E	E	*3	
47	J04	Shutdown and Control Function Charts, Safe Charts, logic diagrams		E	E	*3	
48	J05	Instrument/Electrical Data Sheets	E	E	E	*3	
49	J06	Instrument Calculations including Safety Relief Valves, Control Valves, FE's, RO's, etc.					
50	J07	Serial Link Mapping List		E	E	*3	
51	J08	Utility Consumption List		E	E	*3	
52	J09	Functional Design Specification		E	E	*3	
53	J10	Wiring Diagram		E	E	*3	
54	J11	Earthing Diagram		E	E	*3	
55	J12	Load Calculation					
56	J13	Cable schedule					
57	J14	Junction box schedule					
58	J15	Reliability & Availability Data		E	E	*3	
59	J16	Copies of test certificates issued from the appropriate certifying authorities for 1) equipment to be located in hazardous areas and 2) suitable IP rating.		E	E	*3	
60	J17	List of Vendor Documents and Drawings		E	E	*3	
61	J18	Vendor Data Book (VDB) (2C + 2CD shall also be shipped with equipment at delivery)		E	E	*3	
62	J19	Vendor Data Book (VDB) Index (Vendor data book index)		E	E	*3	
63	J20	List of Instruments and System Cables (Type, Reference, Tag, Length, Routing)		E	E	*3	
64	J21	Calculation Sheets of Intrinsically Safe Loops					
65	J22	Instrument Documentation (Training Plan and manual)		E	E	*3	
66	J23	System Cabinets, Peripherals, Interconnection Block Diagrams (Including system network configuration)		E	E	*3	
67	J24	Loop Diagrams (or Typical Database + I/O Database or Electronic File) (Typical mini loops from marshalling to system and complete electronic database for TPC to generate loop diagrams)					
68	J25	System Cards I/O Assignment					

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	11 of 22	
	TRD FOR TANK GAUGING SYSTEM			

Item no.	VP Code	Data/Document Description	Provide with Bid	For Review	For Approval/ Construction	For Final	Remark
69	J26	Control System Description, Operating Principles, Functional Design Specification (Including power supply, earthing, I.S guidelines)		E	E	*3	
70	J27	Software Specification, Configuration Documentation (Schemes, Charts, Listing) and Manuals		E	E	*3	
71	J28	Logic Diagrams (Interlock & Safety), Sequence Diagrams, Cause & Effect Charts (Functional logic diagrams)					
72	J29	Software Database Exchange Table		E	E	*3	
73	J30	Dimension, Weight, Physical & Electrical Data of Instrument Cable					
74	J31	Cable List (Including interconnection cables supplied by contractor)		E	E	*3	
75	J32	Bulletins and Catalogues (Including technical data sheet for each component)		E	E	*3	
76	J33	Special Precautions for Handling and Erection		E	E	*3	
77	J34	Recommendations for Storage prior and after Erection		E	E	*3	
78	J35	Site Quality Control Plan (QCP)		E	E	*3	
79	J36	Engineering, Procurement, Manufacturing and Test Schedule		E	E	*3	
80	J37	Recommendations for Protection during Transportation		E	E	*3	
81	J38	Packing List		E	E	*3	
82	J39	Shipping Documents, Transport Authorization		E	E	*3	
83	J40	N/A					
V		GENERAL					
84	G01	Equipment List and Bill of Material		E	E	*3	
85	G02	Technical Description		E	E	*3	
86	G03	Technical Catalogues	E	E	E	*3	
87	G04	Recommended Spare Parts For 2 Year Operation, Priced	E	E	E	*3	
88	G05	Recommended Spare parts for Start-up & Commissioning, Priced	E	E	E	*3	
89	G06	List of Special Tools, where applicable	E	E	E	*3	
90	G07	Engineering, Procurement, Manufacturing and Test Schedule		E	E	*3	
91	G08	Progress Report (monthly) including vendor procurement status (monthly)		E	E	*3	
92	G09	Sub-Vendors and Main Suppliers' List		E	E	*3	
VI		PERFORMANCE					
93	P01	Test Procedure		E	E	*3	
94	P02	Test Reports		E	E	*3	
95	P03	QC Inspection Plan		E	E	*3	
96	P04	Software overview, software listings, calculation		E	E	*3	

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	12 of 22	
	TRD FOR TANK GAUGING SYSTEM			

Item no.	VP Code	Data/Document Description	Provide with Bid	For Review	For Approval/ Construction	For Final	Remark
97	P05	Formulas and computation definitions and listings					
VII		QA/CERTIFICATION/REPORT					
98	Q01	Contract Quality Plan/ Project Quality Plan	E	E	E	*3	
99	Q02	Welding Procedures & Qualification Test Reports					
100	Q03	Inspection and Test Plan	E	E	E	*3	
101	Q04	Inspection and Test Reports		E	E	*3	
102	Q05	Calibration Procedures & Results					
103	Q06	Hydro Test/Pneumatic Test Procedures					
104	Q07	Hydro Test/Pneumatic Test Reports					
105	Q08	Material Certification					
106	Q09	Calibration Certificates		E	E	*3	
107	Q10	Hazardous Area Certification, IP Certification		E	E	*3	
108	Q11	Surface Preparation and Paint Procedure and Report		E	E	*3	
109	Q12	Pre-Commissioning/ Commissioning/Site Acceptance Test Procedure		E	E	*3	
110	Q13	Pre-Commissioning/ Commissioning/Site Acceptance Test Report		E	E	*3	
111	Q14	Factory Acceptance Test Procedure		E	E	*3	
112	Q15	Factory Acceptance Test Report		E	E	*3	
113	Q16	Weighing Procedure					
114	Q17	NDE/NDT Procedures & Reports					
115	Q18	Structural Analysis Report					
116	Q19	Stress analysis Report					
117	Q20	Certificate of Equipment Quantity and Performance per the Specification		E	E	*3	
118	Q21	Inspection and testing procedures and results, including third-party inspection results of the metering runs					
119	Q22	Shipping, Unpacking & Storage Procedure		E	E	*3	
120	Q23	Cable continuity & Resistance Test Report					
121	Q24	Certificate of Origin		E	E	*3	
122	Q25	Certificate of Quantity & Quality		E	E	*3	
123	Q26	Procedure for Erection and Installation of the Equipment		E	E	*3	
124	Q27	Fabrication and Quality Control Plan		E	E	*3	
125	Q28	Site Acceptance Tests Procedure (SAT) (The 'issue date' indicated is 8W before SAT date)		E	E	*3	
126	Q29	Declaration of Conformity according to ATEX (Certificates for use of electrical apparatus in hazardous area & certificates for IS barriers)		E	E	*3	
VIII		MANUAL AND INDICES					
127	R01	Installation, Operation and Maintenance Manual (IOM)		E	E	*3	
128	R02	Manufacturer's Data Record (MDR)		E	E	*3	
129	R03	Training Manuals (Operation and Maintenance)		E	E	*3	

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	13 of 22	
	TRD FOR TANK GAUGING SYSTEM			

Item no.	VP Code	Data/Document Description	Provide with Bid	For Review	For Approval/ Construction	For Final	Remark
IX		MISCELLANEOUS					
130	TBA	TBA					

Legend:

*1 : 3C + E

*2 : 3C + E



*3 : 1OR + 5C + E + 2CD

E : Electronic file



OR : Original

C : Copy

CD : CD-ROM



	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	14 of 22	
	TRD FOR TANK GAUGING SYSTEM			

ATTACHMENT #2
PURCHASER FORMAT

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	15 of 22	
	TRD FOR TANK GAUGING SYSTEM			



DEVIATION FROM PURCHASER'S SPECIFICATION

Spec. No.	Paragraph No.	Deviation	PTSC Justification	Client Conclusion	Remarks	Cost Effect When Deviation is Applied

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	18 of 22	
	TRD FOR TANK GAUGING SYSTEM			



SPECIAL TOOL LIST

No.	Tool name	Q'ty	Sketch	Unit price	Total price

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	20 of 22	
	TRD FOR TANK GAUGING SYSTEM			

ELECTRIC LOAD LIST

[illegible]

	HAI PHONG 2 PROJECT	Code:	HP02-00-IN-TRD-0005	
		Rev:	0	
		Dated:	13 th Nov, 2023	
		Page:	22 of 22	
	TRD FOR TANK GAUGING SYSTEM			

ATTACHMENT #3
MATERIAL TAKE OFF

PROJECT: HAI PHONG 2 PROJECT
ATTACHMENT #3: MATERIAL TAKE OFF FOR TANK GAUGING SYSTEM

No.	Work Item	Description	Size / Class	Unit	Quantity	Remark	Rev.
1	Tank Gauging System	Modify Existing Tank Gauging System shall be included modify software, hardware (including modify and add new Terminal, Fuse with holder and add all Accessories (Internal Cable, wire, Din-rail, etc.)) as per specification and drawings.	-	Lot	1		
2	Level Transmitter	Level Type: None-Contact Radar Level Gauge, Connection Size/Rating: 8" - ANSI 150# - RF Flange Level Measuring Principle: Time Domain Reflectometry Element Material: 316L SS, Transmitter Housing: Aluminium, Output: Communication Bus (Foundation Fieldbus and/or TRL/2 bus). Input: suitable for Temperature sensor, Power Supply: 24 VDC, Electrical Protection Class: Ex [ia] IIB T4, IP67	8" - ANSI 150# - RF	Set	2		
3	Temperature Element	Temperature Sensor Type: RTD Pt100, Points: 10, Flange connection: 2" ANSI#150 RF Electrical Protection Class: Ex [ia] IIB T4, IP67	2" ANSI#150 RF	Set	2		
4	Tank Hub	Tank Hub		Set	2		