



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.

**CONCEPTUAL, BASIC and DETAIL DESIGN
ENGINEERING OF STYRENE PARK OFFSITE**



Farnikan
Engineered Solutions

Document Title: WELDING & NDT MAP

Document No. : E1027-FPA-VD-QC-NDT-003

Rev.: R0

Page 1 of 9

STYRENE PARK OFFSITE

Document Title:

WELDING & NDT MAP

Rev.	Issued Date	DESCRIPTION	PREPARED	CHECKED	APPROVED
00	29-Aug-2024	IFA	F.Baviye	N.Abnavi	N.Abnavi



Toase-che Park Sanati Gohar Ofogh Petrochemical Co.

**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE**



Document Title: WELDING & NDT MAP

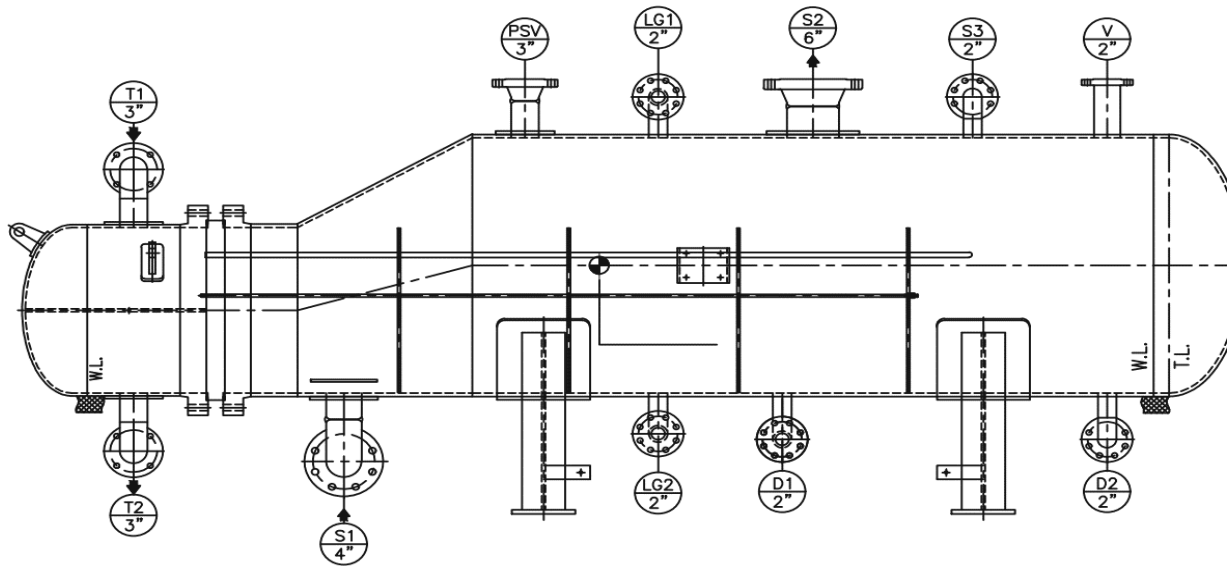
Document No. : E1027-FPA-VD-QC-NDT-003

Rev.: R0

Page 2 of 9

Page	Revisions							Page	Revisions						
	R0	R1	R2	R3	R4	R5	R6		R0	R1	R2	R3	R4	R5	R6
1	X							41							
2	X							42							
3	X							43							
4	X							44							
5	X							45							
6	X							46							
7	X							47							
8	X							48							
9	X							49							
10								50							
11								51							
12								52							
13								53							
14								54							
15								55							
16								56							
17								57							
18								58							
19								59							
20								60							
21								61							
22								62							
23								63							
24								64							
25								65							
26								66							
27								67							
28								68							
29								69							
30								70							
31								71							
32								72							
33								73							
34								74							
35								75							
36								76							
37								77							
38								78							
39								79							
40								80							

DOC. NO.	E1027-FPA-VD-QC-NDT-003		REV.	0
SHEET	3	Of	9	
PROJECT NO.	HX-127			
ITEM	CHILLER			



GENERAL INFORMATION			DESCRIPTION MATERIALS			
TYPE OF SERVICE		CHILLER (EVAPORATOR)		SHELL SIDE	BARREL	SA 516 Gr.70
CONSTRUCTION CODE		ASME VIII div.1 Ed.2021 & TEMA R /10th Ed. 2019			NOZZLES (FROM PIPE/PLATE/FLANGE)	SA 333-6/ SA 516 Gr.70 N/SA 350-LF2
M.D.M.T		-45 °C for Shell side & -29°C for Tube side			FLANGES	SA 350-LF2 CL1
DESCRIPTION MATERIALS			SADDLE	COUPLING / PLUG	-	
TUBE BUNDLE	TUBES	SA 334-6		PLATE	SA 516 Gr.70 N	
	TUBESHEET	SA 350-LF2 CL1		PLATE	SA 283 Gr.C/ SA 516 Gr.70	
	BAFFLES	SA 516 Gr.70		RTB	SA 283 Gr.C/ SA 516 Gr.70	
TIE RODS / SPACERS		SA 36/SA 179	EARTHING LUG	S.S. 304		
CHANNEL SIDE	BARREL	SA 516 Gr.70	APPLICABLE DOCUMENTS			
	NOZZLES (FROM PIPE/PLATE/FLANGE)	SA 106-B/SA 516-70N/SA 105N	GENERAL DRAWINGS	E1027-HSE-VD-ME-DWG-008		
	HEAD	SA 516 Gr.70	PWHT PROCEDURE	NO		
	FLANGE	SA 105 N				
	PIPE	SA 106-B				

SA 266 2N (If Body Flange is mentioned)

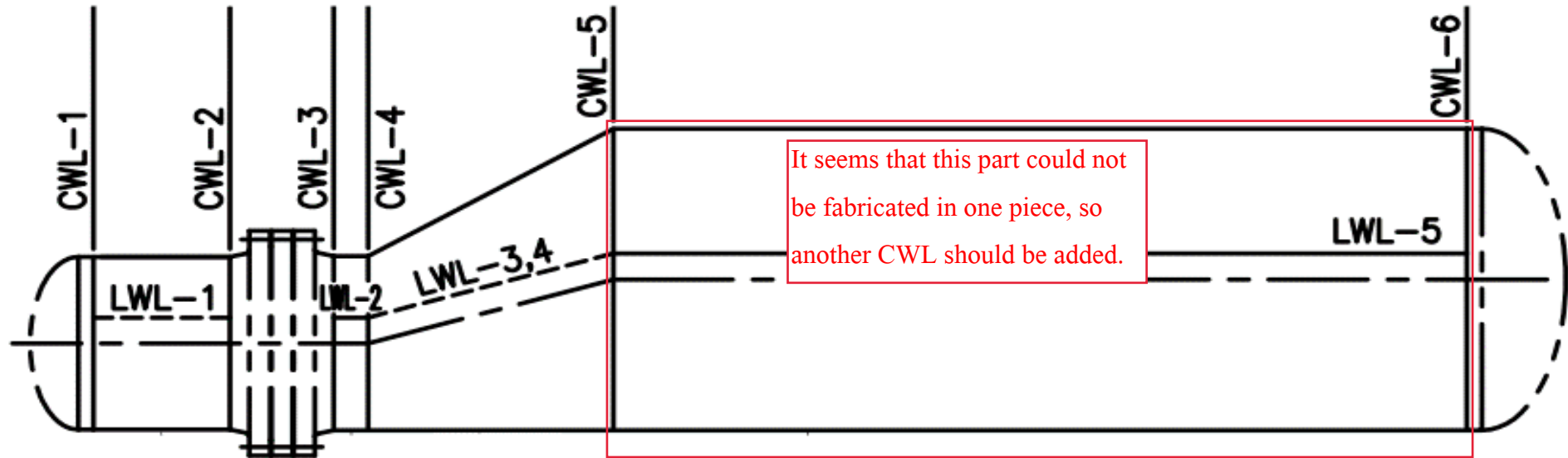
N

CL1

WELDING & NDT MAP

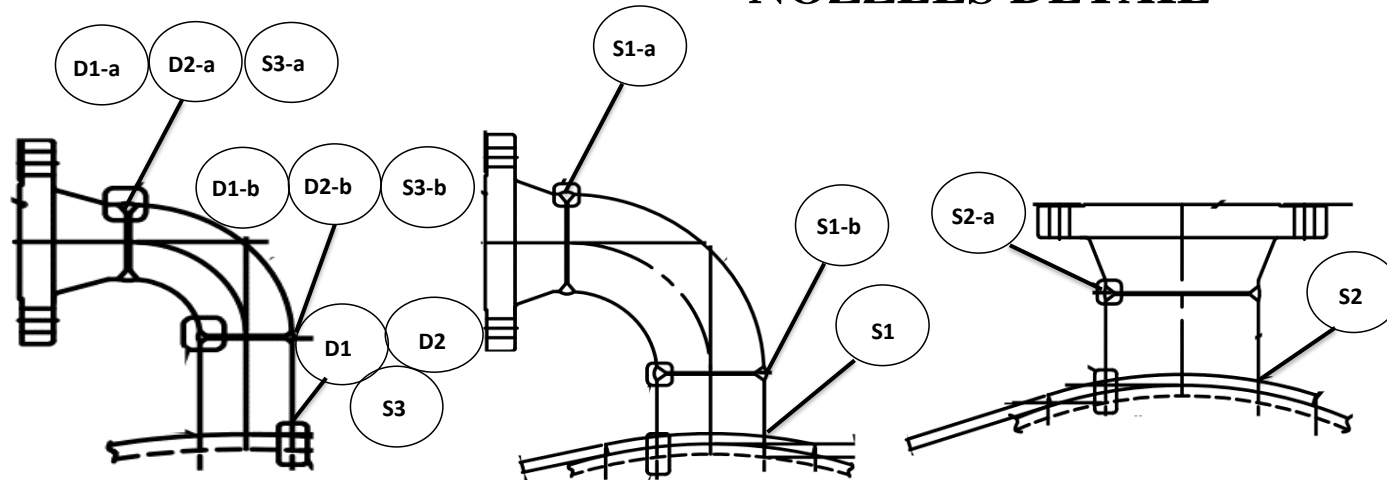
DOC. NO.	E1027-FPA-VD-QC-NDT-003		REV.	0
SHEET	4	Of	9	
PROJECT NO.	HX-127			
ITEM	CHILLER			

SHELL DETAIL



DOC. NO.	E1027-FPA-VD-QC-NDT-003		REV.	0
SHEET	5	Of	9	
PROJECT NO.	HX-127			
ITEM	CHILLER			

NOZZLES DETAIL



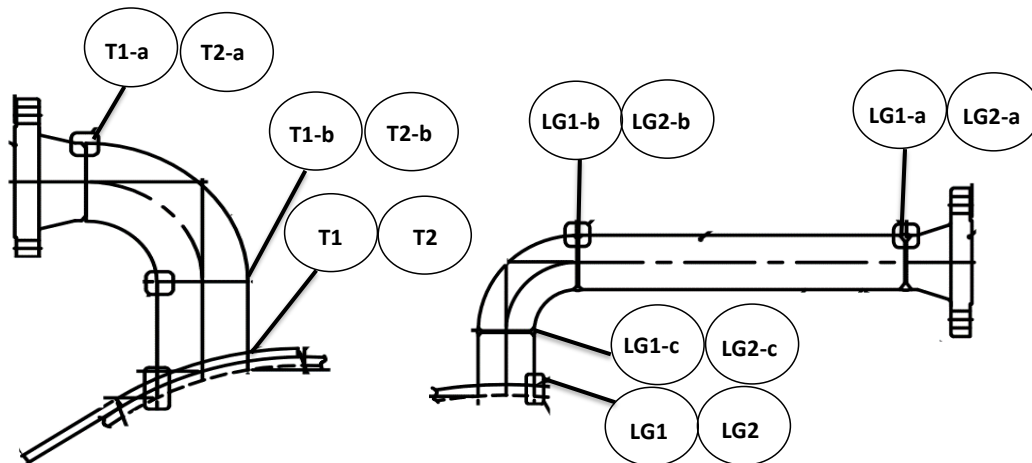
Detail for D1, D2, S3

Detail for S1

Detail for S2

NOZZLE LIST

NOZZLE MARK	Q'TY /1 SET	SIZE (INCH)	FLANGE	
			RATING	SCH.
S1	1	4"	ASME B16.5 300# WN.RF	120
S2	1	6"	ASME B16.5 300# WN.RF	80
T1	1	3"	ASME B16.5 150# WN.RF	80
T2	1	3"	ASME B16.5 150# WN.RF	80
D1	1	2"	ASME B16.5 300# LWN.RF	160
D2	1	2"	ASME B16.5 300# LWN.RF	160
LG1	1	2"	ASME B16.5 300# WN.RF	160
LG2	1	2"	ASME B16.5 300# WN.RF	160
PSV	1	3"	ASME B16.5 300# WN.RF	160
V	1	2"	ASME B16.5 300# LWN.RF	t16.6
S3	1	2"	ASME B16.5 300# WN.RF	160



Detail for T1, T2

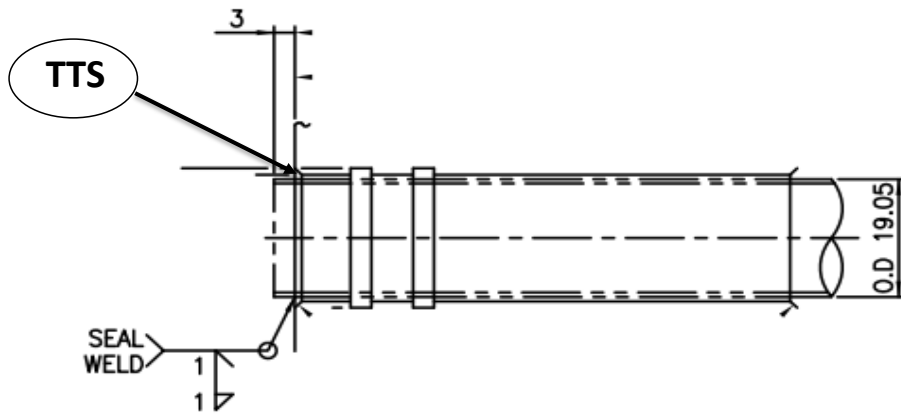
Detail for LG1, LG2

Detail for PSV

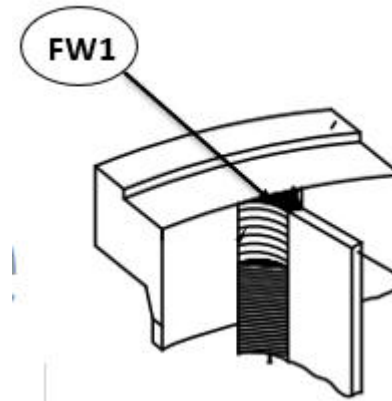
Detail for V

WELDING & NDT MAP

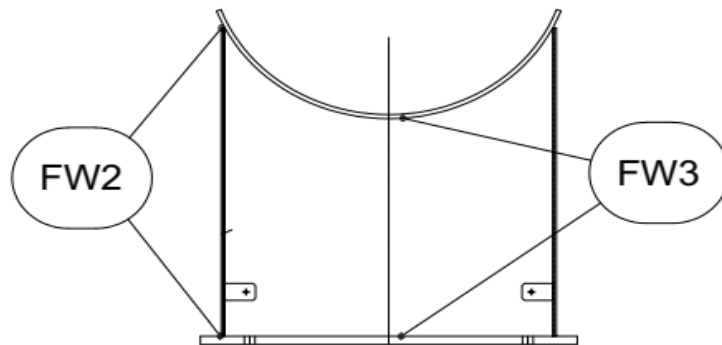
DOC. NO.	E1027-FPA-VD-QC-NDT-003		REV.	0
SHEET	6	Of	9	
PROJECT NO.	HX-127			
ITEM	CHILLER			



TUBE TO TUBESHEET JOINT



PARTITION PLATE DETAIL



SADDLE DETAIL

This exchanger is 4 pass so detail of pass partitions weld to each other to be shown.

WELDING & NDT MAP

All schematic views shall be clear and readable.

DOC. NO.	E1027-FPA-VD-QC-NDT-003		REV.	0
SHEET	7	Of	9	
PROJECT NO.	HX-127			
ITEM	CHILLER			

Joint Type	Schematic	Joint
		LWL-1~LWL-5
B		CWL-1
C		CWL-2,3
D		CWL-4
E		CWL-5
		CWL-6
G		T1-a,T1-b,T2-a,T2-b,S1-a,S1-b,S2-a,PSV-a,LG1-a, LG2-a,S3-a, LG1-b, LG1-c, LG2-b, LG2-c, T1-a, T1-b, T2-a, T2-b
H		T1, T2, S1, S2, PSV
I		LG1, LG2, D1, D2, S3, V
		TTS
K		FW1, FW2, FW3

Used thickness for head does not decrease in straight flange so it seems 12mm to be welded to 10mm, please check.

Used thickness for head does not decrease in straight flange so it seems 14mm to be welded to 12mm, please check.

To be shown in detail and readable view.

According to p.6, welds for pass partition and saddle shall be shown in separate rows and exact details.

WELDING AND NDT MAP

DOC. NO.	E1027-FPA-VD-QC-NDT-003	REV.	0
SHEET	8	Of	9
PROJECT NO.	HX-127		
ITEM	CHILLER		

All nozzle to flange and nozzle to elbow welds shall be 100% RT tested.

WELD IDENTIFICATION	WELDING PROCESS	BASE MATERIAL		W.P.S.		P.Q.R.		Joint Type	IMPACT TEST	PWHT	NDT
		TYPE AND GRADE	THK. (mm)	NUMBER	REV.	NUMBER	QUALIFIED RANGE(mm)				
LWL-1	GTAW+SMAW	SA-516 Gr.70N	10	WPS-HX127-001	0	FPA-PQR-029	5:50	A	N.A.	N.A.	100% RT
		SA-516 Gr.70N									
LWL-2~LWL-4	GTAW+SMAW/SMAW	SA-516 Gr.70N	12	WPS-HX127-001	0	FPA-PQR-029	5:50	A	N.A.	N.A.	100% RT
		SA-516 Gr.70N									
LWL-5	GTAW+SMAW/SMAW+SAW	SA-516 Gr.70N	12	WPS-HX127-002	0	FPA-PQR-029	5:50	A	N.A.	N.A.	100% RT
		SA-516 Gr.70N									
CWL-1	GTAW+SMAW/GTAW+SMAW+SAW	SA-516 Gr.70N	10	WPS-HX127-002	0	FPA-PQR-029	5:50	B	N.A.	N.A.	100% RT
		SA-516 Gr.70N									
CWL-2	GTAW+SMAW/GTAW+SMAW+SAW	SA-516 Gr.70N	10	WPS-HX127-002	0	FPA-PQR-029	5:50	C	N.A.	N.A.	100% RT
		SA-266-2N									
CWL-3	GTAW+SMAW/SMAW+SAW	SA-516 Gr.70N	12	WPS-HX127-002	0	FPA-PQR-029	5:50	C	N.A.	N.A.	100% RT
		SA-266-2N									
CWL-4	GTAW+SMAW/SMAW+SAW	SA-516 Gr.70N	12	WPS-HX127-002	0	FPA-PQR-029	5:50	D	N.A.	N.A.	100% RT
		SA-516 Gr.70N									
CWL-5,CWL-6	GTAW+SMAW/SMAW+SAW	SA-516 Gr.70N	12	WPS-HX127-002	0	FPA-PQR-029	5:50	E	N.A.	N.A.	100% RT
		SA-516 Gr.70N									
T1,T2	GTAW+SMAW	SA-106 Gr.B	10	WPS-HX127-001	0	FPA-PQR-029	5:50	H	N.A.	N.A.	100% UT
		SA-516 Gr.70N									
S1,S2,PSV	GTAW+SMAW	SA-333 Gr.6	12	WPS-HX127-001	0	FPA-PQR-029	5:50	H	N.A.	N.A.	100% UT
		SA-516 Gr.70N									
LG1, LG2,D1,D2,S3	GTAW+SMAW	SA-333 Gr.6	12	WPS-HX127-001	0	FPA-PQR-029	5:50	I	N.A.	N.A.	100% UT
		SA-516 Gr.70N									
V	GTAW+SMAW	SA-350 LF2	12	WPS-HX127-001	0	FPA-PQR-029	5:50	I	N.A.	N.A.	100% UT
		SA-516 Gr.70N									
T1-a,T1-b,T2-a,T2-b	GTAW+SMAW/GTAW	SA-106 Gr.B	7.62	WPS-HX127-001	0	FPA-PQR-029	5:50	G	N.A.	N.A.	100% PT
		SA 234 WPB6									
		SA-105N									
S1-a,S1-b, S2-a,PSV-a,LG1-a, LG2-a,S3-a	GTAW+SMAW	SA-333 Gr.6	8.74, 11.13, 10.97	WPS-HX127-001	0	FPA-PQR-029	5:50	G	N.A.	N.A.	100% PT
		SA-420 WPL6									
		SA-350 LF2									

+ PT



WELDING AND NDT MAP

DOC. NO.	E1027-FPA-VD-QC-NDT-003	REV.	0
SHEET	9	Of	9
PROJECT NO.	HX-127		
ITEM	CHILLER		

All nozzle to flange and nozzle to elbow welds shall be 100% RT tested.

WELDS LIST

WELD IDENTIFICATION	WELDING PROCESS	BASE MATERIAL		W.P.S.		P.Q.R.		Joint Type	IMPACT TEST	PWHT	NDT
		TYPE AND GRADE	THK. (mm)	NUMBER	REV.	NUMBER	QUALIFIED RANGE(mm)				
LG1-b, LG1-c LG2-b, LG2-c	GTAW+SMAW	SA-420-WPL6	8.74	WPS-HX127-001	0	FPA-PQR-029	5:50	G	N.A.	N.A.	100% PT
		SA-333 Gr.6									
TTS	GTAW (ORBITAL)	SA-334-6	-	WPS-HX127-003	0	FPA-PQR-104	1.05:4.22	J	N.A.	N.A.	100% PT
		SA-350-LF2									
FW1	SMAW/GMAW	SA-516 Gr.70	-	WPS-HX127-004 WPS-HX127-005	0	FPA-PQR-029 FPA-PQR-027	5~50 for Groove, ALL for fillet	K	N.A.	N.A.	100% PT
		SA-516 Gr.70									
FW2,FW3	SMAW/GMAW	SA-516 Gr.70	-	WPS-HX127-004 WPS-HX127-005	0	FPA-PQR-029 FPA-PQR-028	5~50 for Groove, ALL for fillet	K	N.A.	N.A.	100% PT
		SA 283 Gr.c									

Please add notes below:

- 100% PT shall be done for root pass.
- 100% VT shall be done for all weld lines.
- 100% PT shall be done final pass and back gouged welds and after edge preparation.
- All intersections between longitudinal and circumferential welds shall be radiographic examined.