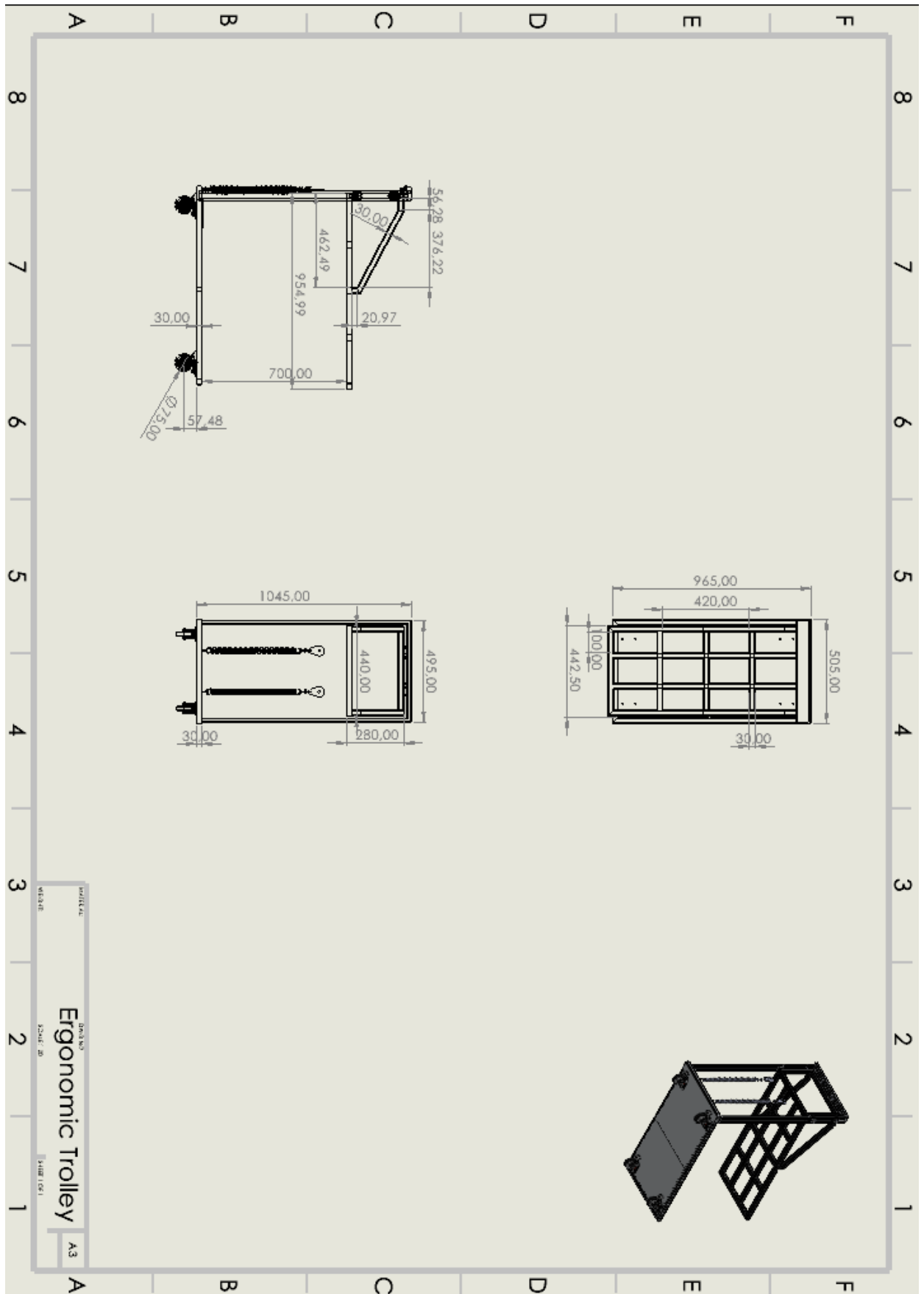
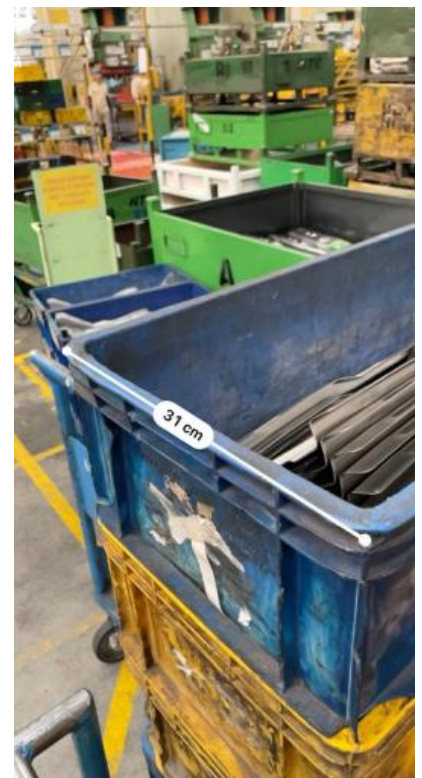
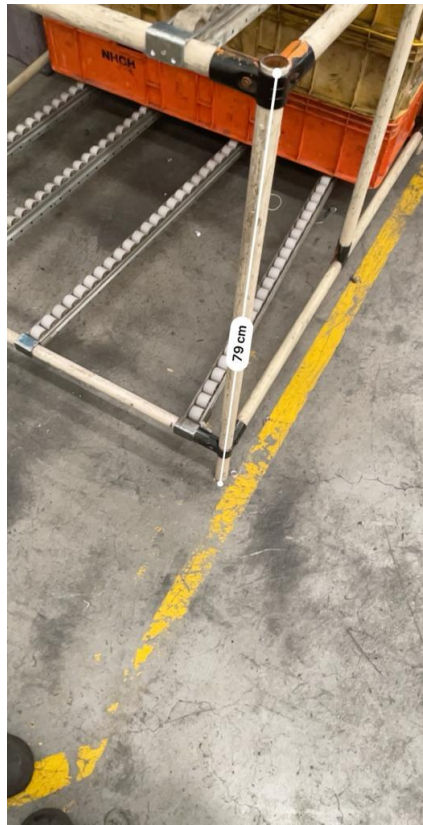
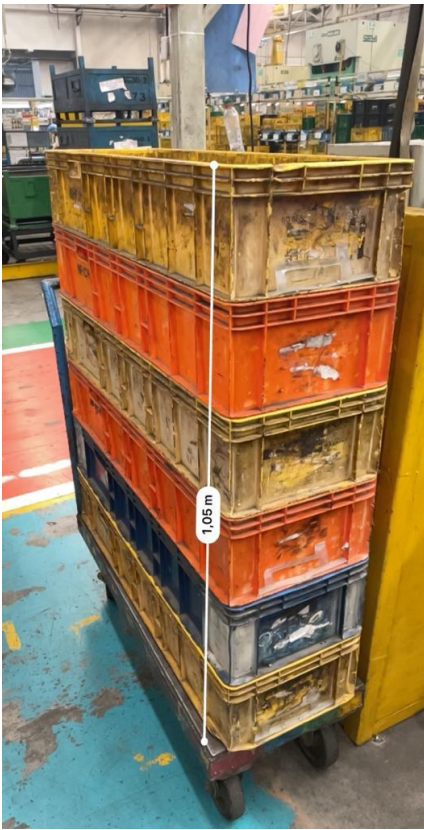


LAMPIRAN

1. Gambar Teknik Rancangan Alat Level Lifter Karakuri Kaizen



2. Dokumentasi Kondisi Lapangan



3. Material Properties ST 37-2 dan ASTM A313 Stainless Steel 302

ASTM A313 Stainless Steel Spring Wire Tensile Strength Requirements for Types 302 Class 1 and 304				
Diameter (d), in.	Diameter (d), mm	Bend Test, Minimum Number of Bends	ksi	Mpa
0.148<d≤0.162	3.76<d≤4.11	3	205-235	1415-1620
0.162<d≤0.177	4.11<d≤4.50	3	198-228	1365-1570
0.177<d≤0.192	4.50<d≤4.88	1	194-225	1335-1550
0.192<d≤0.207	4.88<d≤5.26	1	188-220	1295-1515
0.207<d≤0.225	5.26<d≤5.72	1	182-214	1255-1475
0.225<d≤0.250	5.72<d≤6.35	1	175-205	1205-1415
0.250<d≤0.278	6.35<d≤7.06	1	168-198	1160-1365
0.278<d≤0.306	7.06<d≤7.77	1	161-192	1110-1325

ST37-2 Properties	Thickness	
	Yiels Strength (MPa)	d≤16
	235	225
Tensile Strength (MPa)	d<3	3 ≤ d ≤ 100
	360-510	340-470
Elongation (%)	22	
Shear Strength (MPa)	230	
Density (g/cm ³)	7,8	
Melting Point	1470 Celcius	
Thermal Conductivity (W/mK)	53	
Electrical Conductivity (%IACS)	6,9	

4. Standard Wire Gauge Sebagai Panduan Pembuatan Pegas

SWG	Diameter (mm)	SWG	Diameter (mm)	SWG	Diameter (mm)	SWG	Diameter (mm)
7/0	12.70	7	4.470	20	0.914	33	0.2540
6/0	11.785	8	4.064	21	0.813	34	0.2337
5/0	10.973	9	3.658	22	0.711	35	0.2134
4/0	10.160	10	3.251	23	0.610	36	0.1930
3/0	9.490	11	2.946	24	0.559	37	0.1727
2/0	8.839	12	2.642	25	0.508	38	0.1524
0	8.229	13	2.337	26	0.457	39	0.1321
1	7.620	14	2.032	27	0.4166	40	0.1219
2	7.010	15	1.829	28	0.3759	41	0.1118
3	6.401	16	1.626	29	0.3454	42	0.1016
4	5.893	17	1.422	30	0.3150	43	0.0914
5	5.385	18	1.219	31	0.2946	44	0.0813
6	4.877	19	1.016	32	0.2743	45	0.0711

5. Steel Wire Suspension Ropes For Lifts, Elevator, and Hoists Sebagai Panduan Pembuatan Wire Ropes

Type of rope	Nominal diameter (mm)	Average weight (N/m)	Tensile strength (N)	
			Tensile strength of wire	
			1100–1250 MPa	1250–1400 MPa
6 × 19	6, 8, 10, 12, 14, 16 18, 20, 22, 25	0.0383 d^2	385 d^2	435 d^2
8 × 19	8, 10, 12, 14, 16 18, 20, 22, 25	0.034 d^2	355 d^2	445 d^2

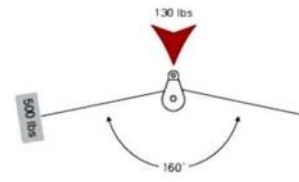
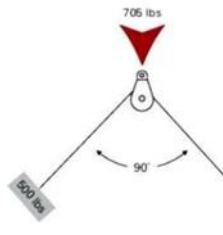
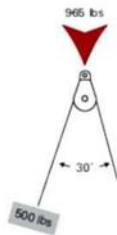
6. Factor Of Safety for Wire Ropes Sebagai Panduan Pembuatan Wire Rope

Application of wire rope	Factor of safety	Application of wire rope	Factor of safety
Track cables	4.2	Derricks	6
Guys	3.5	Haulage ropes	6
Mine hoists : Depths		Small electric and air hoists	7
upto 150 m	8	Over head and gantry cranes	6
300 – 600 m	7	Jib and pillar cranes	6
600 – 900 m	6	Hot ladle cranes	8
over 900 m	5	Slings	8
Miscellaneous hoists	5		

7. Diameter of Wire and Area of Wire Ropes Sebagai Panduan Pembuatan Wire Ropes

Type of wire rope	6 × 8	6 × 19	6 × 37	8 × 19
Wire diameter (d_w)	0.106 d	0.063 d	0.045 d	0.050 d
Area of wire rope (A)	0.38 d^2	0.38 d^2	0.38 d^2	0.35 d^2

8. Stress Formula sebagai panduan perhitungan pembebanan pada roller



Angle	Factor
0°	2.0
10°	1.98
20°	1.97
30°	1.93
40°	1.87
50°	1.81
60°	1.73

Angle	Factor
70°	1.64
80°	1.53
90°	1.41
100°	1.29
110°	1.15
120°	1.00
130°	0.84

Angle	Factor
140°	.680
150°	.520
160°	.350
170°	.170
180°	.000
—	—
—	—

**LEMBAR KONSULTASI PEMBIMBING TUGAS AKHIR
MAHASISWA FAKULTAS TEKNIK**

Nama : Gilrandy Azalia Muntaz
NIM : 1910311022
PROGRAM STUDI : SI Teknik Mesin
JUDUL TUGAS AKHIR : Optimasi Sistem Material Handling Melalui Pendekatan Prinsip
Karakuri Kaizen Pada Industri Manufaktur Sheet Metal
PEMBIMBING : 1. Sigit Pradana, S.T, M.T
2. Dr. Ir. Muchamad Oktaviandri, S.T., M.T., IPM., ASEAN. Eng











No	HARI	TANGGAL	MATERI KONSULTASI	PARAF PEMBIMBING 2
1	Senin	20 Februari/23	Tata cara penulisan skripsi bab 1-3	OK
2	Jumat	12 Mei/23	Pengusunan Bab 1 dan Bab 3	OK
3	Rabu	17 Mei/23	Pembuatan diagram alir	OK
4	Jumat	19 Mei/23	Penggunaan kata bahasa yang tepat	OK
5	Jumat	9 Juni/23	revisi penggunaan kata yg salah	OK
6	Rabu	21 Juni/23	finalisasi bab I - III	OK
7	Rabu	5 Juli/23	Perambahan beberapa komponen penulisan	OK
8	Jumat	21 Juli/23	Penyeragaman bab III & IV	OK
9	Rabu	16 Agustus/23	relewu draft bab III	OK
10	Jumat	15 Desember/23	Finalisasi penulisan & isi	OK

Jakarta, 19 Mei 2023
Kepala Program Studi

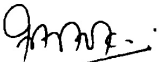

Ir. Fahrudin, S.T., M.T.

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No	HARI	TANGGAL	MATERI KONSULTASI	PARAF PEMBIMBING I
1	Rabu	21 September 2022	Bimbingan konsultasi judul skripsi	
2	Jumat	10 Februari 2023	Konsultasi rancangan penelitian	
3	Kamis	25 Mei 2023	Review draft skripsi dan konsultasi rancangan model material handling	
4	Sabtu	27 Mei 2023	Konsultasi mengenai metode simulasi model material handling	
5	Rabu	7 Juni 2023	Konsultasi mengenai rancangan awal	
6	Senin	18 Juni 2023	Konsultasi penggunaan parameter nilai	
7	Senin	3 Juli 2023	Konsultasi penggunaan material	
8	Kamis	20 Juli 2023	Validasi data awal	
9	Selasa	15 Agustus 2023	Review draft hasil penelitian	
10	Selasa	19 September 2023	Validasi data & hasil penelitian	

Jakarta, 19 Mei 2023
Kepala Program Studi


Ir. Fahrudin, S.T., M.T.