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# LAMPIRAN

**Lampiran 1.1** Load flow report sebelum penambahan gardu traksi Tambun pada ETAP 19.0.1 rute Bekasi Timur - Cibitung

Project:		ETAP						Page:		1	
Location:		19.0.1C						Date:		03-08-2023	
Contract:								SN:			
Engineer:		Study Case: dcLF						Revision:		Base	
Filename: Gangguan.KRL								Config.:		Normal	

<b>LOAD FLOW REPORT</b>											
ID	Bus	Type	Op. V		Source	Load (kW)			Load Flow		
			V	%		kW	Const. kVA	Const. Z	Const. I	To Bus ID	kW
Bus HSCB BKT	Load	1500.0	87.7	5261.213	0.00	0.00	0.00	Out.Going BKT	2630.607	2000.000	
								Out.Going BKT	2630.607	2000.000	
								Rectifier BKT	-5261.213	-4000.000	
Bus HSCB CIT	Load	1500.0	87.7	5261.213	0.00	0.00	0.00	Out.Going CIT	2630.607	2000.000	
								Out.Going CIT	2630.607	2000.000	
								Rectifier CIT	-5261.213	-4000.000	
Bus HSCB CIT,	Load	1500.0	92.0	5518.731	0.00	0.00	0.00	Out.Going CIT	2759.365	2000.000	
								Out.Going CIT	2759.365	2000.000	
								Rectifier CIT,	-5518.731	-4000.000	
Bus HSCB CKR	Load	1500.0	92.0	5518.731	0.00	0.00	0.00	Out.Going CKR	2759.365	2000.000	
								Out.Going CKR	2759.365	2000.000	
								Rectifier CKR	-5518.731	-4000.000	
dcBus1	Load	1500.0	81.5	0	0.00	0.00	0.00	dcBus5	2325.525	1901.804	
								Out.Going BKT	-2325.525	-1901.804	
dcBus2	Load	1500.0	81.5	0	0.00	0.00	0.00	dcBus6	2443.109	1997.964	
								LAA BKT-CIT	-2443.109	-1997.964	
dcBus4	Load	1500.0	81.5	0	0.00	0.00	0.00	dcBus57	2358.740	1928.968	
								LAA BKT-CIT	-2358.740	-1928.968	
dcBus5	Load	1500.0	81.5	0	0.00	2325.12	0.00	dcBus1	-2325.124	-1901.804	
								KRL JR 205 1	2325.124	1901.804	
dcBus.5	Load	1500.0	81.5	0	0.00	0.00	0.00	dcBus36	2655.020	2171.264	
								Out.Going CIT	-2655.020	-2171.264	
dcBus6	Load	1500.0	81.5	0	0.00	2442.67	0.00	dcBus2	-2442.666	-1997.964	
								KRL JR 205 2	2442.666	1997.964	
dcBus.11	Load	1500.0	85.5	0	0.00	0.00	0.00	dcBus72	2350.538	1833.646	
								Out.Going CKR	-2350.538	-1833.646	

**Lampiran 1.2** Load flow report sebelum penambahan gardu traksi Telaga Murni pada ETAP 19.0.1 rute Cibitung – Cikarang

Project:	<b>ETAP</b>							Page:	2		
Location:	19.0.1C							Date:	03-08-2023		
Contract:								SN:			
Engineer:	Study Case: dcLF							Revision:	Base		
Filename:	Gangguan.KRL							Config.:	Normal		

ID	Bus		Op. V		Source		Load (kW)			Load Flow	
	Type	V	%	kW	Const. kVA	Const. Z	Const. I	To Bus ID	kW	Amp	
dcBus36	Load	1500.0	81.5	0	0.00	2654.50	0.00	dcBus.5 KRL JR 205.4	-2654.498 2654.498	-2171.264 2171.264	
dcBus57	Load	1500.0	81.5	0	0.00	2358.33	0.00	dcBus4 KRL JR 205.3	-2358.328 2358.328	-1928.968 1928.968	
dcBus66	Load	1500.0	85.4	0	0.00	2406.19	0.00	dcBus67 KRL JR 205.1	-2406.187 2406.187	-1878.583 1878.583	
dcBus67	Load	1500.0	85.5	0	0.00	0.00	0.00	dcBus66 Out.Going CiT	2408.142 -2408.142	1878.583 -1878.583	
dcBus68	Load	1500.0	85.4	0	0.00	2510.28	0.00	dcBus69 KRL JR 205.2	-2510.278 2510.278	-1959.919 1959.919	
dcBus69	Load	1500.0	85.5	0	0.00	0.00	0.00	dcBus68 LAA CIT-CKR	2512.406 -2512.406	1959.919 -1959.919	
dcBus71	Load	1500.0	85.5	0	0.00	0.00	0.00	dcBus74 LAA CIT-CKR	2984.056 -2984.056	2327.852 -2327.852	
dcBus72	Load	1500.0	85.4	0	0.00	2348.68	0.00	dcBus.11 KRL JR 205.5	-2348.675 2348.675	-1833.646 1833.646	
dcBus74	Load	1500.0	85.4	0	0.00	2981.05	0.00	dcBus71 KRL JR 205.3	-2981.054 2981.054	-2327.852 2327.852	
LAA BKT-CIT	Load	1500.0	81.5	0	0.00	0.00	0.00	Out.Going BKT Out.Going CIT dcBus4 dcBus2	-2565.672 -2236.177 2358.740 2443.109	-2098.196 -1828.736 1928.968 1997.964	
LAA CIT-CKR	Load	1500.0	85.5	0	0.00	0.00	0.00	Out.Going CKR Out.Going CiT dcBus71 dcBus69	-2777.033 -2719.429 2984.056 2512.406	-2166.354 -2121.417 2327.852 1959.919	

**Lampiran 1.3** *Over and under voltage* sebelum penambahan gardu traksi Tambun pada ETAP 19.0.1 rute Bekasi Timur – Cikarang

Project:	<b>ETAP</b>	Page:	1
Location:	19.0.1C	Date:	03-08-2023
Contract:		SN:	
Engineer:	Study Case: dcLF	Revision:	Base
Filename: Gangguan.KRL		Config.:	Normal

**OverVoltage Buses Summary Report**

Overvoltage Buses - Critical Limit = 105 % - Marginal Limit = 102 %

Bus		Operating V		Bus		Operating V	
ID	V	% Mag	V	ID	V	% Mag	V
* Indicates bus voltages violate critical limit							
# Indicates bus voltages violate marginal limit							

**UnderVoltage Buses Summary Report**

Undervoltage Buses - Critical Limit = 95 % - Marginal Limit = 98 %

Bus		Operating V		Bus		Operating V	
ID	V	% Mag	V	ID	V	% Mag	V
*Bus HSCB BKT	1500.00	87.69	1315.30	*Bus HSCB CIT	1500.00	87.69	1315.30
*Bus HSCB CIT	1500.00	91.98	1379.68	*Bus HSCB CKR	1500.00	91.98	1379.68
*dcBus1	1500.00	81.52	1222.80	*dcBus2	1500.00	81.52	1222.80
*dcBus4	1500.00	81.52	1222.80	*dcBus5	1500.00	81.51	1222.59
*dcBus.5	1500.00	81.52	1222.80	*dcBus6	1500.00	81.51	1222.58
*dcBus.11	1500.00	85.46	1281.89	*dcBus36	1500.00	81.50	1222.56
*dcBus57	1500.00	81.51	1222.59	*dcBus66	1500.00	85.39	1280.85
*dcBus67	1500.00	85.46	1281.89	*dcBus68	1500.00	85.39	1280.81
*dcBus69	1500.00	85.46	1281.89	*dcBus71	1500.00	85.46	1281.89
*dcBus72	1500.00	85.39	1280.88	*dcBus74	1500.00	85.37	1280.60
*LAA BKT-CIT	1500.00	81.52	1222.80	*LAA CIT-CKR	1500.00	85.46	1281.89
*Out.Going BKT	1500.00	81.52	1222.80	*Out.Going CIT	1500.00	85.46	1281.89
*Out.Going CIT	1500.00	81.52	1222.80	*Out.Going CKR	1500.00	85.46	1281.89

\* Indicates bus voltages violate critical limit  
# Indicates bus voltages violate marginal limit

**Lampiran 1.4 Load Flow Report** Setelah Penambahan Gardu Traksi Tambun pada ETAP 19.0.1 Bekasi Timur – Cibitung (1)

Project:		<b>ETAP</b>						Page:	1	
Location:		19.0.1C						Date:	25-07-2023	
Contract:								SN:		
Engineer:		Study Case: dcLF						Revision:	Base	
Filename: kereta 2								Config.:	5 KRL	

<b>LOAD FLOW REPORT</b>										
Bus		Op. V		Source		Load (kW)			Load Flow	
ID	Type	V	%	kW	Const. kVA	Const. Z	Const. I	To Bus ID	kW	Amp
Bus HSCB BKT	Voltage Reg.	1500.0	100.0	7553.765	0.00	0.00	0.00	Out Going BKT	4145.195	2763.464
								Out Going BKT	3408.569	2272.380
								Rectifier BKT	-7553.765	-5035.843
Bus HSCB CIT	Voltage Reg.	1500.0	100.0	6817.139	0.00	0.00	0.00	Out Going CIT	3408.569	2272.380
								Out Going CIT	3408.569	2272.380
								Rectifier CIT	-6817.139	-4544.759
Bus HSCB TB	Voltage Reg.	1500.0	100.0	7553.765	0.00	0.00	0.00	Out Going TB	4145.195	2763.464
								Out Going TB	3408.569	2272.380
								Rectifier TB	-7553.765	-5035.843
dcBus1.2	Load	1500.0	99.8	0	0.00	0.00	0.00	dcBus43	4377.738	2924.347
								Out Going BKT	-4377.738	-2924.347
dcBus1.3	Load	1500.0	99.8	0	0.00	0.00	0.00	dcBus42	4380.813	2926.400
								LAA BKT - TB	-4380.813	-2926.400
dcBus2.1	Load	1500.0	99.8	0	0.00	0.00	0.00	dcBus41	4382.264	2927.370
								LAA TB - CIT	-4382.264	-2927.370
dcBus2.2	Load	1500.0	99.8	0	0.00	0.00	0.00	dcBus38	4382.264	2927.370
								Out Going CIT	-4382.264	-2927.370
dcBus38	Load	1500.0	99.8	0	0.00	4381.13	0.00	dcBus2.2	-4381.131	-2927.370
								KRL JR 205 CIT.2	4381.131	2927.370
dcBus41	Load	1500.0	99.8	0	0.00	4381.13	0.00	dcBus2.1	-4381.131	-2927.370
								KRL JR 205 CIT.1	4381.131	2927.370
dcBus42	Load	1500.0	99.7	0	0.00	4378.23	0.00	dcBus1.3	-4378.231	-2926.400
								KRL JR 205 BKT.2	4378.231	2926.400
dcBus43	Load	1500.0	99.7	0	0.00	4372.09	0.00	dcBus1.2	-4372.088	-2924.347
								KRL JR 205 BKT.1	4372.088	2924.347

**Lampiran 1.5** load flow report setelah penambahan gardu traksi Tambun pada ETAP 19.0.1 rute Bekasi Timur – Cibitung (2)

Project:	<b>ETAP</b>							Page:	2		
Location:	19.0.1C							Date:	25-07-2023		
Contract:								SN:			
Engineer:	Study Case: dcLF							Revision:	Base		
Filename:	kereta 2							Config.:	5 KRL		

ID	Bus		Op. V		Source		Load (kW)			Load Flow	
	Type	V	%	kW	Const. kVA	Const. Z	Const. I	To Bus ID	kW	Amp	
dcBus70	Load	1500.0	99.8	0	0.00	0.00	0.00	dcBus71	4357.697	2910.959	
								Out Going TB	-4357.697	-2910.959	
dcBus71	Load	1500.0	99.2	0	0.00	4332.15	0.00	dcBus70	-4332.148	-2910.959	
								KRL TB	4332.148	2910.959	
LAA BKT - TB	Load	1500.0	99.8	0	0.00	0.00	0.00	Out Going TB	-1219.909	-814.904	
								Out Going BKT	-3160.904	-2111.496	
								dcBus1.3	4380.813	2926.400	
LAA TB - CIT	Load	1500.0	99.8	0	0.00	0.00	0.00	Out Going TB	-1961.036	-1309.980	
								Out Going CIT	-2421.228	-1617.390	
								dcBus2.1	4382.264	2927.370	
Out Going BKT	Load	1500.0	99.8	0	0.00	0.00	0.00	Bus HSCB BKT	-4136.897	-2763.464	
								Bus HSCB BKT	-3401.746	-2272.380	
								LAA BKT - TB	3160.904	2111.496	
								dcBus1.2	4377.738	2924.347	
Out Going CIT	Load	1500.0	99.8	0	0.00	0.00	0.00	Bus HSCB CIT	-3401.746	-2272.380	
								Bus HSCB CIT	-3401.746	-2272.380	
								LAA TB - CIT	2421.228	1617.390	
								dcBus2.2	4382.264	2927.370	
Out Going TB	Load	1500.0	99.8	0	0.00	0.00	0.00	Bus HSCB TB	-4136.897	-2763.464	
								Bus HSCB TB	-3401.746	-2272.380	
								LAA BKT - TB	1219.909	814.904	
								LAA TB - CIT	1961.036	1309.980	
								dcBus70	4357.697	2910.959	





**Lampiran 1.6** *Over and under voltage* setelah penambahan gardu traksi Tambun pada ETAP 19.0.1 rute Bekasi Timur – Cibitung

Project:	<b>ETAP</b>	Page:	1
Location:	19.0.1C	Date:	25-07-2023
Contract:		SN:	
Engineer:	Study Case: dcLF	Revision:	Base
Filename: kereta 2		Config.:	5 KRL

OverVoltage Buses Summary Report

Overvoltage Buses - Critical Limit = 105 % - Marginal Limit = 102 %

Bus		Operating V		Bus		Operating V	
ID	V	% Mag	V	ID	V	% Mag	V
* Indicates bus voltages violate critical limit							
# Indicates bus voltages violate marginal limit							

UnderVoltage Buses Summary Report

Undervoltage Buses - Critical Limit = 90 % - Marginal Limit = 98 %

Bus		Operating V		Bus		Operating V	
ID	V	% Mag	V	ID	V	% Mag	V
* Indicates bus voltages violate critical limit							
# Indicates bus voltages violate marginal limit							

**Lampiran 1.7** *Over and under voltage* sebelum penambahan gardu sisip Telaga Murni pada ETAP 19.0.1 rute Cibitung – Cikarang

Project:	<b>ETAP</b>	Page:	1
Location:	19.0.1C	Date:	25-07-2023
Contract:		SN:	
Engineer:	Study Case: dcLF	Revision:	Base
Filename: kereta3		Config.:	Normal

OverVoltage Buses Summary Report

Overvoltage Buses - Critical Limit = 105 % - Marginal Limit = 102 %

Bus		Operating V		Bus		Operating V	
ID	V	% Mag	V	ID	V	% Mag	V
* Indicates bus voltages violate critical limit							
# Indicates bus voltages violate marginal limit							

UnderVoltage Buses Summary Report

Undervoltage Buses - Critical Limit = 95 % - Marginal Limit = 98 %

Bus		Operating V		Bus		Operating V	
ID	V	% Mag	V	ID	V	% Mag	V
* Indicates bus voltages violate critical limit							
# Indicates bus voltages violate marginal limit							

**Lampiran 1.8** Load flow report setelah penambahan gardu traksi Telaga Murni pada ETAP 19.0.1 Cibitung – Cikarang (1)

Project:		ETAP						Page: 1	
Location:		19.0.1C						Date: 25-07-2023	
Contract:								SN:	
Engineer:		Study Case: dcLF						Revision: Base	
Filename: kereta3								Config.: Normal	

Bus ID	Bus Type	Op. V		Source kW	Load (kW)			To Bus ID	Load Flow	
		V	%		Const. kVA	Const. Z	Const. I		kW	Amp
Bus HSCB CIT	Voltage Reg.	1500.0	100.0	7301.657	0.00	0.00	0.00	Out Going CIT	3650.828	2433.885
								Out Going CIT	3650.828	2433.885
								Rectifier CIT	-7301.657	-4867.771
Bus HSCB CKR	Voltage Reg.	1500.0	100.0	7301.657	0.00	0.00	0.00	Out Going CKR	3650.828	2433.885
								Out Going CKR	3650.828	2433.885
								Rectifier CKR	-7301.657	-4867.771
Bus HSCB TLM	Voltage Reg.	1500.0	100.0	7301.657	0.00	0.00	0.00	Out Going TLM	3650.828	2433.885
								Out Going TLM	3650.828	2433.885
								Rectifier TLM	-7301.657	-4867.771
dcBus4	Load	1500.0	99.5	0	0.00	4361.08	0.00	Out Going CIT	-4361.079	-2920.663
								KRL JR 205 1	4361.079	2920.663
dcBus8	Load	1500.0	99.5	0	0.00	4361.08	0.00	Out Going TLM	-4361.079	-2920.663
								KRL JR 205 3	4361.079	2920.663
dcBus10	Load	1500.0	99.5	0	0.00	4361.08	0.00	Out Going CKR	-4361.079	-2920.663
								KRL JR 205 5	4361.079	2920.663
dcBus18	Load	1500.0	99.5	0	0.00	4361.08	0.00	LAA CIT - TLM	-4361.079	-2920.663
								KRL JR 205 2	4361.079	2920.663
dcBus19	Load	1500.0	99.5	0	0.00	4361.08	0.00	TLM - CKR	-4361.079	-2920.663
								KRL JR 205 4	4361.079	2920.663
LAA CIT - TLM	Load	1500.0	99.6	0	0.00	0.00	0.00	dcBus18	4362.207	2920.663
								Out Going CIT	-2908.137	-1947.109
								Out Going TLM	-1454.069	-973.554
Out Going CIT	Load	1500.0	99.6	0	0.00	0.00	0.00	Bus HSCB CIT	-3635.172	-2433.885
								Bus HSCB CIT	-3635.172	-2433.885
								dcBus4	4362.207	2920.663
								LAA CIT - TLM	2908.137	1947.109

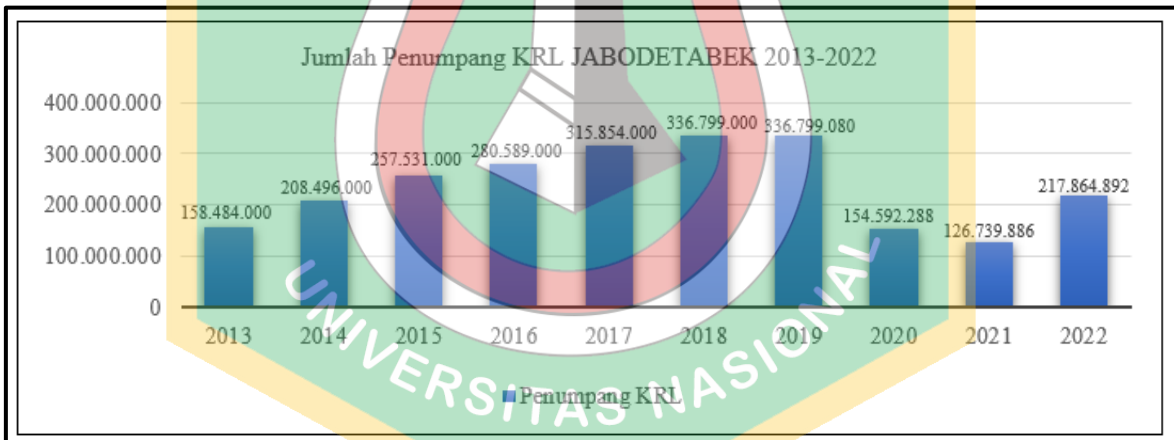
**Lampiran 1.9** Load flow report setelah penambahan gardu traksi Telaga Murni pada ETAP 19.0.1 rute Cibitung – Cikarang (2)

Project:	<b>ETAP</b>	Page:	2
Location:	19.0.1C	Date:	25-07-2023
Contract:		SN:	
Engineer:	Study Case: dcLF	Revision:	Base
Filename: kereta3		Config.:	Normal

ID	Bus		Op. V		Source			Load (kW)			Load Flow	
	Type	V	%	kW	Const. kVA	Const. Z	Const. I	To Bus ID	kW	Amp		
Out Going CKR	Load	1500.0	99.6	0	0.00	0.00	0.00	Bus HSCB CKR	-3635.172	-2433.885		
								Bus HSCB CKR	-3635.172	-2433.885		
								dcBus10	4362.207	2920.663		
								TLM - CKR	2908.137	1947.109		
Out Going TLM	Load	1500.0	99.6	0	0.00	0.00	0.00	Bus HSCB TLM	-3635.172	-2433.885		
								Bus HSCB TLM	-3635.172	-2433.885		
								dcBus8	4362.207	2920.663		
								LAA CIT - TLM	1454.069	973.554		
TLM - CKR	Load	1500.0	99.6	0	0.00	0.00	0.00	dcBus19	4362.207	2920.663		
								Out Going TLM	-1454.069	-973.554		
								Out Going CKR	-2908.137	-1947.109		

**Lampiran 1.10** Data penumpang KRL Badan Pusat Statistik 2013-2022



**Lampiran 1.11** Jadwal perjalanan KRL stasiun Bekasi Timur, KRL Access 2023

No.	Jadwal KRL Pagi		No.	Jadwal KRL Sore	
	BKST- CKR	BKST - KPB		BKST- CKR	BKST- KPB
1.	05.57	05.55	1.	16.01	16.07
2.	06.21	06.25	2.	16.21	16.17
3.	06.36	06.30	3.	16.31	16.40
4.	06.53	06.40	4.	16.46	17.05
5.	07.16	07.05	5.	17.20	17.16
6.	07.22	07.20	6.	17.31	17.24
7.	07.43	07.28	7.	17.45	17.36
8.	07.47	07.40	8.	17.58	17.52
9.	08.06	07.56	9.	18.03	18.03
10.	08.10	08.15	10.	18.14	18.08

**Lampiran 1.12** Jadwal perjalanan KRL stasiun Cibitung, KRL Access 2023

No.	Jadwal KRL Pagi		No.	Jadwal KRL Sore	
	CIT - CKR	CIT - KPB		CIT- CKR	CIT - KPB
1.	06.01	06.09	1.	16.11	16.07
2.	06.15	06.22	2.	16.31	16.32
3.	06.23	06.43	3.	16.41	16.50
4.	06.42	06.58	4.	16.56	17.01
5.	07.13	07.02	5.	17.02	17.13
6.	07.23	07.22	6.	17.16	17.25
7.	07.37	07.54	7.	17.33	17.42
8.	08.05	08.03	8.	17.48	17.53
9.	08.12	08.24	9.	18.08	18.15
10.	08.17	08.43	10.	18.24	18.33

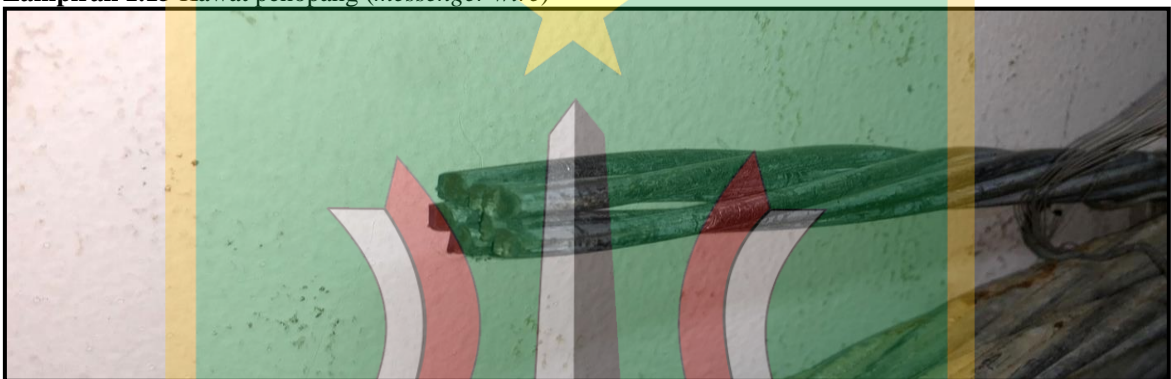
**Lampiran 1.13** Jadwal perjalanan KRL stasiun Cikarang, KRL Access 2023

No.	Jadwal KRL Pagi		No.	Jadwal KRL Sore	
	CKR -KPB			CKR - KPB	
1.	05.55		1.	16.24	
2.	06.09		2.	16.42	
3.	06.14		3.	16.55	
4.	06.24		4.	17.07	
5.	06.38		5.	17.10	
6.	06.46		6.	17.21	
7.	07.11		7.	17.36	
8.	07.24		8.	17.47	
9.	07.41		9.	17.53	
10.	08.01		10.	18.09	

**Lampiran 1.14** Kawat penyulang (*feeder wire*)



**Lampiran 1.15** Kawat penopang (*messenger wire*)



**Lampiran 1.16** Kawat Kontak LAA (*trolley wire*)



**Lampiran 1.17** Rel tipe R 54



# Analisis Kapasitas Daya Pada Gardu Traksi Terhadap Penyempitan Headway Kereta Commuter Line Rute Bekasi Timur - Cikarang di PT KAI (Persero)

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