

TABLE: Joint Reactions

Joint	OutputCase	Fx	Fy	Fz
Text	Text	Kgf	Kgf	Kgf
A-1	DEAD S	16.65	45	861.98
A-1	DEAD	49.34	-158.83	1640.14
A-1	DEAD OP	4.08	-14.37	92.37
A-1	DEAD N	-1631.93	429.16	-2881.5
A-1	LIVE	3.34	25.54	1383.73
A-1	WX	31.57	329.34	-352.72
A-1	WY	-387.76	93.94	-669.09
A-1	SNOW	9.74	-24.99	547.6
A-1	EQX	106.43	1146.34	-1764.17
A-1	EQY	-1561.76	337	-3289.21
A-1	EQXO	210.24	2295.43	-3529.78
A-1	EQYO	-3123.79	673.24	-6571.39
A-2	DEAD S	-20.6	1.599E+13	380.54
A-2	DEAD	-33.06	-0.0000289	811.07
A-2	DEAD OP	-0.21	-3.963E-07	55.27
A-2	DEAD N	-10.59	-1.13	-378.95
A-2	LIVE	-76.47	6.353E+13	402.18
A-2	WX	1.165E+12	49.87	8.288E+13
A-2	WY	-54.91	-1.269E+13	-353.83
A-2	SNOW	-19.58	-8.653E+07	221.21
A-2	EQX	0.004107	45.8	0.09216
A-2	EQY	-48.82	-0.38	-1465.12
A-2	EQXO	0.00889	92.7	0.18
A-2	EQYO	-98.54	-0.78	-2927.34
A-3	DEAD S	16.65	45	861.98
A-3	DEAD	49.34	158.83	1640.17
A-3	DEAD OP	4.08	14.37	92.37
A-3	DEAD N	39.17	235.02	482.86
A-3	LIVE	3.34	-25.54	1383.73
A-3	WX	-31.57	329.34	352.72
A-3	WY	387.76	-93.94	669.09
A-3	SNOW	9.74	24.99	547.6
A-3	EQX	-106.49	1146.49	1764.07
A-3	EQY	-1071.77	-428.48	-2570.23
A-3	EQXO	-210.36	2295.75	3529.6
A-3	EQYO	-2144	-856.2	-5134.3
B-1	DEAD S	34.11	-1.44	482.68
B-1	DEAD	174.23	-2.24	983.92
B-1	DEAD OP	16.3	0.03128	81.45
B-1	DEAD N	-670.87	1.33	2555.04
B-1	LIVE	-43.74	-6.51	64.14
B-1	WX	255.25	0.99	-374.63
B-1	WY	-1.33	-70.96	504.74
B-1	EQX	-985.73	4.1	-1834.5
B-1	EQY	-51.12	-28.6	2619.38
B-1	EQXO	-1968.03	8.18	-3658.39
B-1	EQYO	-102.38	-57.85	5233.15
B-2	DEAD S	-3.76E-15	-9.82	342.79
B-2	DEAD	-1.168E-10	-61.15	847.79
B-2	DEAD OP	-1.602E-11	-8.01	77.09
B-2	DEAD N	-0.0003857	-403.24	720.08
B-2	LIVE	8.844E-15	82.81	-147.91
B-2	WX	-56.07	3.583E-12	-6.399E-12
B-2	WY	-8.004E-14	-439.42	682.53
B-2	SNOW	-3.498E-11	3.21	131.34
B-2	EQX	0.02819	0.04229	-0.07544
B-2	EQY	0.006383	-1570.51	2804.88
B-2	EQXO	-0.2	0.08416	-0.15
B-2	EQYO	0.0007335	-3138.25	5603.81
B-3	DEAD S	-34.11	-3.44	482.68
B-3	DEAD	-174.23	-2.24	983.9
B-3	DEAD OP	-16.3	0.03128	81.45
B-3	DEAD N	-670.07	1.26	1104.47
B-3	LIVE	43.74	-6.51	64.14
B-3	WX	-255.25	-0.99	374.63
B-3	WY	1.33	-70.96	504.74
B-3	SNOW	-24.65	-1.56	193.87
B-3	EQX	-985.8	-4.09	1834.58
B-3	EQY	-40.75	-28.68	1900.29
B-3	EQXO	-1968.16	8.15	3658.54
B-3	EQYO	-81.36	-57.83	3796.07

- NOTES:**
- Loading Data
WIND :ASCE7-16, VELOCITY :125km/h, EXPOSURE : C
Earthquake: Standard No. 2800, A=0.3, B=2.75, I=1.4, R=3.5, SOIL TYPE=IV
 - Fans
-100% AP(Adjustable pitch-manual)
 - Miscellaneous
- The Inlet Header Boxes Are Fixed In The Direction Of Fin Tubes, Refer To Table For The Lateral Displacement In Y Direction
- Flange Face Detail : ASME ANSI B16.5
 - All Dimensions Are In Millimeter Unless Otherwise Specified.
 - All Dimensions Tolerances Are According to API 661.(Figure 10)
 - Bolts which are used for fixing headers to side frame , on sliding side should be removed after erection.
 - PROTECTION(SEE Galvanizing Specification and Inspection Procedure: EI027-DMF-VD-QC-PRO-024
 - RADIOGRAPHIC TEST (FULL/SPOT) SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF ASME SEC. VIII DIV.1 UW-11 & UW-12.
 - 50% motors per unit to be VFD.

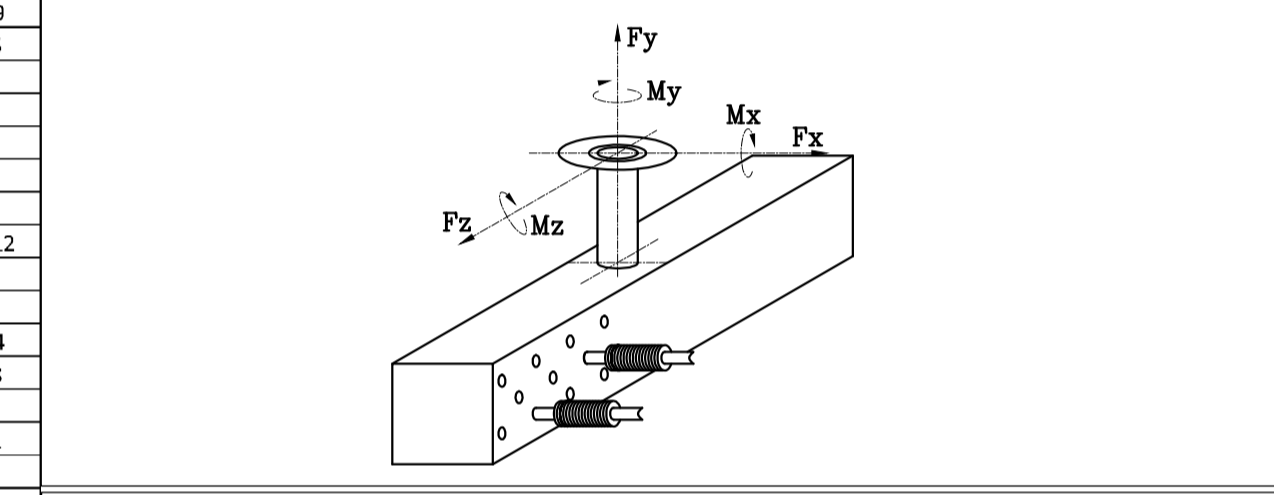
LOAD DEFINITION*

LOAD	DESCRIPTION
DEAD	DEAD LOAD(PLENUMS+FAN RINGS+FAN GUARDS+FAN+MOTOR+SPEED REDUCERS+GRATING+TUBE BUNDLE EMPTY)+HEADER WALK WAY
DEAD OP	WEIGHT OF LIQUID WITHIN EACH TUBE BUNDLE & STEAM COIL(WATER)
DEADS	SELF WEIGHT OF STRUCTURE
DEADN	NOZZEL LOAD
LIVE	WALKWAY LOAD 250 Kg/m ²
EQX	SEISMIC LOAD DIR.X
EQY	SEISMIC LOAD DIR.Y
WX	WIND LOAD DIR.X
WY	WIND LOAD DIR.Y
SNOW	66 Kg/m ²

* Further Definition Check the Steel Structure Calculation.Doc No.: EI027-DMF-VD-ST-CAL-004
1158-A01-0030-00

THE MAXIMUM ALLOWABLE MOMENTS AND FORCES PER EACH NOZZLE (IF LOADS ARE DIVIDED EQUALLY FOR NOZZLES ACCORDING TO 3xAPI 661(7.1.10.1))

SIZE	Fx(N)	Fy(N)	Fz(N)	Mx(N.m)	My(N.m)	Mz(N.m)
4"	10020	8010	10020	2430	3660	2430
2"	3060	3990	3060	450	720	450



CONNECTIONS

NO.	REP.	QTY. PER BAY/ZUNIT	DIA	DESIGNATION
N1	INLET NOZZLE/FLANGE	1/2	4"	FLANGE ANSI B16.5, 300 LWN, SA-350 L2 CL.1 N, THK.=13.49
N2	OUTLET NOZZLE/FLANGE	1/2	2"	FLANGE ANSI B16.5, 300 LWN, SA-350 L2 CL.1 N, THK.=16.6
V1&V2	VENT	2/4	1"	FLANGE ANSI B16.5, 300 LWN, SA-350 L2 CL.1 N, THK.=14.3
D1&D2	DRAIN	2/4	1"	FLANGE ANSI B16.5, 300 LWN, SA-350 L2 CL.1 N, THK.=14.3
1A	VIBRATION SWITCH	2/4	-	SEE FAN DRIVE ASSEMBLY DRAWING
2A	MOTOR(7.5kw)	2/4	-	SEE FAN DRIVE ASSEMBLY DRAWING
3A	FAN	2/4	7ft	SEE FAN DRIVE ASSEMBLY DRAWING

LATERAL DISPLACEMENT OF HEADERS (DIRECTION X) INSIDE BUNDLE FRAME IN RELATION WITH EXPANSION FORCES ON NOZZLES (mm) (ACCORDING TO API661 7-1-1-2)

MAXIMUM DISPLACEMENT INLET/OUTLET : ±9

* FOR MORE DETAILS FOR EACH COMPONENT OF AIR COOLER REFER TO BELOW DRAWING & DOCUMENTS.

REFERENCED DWG&DOC.

TITLE	VENDOR DOCUMENT NO.	CLIENT DOCUMENT NO.
Tube Bundle Drawing	1158-A01-2000-00	EI027-DMF-VD-ME-DWG-025
Bundle Frame Drawing	1158-A01-2400-00	EI027-DMF-VD-ME-DWG-007
Fan Drive Assembly Drawing	1158-A01-6000-00	EI027-DMF-VD-ME-DWG-008
Fan Ring Drawing	1158-A01-5067-00	EI027-DMF-VD-ME-DWG-009
Support Mechanism Drawing	1158-A01-5167-00	EI027-DMF-VD-ME-DWG-010
Plenum Drawing	1158-A01-5110-00	EI027-DMF-VD-ME-DWG-011
Steel Structure Drawing	1158-A01-1100-00	EI027-DMF-VD-ST-DWG-013
Header Walkway Drawing	1158-A01-1200-00	EI027-DMF-VD-ST-DWG-014
Ladder Drawing	1158-A01-1920-00	EI027-DMF-VD-ST-DWG-015
Surface Preparation and Painting Procedure for Air Cooler	1158-A01-0501-00	EI027-DMF-VD-QC-PRO-024

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	APPROVED BY	FINAL APPROVED BY
R4	09/22/2024	ISSUED FOR APPROVAL	F.S.Z	J.M.	J.B.L	A.G.H.Z
R3	08/21/2024	ISSUED FOR APPROVAL	F.S.Z	J.M.	J.B.L	A.G.H.Z
R2	08/10/2024	ISSUED FOR APPROVAL	F.S.Z	J.M.	J.B.L	A.G.H.Z
R1	07/22/2024	ISSUED FOR APPROVAL	F.S.Z	J.M.	J.B.L	A.G.H.Z
RO	06/30/2024	ISSUED FOR APPROVAL	F.S.Z	J.M.	J.B.L	A.G.H.Z

CLIENT: **ENBR TEKNOLOJI**

PROJECT: **AIR COOLER FOR Toase-che Park Sanati Gohar Ofogh Petrochemical Co.**

General Arrangement Drawing
1158-A01-1000-00

dt thermal technology

Factory : Km 14 special Karaj road

DWG. NO. EI027-DMF-VD-ME-DWG-003
SCALE: N.T.S. SIZE: A1 REV: R4

THIS DOCUMENT OF A CONFIDENTIAL NATURE IS THE PROPERTY OF DAMAFIN AND SHALL NOT BE REPRODUCED IN ANY MANNER, NOR USED FOR ANY PURPOSE WHATSOEVER, WITHOUT WRITTEN PERMISSION OF DAMAFIN.

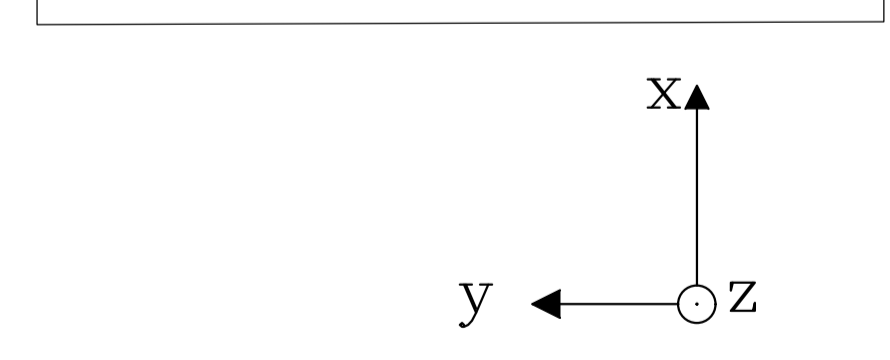
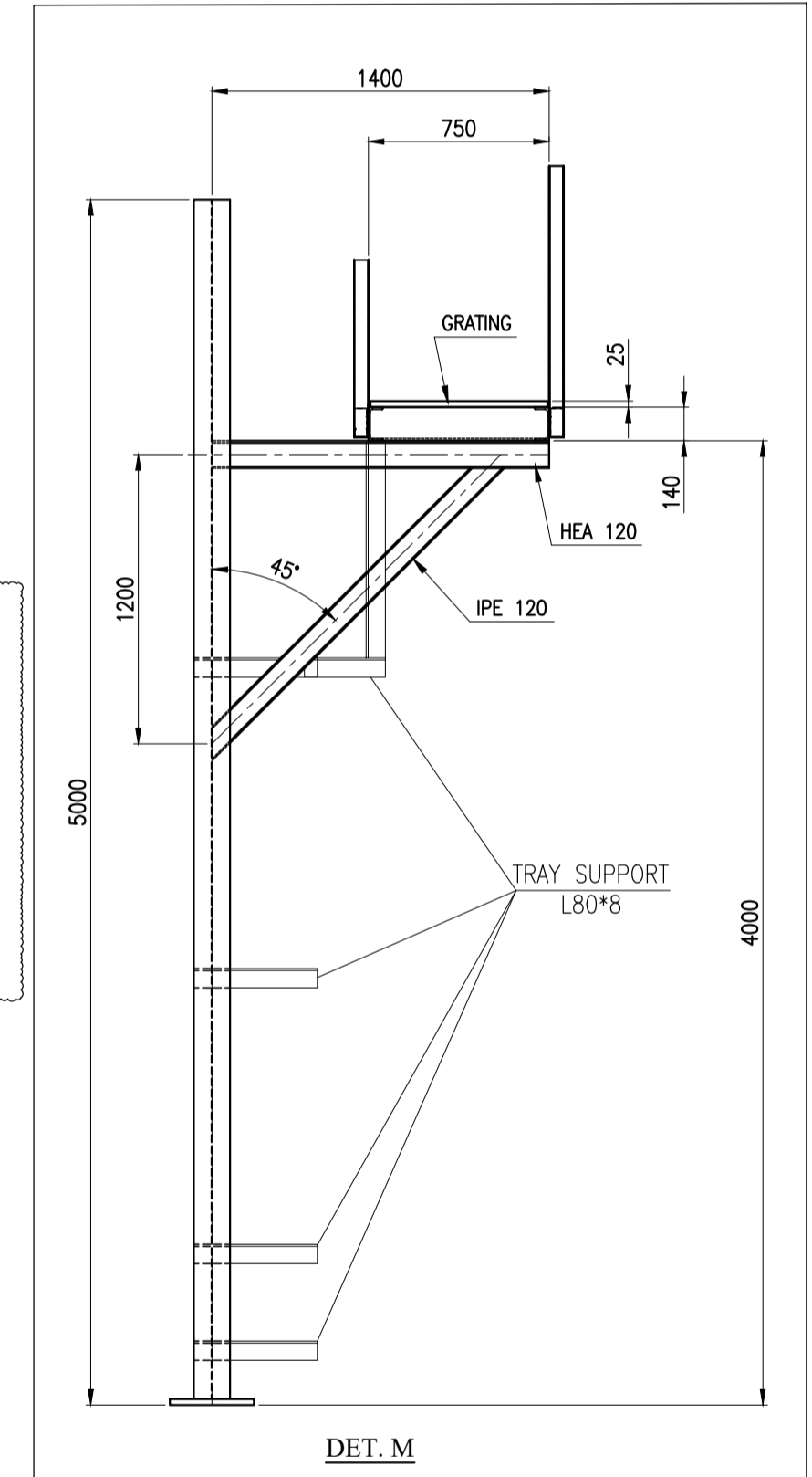
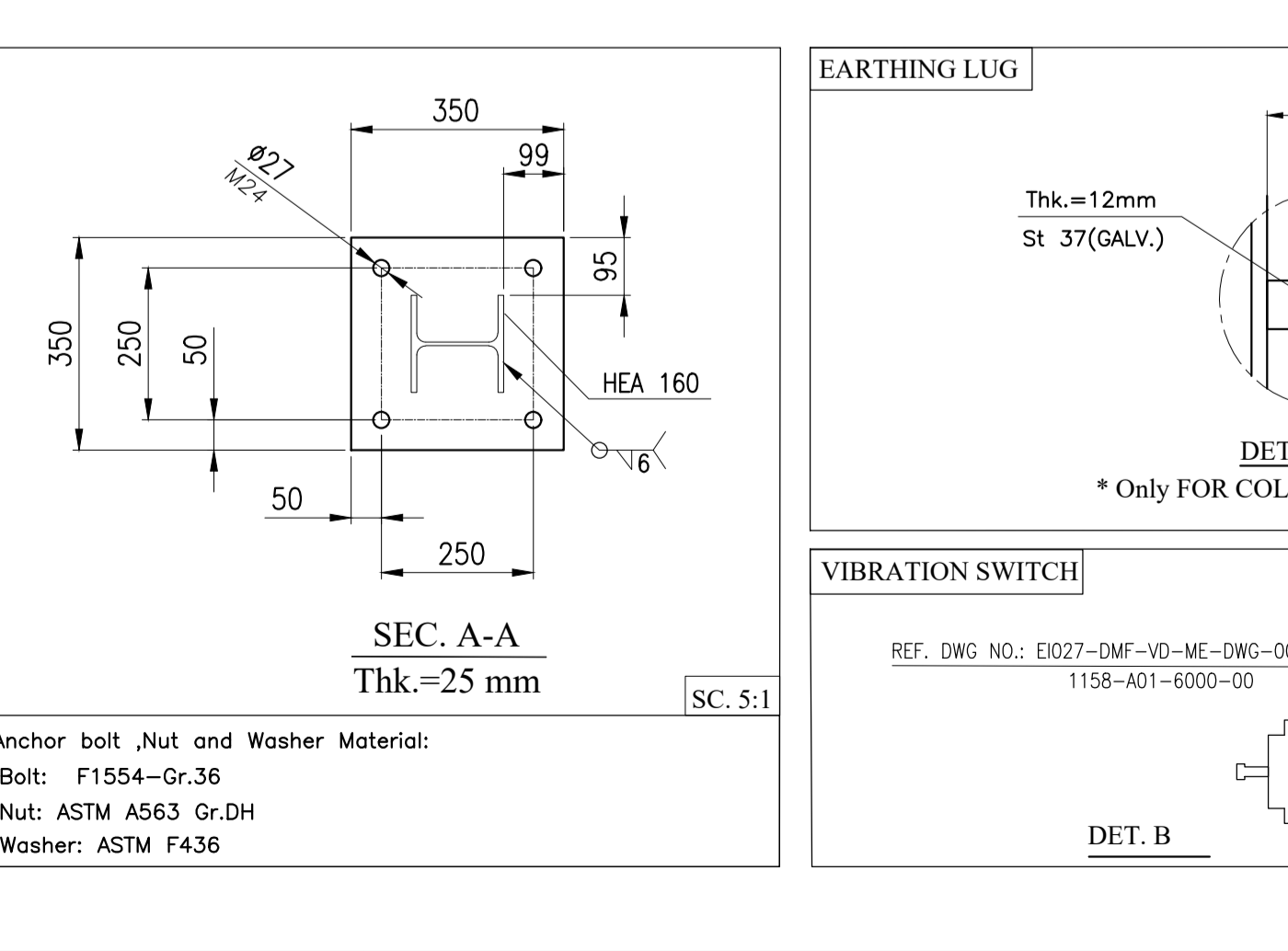
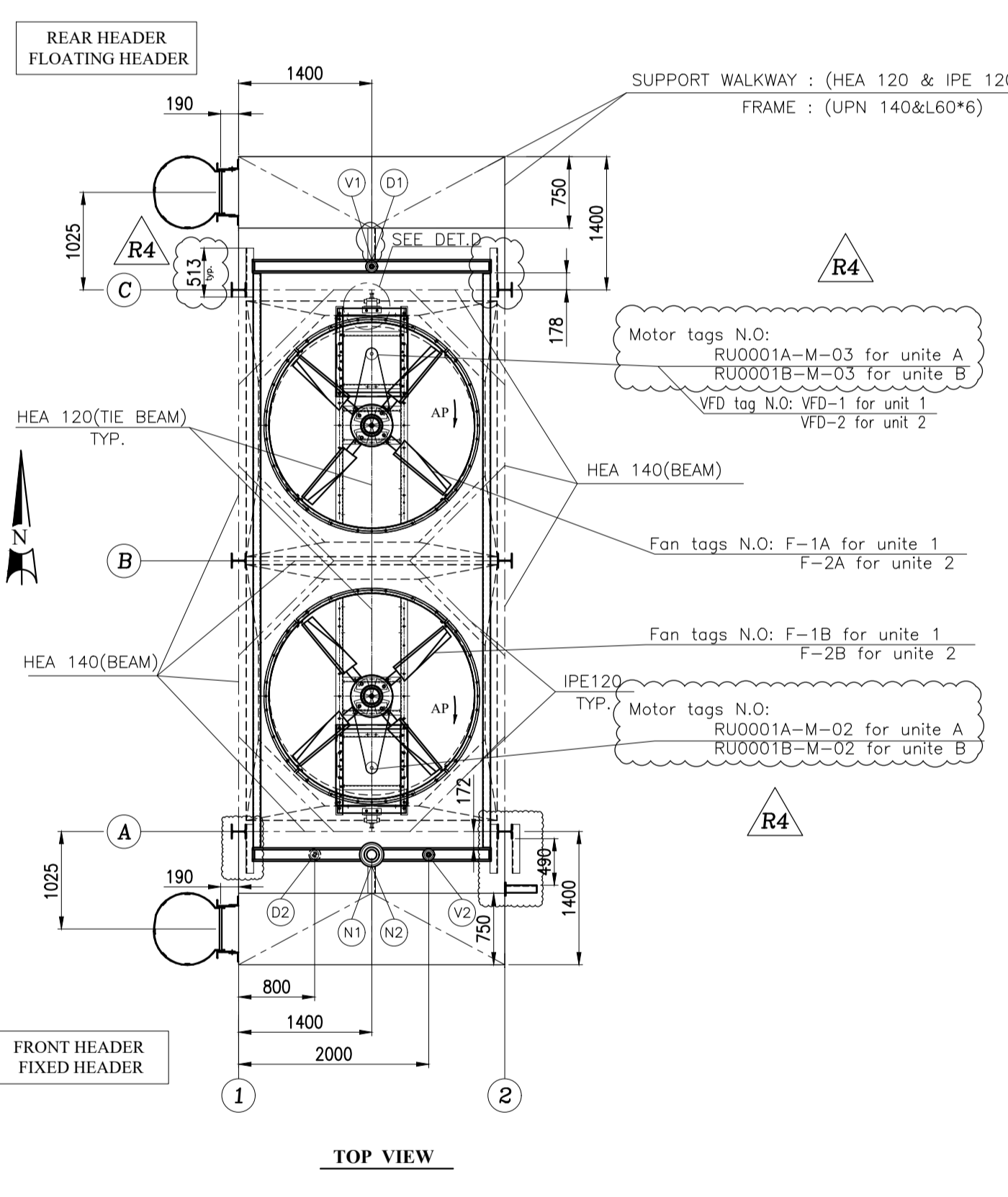


Table 1. Weight of equipments For 1 Units (Total Units = 2)

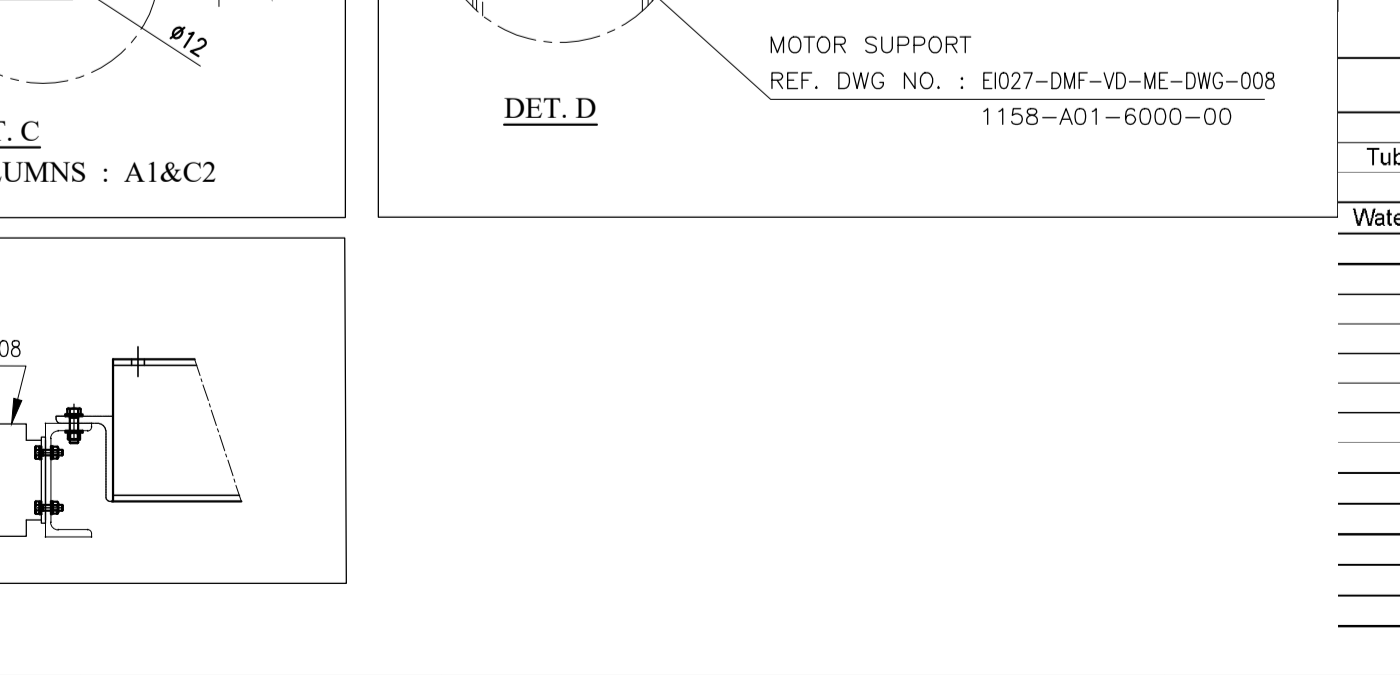
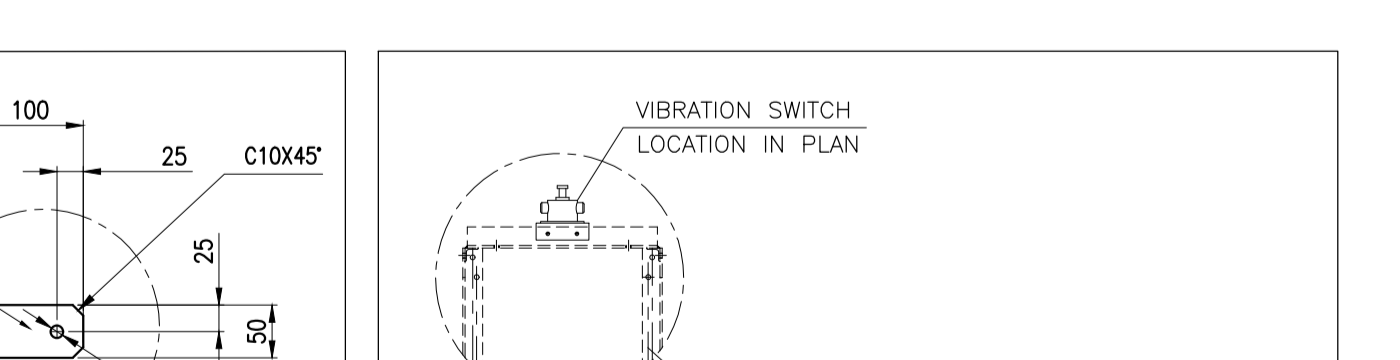
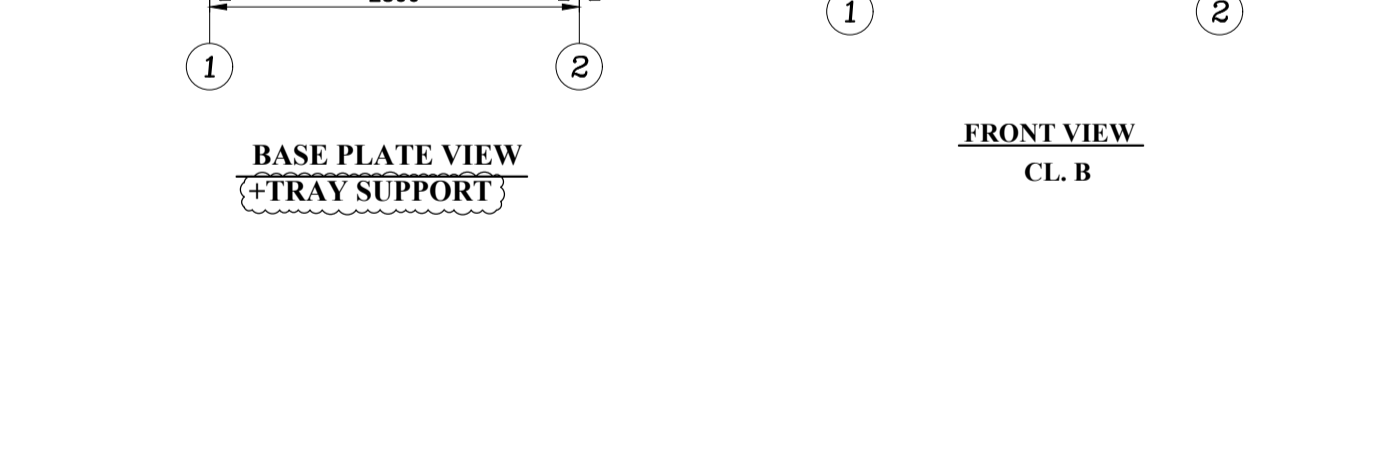
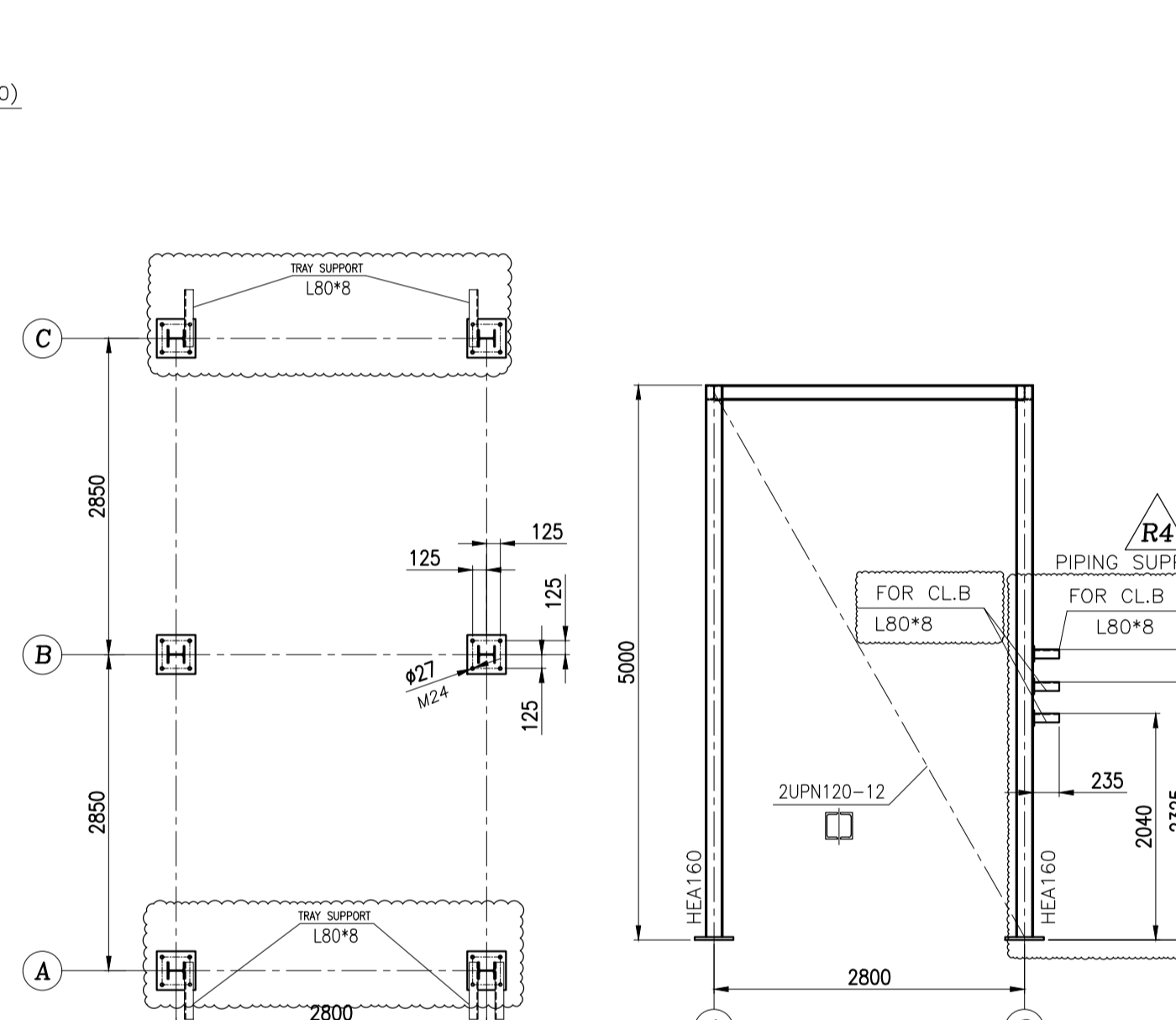
Equipment	Total No in one Unit	Total Weight in one Unit (tonf)	Total No. for One Bay	Weight for One Bay (kgf)
Bundle Frame	1	0.865	1	865
Tube Bundle & Headers	1	2.635	1	2635
Water in Tubes & Headers	1	0.48	1	480
Plenum	2	0.245	2	490
Fan Ring	2	0.13	2	260
Motor	2	0.07	2	140
Fan	2	0.0275	2	55
Speed Reducer	2	0.25	2	500
Machinery Mount	2	0.32	2	640
Fan Guard	2	0.0325	2	65
sum				2150
Fabrication Weight For 1 Units				5650
Operation Weight For 1 Units				6130
Hydrotest Weight For 1 Units				6130
Total Weight of Main structure, Ladder for 1 Units				6800

FRONT VIEW CL. A.C

* THIS DIMENSION WILL BE FINALIZED AFTER APPROVED OF MOTOR DATA SHEET



SIDE VIEW



Anchor bolt, Nut and Washer Material:
Bolt: F1554-Gr.36
Nut: ASTM A563 Gr.DH
Washer: ASTM F436