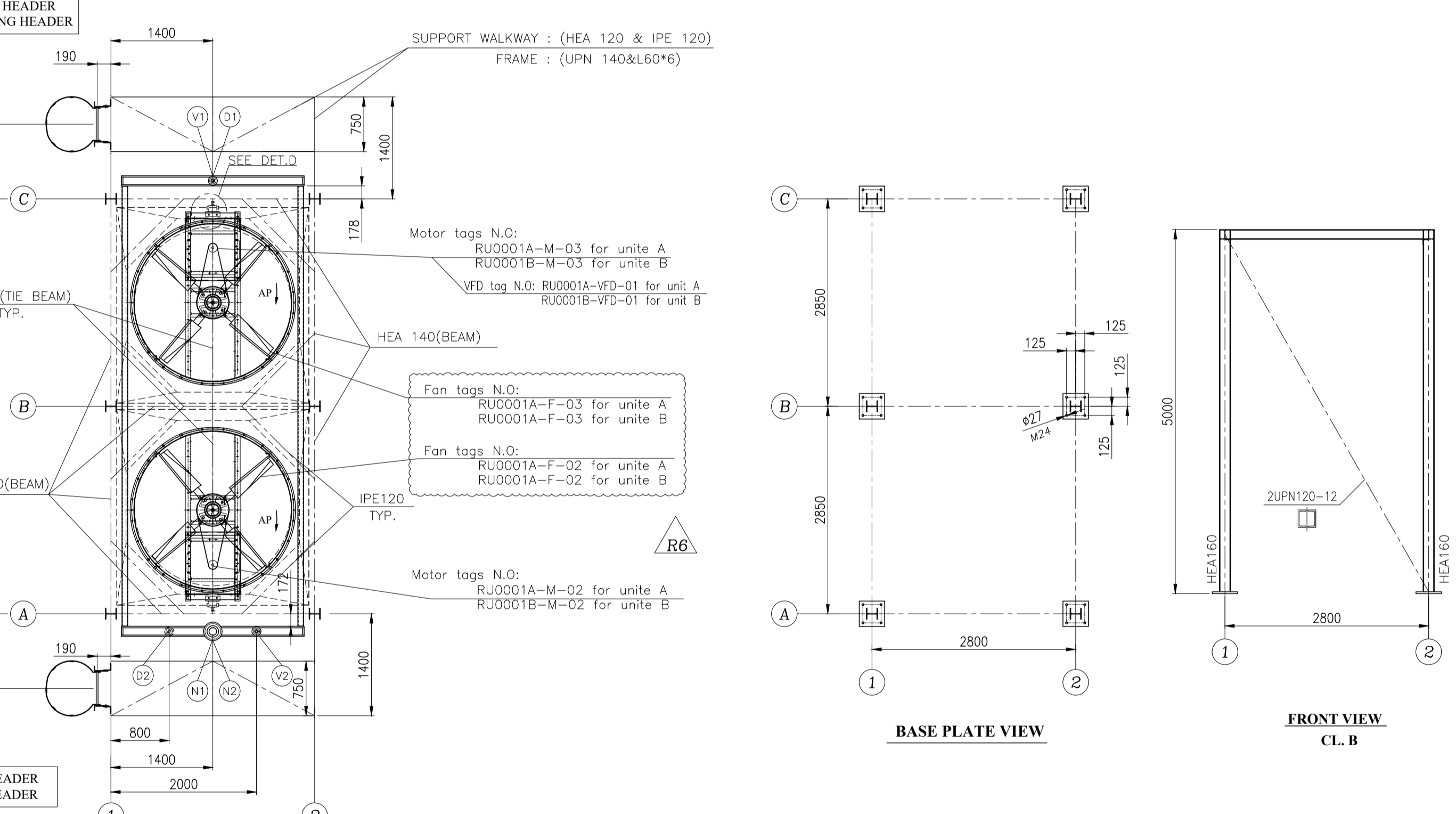
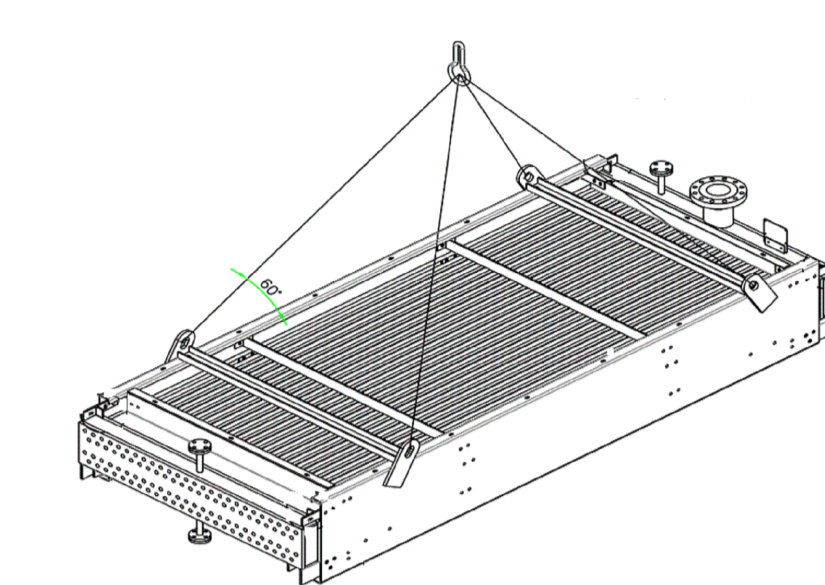
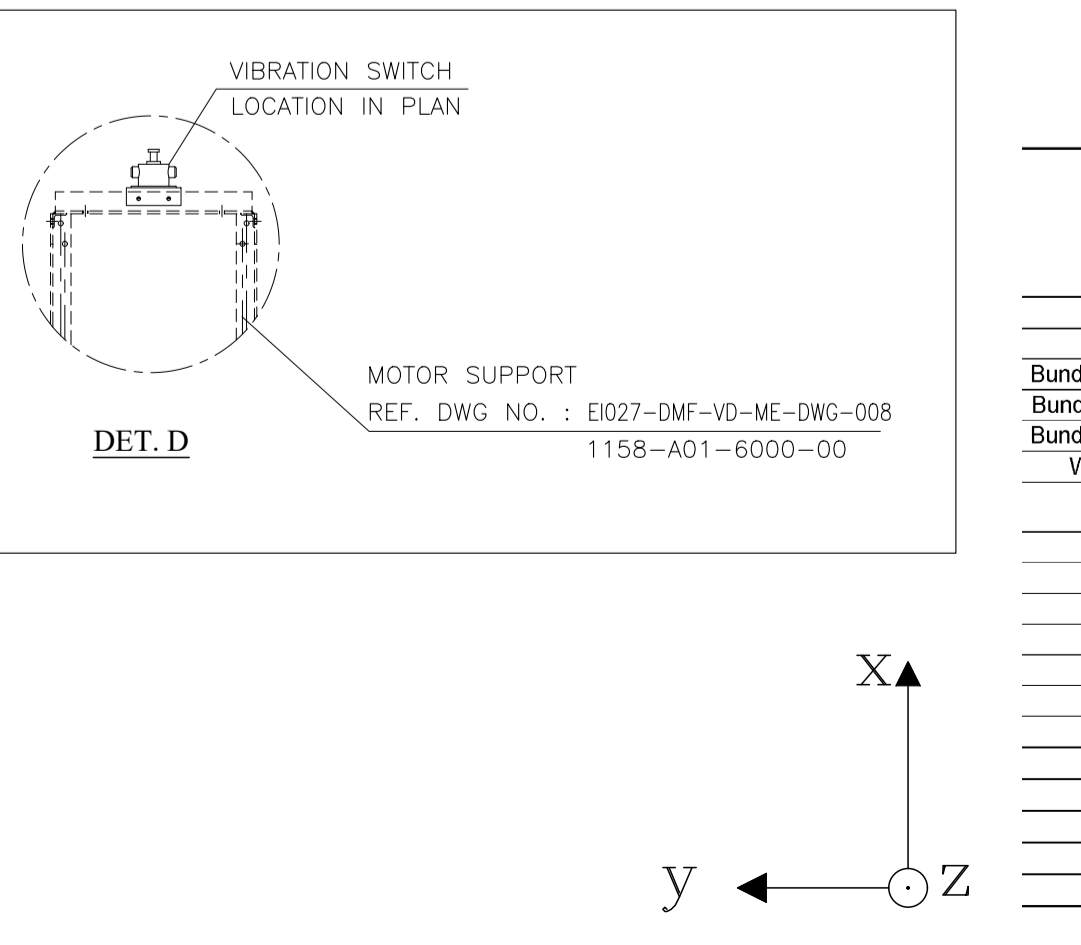
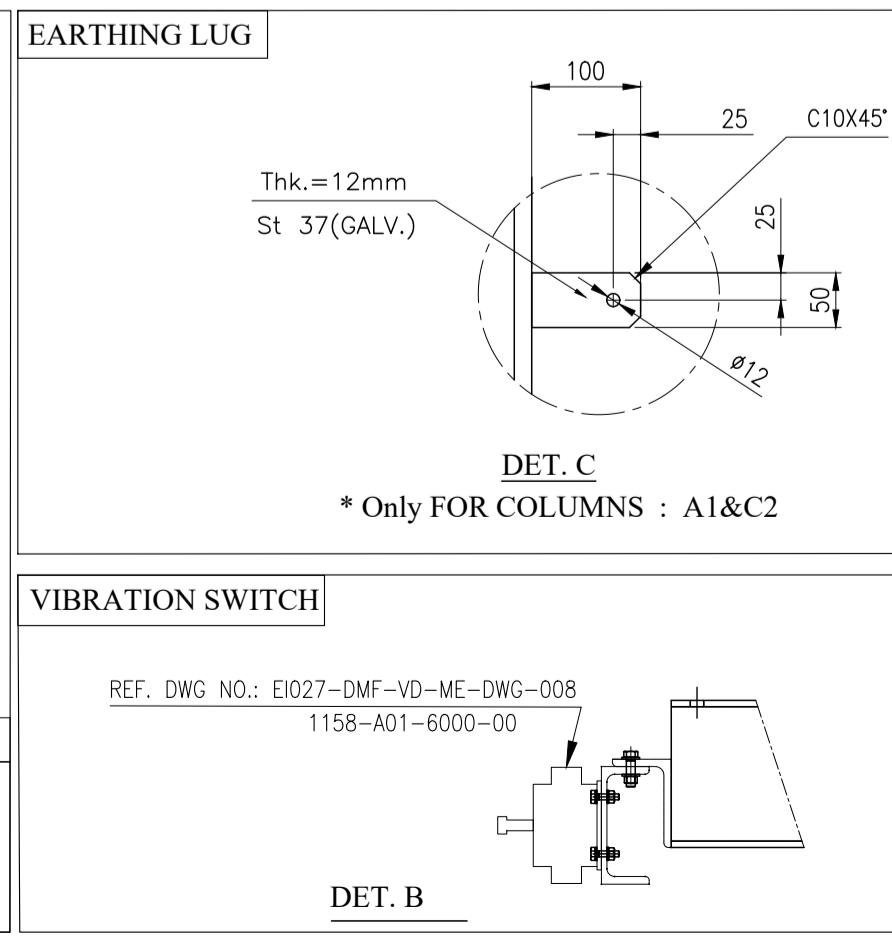
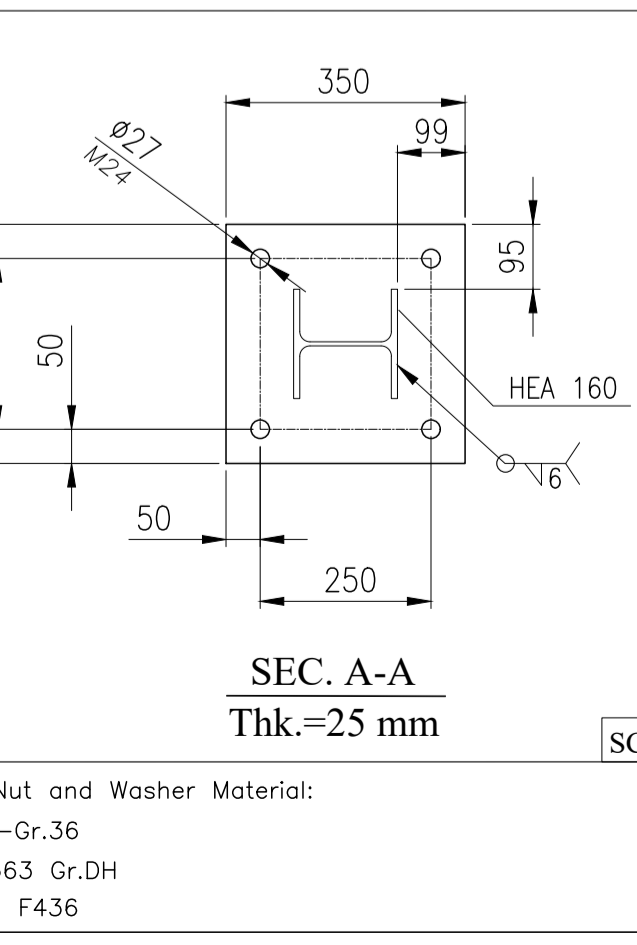


FRONT VIEW CL. A-C
SIDE VIEW

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



TOP VIEW
BASE PLATE VIEW
FRONT VIEW CL. B
DET. M



SCHEMATIC OF BUNDLE LIFTING

TABLE: Joint Reactions				
Joint Text	Output Case	Fx Kgf	Fy Kgf	Fz 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	EQY	31.57	329.34	352.72
A-1	WY	-387.76	93.94	-669.09
A-1	SNOW	9.74	24.99	547.61
A-1	EQX	106.43	1146.34	-1764.17
A-1	EQY	-1561.76	337	-3289.21
A-1	EQO	210.24	2295.43	-3529.78
A-1	EQVO	-3123.79	673.24	-6571.39
A-2	DEAD_S	-20.6	1.599E+13	380.54
A-2	DEAD	-33.06	-0.00000289	811.07
A-2	DEAD_OP	-0.21	-3.963E-07	55.37
A-2	DEAD_N	10.59	-1.13	-378.55
A-2	LIVE	-76.47	6.353E+13	402.18
A-2	EQY	1.165E+12	49.87	8.288E+13
A-2	WY	-54.91	-1.269E+13	-313.83
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	EQO	0.00889	92.7	0.18
A-2	EQVO	-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	EQY	-31.57	329.34	352.72
A-3	WY	-387.76	-93.94	-669.09
A-3	SNOW	9.74	24.99	547.61
A-3	EQX	-106.49	1146.49	1764.07
A-3	EQY	-1071.77	-428.48	-2570.23
A-3	EQO	-210.36	2295.75	3529.6
A-3	EQVO	-2144	-856.2	-5134.3
B-1	DEAD_S	34.11	-1.44	482.68
B-1	DEAD	174.23	-2.24	483.92
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	EQY	-255.25	0.99	-374.63
B-1	WY	-1.33	-70.96	504.74
B-1	SNOW	24.65	-1.56	193.87
B-1	EQX	-985.73	4.1	-1834.5
B-1	EQY	-51.12	-28.6	2619.38
B-1	EQO	-1968.03	8.18	-3658.39
B-1	EQVO	-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	EQY	-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	EQO	0.2	0.08416	-0.15
B-2	EQVO	0.0007635	-3138.25	5603.81
B-3	DEAD_S	-34.11	-1.44	482.68
B-3	DEAD	-174.23	-2.24	483.9
B-3	DEAD_OP	16.3	0.03128	81.45
B-3	DEAD_N	-670.87	1.26	1104.47
B-3	LIVE	43.74	-6.51	64.14
B-3	EQY	-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	-985.73	-4.09	1834.58
B-3	EQY	-40.75	-28.68	1909.29
B-3	EQO	-1968.16	-8.15	3658.54
B-3	EQVO	-81.36	-57.83	3796.07

GENERAL DATA	
ITEM NO.	-
DESIGN CODE BUNDLE/STRUCTURE	ASME SEC.VIII DIV.1(2019), API 661-7th EDITION R2018
INLET PRESSURE/PRESSURE DRG. (ALLOWABLE/CALC)	19.8 Bar / (0.1/0.016) Bar
DESIGN PRESSURE	22+F.V. (barg)
HYDROSTATIC TEST PRESSURE	28.6 (bar)
TEMPERATURE IN/OUT(TUBE SIDE)	73.5°C/56.32°C
DESIGN TEMPERATURE	120 °C
MINIMUM DESIGN METAL TEMPERATURE	-45°C
AIR INLET/OUTLET TEMPERATURE (AIR SIDE)	48 / 62.28 °C
MINIMUM DESIGN AMBIENT TEMPERATURE	5 °C
CORROSION ALLOWANCE	3 mm
ULTRASONIC TEST	YES(Full)[See note 8]
RADIOGRAPHY	YES(Full)[See note 8]
STRESS RELIEVING	YES
BARE/FINNED SURFACE PER UNIT	66.101/1579.2 m ²
NUMBER OF BUNDLE PER BAY	1
NUMBER OF UNIT	2
NUMBER OF BAY PER UNIT	1
NOZZLE SIZE(INLET/OUTLET/RATING/TYPE)	1x4"/1x2"/SCH.160/#300
PROCESS FLUID NAME	PROPANE
SERVICE	PROPANE
PASSES PER BUNDLE	4
FINNED-TUBES/BUNDLE	NO.140 TUBES,OD=25.4,SEAMLESS MIN.W.BWG16,THK.=1.65,L=6096 mm
Tube to tube sheet joint	STRENGTH WELD + EXPANDED
Fin (Type,material, OD,PPI)	EXTRUDE.AL 1060,57,15,11
STEAM COIL	NO
LOUVER/TYPE	NO/-
PLENUM / FAN RING	FORCED TYPE/CONICAL L/D=0.05
VIBRATION SWITCH	YES,(FOR EACHFAN) MANUAL & ELECTRIC RESET,Exd IC T5 Gb,IP65
FAN SPECIFICATION RPM/DIAMETER	362/7 Ft
Pitch angle (for fan)	8.6°
BLADE NO./ MATERIAL	4/ALUMINIUM
AIR QUANTITY FOR FAN	26.879 m ³ /S
STATIC PRESSURE	102.95 Pa
AIR TEMPERATURE IN/OUT	48°C/52.28°C
SPEED REDUCER TYPE	V BELT
REDUCTION RATIO	3.76
MOTOR TYPE	ELECTRIC-Exhb.IIB-T4-IP55
VOLTAGE/Freq./PHASES	400/50/3
RPM/KW	1500/7.5 Kw
Motor VFD per unit	50%
VFD POWER	YES(11 Kw)
S.P.L. 1m all side of fan:	<85 dB(A)1m all sides

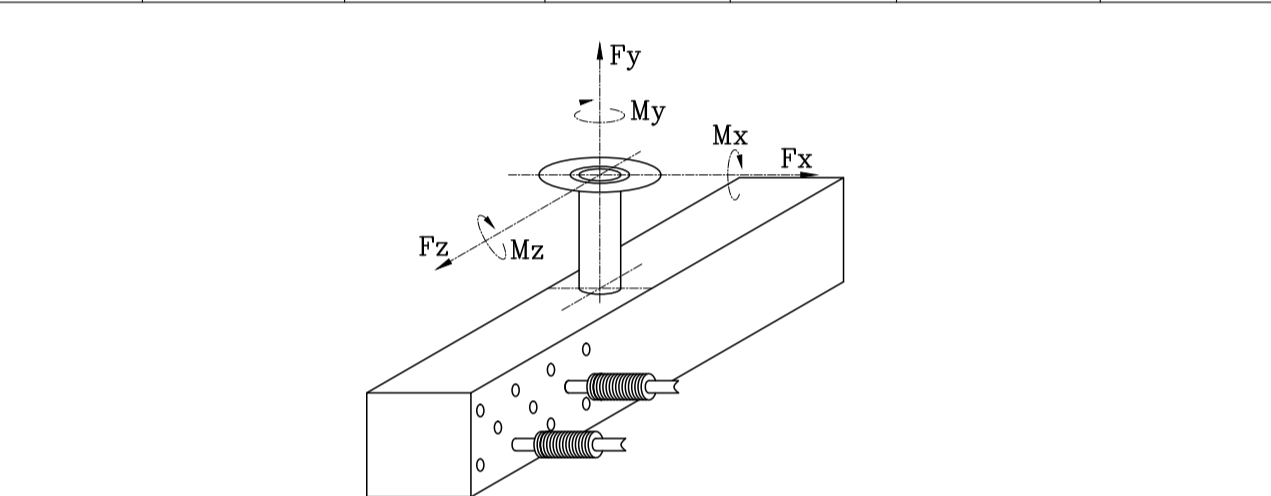
Table 1. Weight of equipments For 1 Units (Total Units = 2)			
	Total No in one Unit	Unit Weight (tonf)	Total Weight for One Bay (kgf)
Bundle Frame	1	1.091	1091
Tube Bundle & Headers	1	2.922	2922
Bundle frame & tube bundle(DRY)	1	4.013	4013
Bundle frame & tube bundle (OP)	1	4.222	4222
Bundle frame & tube bundle(HYD)	1	4.493	4493
Water in Tubes & Headers	1	0.48	480
Plenum	2	0.262	524
Fan Ring	2	0.13	260
Motor	2	0.07	140
Fan	2	0.0275	55
Speed Reducer	2	0.25	500
Machinery Mount	2	0.32	640
Fan Guard	2	0.0325	65
sum			2184
Fabrication Weight For 1 Units			11167
Operation Weight For 1 Units			11376
Hydrotest Weight For 1 Units			11647
Total Weight of Main structure, Ladder for 1 Units			4970

NOTES:
 1) 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
 2) Fans
 -100% AP(Adjustable pitch-manual)
 3) 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
 4) All Dimensions Are In Millimeter Unless Otherwise Specified.
 5) All Dimensions Tolerances Are According to API 661.(Figure 10)
 6) Bolts which are used for fixing headers to side frame , on sliding side should be removed after erection.
 7) PROTECTION(SEE Galvanizing Specification and Inspection Procedure: EIO27-DMF-VD-QC-PRO-024
 8) RADIOGRAPHIC TEST (FULL/SPOT) SHALL BE IN COMPLIANCE WITH THE NDT PROCEDURE & WELD/NDT MAP EIO27-DMF-VD-QC-PRO-023
 9) 50% motors per unit to be VFD.

LOAD DEFINITION*					
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.: EIO27-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/UNIT	DESIGNATION	
N1	INLET NOZZLE/FLANGE	1/2	4"	FLANGE ANSI B16.5,#300,WNF,SCH.160,SA-313 G/6 /SA-350 LF2 CL.1,N,THK.=13.49
N2	OUTLET NOZZLE/FLANGE	1/2	2"	FLANGE ANSI B16.5,#300,LWN,RF,SA-350 LF2 CL.1,N,THK.=16.6
V1&V2	VENT	2/4	1"	FLANGE ANSI B16.5,#300,LWN,SA-350 LF2 CL.1,N,THK.=14.3
D1&D2	DRAIN	2/4	1"	FLANGE ANSI B16.5,#300,LWN,SA-350 LF2 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	EIO27-DMF-VD-ME-DWG-005	
Bundle Frame Drawing	1158-A01-2400-00	EIO27-DMF-VD-ME-DWG-007	
Fan Drive Assembly Drawing	1158-A01-6000-00	EIO27-DMF-VD-ME-DWG-008	
Fan Ring Drawing	1158-A01-5087-00	EIO27-DMF-VD-ME-DWG-009	
Support Mechanism Drawing	1158-A01-5167-00	EIO27-DMF-VD-ME-DWG-010	
Plenum Drawing	1158-A01-5110-00	EIO27-DMF-VD-ME-DWG-011	
Steel Structure Drawing	1158-A01-1100-00	EIO27-DMF-VD-ME-DWG-013	
Header Walkway Drawing	1158-A01-1200-00	EIO27-DMF-VD-ME-DWG-014	
Ladder Drawing	1158-A01-1520-00	EIO27-DMF-VD-ME-DWG-015	
Surface Preparation and Painting Procedure for Air Cooler	1158-A01-GS01-00	EIO27-DMF-VD-QC-PRO-024	

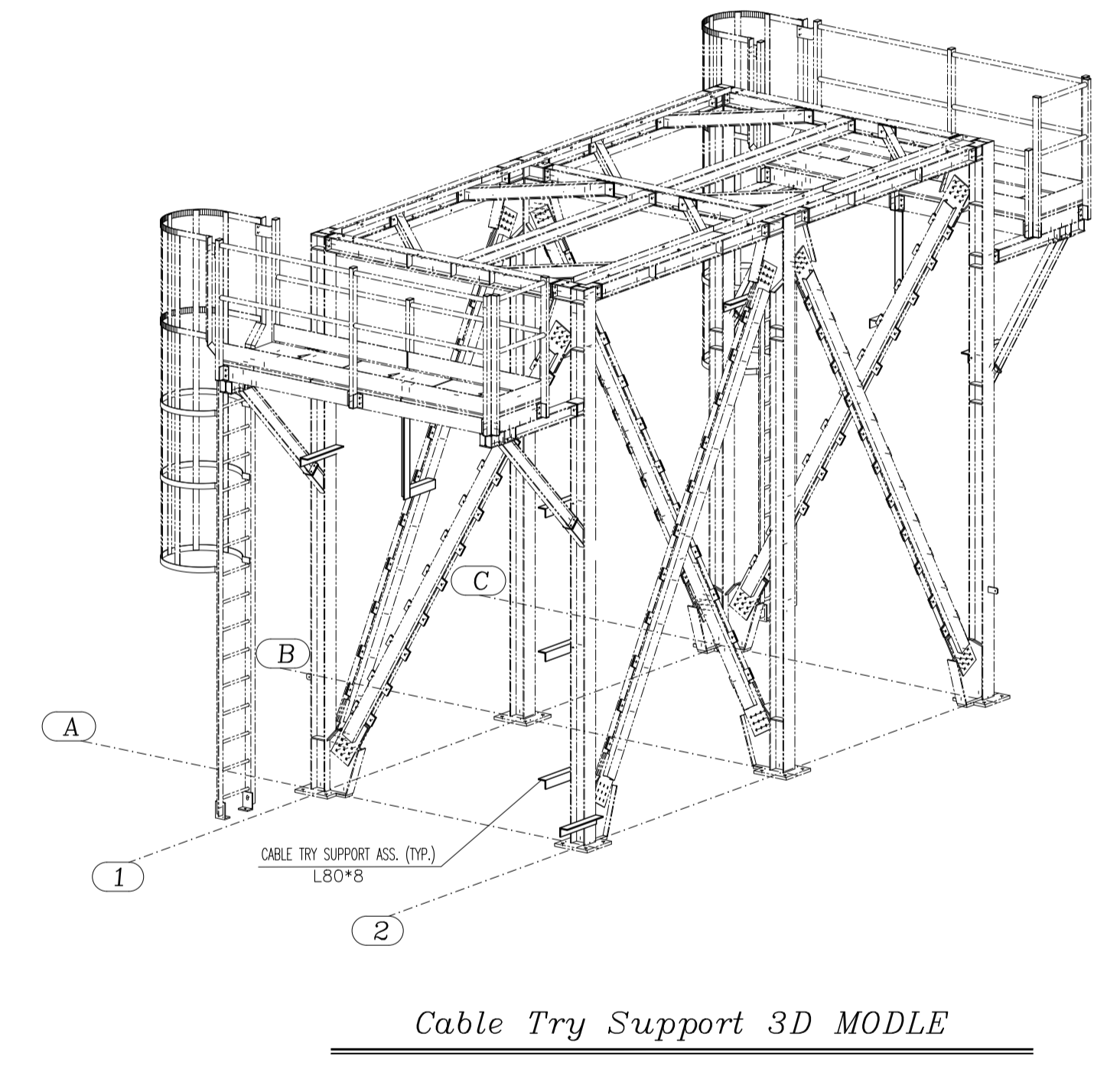
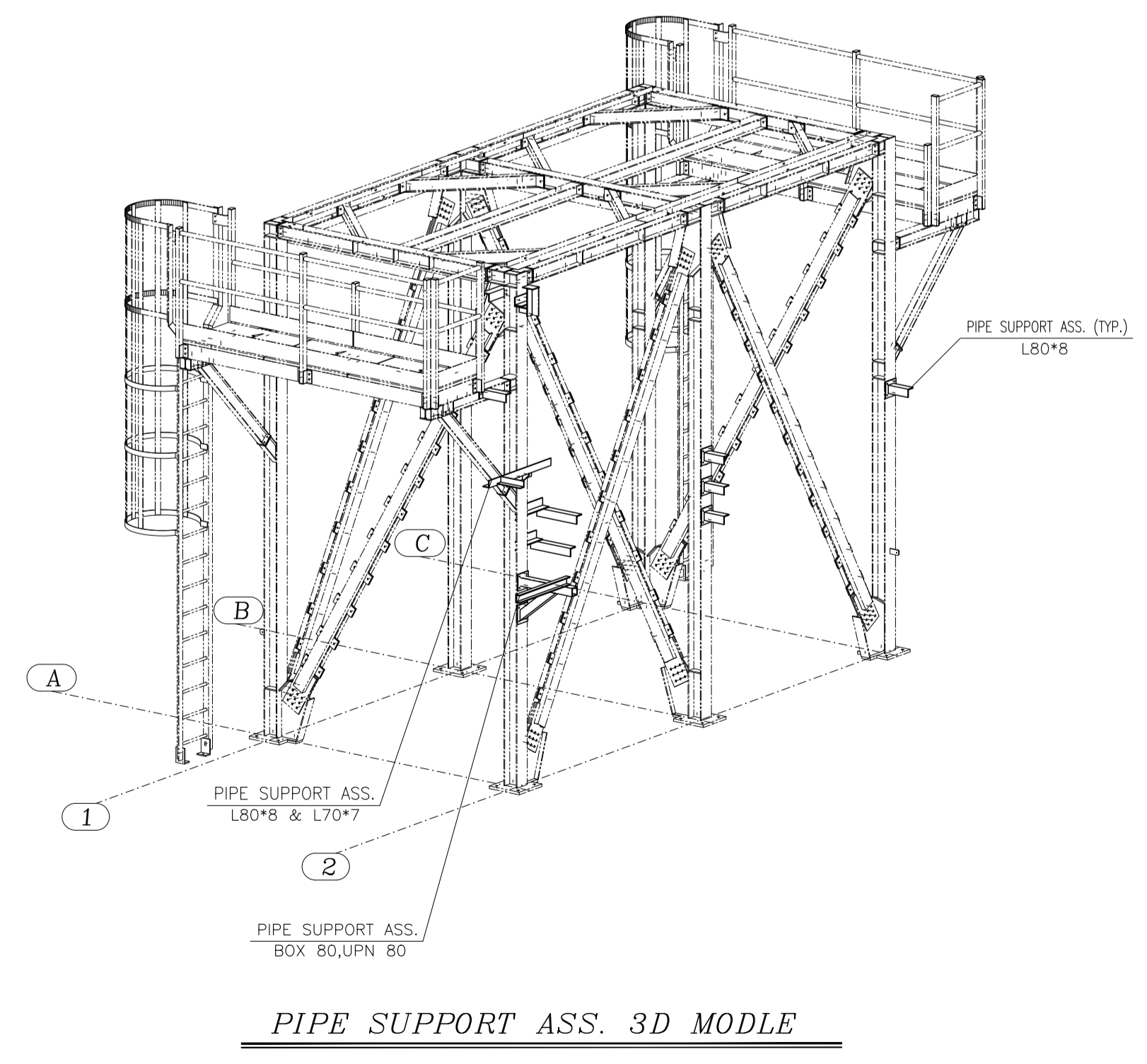
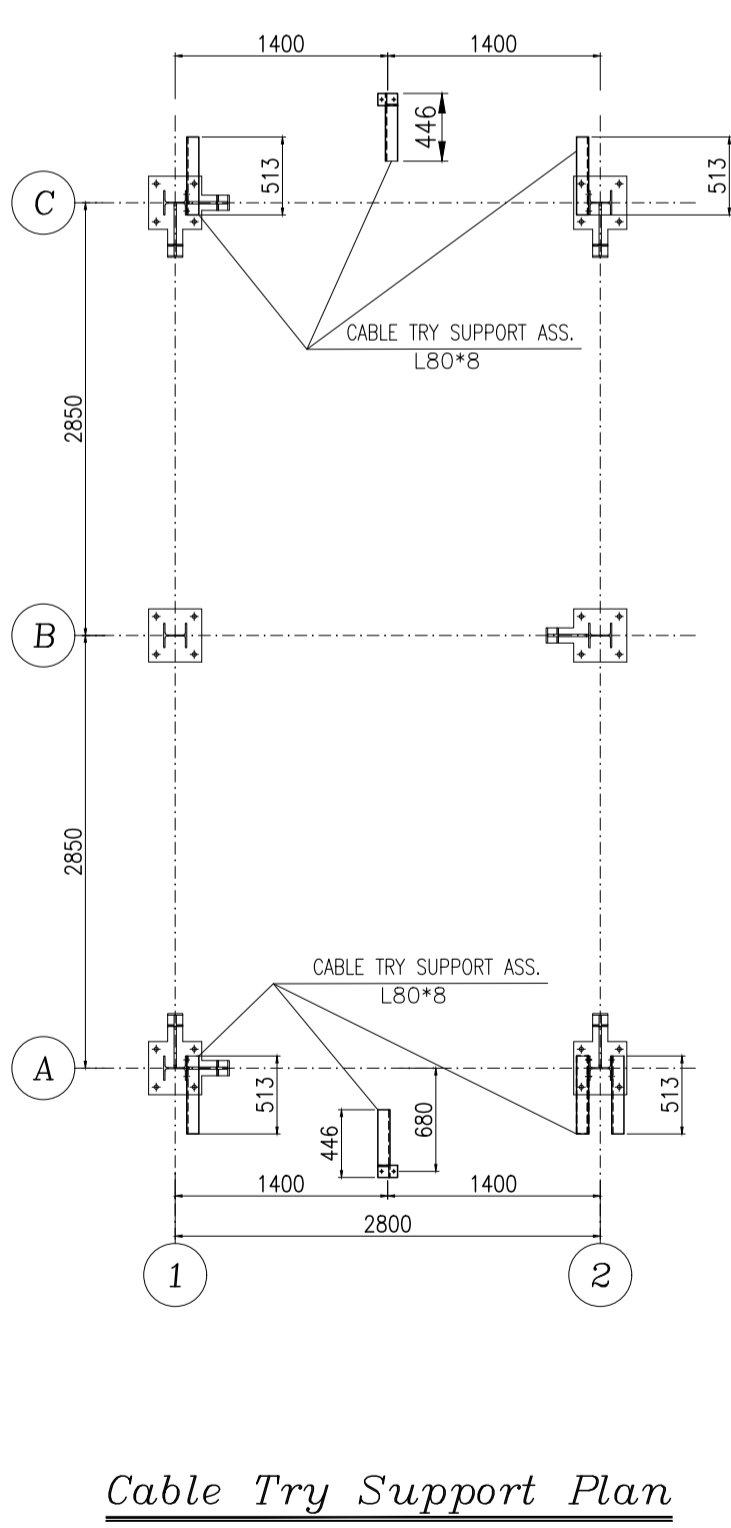
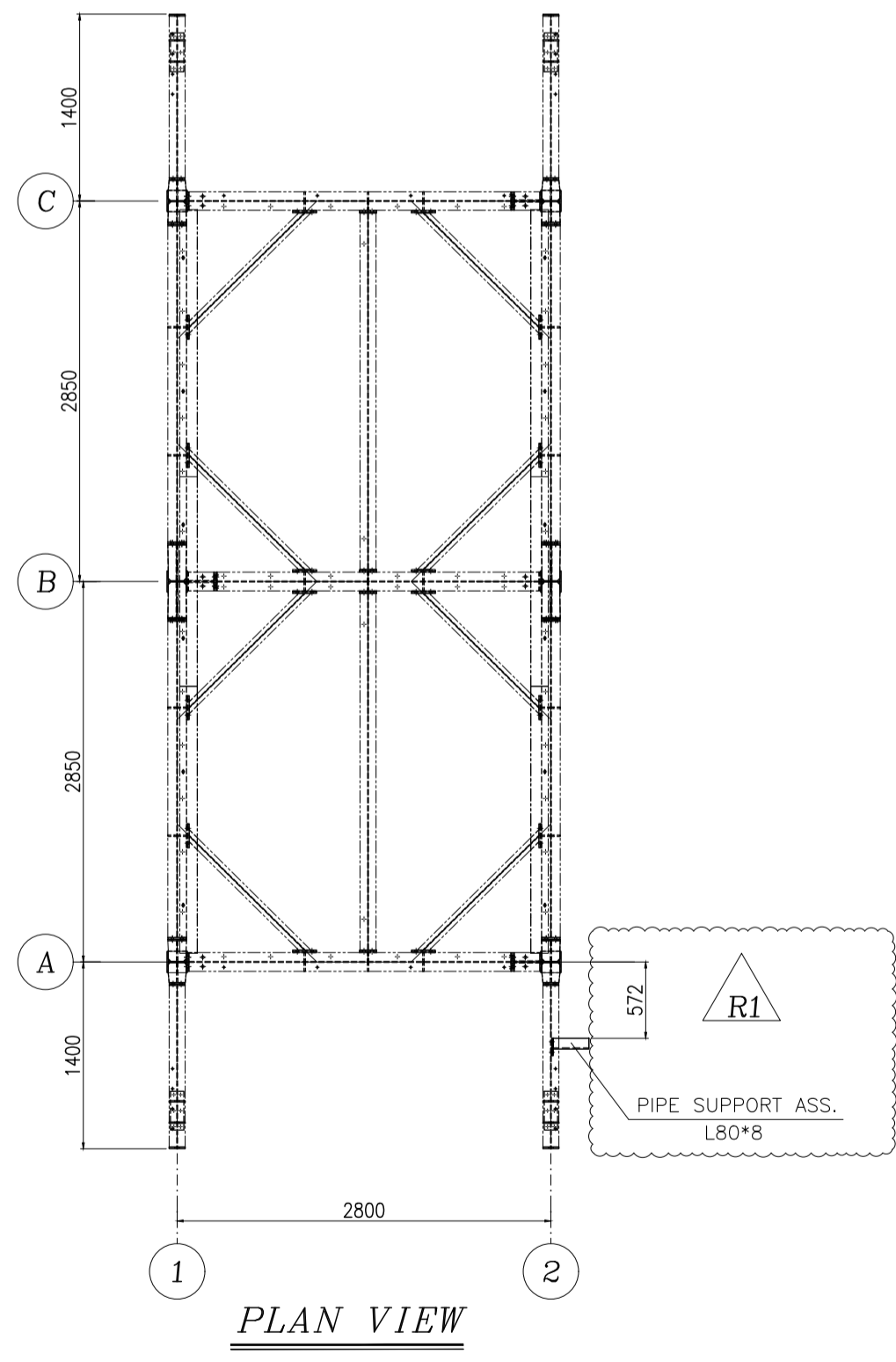
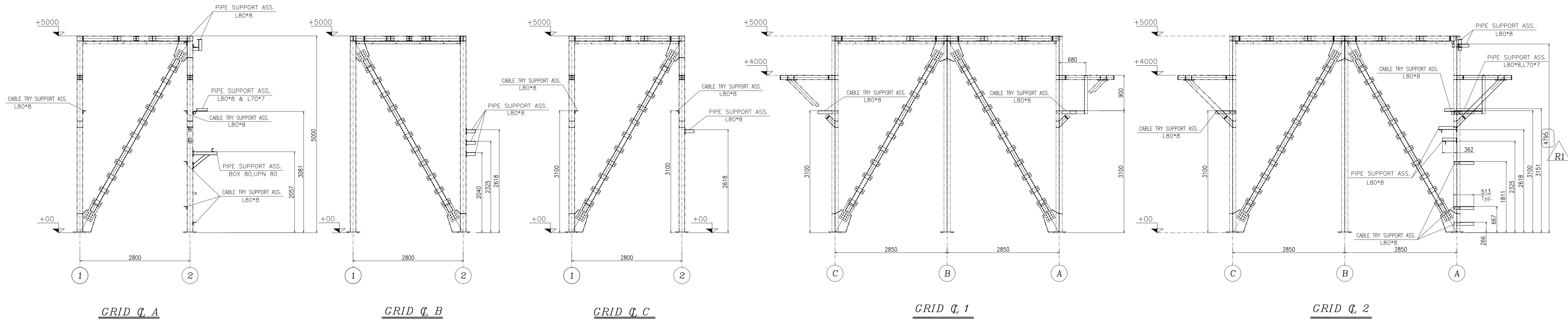
REV	DATE	DESCRIPTION	BY	CHECKED	APPROVED BY	FINAL APPROVED BY
R6	12/28/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ
R5	11/13/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ
R4	09/22/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ
R3	08/21/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ
R2	08/10/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ
R1	07/22/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ
REV	06/30/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ

CLIENT: **ENBR TEKNOLOJI**

PROJECT : **AIR COOLER FOR Toase-che Park Sanati Gohar Ofogh Petrochemical Co. General Arrangement Drawing 1158-A01-1000-00 (Sheet 1 of 2)**

DWG. NO. EIO27-DMF-VD-ME-DWG-003
 SCALE: N.T.S. SIZE: A1 REV.: R6
 Factory : Km 14 special Karaj road

dt Damafin thermal technology



REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	APPROVED BY	FINAL APPROVED BY
R1	12/28/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ
R0	11/13/2024	ISSUED FOR APPROVAL	F.SZ	J.M.	J.B.L	A.GHZ

CLIENT: **ENBR TEKNOLOJI**

PROJECT: **AIR COOLER FOR Toase-che Park Sanati Gohar Ofogh Petrochemical Co. General Arrangement Drawing**
 1158-A01-1000-00
 (Sheet 2 of 2)

DWG. NO. **E1027-DMF-VD-ME-DWG-003**

SCALE: N.T.S. SIZE: A1 REV.: R1

CONTRACTOR: **dt Damafin thermal technology**
 Factory : Km 14 special Karaj road

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