


OWNER: 	CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE PARK OFFSITE						EPCC CONTRACTOR:	
CLIENT:	MATERIAL REQUISITION FOR AIR COOLERS							
MC:	Plant Code	Phase	Unit	Discipline	Doc Type	Serial	Rev.:	Page
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MATERIAL REQUISITION FOR AIR COOLERS

00	15-Feb-24	Issued for Review	F.SH.	M.O	A.M.	
Rev.	Date	Purpose of Issue	Prepared	Checked	Approved	AC Code



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1. Scope

This document covers design, material supply, manufacturing, assembling, inspection, testing, delivery and all other activities that is required for supply of Air Coolers to ASME section VIII Division 1 and API 661 to successful startup of the equipment.

This Requisition sets out the minimum requirements and does not relieve the Vendor of his full responsibility for the design and the reliable operation of supplied items. Therefore, the Vendor will be liable for the correct operation of any auxiliary elements involved. In the preparation of his proposal the Vendor shall fulfill all the provisions of this Requisition even if they differ from vendor standard supply. Whenever the Vendor cannot comply with the present Requisition for technical reasons, he shall state it in detail in the chapter of the deviations.

2. Definitions

2.1 Abbreviations

Abbreviation	Meaning
NDT	None Destructive Test
QA	Quality assurance
WPS/PQR	Welding Procedure Specification/Procedure Qualification Record
CD	Compact Disc
QCP	Quality Control Plan
MOM	Minuets Of Meeting
PMI	Positive Metal Identification

3. References


3.1 General

All documents, codes and standards referenced in this requisition, shall form an integral part of this Requisition and shall be followed where applicable.

For codes and standards, below revision in section 3.2 shall be followed. Purchaser reserve the right to request the vendor to use and follow an older revision of a code or standard due to his requirements.

3.2 Code and standards


No.	Code/Standard Number	Code/Standard Title
1	ASME Section VIII, Div 1 Edition 2021	Rules for Construction of Pressure Vessels
2	ASME Section VIII, Div.2, Edition 2021	Rules for Construction of Pressure Vessels, Alternative Rules
3	ASME Section V, Edition 2021	Nondestructive Examination
4	ASME Section IX, Edition 2021	Welding and Brazing Qualifications

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5	ASTM/ASME Section II, Edition 2021	Materials
6	API 661, 7th (2013), Reaffirmed 2018	Petroleum, Petrochemical, And Natural Gas Industries-Air-Cooled Heat Exchangers
7	BS EN 10204 (3.1)	Metallic Products - Types Of Inspection Documents
8	UBC 97	Uniform Building Code
9	WRC 107/297	Local Stresses In Cylindrical Shells Due To External Loading On Nozzles
10	ASME B16.5	Pipe Flanges And Flanged Fittings: Nps 1/2 Through Nps 24 Metric/Inch Standard
11	ASME B16.47 Series B	Large Diameter Steel Flanges Nps 26 Through Nps 60 Metric/Inch Standard
12	ASME B16.9	Factory-Made Wrought Butt welding Fittings
13	ASME B16.20	Metallic Gaskets For Pipe Flanges Ring-Joint, Spiral-Wound, And Jacketed
14	ASME B16.21	Nonmetallic Flat Gaskets For Pipe Flanges
15	ASME B1.1	Unified Inch Screw Threads
16	ASME B18.2.1	Square, Hex, Heavy Hex, And Askew Head Bolts And Hex, Heavy Hex, Hex Flange, Lobed Head, And Lag Screws (Inch Series)
17	ASME B18.2.2	Nuts For General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, And Coupling Nuts (Inch Series)
18	ASME B36.19	Stainless Steel Pipe
19	ASME B36.10	Welded And Seamless Wrought Steel Pipe
20	AISC 15 th Edition (2017)	Steel Construction Manual
21	AWS	American National Standard for Welding

3.3 Project Documents

No.	Document Title	Document Number	Revision	Remarks
A	General Documents :			
1	Site and Design Condition for Offsite Area	EI027-000-ED-PR-SPC-002	02	
B	Technical Documents:			
B-1	Equipment:			
	ITP		02	
B-2	Structure:			
B-3	Process:			
1	Preliminary Data Sheet for	API Data Sheet	00	

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No.	Document Title	Document Number	Revision	Remarks
	Air Cooler			
B-4	Pipping:			
B-5	Instrument:			
1	Specification for Package Instrumentation	EI027-000-ED-IN-SPC-004	02	
B-6	Electrical:			
1	Specification For Low Voltage Motors	EI027-000-EB-EL-SPC-002	03	

4. Inquired Items

4.1 Item Name and Tag Number

No.	Item Description	Item Tag Number	Number Required	Type
1	Condenser	AE 001 A/B	2	Air Cooler

5. Scope of Work and Supply


5.1 Scope of Supply

The supply shall include all the items with all the appurtenances and accessories (internal and external) shown on the attached specifications, drawings, sketches, standards and requested in this material requisition and/or necessary for testing, shipment, operation and maintenance except items that have been explicitly excluded.


The supply shall also include Design, Manufacturing, Testing, Inspection, Spare Parts, Certification, Packing, Supply of goods, Services and Documentation for the equipment fully in accordance with the specifications, Attached Drawings and other attachments to the requisition.

Vendor proposal in particular shall include, but not be limited to, equipment and materials specified in the following: Items marked with "Vendor" in column of "Included in supply scope of:" hereunder shall be within Vendor Scope of supply.

No.	Item Description	Included In Supply Scope of:
1	Tube Bundles	Vendor
2	Structures with Plenums and Fan rings	Vendor
3	Fans with Transmissions, supports, guards and Grease connection	Vendor
4	Electric motors with individual lubrication	Vendor
5	Vibration switch (One per each Fan)	Vendor
6	Walkway With Relevant Galvanized Gratings/ Checker Plate (As per relevant	Vendor

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	Standard Drawings) to headers both ends and each side connecting including ladders	
7	Motor and Fan maintenance and service platforms and ladders	Others
8	Anchor bolts & nuts w/washer for Pipe Rack installation	Others
9	setting bolts & nuts w/washer for Pipe Rack installation	Others
10	Set bolts & nuts with washer for installation of unit on structure	Vendor
11	Name plates and Relevant Support	Vendor
12	Two (2) Earthling Bosses per bay	Vendor
13	Sliding plates	Vendor
14	Four (4) lifting lugs per bundle	Vendor
15	Vent, drain and Chemical cleaning connection (Blind flange, bolts, nuts and spiral wound gaskets shall be provided)	Vendor
16	Instrument test points (Thermo well, pressure point connection)	Vendor
17	Louvers and Actuators with Positioner, if specified	Vendor
18	Steam coils If specified	Vendor
19	Grease connections line	Vendor
20	VVVF Control Panel, if required.	Others
21	Fan Induced Walkway (If Required)	Vendor
22	Tube Access Plugs (Where Required)	Vendor
23	Plenum Chambers	Vendor
24	Fans, Relevant Accessories (Including Rings & Deck), Fan-Shaft and Bearings, Etc	Vendor
25	External Welded Support And Motor, Machinery Supports	Vendor
26	Protection Nets For Fans And Belts (Fan Guards)	Vendor
27	Coupling And Power Transmission / Pulleys & Belts (Which Applicable)	Vendor
28	Wiring and Glands Plus Junction Box	Others
29	Electric Motors With Relevant Support Frames	Vendor
30	Bearings	Vendor
31	Junction box	Others
32	Gasket, Bolts and Nuts For Nozzles With Blinded Flanges	Vendor
33	Gasket, Bolts, Nuts and Washers For Nozzles With Companion Flanges, Internal Flanges, Blinded Flanges And Girth Flanges	Vendor
34	External/Internal Surface Coating	Vendor
35	Clips For Ladders, Platforms, Stairways and Piping Supports	Vendor
36	All Necessary Devices For Transportation (Including Adequate Saddles, Nozzle Covers, Bolts, Nuts, Temporary Gaskets For Shipping,"&" Cradle, Wooden Belts For Sling The Equipment, Packing Boxes, Fittings, Etc.)	Vendor
37	Piping Support Structure	Vendor
38	Protection Nets For Fans And Belts (Fan Guards)	Vendor
39	Piping Headers and Manifold	Others
40	Lighting Around Cooler	Others
41	Permanent Gasket and bolts and nuts to Process Nozzles	Others
42	Pipe supports for Header pipes	Vendor

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43	Insulation Material	Others
44	Fireproofing Material	Others
45	Spreader beam for installation	Others
46	Temporary bracing and support for transportation, if necessary	Vendor
47	Inhibition materials against internal corrosion for transportation and long time storage at stockyard	Vendor
48	Final Data Book	Vendor
49	Spare parts for insurance, construction, pre-commissioning, commissioning and start-up, (Tube Spare Parts to be Included) (To Be Quoted Separately) (*Option*)	Vendor
50	Spare parts for two (2) years operation (Tube Spare Parts to be Included) (To Be Quoted Separately) (*Option*)	Vendor
51	Special tools for erection & maintenance (Tube Spare Parts to be Included) (To Be Quoted Separately) (*Option*)	Vendor

5.2 Scope of Work

No.	Item Description	Included in Supply Scope of:
1	Thermal Calculation and guarantee	Vendor
2	Strength Calculation and Stress analysis based on the relevant specification and codes	Vendor
3	Performance guarantee	Vendor
4	Mechanical design and guarantee	Vendor
5	Structural Calculation	Vendor
6	Guarantee of the suitability of all used materials (chemical composition, mechanical properties and origin of materials)	Vendor
7	Material Procurement	Vendor
8	Documentation As Per Para. 6.3 Of Requisition In Addition To Documents Requested In The Relevant Job Specification	Vendor
9	Shop Drawing	Vendor
10	Detail design & drawings including platform and ladder	Vendor
11	Shop fabrication and assembling	Vendor
12	Welding Procedure Qualification Tests	Vendor
13	Welder Performance Qualification Tests	Vendor

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No.	Item Description	Included in Supply Scope of:
14	PWHT or Stress relieving, if required	Vendor
15	NDT and Hardness Test after PWHT (Where Required)	Vendor
16	Positive Material Identification (PMI) For Non-Carbon Steel Material	Vendor
17	Hydraulic / Hydrostatic Test	Vendor
18	Removing Of Any Scale, Rust, Barb And Any Foreign Material	Vendor
19	Internal Lining, Cladding or Coating (If Required)	Vendor
20	Surface Preparation	Vendor
21	Primer Painting	Vendor
22	Intermediate Painting	Vendor
23	Final Painting / Coating / Color approval	Vendor
24	Chemical Cleaning, Pickling & Passivation For Stainless Steel Parts	Vendor
25	Surface Preparation & Primer / Intermediate / Final Painting of Ladders and Platforms	Vendor
26	Shop inspection and tests	Vendor
27	Providing Required Facilities For Inspection and Test	Vendor
28	Preservation: N2 Purging with 1 barg Pressure	Vendor
29	Marking, packing and transportation	Vendor
30	Documentation as per the requirements of this specification	Vendor
31	All certificates requested in this specification , specially material certificates	Vendor
32	Providing size of anchor bolts, foundation layout and final loading data due to wind and earthquake.	Vendor
33	Ex-Work Delivery	Vendor
34	Field Erection, Welding And Testing	Others
35	Supervision At Site For Erection / Installation (To Be Quoted Separately) (*Option*)	Vendor

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6. Documentation

6.1 Language of documentation

All documents shall be written in the English. Persian may be used for local letters and minutes of meeting if approved by purchaser. All documents in other languages shall be translated to English before submittal.


6.2 Unit of measurement

SI units shall be used as far as possible except for followings:

- Pipe and flange nominal diameter should be represented in inch.


6.3 Documents shall be submitted by vendor

LIST OF DOCUMENTS REQUIRED FROM VENDOR							
NO.	DESCRIPTION	AT THE TIME OF BID Q/TYPE	AFTER ORDERING				AT THE FINAL INSP. (Note 4)
			DRAWINGS AND DOCUMENTS (NOTE 10)				
			Q/TYPE (Note 1)	DEL. TIME (Note 2)	PURPOSE (Note 3)	FINAL ISSUE (Note 1)	
A	General:						
1	Sub-Vendor/Sub-Supplier List	4/C	-	-	R	-	-
2	Vendor Print Index And Schedule (VPIS)	-	4/C+1/CD	2 W+ Monthly	R	-	-
3	Country of Origins of Material	4/C	4/C+1/CD	With Material Certificate	I	-	-
4	Vendor's Procurement Status	-	4/C	Monthly	I	-	-
5	Vendor's Progress Report	-	4/C	Monthly	R	-	-
6	Material Certificates / Certificate of Origin	-	4/C+1/CD	3 W Before Fabrication Start	I	10/C+2/CD	X
7	Inspection and Test Plan	-	4/C+1/CD	4 W	R	10/C+2/CD	X
8	Copy Of Un-priced Sub-Vendor/Sub-Supplier Orders	-	4/C+1/CD	1 W After Sub-Order Placement	I	-	-

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			DRAWINGS AND DOCUMENTS (NOTE 10)				FINAL ISSUE (Note 1)	
			Q/TYPE (Note 1)	DEL. TIME (Note 2)	PURPOSE (Note 3)			
9	Spare Parts List For Erection, Pre Commissioning, Commissioning And Start-Up	4/C	4/C+1/CD	10 W	R	10/C+2/CD	X	
10	Spare Parts List For 2 Year Operation	4/C	4/C+1/CD	10 W	R	10/C+2/CD	X	
11	Welding Procedure Specifications And Procedure Qualification Records (WPS & PQR) Including General Arrangement Drawings And Related Weld Or Welding Map For All Welding	-	4/C+1/CD	6 W Before Welding	R	10/C+2/CD	X	
12	Welders Qualification Certificates	-	4/C+1/CD	3 W Before Welding	R	10/C+2/CD	X	
13	Testing / NDT Procedures	-	4/C+1/CD	6 W Before Test	R	10/C+2/CD	X	
14	Heat Treatment Procedures (If Applicable)	-	4/C+1/CD	6 W Before Treat	R	10/C+2/CD	X	
15	Hardness Test Procedures (If Applicable)	-	4/C+1/CD	6 W Before Treat	R	10/C+2/CD	X	
16	Painting Procedure	-	4/C+1/CD	6 W Before Painting	R	10/C+2/CD	X	
17	Pickling And Passivation Procedure (If Applicable)	-	4/C+1/CD	6 W Before Pickling	R	10/C+2/CD	X	
18	NDT Personal Qualification Certificate	-	4/C+1/CD	6 W Before Test	R	10/C+2/CD	X	

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			Q/TYPE (Note 1)	DEL. TIME (Note 2)	PURPOSE (Note 3)	FINAL ISSUE (Note 1)		
19	NDT Map	-	4/C+1/CD	6 W Before Test	R	10/C+2/CD	X	
20	Testing / NDT Records	-	4/C+1/CD	2 W After Test	R	10/C+2/CD	X	
21	Heat Treatment Records (If Any)	-	4/C+1/CD	2 W After Treat	R	10/C+2/CD	X	
22	Internal Lining/Coating/Painting Procedures (If Applicable)	-	4/C+1/CD	6 W Before Lining	R	10/C+2/CD	X	
23	PMI Procedure (If Applicable)	-	4/C+1/CD	6 W Before Test	R	10/C+2/CD	X	
24	PMI Record (If Applicable)	-	4/C+1/CD	2 W After Test	R	10/C+2/CD	X	
25	Hydrotest Procedure	-	4/C+1/CD	6 W Before Test	R	10/C+2/CD	X	
26	Hydrotest Certificates	-	4/C+1/CD	2 W After Treat	R	10/C+2/CD	X	
27	Other Shop Test Reports	-	4/C+1/CD	2 W Before Test	R	10/C+2/CD	X	
28	Installation, Operation, Maintenance Manuals	-	4/C+1/CD	1 M Before Delivery	R	10/C+2/CD	X	
29	Special Tools For Erection & Maintenance	4/C	4/C+1/CD	16W	R	10/C+2/CD	X	


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			DRAWINGS AND DOCUMENTS (NOTE 10)				FINAL ISSUE (Note 1)	
			Q/TYPE (Note 1)	DEL. TIME (Note 2)	PURPOSE (Note 3)			
30	Packing Lists and Packing Sketch	-	4/C+1/CD	Upon Shipment	R	10/C+2/CD	X	
31	Instruction for Packing, Marking, Shipping and Delivery	-	4/C+1/CD	Upon Shipment	R	10/C+2/CD	X	
32	Material + Mill Certificates And Acceptance Certificates	-	10/C+2/CD	1 W Before Delivery	R	10/C+2/CD	X	
33	Equipment Inspection Release Certificates	-	10/C+2/CD	2 W After Delivery	R	10/C+2/CD	X	
34	Transportation Instructions (On Purchaser's Request i.e. Heavy Lifts, Special Packages, etc.)	-	4/C+1/CD	6 W Before Shipping	R	10/C+2/CD	X	
35	Installation Manual With Assembling Procedure Including Lifting Procedure At Site	-	4/C+1/CD	2(TWO) M/ BEFORE DELIVERY	R	10/C+2/CD	X	
36	As-Built Drawings	-	10/C+2/CD	2 W Before Delivery	R	10/C+2/CD	X	
37	List of Documents to Be Included in Vendor Data Book	-	4/C+1/CD	2 M Before Delivery	R	-	X	
38	Vendor Data Book	-	-	2 W After Delivery	R	10/C+4/CD	X	
B	Process:							
1	Thermal And Sizing Calculation Sheets	4/C	4/C+1/CD	4 W	R	10/C+2/CD	-	


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			Q/TYPE (Note 1)	DEL. TIME (Note 2)	PURPOSE (Note 3)	FINAL ISSUE (Note 1)	
C	Mechanics:						
1	Datasheets And Specification For Each Equipment	4/C	4/C+1/CD	4 W	R	10/C+2/CD	X
2	Outline Drawings (Plan, Elevation And Nozzle Details)	4/C	4/C+1/CD	4 W	R	10/C+2/CD	X
3	General Assembly And Dimensional Arrangement Drawing	4/C	4/C+1/CD	4 W	R	10/C+2/CD	X
4	Loading Data On Foundation (Static And Dynamic)	4/C	4/C+1/CD	4 W	R	10/C+2/CD	X
5	Detail Fabrication Drawings Of Bundle And Frame, Including Steam Coil, If Any (Drawn To Scale).	-	4/C+1/CD	6 W	R	10/C+2/CD	X
6	Detail Drawings Of Moving Parts Such As Supports Of Motors, Pulley & Belts And Plenum Chamber, Fan & Drive Guards, Louvers And Relevant Mechanism Details (Drawn To Scale)	-	4/C+1/CD	4 W	R	10/C+2/CD	X
7	Drawings Of Structures Including Platforms & Ladders	-	4/C+1/CD	12 W	R	10/C+2/CD	X
8	Data Sheet Of Fan With Performance Curve & Noise Level	-	4/C+1/CD	8 W	R	10/C+2/CD	X
9	Characteristic Curve For Louver, If Applicable	-	4/C+1/CD	8 W	R	10/C+2/CD	X
10	Mechanical Strength Calculation Sheets Of headers, Tube And Nozzles	-	4/C+1/CD	4 W	R	10/C+2/CD	-
11	Local Stress Analysis	-	4/C+1/CD	6 W	R	10/C+2/CD	-

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			Q/TYPE (Note 1)	DEL. TIME (Note 2)	PURPOSE (Note 3)	FINAL ISSUE (Note 1)	
	Due To Nozzle Loads By FEM						
12	Calculation For Stability Check, Frequencies, Center Of Gravity	-	4/C+1/CD	8 W	R	10/C+2/CD	-
13	Maximum Allowance Forces And Moments For Connecting Nozzles	-	4/C+1/CD	4 W	R	10/C+2/CD	-
14	Steel Structure Calculation Considering Wind, Seismic Load	-	4/C+1/CD	12 W	R	10/C+2/CD	-
15	Lubricants Chart, If Applicable	-	4/C+1/CD	16 W	R	10/C+2/CD	X
16	Equipment Noise Data Sheet	-	4/C+1/CD	3 W	R	10/C+2/CD	X
17	Fan Performance Curves	-	4/C+1/CD	8 W	R	10/C+2/CD	X
18	As Built Drawings	-	-	16 W	R	10/C+2/CD	-
D	Electrical						
1	Electrical Motor Data Sheet	-	4/C+1/CD	8 W	R	10/C+2/CD	X
2	Cross sectional Drawing for LV motors with Part List. (only if non standard)	-	4/C+1/CD	8 W	R	10/C+2/CD	X
3	Wiring Diagrams With Connections To Terminal Blocks	-	4/C+1/CD	8 W	R	10/C+2/CD	X
4	Motor Nameplate Drawing	-	4/C+1/CD	14 W	R	10/C+2/CD	X
D	Instrument						
1	Vibration Switch Data Sheet and Drawing	-	4/C+1/CD	8 W	R	10/C+2/CD	X
2	Catalogs For All Instruments	-	4/C+1/CD	8 W	R	10/C+2/CD	X
3	Report Of Functional And Performance Test, IP Test, Hazardous Classification Test	-	4/C+1/CD	8 W	R	10/C+2/CD	X

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			Q/TYPE (Note 1)	DEL. TIME (Note 2)	PURPOSE (Note 3)	FINAL ISSUE (Note 1)	

- (1) Q=QUANTITY, C=COPY, T=TRANSPARENT, P=POLYESTER, CD=COMPACT DISC, E=E-FILE
- (2) W=WEEK AFTER ORDER PLACEMENT, M=MONTH AFTER ORDER PLACEMENT
- (3) R=FOR REVIEW, I=FOR INFORMATION
- (4) X=DOCUMENTS TO BE SUBMITTED AT THE FINAL INSPECTION / DATA BOOK
- (5) PRICED COPY + UNPRICED COPY
- (6) PURCHASER HAS THE RIGHT TO REJECT SUB-VENDORS/SUB-SUPPLIERS IF HIS CAPABILITY IS JUDGED POOR OR NOT PROVEN.
- (7) NO DRAWING / DOCUMENT COULD BE REVIEWED BEFORE RECEIVING VPIS.
- (8) ALL DRAWINGS SHOULD INCLUDE WEIGHTED PART LIST.
- (9) ORIGINAL E_FILE SHOULD BE PROVIDED FOR FEA
- (10) ORIGINAL E_FILE SHOULD BE PROVIDED.