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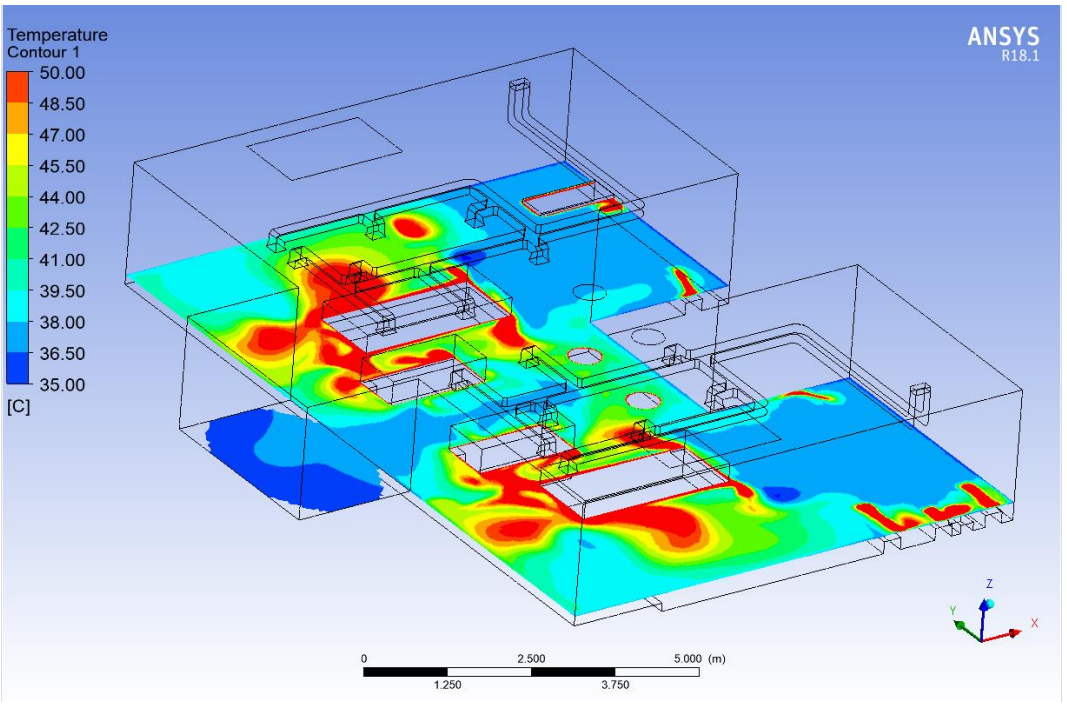
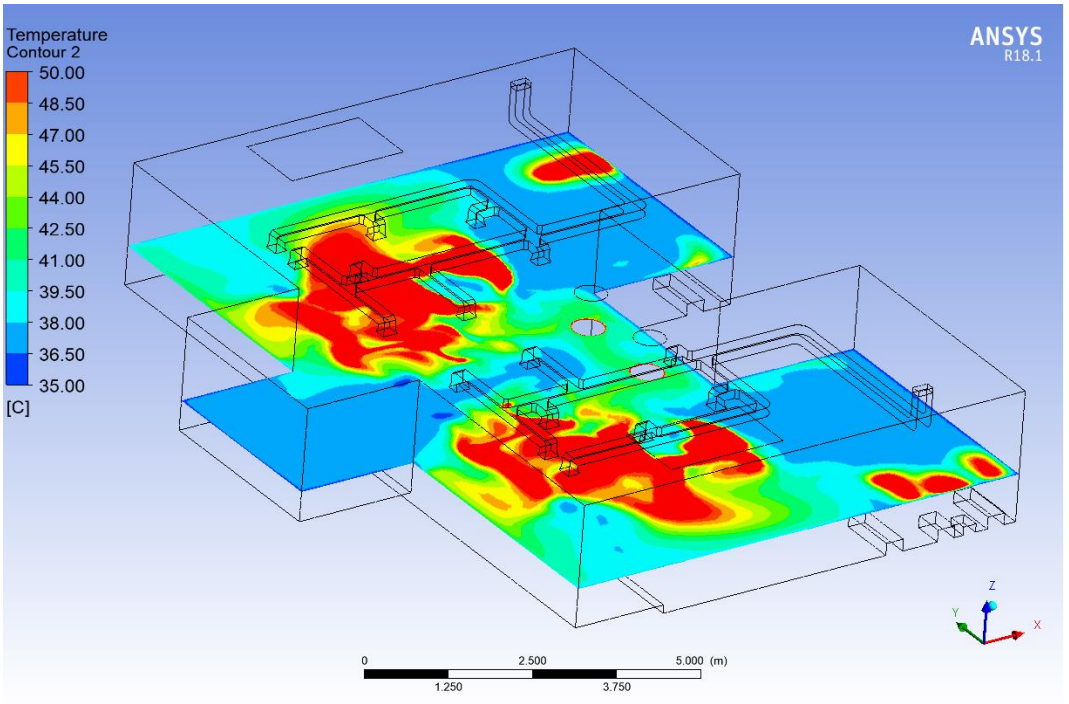
L A M P I R A N

LAMPIRAN 1, POST-PROCESSOR TEMPERATUR MODEL OUTLET DUCTING 2 DAN MODEL OUTLET DUCTING 3

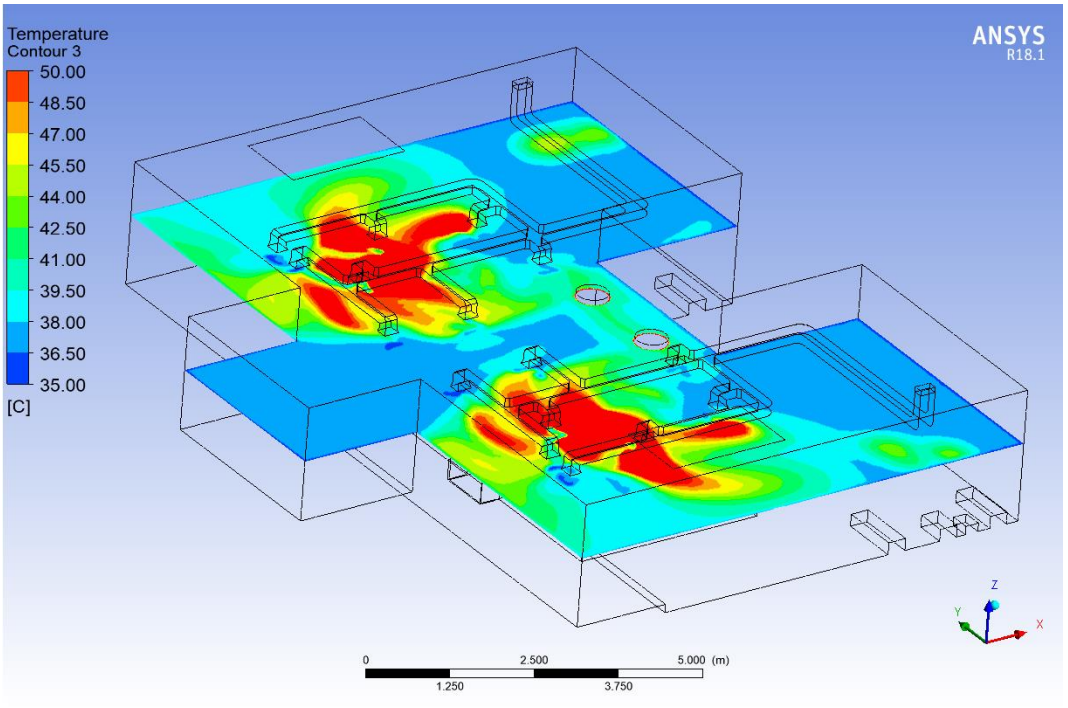
- MODEL OUTLET DUCTING 2



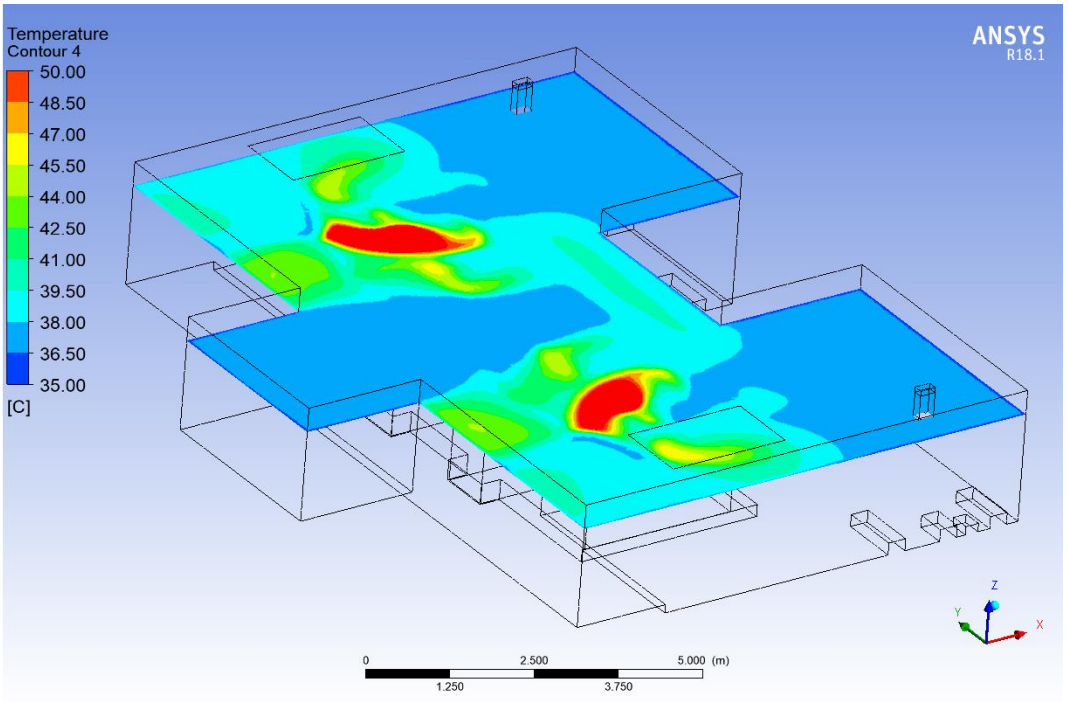
Lampiran 1.1 Perbedaan temperatur kamar mesin model ducting 2 pada ketinggian 0,5 meter



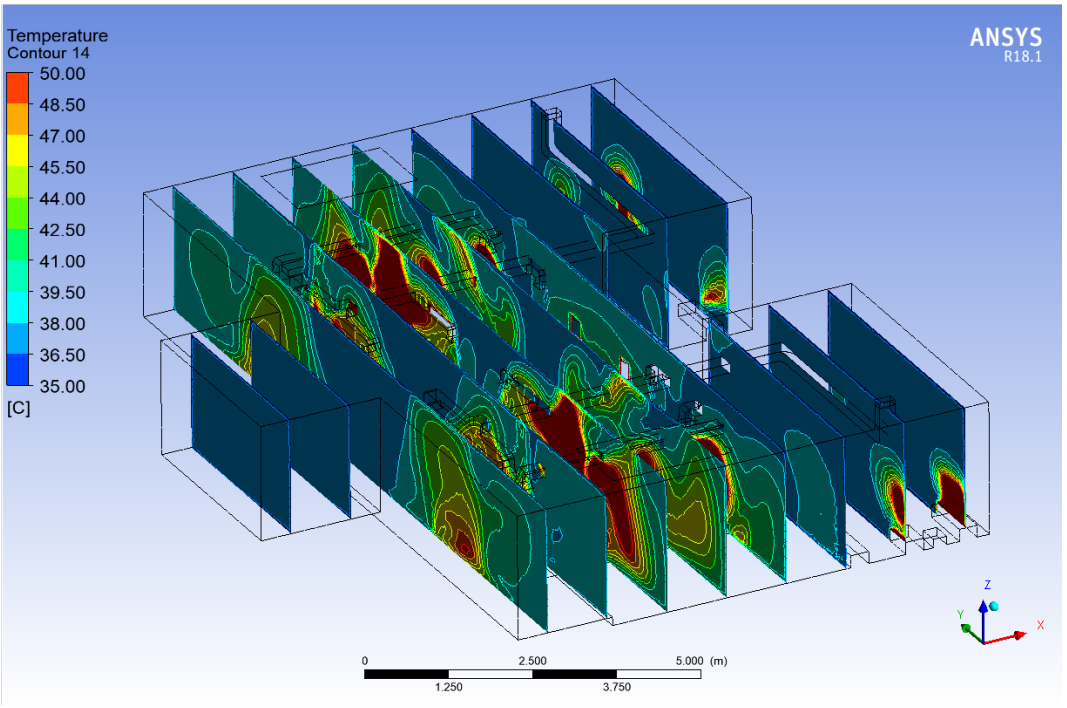
Lampiran 1.2 Perbedaan temperatur kamar mesin model ducting 2 pada ketinggian 1 meter



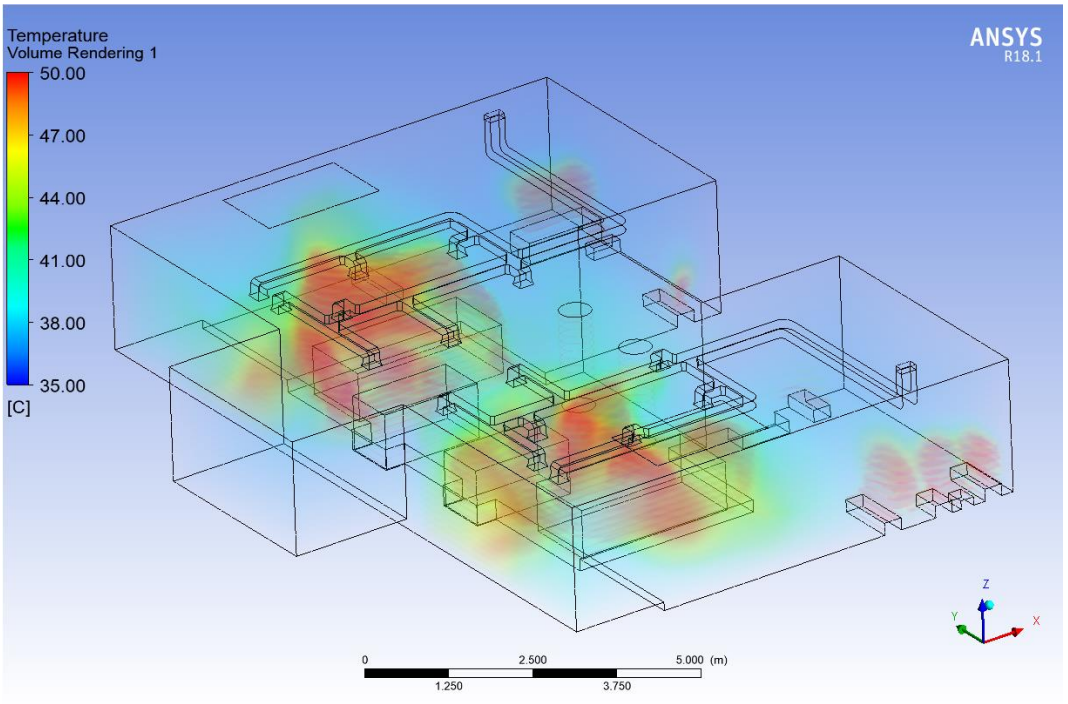
Lampiran 1.3 Perbedaan temperatur kamar mesin model ducting 2 pada ketinggian 1,5 meter



Lampiran 1.4 Perbedaan temperatur kamar mesin model ducting 2 pada ketinggian 2 meter

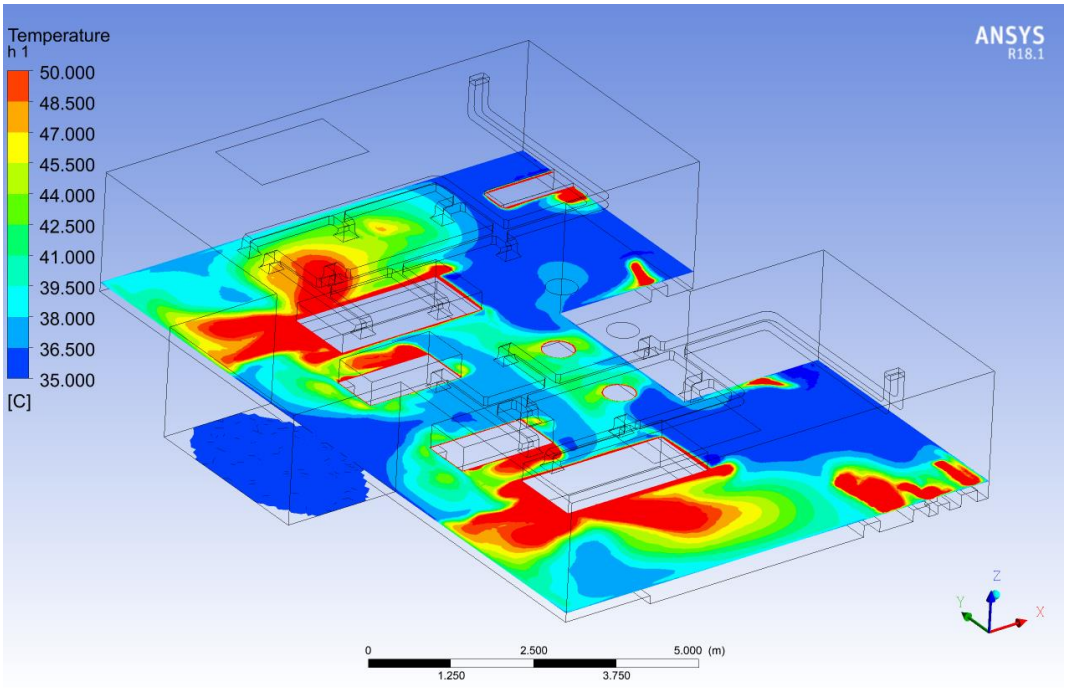


Lampiran 1.5 Perbedaan temperatur kamar mesin model ducting 2 pada bidang melintang

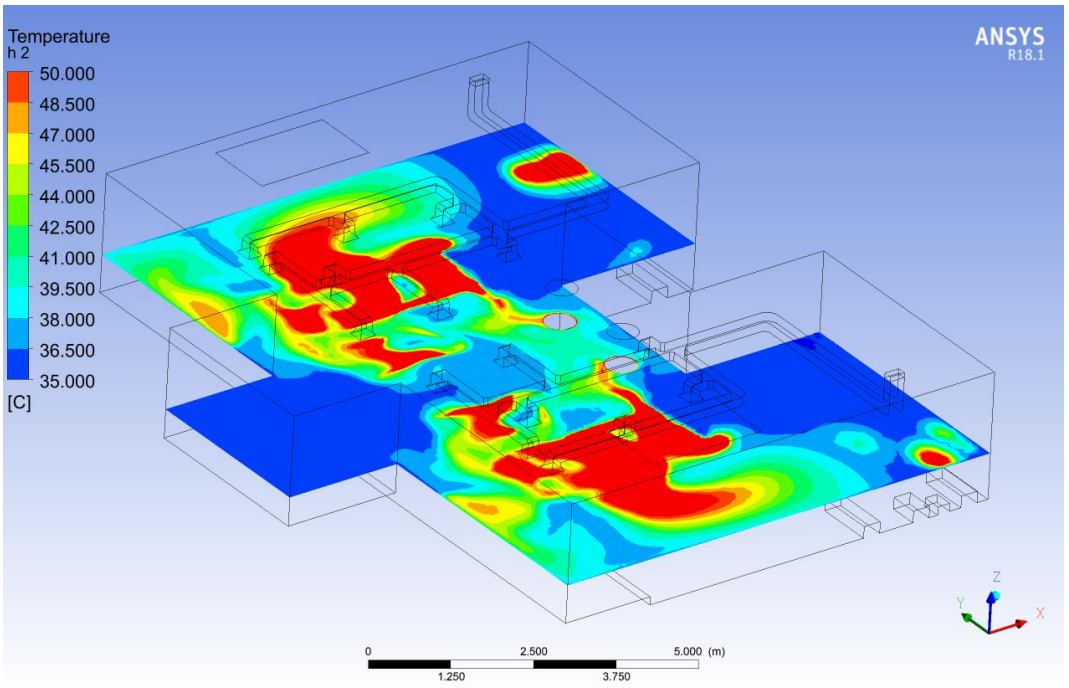


Lampiran 1.6 Visualisasi volume temperatur kamar mesin model ducting 2

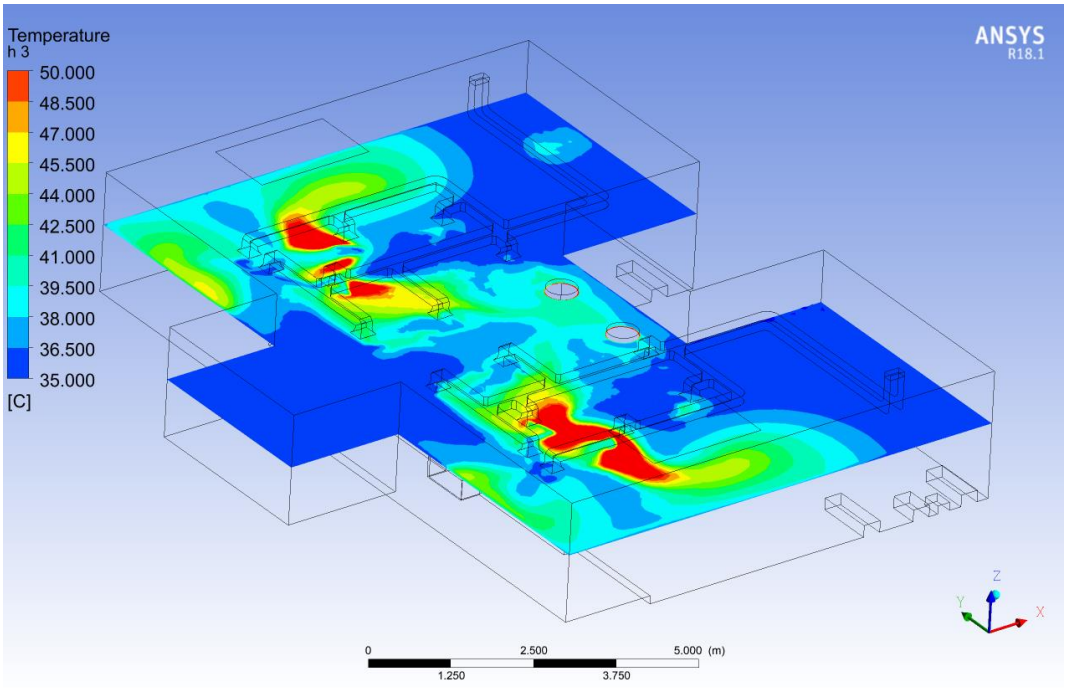
- MODEL OUTLET DUCTING 3



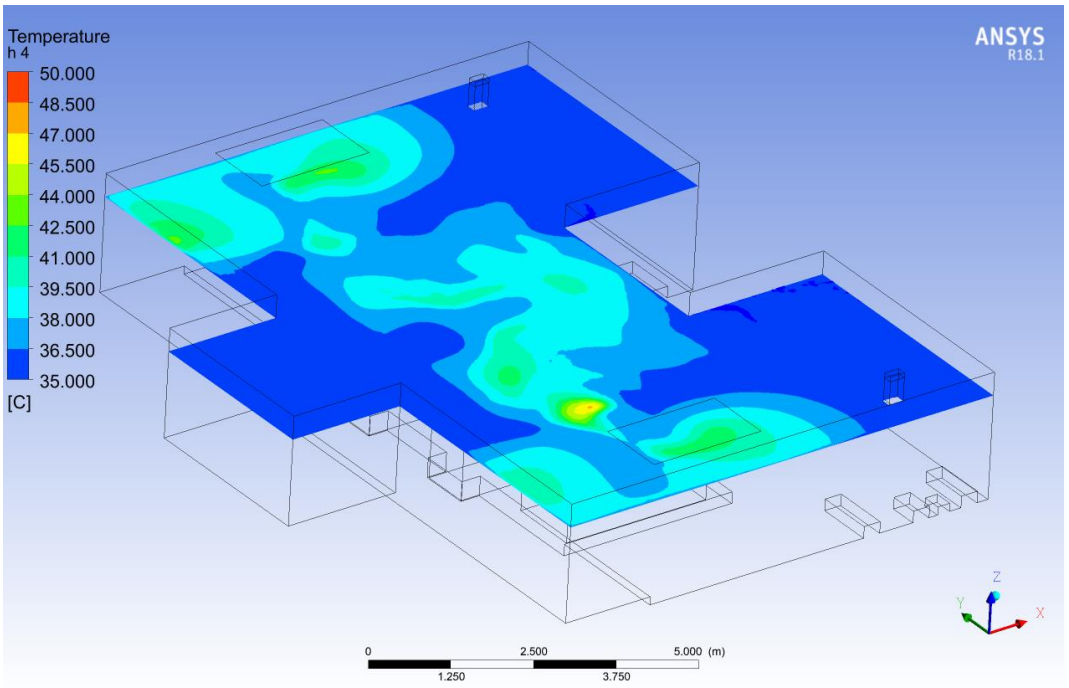
Lampiran 1.7 Perbedaan temperatur kamar mesin model ducting 3 pada ketinggian 0,5 meter



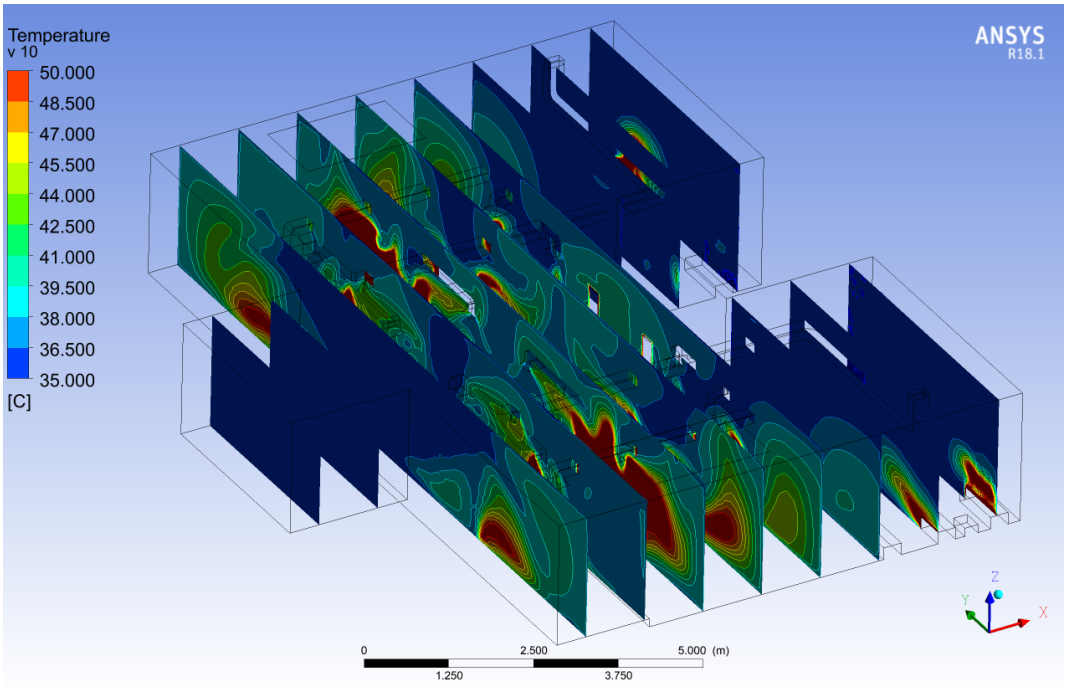
Lampiran 1.8 Perbedaan temperatur kamar mesin model ducting 3 pada ketinggian 1 meter



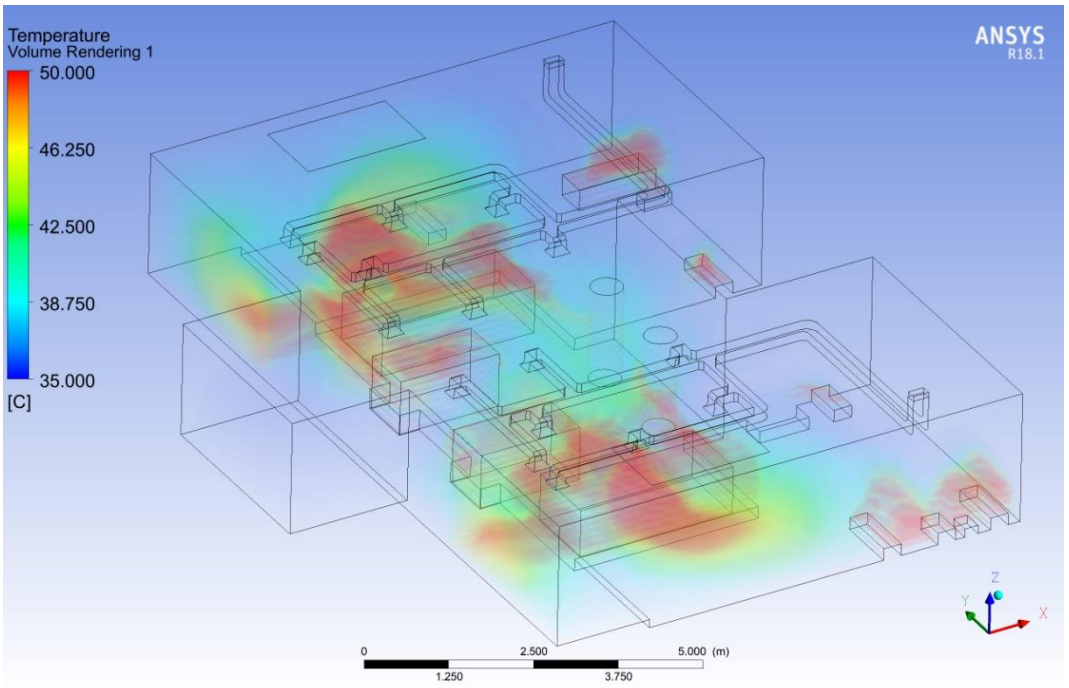
Lampiran 1.9 Perbedaan temperatur kamar mesin model ducting 3 pada ketinggian 1,5 meter



Lampiran 1.10 Perbedaan temperatur kamar mesin model ducting 3 pada ketinggian 2 meter



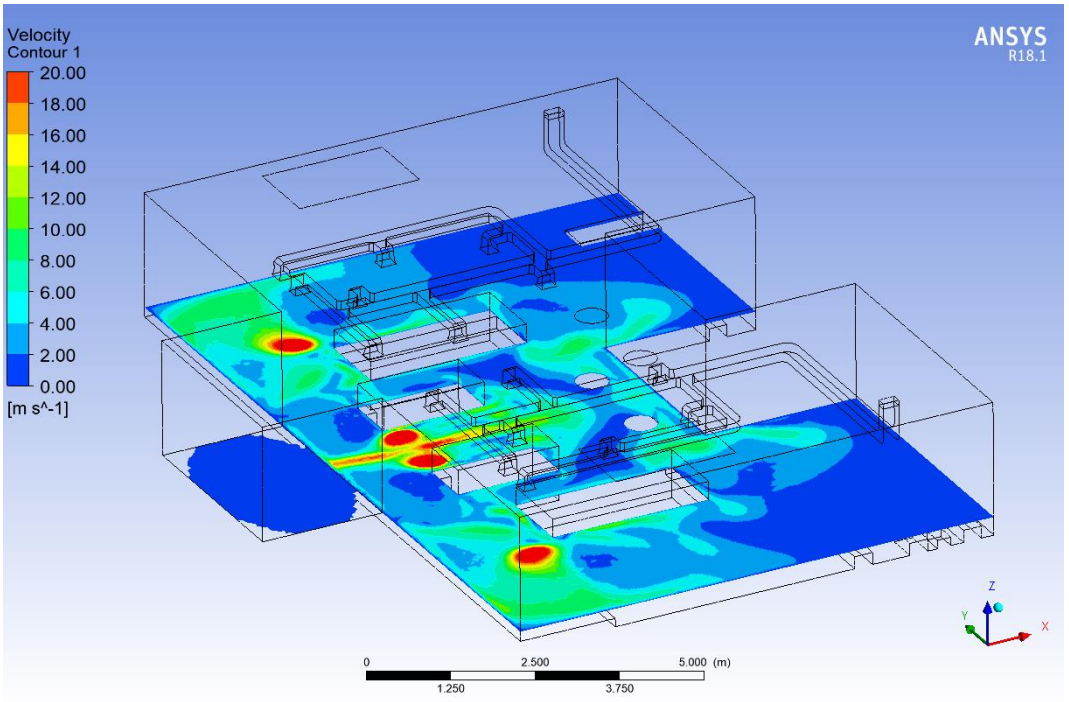
Lampiran 1.11 Perbedaan temperatur kamar mesin model ducting 3 pada bidang melintang



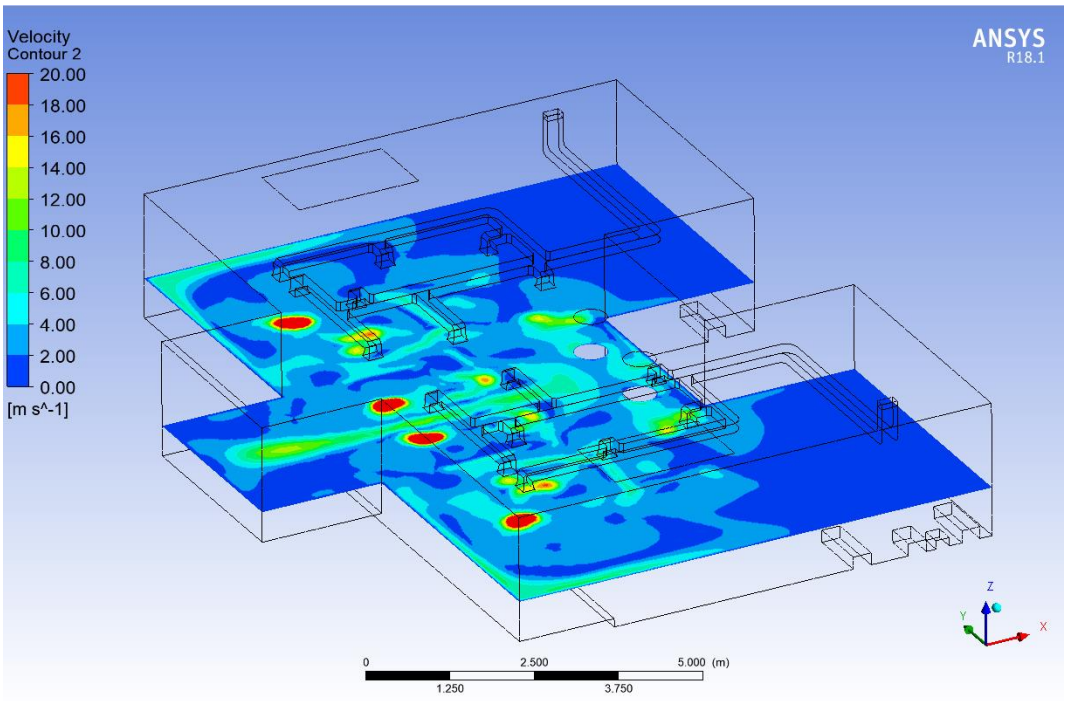
Lampiran 1.12 Visualisasi volume temperatur kamar mesin model ducting 3

LAMPIRAN 2, POST-PROCESSOR LAJU ALIRAN UDARA MODEL OUTLET DUCTING 2 DAN MODEL OUTLET DUCTING 3

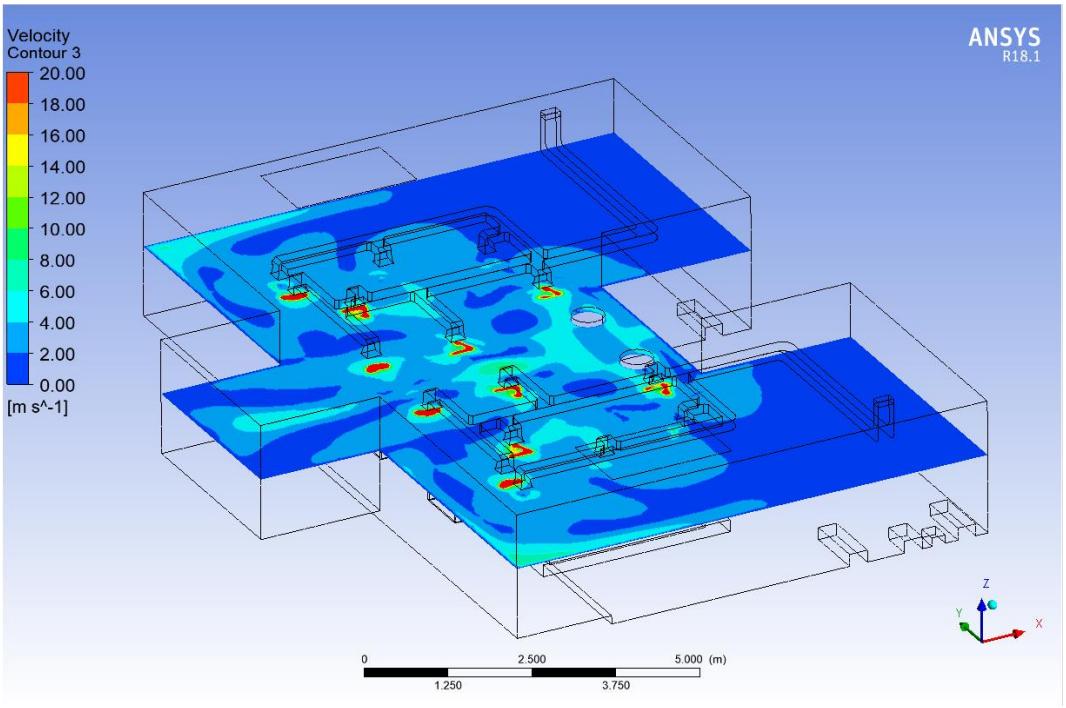
- MODEL OUTLET DUCTING 2



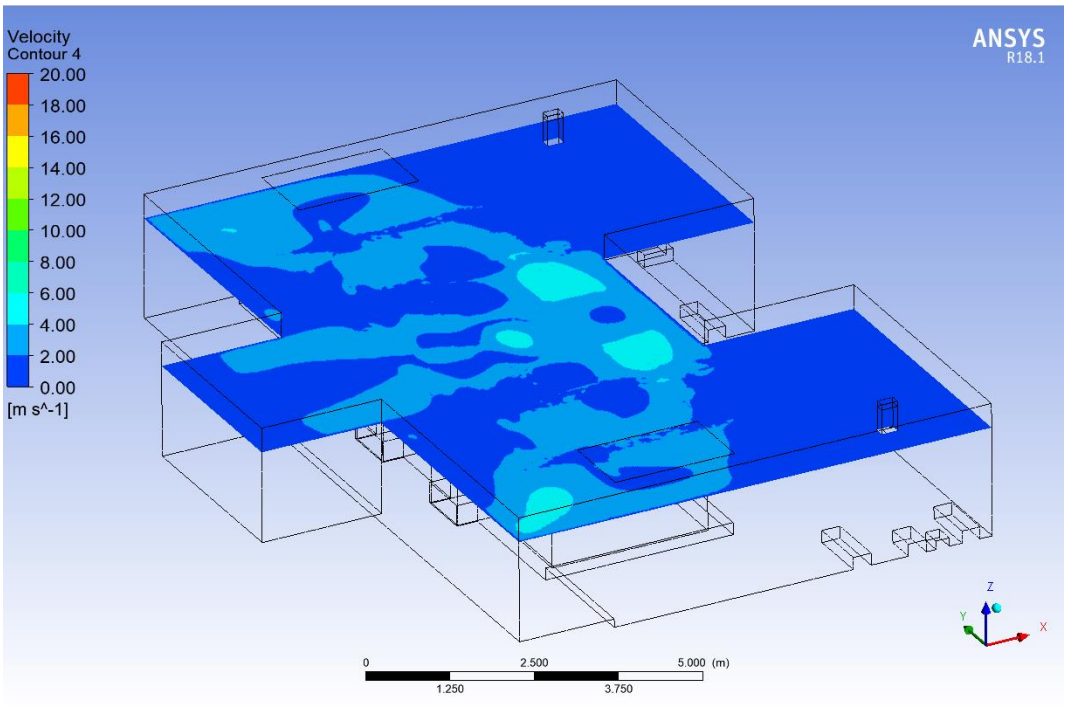
Lampiran 2.1 Laju aliran udara kamar mesin model ducting 2 pada ketinggian 0,5 meter



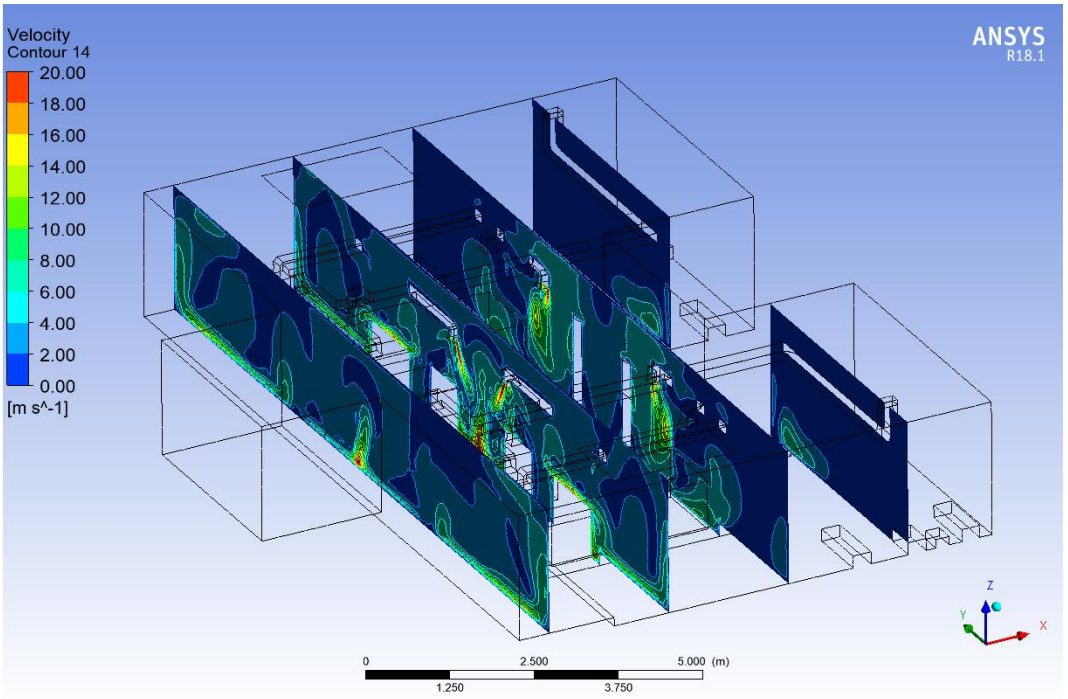
Lampiran 2.2 Laju aliran udara kamar mesin model ducting 2 pada ketinggian 1 meter



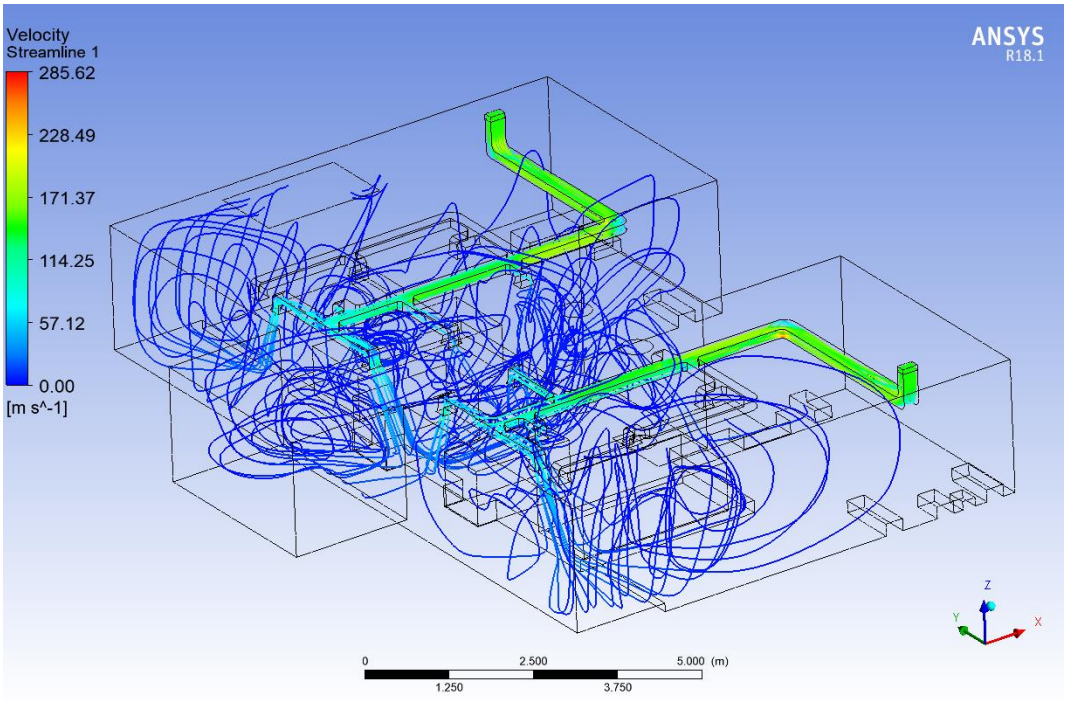
Lampiran 2.3 Laju aliran udara kamar mesin model ducting 2 pada ketinggian 1,5 meter



Lampiran 2.4 Laju aliran udara kamar mesin model ducting 2 pada ketinggian 2 meter

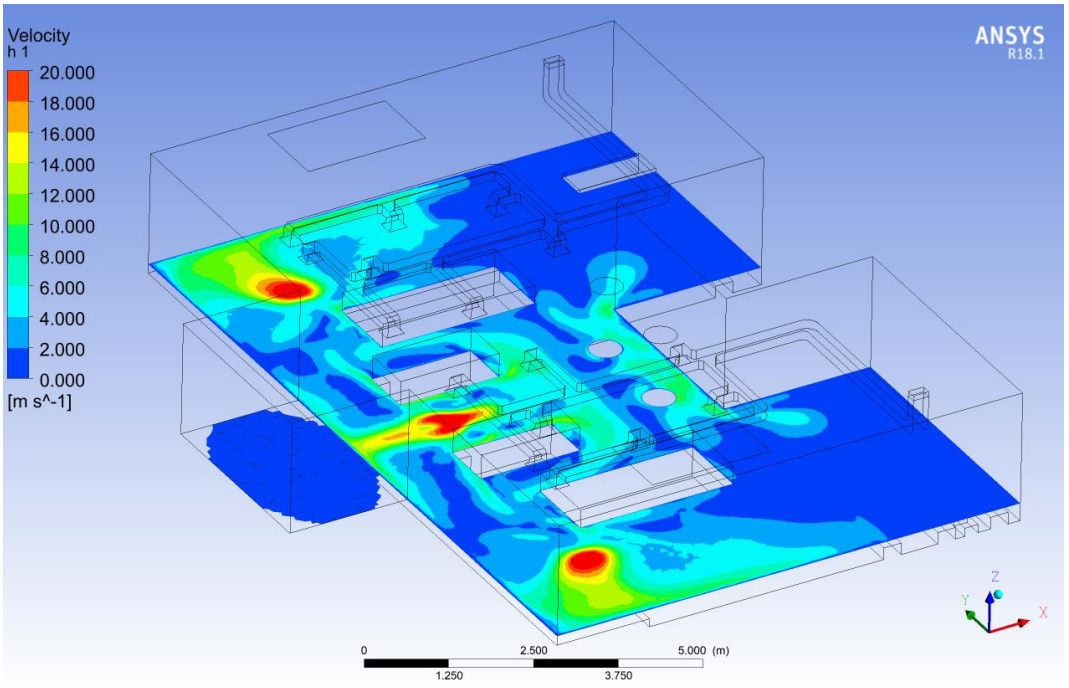


Lampiran 2.5 Laju aliran udara kamar mesin model ducting 2 pada bidang melintang

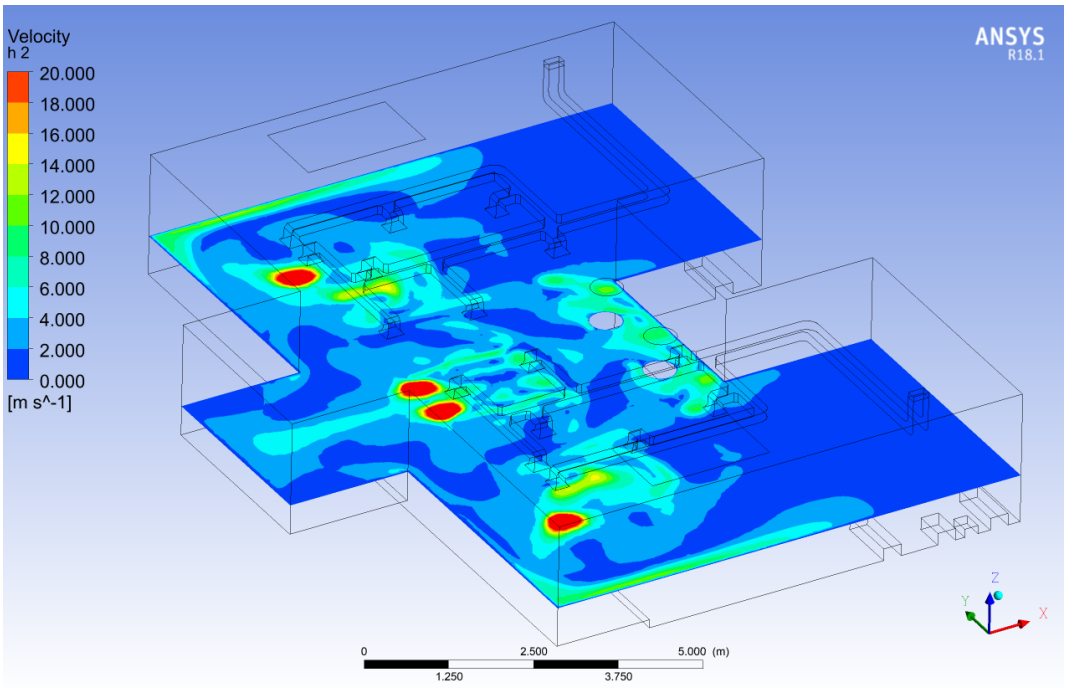


Lampiran 2.6 Visualisasi distribusi laju aliran udara kamar mesin model ducting 2

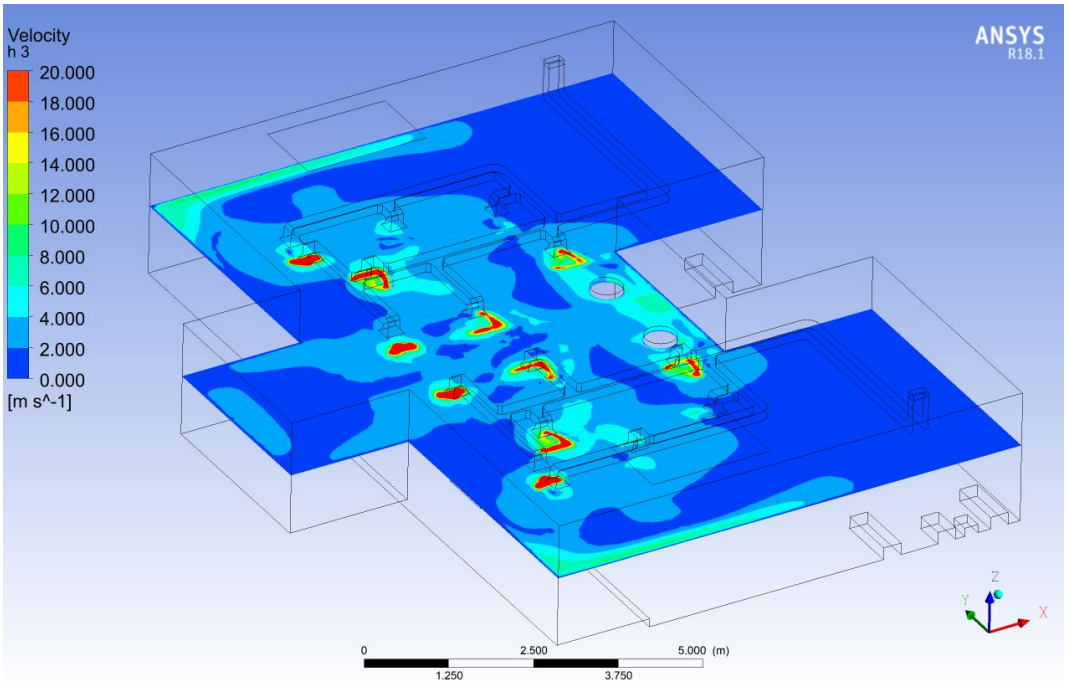
- MODEL OUTLET DUCTING 3



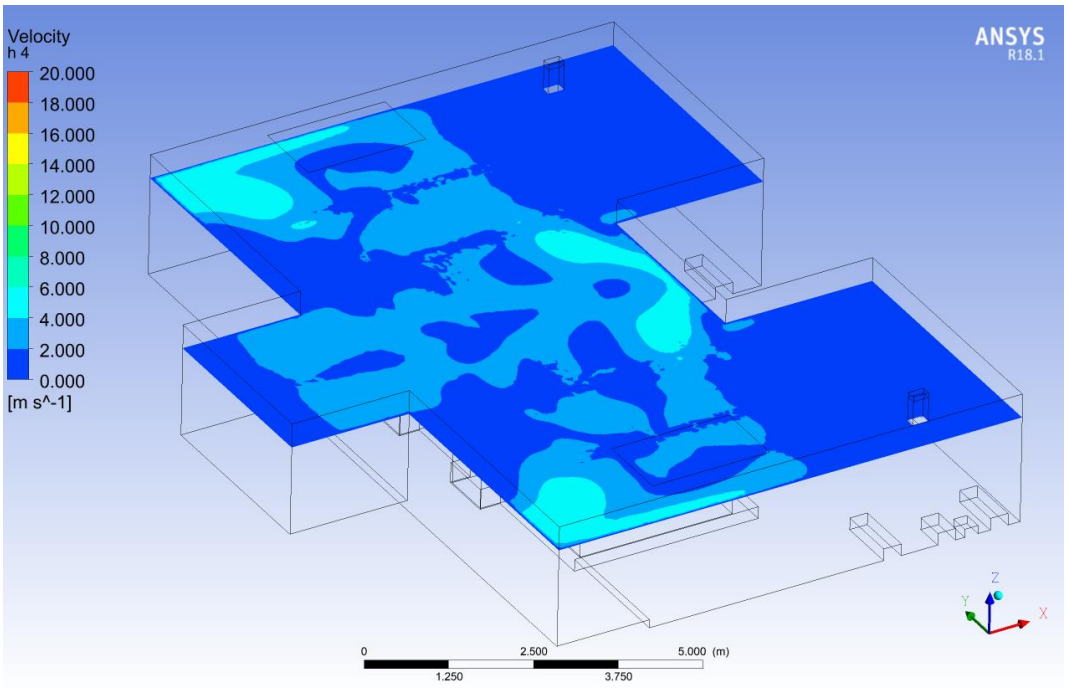
Lampiran 2.7 Laju aliran udara kamar mesin model ducting 3 pada ketinggian 0,5 meter



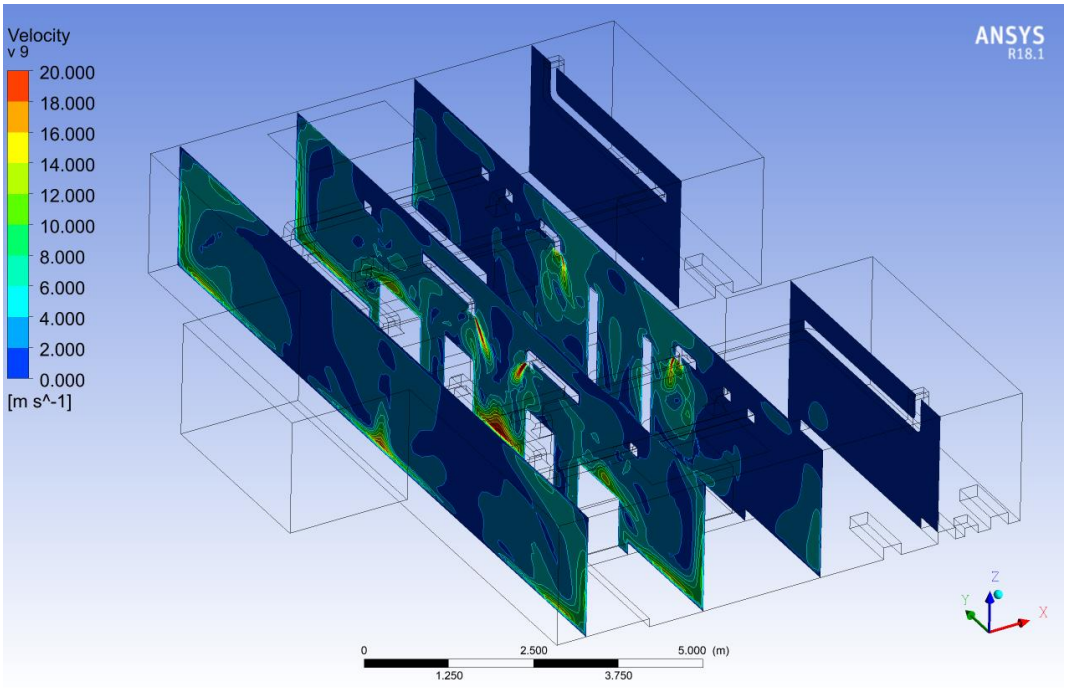
Lampiran 2.8 Laju aliran udara kamar mesin model ducting 3 pada ketinggian 1 meter



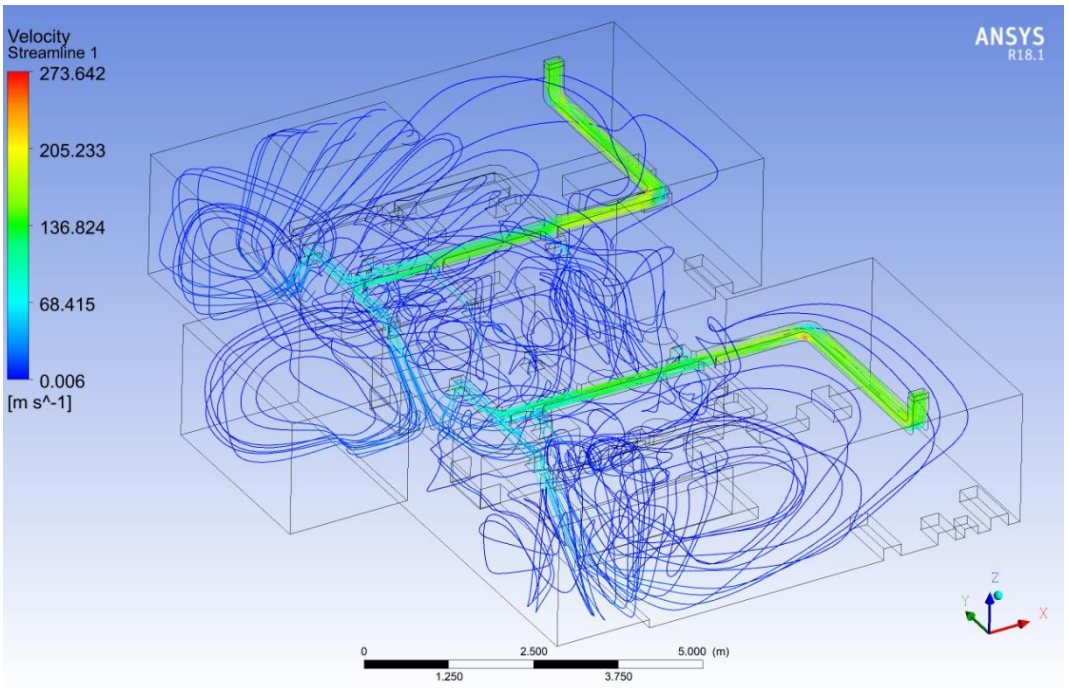
Lampiran 2.9 Laju aliran udara kamar mesin model ducting 3 pada ketinggian 1,5 meter



Lampiran 2.10 Laju aliran udara kamar mesin model ducting 3 pada ketinggian 2 meter



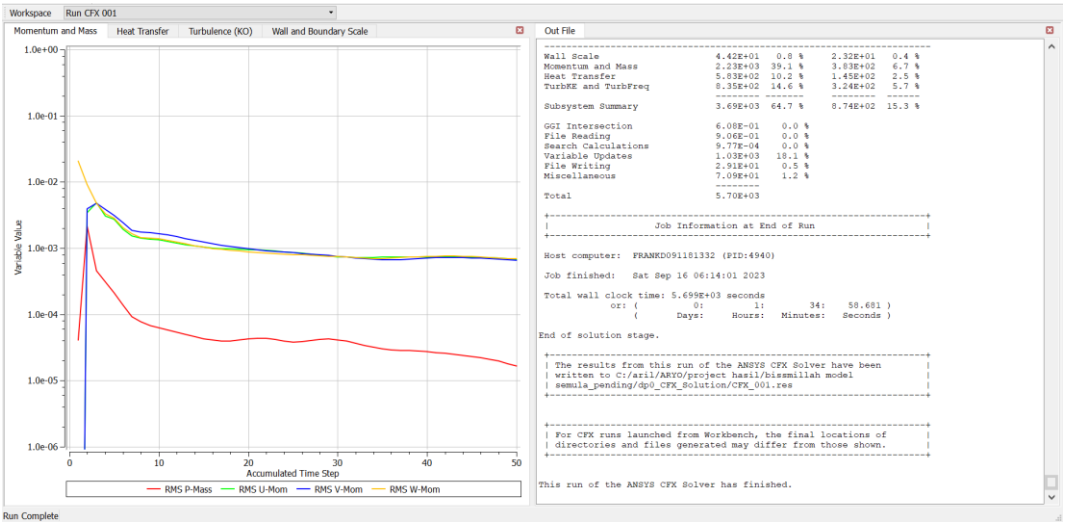
Lampiran 2.11 Laju aliran udara kamar mesin model ducting 3 pada bidang melintang



Lampiran 2.12 Visualisasi distribusi laju aliran udara pada kamar mesin model ducting 3

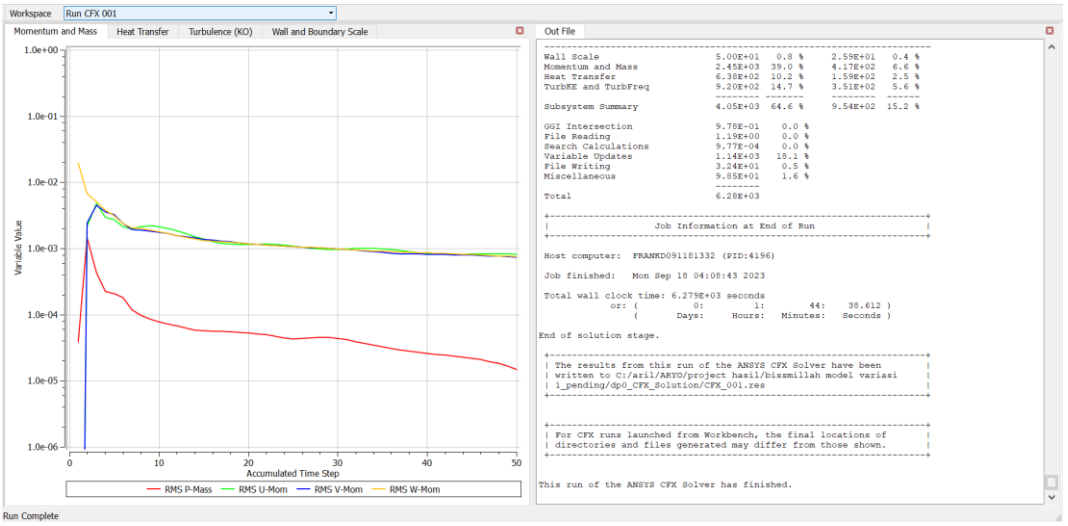
LAMPIRAN 3, GRAFIK SOLVER CONTROL

- MODEL DUCTING 1



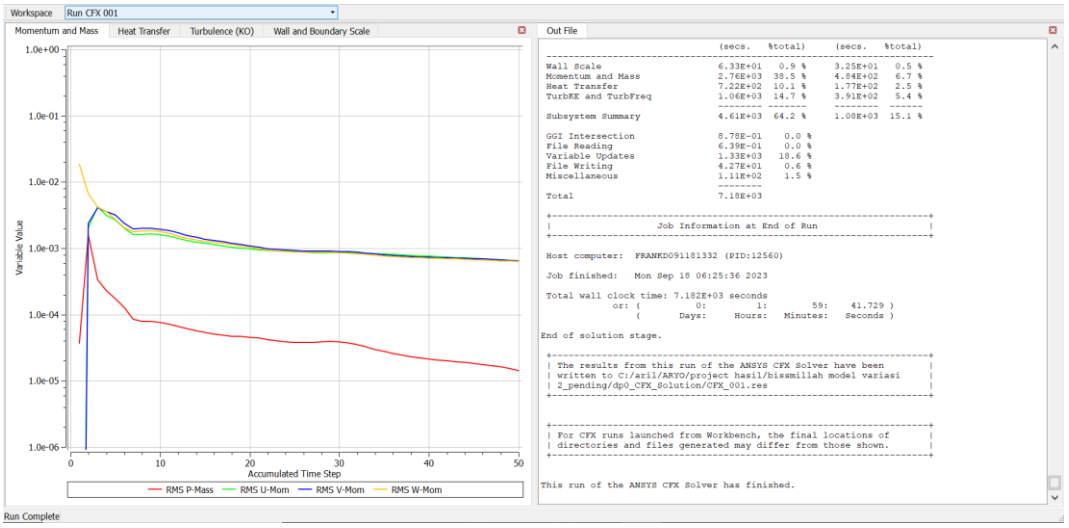
Lampiran 3.1 Hasil *solver control* model outlet 1

- MODEL DUCTING 2



Lampiran 3.2 Hasil *solver control* model outlet 2

- MODEL DUCTING 3



Lampiran 3.3 Hasil *solver control* model outlet 3

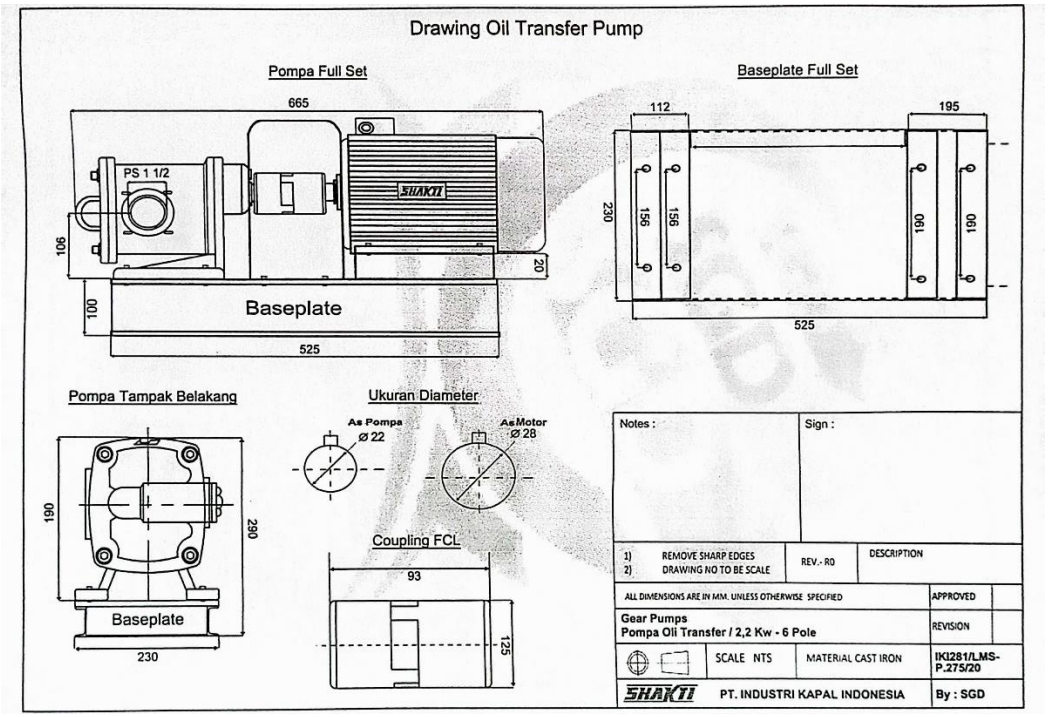
LAMPIRAN 4, GAMBAR PENDUKUNG

Activity	Metabolic Rate		
	Met Units	W/m^2	$Btu/h \cdot ft^2$
Resting			
Sleeping	0.7	40	13
Reclining	0.8	45	15
Seated, quiet	1.0	60	18
Standing, relaxed	1.2	70	22
Walking (on level surface)			
0.9 m/s, 3.2 km/h, 2.0 mph	2.0	115	37
1.2 m/s, 4.3 km/h, 2.7 mph	2.6	150	48
1.8 m/s, 6.8 km/h, 4.2 mph	3.8	220	70
Office Activities			
Reading, seated	1.0	55	18
Writing	1.0	60	18
Typing	1.1	65	20
Filing, seated	1.2	70	22
Filing, standing	1.4	80	26
Walking about	1.7	100	31
Lifting/packing	2.1	120	39
Driving/Flying			
Automobile	1.0 to 2.0	60 to 115	18 to 37
Aircraft, routine	1.2	70	22
Aircraft, instrument landing	1.8	105	33
Aircraft, combat	2.4	140	44
Heavy vehicle	3.2	185	59
Miscellaneous Occupational Activities			
Cooking	1.6 to 2.0	95 to 115	29 to 37
House cleaning	2.0 to 3.4	115 to 200	37 to 63
Seated, heavy limb movement	2.2	130	41
Machine work			
sawing (table saw)	1.8	105	33
light (electrical industry)	2.0 to 2.4	115 to 140	37 to 44
heavy	4.0	235	74
Handling 50 kg (100 lb) bags	4.0	235	74
Pick and shovel work	4.0 to 4.8	235 to 280	74 to 88
Miscellaneous Leisure Activities			
Dancing, social	2.4 to 4.4	140 to 255	44 to 81
Calisthenics/exercise	3.0 to 4.0	175 to 235	55 to 74
Tennis, single	3.6 to 4.0	210 to 270	66 to 74
Basketball	5.0 to 7.6	290 to 440	90 to 140
Wrestling, competitive	7.0 to 8.7	410 to 505	130 to 160

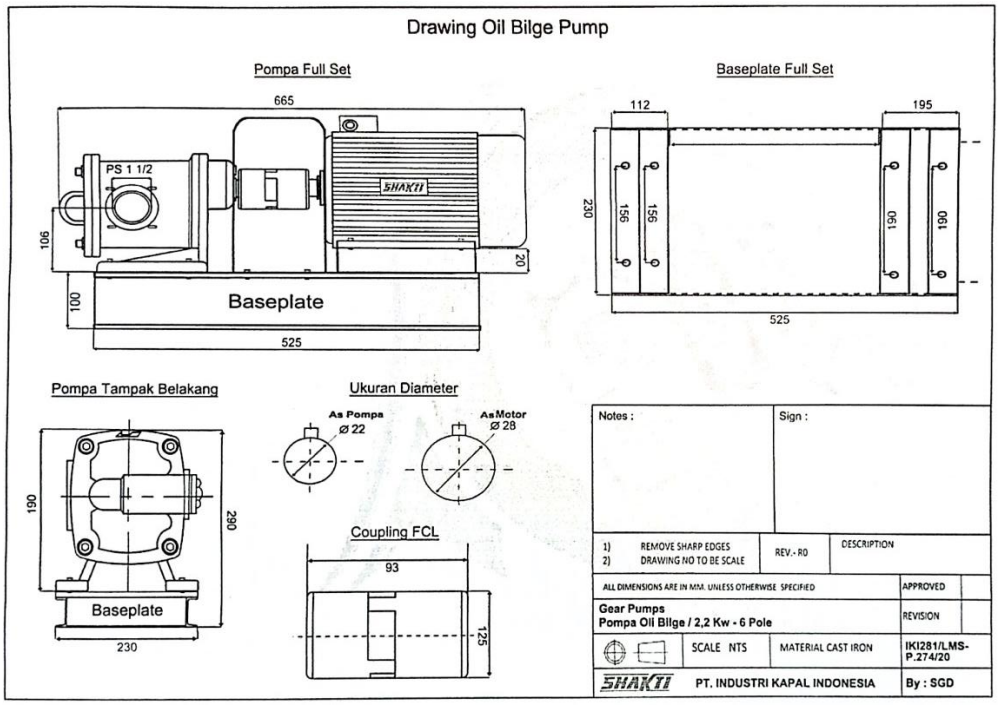
Lampiran 4.1 heat flux pekerja berdasarkan jenis aktifitas (*sumber : ANSI/ASHRAE Standard 55: 2017*)

T, K	ρ kg/m^3	c_p kj/kg.^{0}C	μ kg/m.s x 10^5	ν m^2/s x 10^4	k W/m.^{0}C	α m^2/s x 10^4	Pr
100	3.6010	1.0266	0.6924	1.923	0.009246	0.02501	0.770
150	2.3675	1.0099	1.0283	4.343	0.013735	0.0574	0.753
200	1.7684	1.0061	1.3289	7.490	0.01809	0.10165	0739
250	1.4128	1.0053	1.5990	11.31	0.02227	0.15675	0.722
300	1.1774	1.0057	1.8462	15.69	0.02624	0.22160	0.708
350	0.9980	1.0090	2.075	20.76	0.03003	0.2983	0.697
400	0.8826	1.0140	2.286	25.90	0.03365	0.3760	0.689
450	0.7833	1.0207	2.484	31.71	0.03707	0.4222	0.683
500	0.7048	1.0295	2.671	37.90	0.04038	0.5564	0.680
550	0.6423	1.0392	2.848	44.34	0.04360	0.6532	0.680
600	0.5879	1.0551	3.018	51.35	0.04659	0.7512	0.680
650	0.5430	1.0635	3.177	58.51	0.04953	0.8578	0.682
700	0.5030	1.0752	3.332	66.25	0.05230	0.9672	0.684
750	0.4709	1.0856	3.481	73.91	0.05509	1.0774	0.686
800	0.4405	1.0978	3.625	82.29	0.05779	1.1951	0.689
850	0.4149	1.1095	3.765	90.75	0.06028	1.3097	0.692
900	0.3925	1.1212	3.899	99.3	0.06279	1.4271	0.696
950	0.3716	1.1321	4.023	108.2	0.06525	1.5510	0.699
1000	0.3524	1.1417	4.152	117.8	0.06752	1.6779	0.702
1100	0.3204	1.160	4.44	138.6	0.0732	1.969	0.704
1200	0.2947	1.179	4.69	159.1	0.0782	2.251	0.707
1300	0.2707	1.197	4.93	182.1	0.0837	2.583	0.705
1400	0.2515	1.214	5.17	205.5	0.0891	2.920	0.705
1500	0.2355	1.230	5.40	229.1	0.0946	3.262	0.705
1600	0.2211	1.248	5.63	254.5	0.100	3.609	0.705
1700	0.2082	1.467	5.85	280.5	0.105	3.977	0.705
1800	0.1970	1.287	6.07	308.1	0.111	4.379	0.704
1900	0.1858	1.309	6.29	338.5	0.117	4.811	0.704
2000	0.1762	1.338	6.50	369.0	0.124	5.260	0.702
2100	0.1682	1.372	6.72	399.6	0.131	5.715	0.700
2200	0.1602	1.419	6.93	432.6	0.139	6.120	0.707
2300	0.1538	1.482	7.14	464.0	0.149	6.540	0.710
2400	0.1458	1.574	7.35	504.0	0.161	7.020	0.718
2500	0.1394	1.688	7.57	543.5	0.175	7.441	0.730

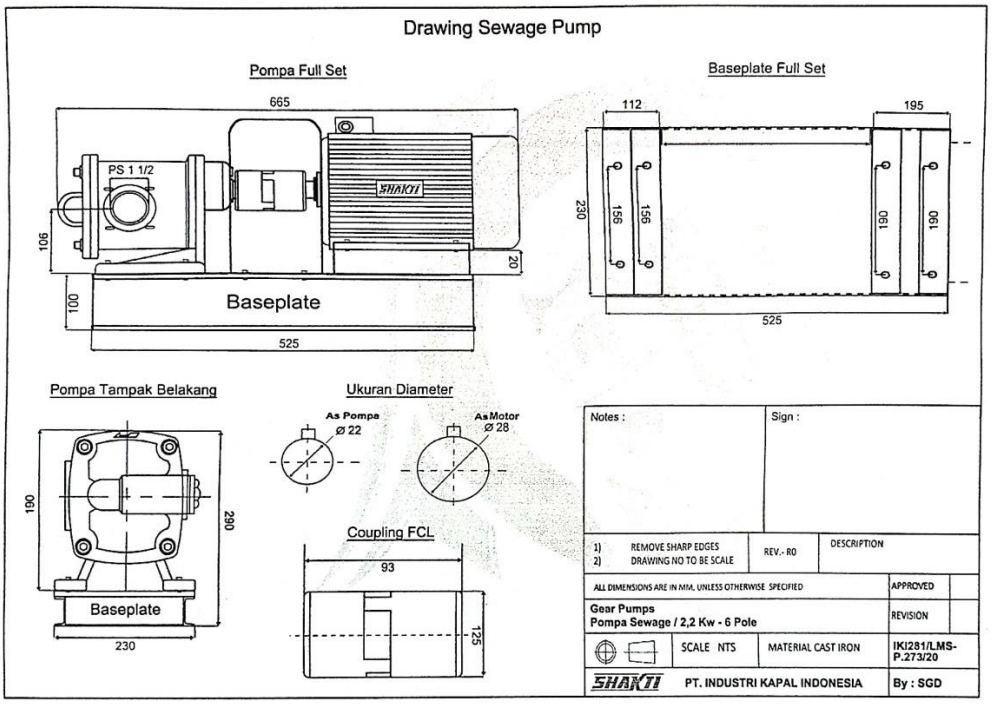
Lampiran 4.2 Sifat-sifat udara pada tekanan atmosfer (*sumber : Natl Bur Stand Hal. 564*)



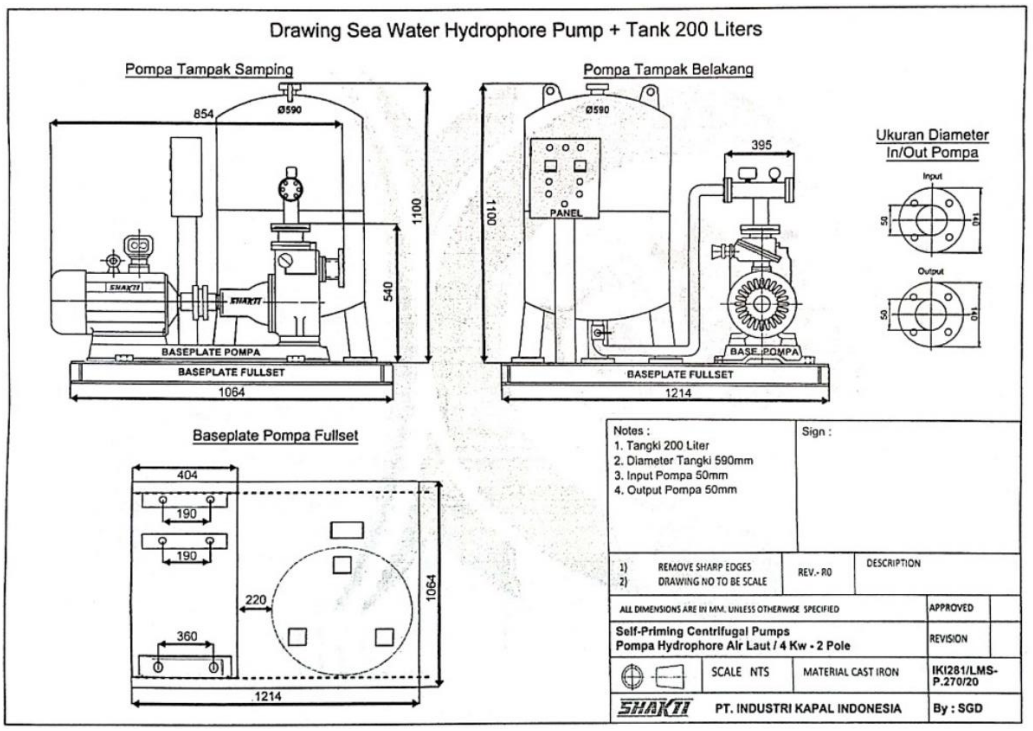
Lampiran 4.3 Gambar dimensi pompa transfer bahan bakar



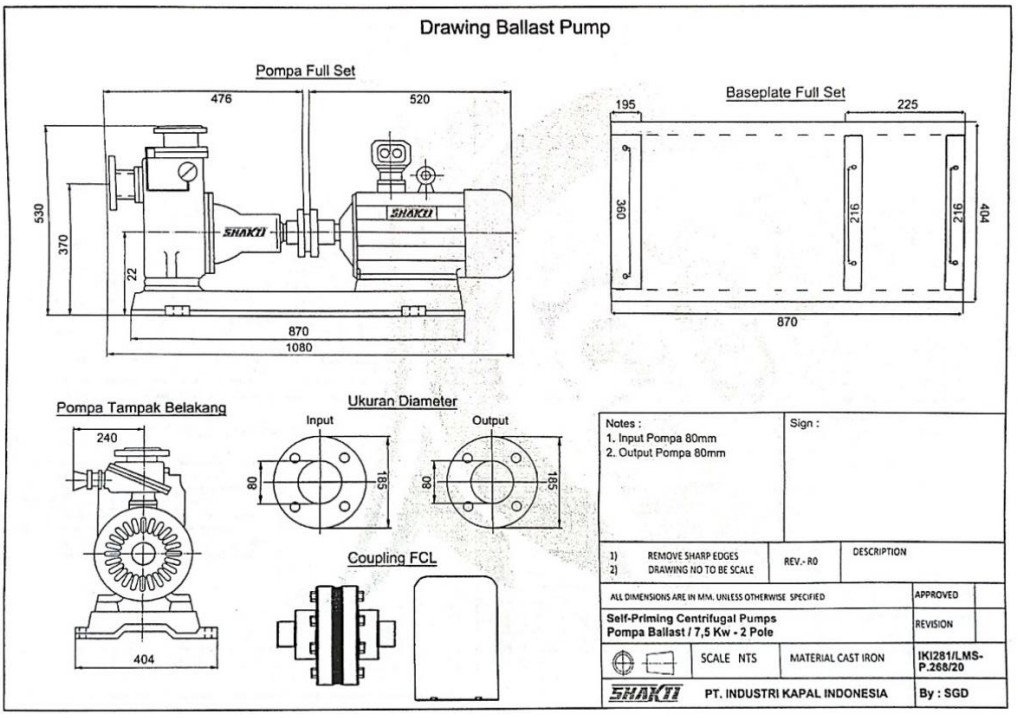
Lampiran 4.4 Gambar dimensi pompa bilga (minyak kotor)



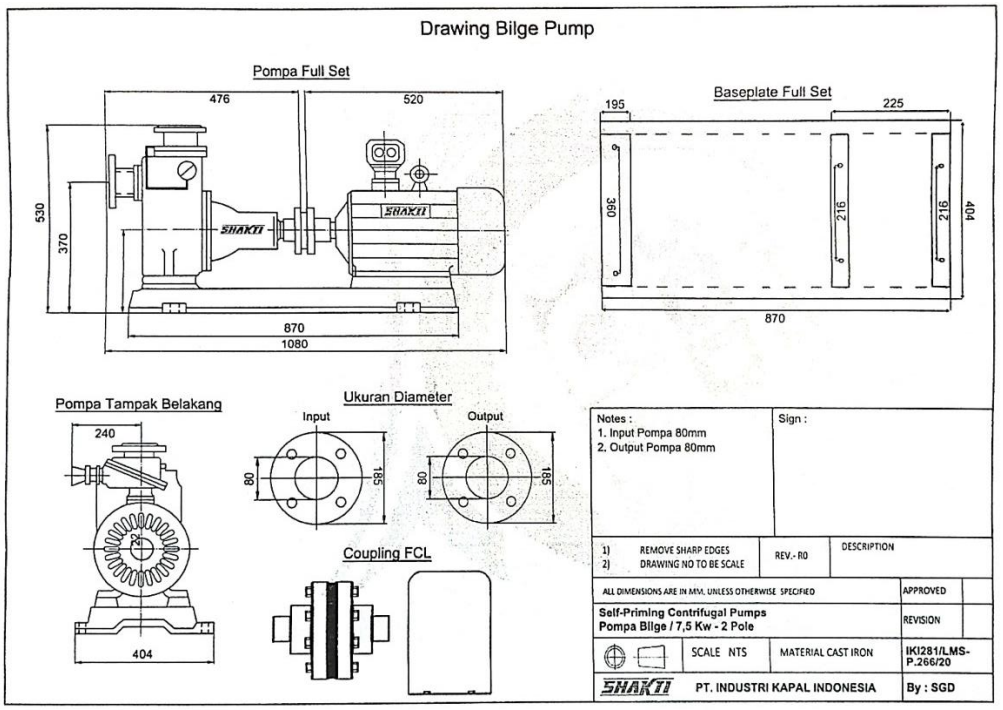
Lampiran 4.5 Gambar dimensi pompa sewage



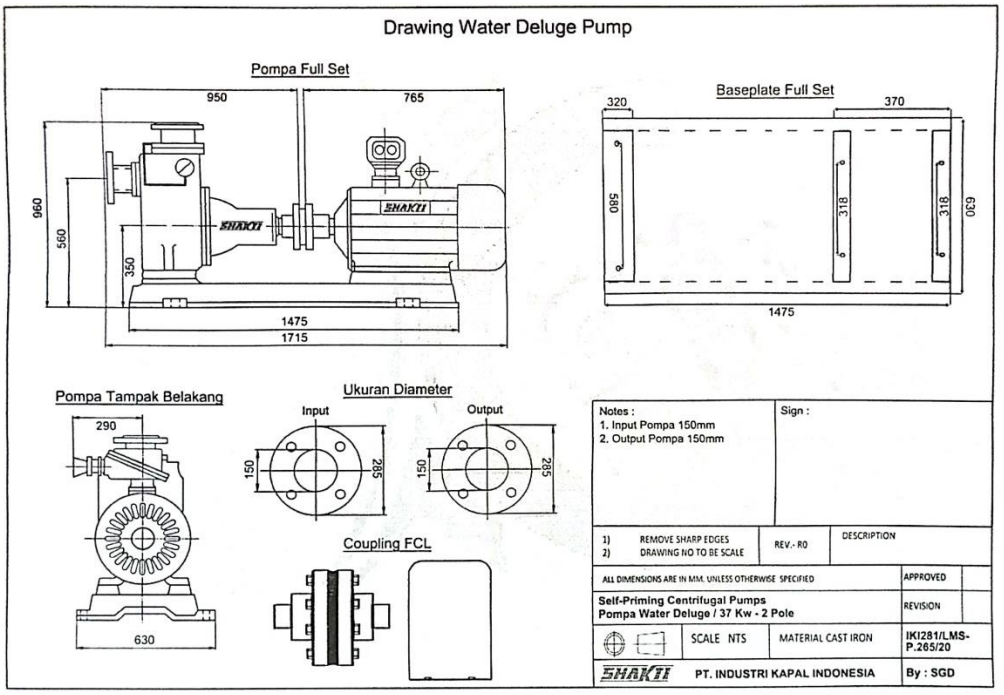
Lampiran 4.6 Gambar dimensi pompa hydrophore air tawar 0,12 0,36



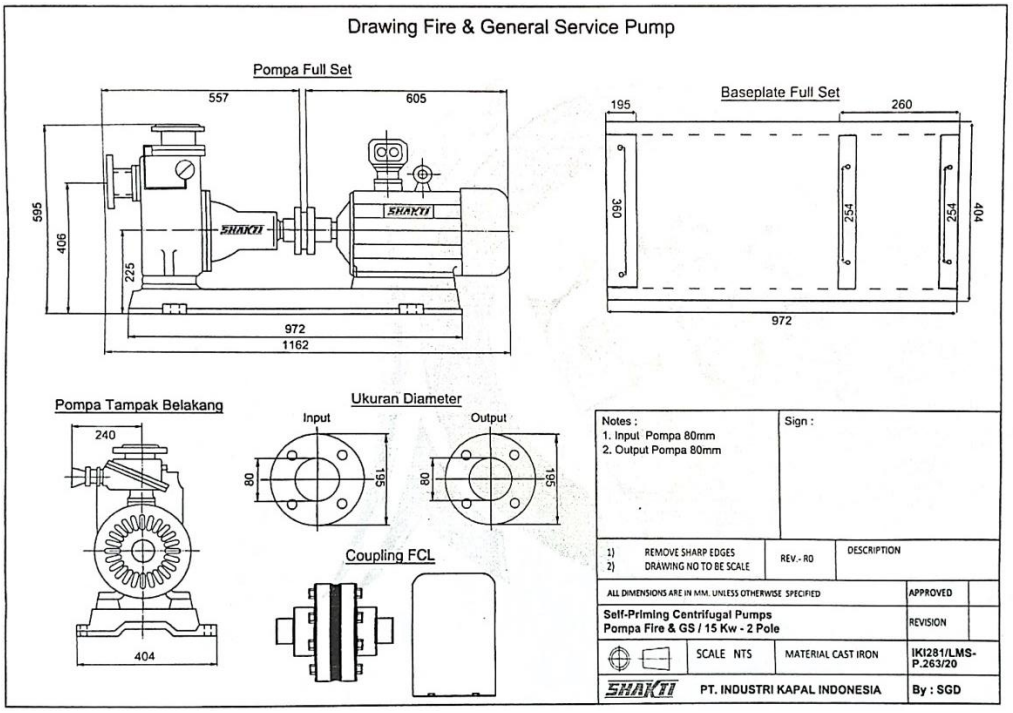
Lampiran 4.7 Gambar dimensi pompa ballast



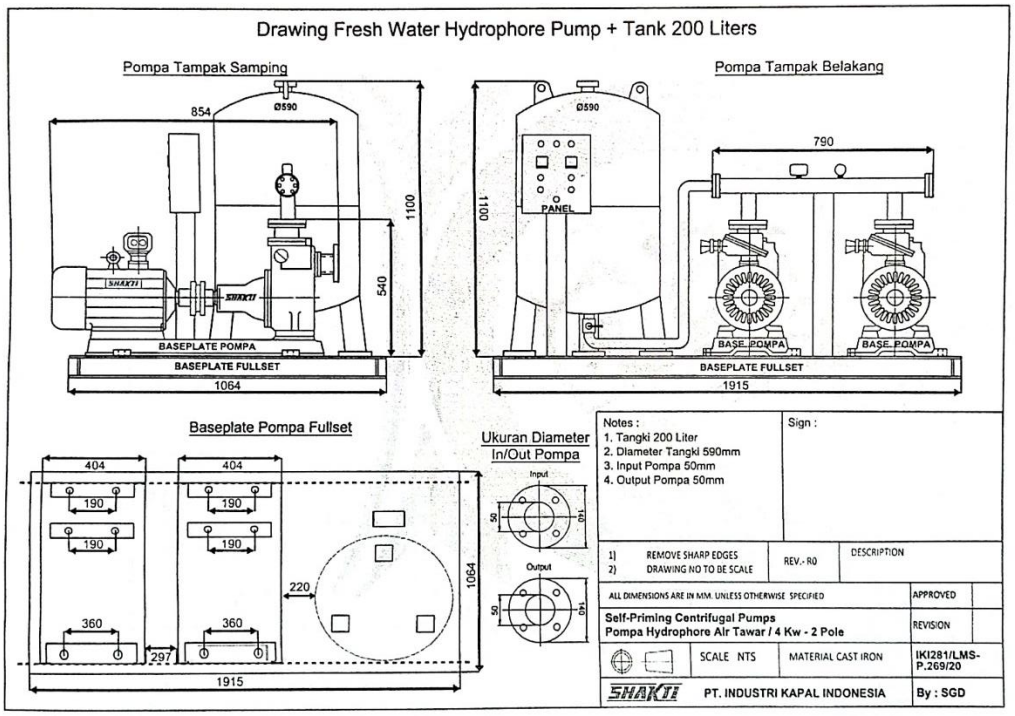
Lampiran 4.8 Gambar dimensi pompa bilga



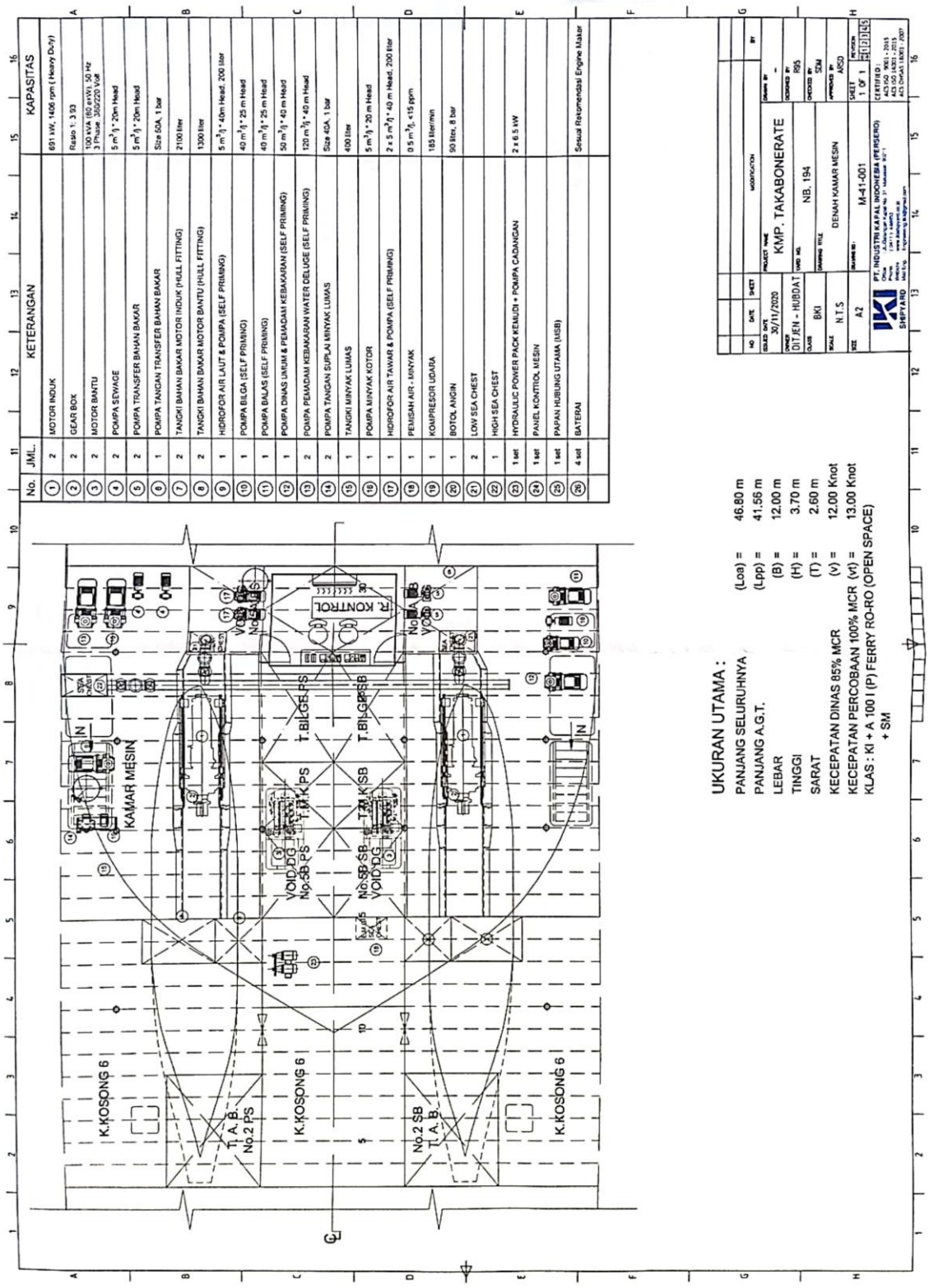
Lampiran 4.9 Gambar dimensi pompa water deluge



Lampiran 4.10 Gambar dimensi pompa dinas umum dan kebakaran



Lampiran 4.11 Gambar dimensi pompa hydrophore air laut



Lampiran 4.12 Layout kamar mesin

SPECIFICATIONS	
Application	Propulsion/Auxiliary Generator
Cylinder configuration	6 in-line
Total displacement (l)	29.96
Bore x stroke (mm)	170 x 220
Flywheel and housing	SAE 18/SAE No.0
Compression ratio	14.0:1
Dry weight (kg)	3130
Method of operation	4-cycle, water cooled, diesel engine, direct-injection,turbocharged with air-cooler
Cooling method	Engine coolant: Indirect cooling by sea water Intake air: Direct cooling by sea water

Lampiran 4.13 Brosur spesifikasi mesin induk

Product Specifications for 4.4TW2GM

Perkins

Power Rating

Minimum Power	93.6 kW
Maximum Power	106.8 kW
Maximum Torque	623 Nm @ 1800 rpm
Rated Speed	1500-1800 rpm

General

Bore	105 mm
Stroke	127 mm
Displacement	4.4 l
Aspiration	Turbocharged air to water cooled
Rotation from Flywheel End	Clockwise
Total Coolant Capacity	15 l
Total Lubricating Capacity	15 l
Combustion System	Direct injection
Cycle	4 stroke
Compression Ratio	19.3:1
Number of Cylinders	4 inline
Cooling System	Liquid

Lampiran 4.14 Brosur spesifikasi generator