	IAYA CM KADIRAT OPS			KNIS PROYE	к			Nomor : Halaman : Tanggal :				
PEMI	A PROYEK LIK J PROYEK	: LRT JABODEBEK : Direktorat Jenderal Perkereta Apian : Struktur Elevated										
LOKA PERIO		: Line -1 ( Cawang - Cibubur ) : 2015 - 2019 , perpanjangan waktu sd 2021										
NO	Description		Service Line -1 ( Cawang- Cibubur )									
7	Power Supply of Traction Power Substation (TPSS)	Brand	Brand & Type  Type	Volume Quantity	Capacity Capacity	Unit	Standard Code Standard Code	Remark				
	Material of MV Switchgear Panel 20 KV :	Brand	туре	Quantity	Сарасну	Oillt	Statitual Code	Remark				
	Incoming MV Switchgear Panel 20 KV (DS & CB + Metering)	: ABB	Safe Ring / Safe Plus (Gas Insulated)	4	630, 24 kV, 20 kA	set	i).Metal Enclosed Switchgear: IEC 62271-200, II).General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, IV).Switch Fuse Combination: IEC 62271-105, IV). Circuit Breakers: IEC 62271-108	Type Cubicle : Modular				
	Outgoing interconnection TPSS MV Switchgear Panel 20 KV	: ABB	Safe Ring/Safe Plus (Gas Insulated)	15	630 A, 24 kV, 20 kA	set	i).Metal Enclosed Switchgear : IEC 62271 -200, ii).General Purpose Switches : IEC 60265-1, iii). Disconnectors and Earthing Switches : 62271-102, iv).Switch Fuse Combination : IEC 62271-102, iv). Circuit Breakers : IEC 62271-100 & vi). Comman Clouses : IEC 60694	Type Cubicle : Modular				
	Outgoing Traction Transformer MV Switchgear Panel 20 KV	: ABB	Safe Ring /Safe Plus ( Gas Insulated )	9	630 A, 24 kV, 20 kA	set	I). Metal Enclosed Switchgear: IEC 62271-200, II). General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, Iv). Switch Fuse Combination: IEC 62271-105, V. Circuit Breakers: IEC 62271-100 & vi). Comman Clouses: IEC 60694	Type Cubicle : Modular				
	Cutgoing Auxiliary Transformer MV Switchgear Panel 20 KV (FLBS)	: ABB	Safe Ring/Safe Plus (Gas Insulated)	7	200 A, 24 kV, LBS Fuse	set	I). Metal Enclosed Switchgear: IEC 62271-200, II), General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, IV). Switch Fuse Combination: IEC 62271-105, IV). Circuit Breakers: IEC 62271-100 & IV). Comman Clouses: IEC 60694	Type Cubicle : Modular				
	Outgoing interconnection DSS MV Switchgear Panel 20 KV (LBS)	: ABB	Safe Ring / Safe Plus, Type F	-	630 A, 24 kV, 20 kA	set	I).Metal Encosed Switchgear: IEC 62271 - 200, ii).General Purpose Switches: IEC 80265-1, iii). Switches: 62271-102, iv).Switch Fuse Combination: IEC 62271-105, v). Breakers: IEC 62271-100 & vi). Comman Clouses: IEC 60694	Type Cubicle : Modular				
	- Surge Arester for MV Switchgear	: ABB	Polimer	24	20 kA, 26 kV	set	IEC 62271 / IEC 60265	Indoor LA				
	Material of Transformator  Traction Transformer 20k1//2x0.59 kV ,3300 kVA						i). Railway Application, Fixed Installation Traction Transformer : EN	1				
		: LSIS	Cast Resin Dry ( AN )	9	3300 kVA	set	50329. ii). Semiconductor Convertors General Requirements and Line Commutated Convertors: EN 60146. & iii). Dry-Type Transformer: IEC 60076-11	Installation Indoor , Air Natural System				
	<ul> <li>Auxiliary Transformer 20 kVA 20/0.38 kV TPSS</li> <li>Auxiliary Transformer 100 kVA 20/0.38 kV TPSS/DSS</li> </ul>	: Trafindo / Fortune : Trafindo / Fortune	Cast Resin Dry ( AN ) Cast Resin Dry ( AN )	3 4	20 kVA 100 kVA	set set	IEC 60076-11 IEC 60076-11	indoor of insttalation indoor of insttalation				
	- Auxiliary Transformer 400 U/A 200.38 U/O/C Material of LV System - Punel Distribusi Type Wall mounted LV 20 U/A	: Trafindo / Fortune : Scheneider	Cast Resin Dry ( AN )  Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	3	400 kVA 20 kVA, 380 Volt	set	IEC 60076-11  I). Standar of Voltages: IEC 60038. II). Vocabulary: IEC 60050. II). Insulation Co-Ordination: IEC 60071. Iv). Electrical Relays. v). Semi Conductor Converters: IEC 60146. vi). Low Voltages Fuses. Vii). Electrical Installation of Bulldings. IEC 60034. viii). Degrees of	indoor of insttalation				
	Panel Distribusi Type Free Standing. LV 100 kVA	: Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	4	100 kVA, 380 Volt	set	Protection Provided Enclosures (IP Code)  1). Standar of Vollages: 11c G0038: ii). Vocabulary: 11c G0050: iii).  Insulation Co-Ordination: 11c G0071: iii). Electrical Relays. v). Semi Conductor Corverlers: 11c G0146: vi). Low Voltages Fluses. viii).  Electrical Installation of Buildings: 11c G0364 & viii). Degrees of Protection Provided Enclosures (IP Code).					
	Panel Distribusi Type Free Standing LV OCC	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	-	400 kVA, 380 Volt	set	Projection Provided Enclosures (IP Code):  N. Standard Voltages: IEC 60038. III) Volcabulary: IEC 60050. III).  Insulation Co-Ordination: IEC 60071. IV). Electrical Relays. v). Semi Conductor Converters: IEC 60046. IV). Voltages Fuses.  Electrical Installation Folladings: IEC 600546 viii). Poperes of IV). Standard Voltages: IEC 800508. III) Volcabulary: IEC 600500. III).					
	Automatic Change Over Switch 100 kVA  -  Automatic Change Over Switch 400 kVA OCC	: Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	4	100 kVA,380 Volt	set	II. Satisation for Violages : IEC 000071. IV) Electrical Relays. V). Semi Conductor Converters : IEC 60071. IV). Electrical Relays. V). Semi Conductor Converters : IEC 60146. VI). Low Voltages Fuses. VII). Electrical Installation of Bulldings : IEC 60384 4 VIII). Degrees of Protection Provided Foologues (IP Code).  I). Standard O'Voltages : IEC 60038. II). Vocabulary : IEC 60050. III).					
	. Material of Backup System	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	-	400 kVA, 380 Volt	set	Insulation Co-Ordination : IEC 60071, Iv). Electrical Relays. v). Semi Conductor Converters : IEC 60146, v). Low Voltages Fuses. Vii). Electrical Installation of Buildings : IEC 60364 & viii). Degrees of Protection Provided Enclosures (IP Code).					
	. Industrial UPS 40 kVA complete with 2 hours back up battery	: Vertiv	Double Conversion True On Line UPS-System	4	40 kVA	set	IEC 62040-3					
	Industrial UPS 100 kVA complete with 2 hours back up battery	: Vertiv	Double Conversion True On Line UPS-System	-	100 kVA	set	IEC 62040-3					
	Generator Set capacity 50 kVA, complete with local panel control Generator set capacity 100 kVA, complete with local panel control	: Engine Cummins & Generator Stamford : Engine Cummins & Generator Stamford	Silent Silent	- 4	50 kVA 100 kVA	set set						
	<ul> <li>Generator set capacity 300 kVA, complete with local panel control OCC</li> <li>Batteries &amp; charger for DC 110 Volt source and DC Switchboard 110 VDC</li> </ul>	: Engine Cummins & Generator Stamford : Vertiv	Silent Battery Type : V-FT, 12 V 100FC, Charger Type : 6 Pulse, Thyristor	7	300 kVA 25 Ampere	set set	IEC60896-21/22,UL 1989, UL 94					
	Material of Rectifier & DC System  - Rectifier L2 kIAC750 VDC, 3000 kW, 12 Pulse	: Secheron	Np + 1 Number of Pulse, Modular Fixed Indoor (CB type MBS 500 , Metal Clad)	9	3000 kW, 4000 A &750 Volt- DC	set	IEC 60146 : Semiconductors. II).IEC 60146-1 , Part 1-1 : Specification of Basic Requirements. III). 60747 : Semiconductor Devices IV). EN 50328 : Railway Applications - Electronic Power Coverters for Substation					
	Incoming DC Switchgear 750 VDC Panel (HSCB)	: Secheron	HSCB UR40E-81S/ SEPCOS2	9	3000 kW, 4000 A &750 Volt- DC	set	EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.     Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch     Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear     Assemblies. Part 7:Measurement. Control & Protection					
	Outgoing DC Switchgear 750 VDC Panel (HSCB)	: Secheron	HSCB UR40E-81S/ SEPCOS2, MBS 500	37	2600 A, 750 VDC	set	i). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection					
	Negative Panel	: Secheron	LBR	9	4000 A , 750 Volt-DC	set	i). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Armester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection					
	Lightning arester for DC Switchgear  PLC Panel Control cubicle	: Siemens	3EB2-010	46	1000 VDC	set	), EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4: Outdoor DC Switcheh Disconnector. Part 5: Surge Airester. Part 6: DC Switchgear Assembles. Part 7:Measurement, Control & Protection J; EN 61000-64: Emitted Interference. Ii) EN 61000-62:					
	DS for outgoing to third rail & support	: Siemens : Secheron	SIMATIC IPC277E (NANOPANEL PC)  SW-type	58	32 BIT 4000 A , 750 Volt-DC	set	Interference Immunity I). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6:DC Switchgear					
	Linked Break Device/ intertriping system	: Secheron	Switch Type DS	7	4000 A , 750 Volt-DC	set	Assemblies. Part 7:Measurement, Control & Protection  1). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6:DC Switchgear					
	Voltage Limiting Device	: Secheron	V Guard-H	7	Thermal Nominal Current : 1000 A	set	Assemblies. Part 7:Measurement, Control & Protection I). EN: 50526-2: voltage limiting device of classes 3 and 4, EN 50122- 1: Protective provision about Electrical Safety in VLD-F, VLD-O or Both Funtions.					
	- Blue Light Station	: Secheron	LBS 130 Wall Mounted	16	-	set	D. EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Profection	Push Button				
	- Track Bypass switch	: Secheron	House inside a polyester cabinet, motorized	16	4000 A, 750 Volt-DC	set	En: 50123 / IEC 61992 Part 1: General, Part 2: Circuit Breakers. Part 3: Indoor DC Disconnector. Part 4: Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assembles. Part 7: Measurement, Control & Protection					
					·		SPL 43-5-46, IEC 60502- 2 : Copper conductor <xlpe isulated<="" td=""><td></td></xlpe>					
	Material of Cable  Cuble interkoneksi TPSS 20 kV XLPE Insulation  - Characteristics of the Cable State of th	: Voksel	N2XSEBY, 3Cx185 mm-sqr	15.982	453 A, 20 kV	m	Copper Tape Scree, PVC Inner Sheathed, Double Steel Tape Armor, PVC Sheathed.					
		: Voksel : Voksel	N2XSEBY, 3Cx185 mm-sqr N2XSEBY , 3Cx50 mm-sqr	15.982	453 A, 20 kV 205 A, 20 kV	m	Armor, PVC Sheathed.  SPL 43-5-46, IEC 60502-2: Copper conductor <xlpe copper="" double="" inner="" isulated="" pvc="" scree,="" sheathed,="" steel="" tape="" tape<="" td=""><td></td></xlpe>					
	Cuble interkoneksi TPSS 20 kV, XLPE Insulation  Cuble interkoneksi DSS 20 kV, XLPE Insulation  Embeded Brucket, cuble tragilalder & accessories	: Voksel : Jordahl, Hilti	N2XSEBY , 3Cx50 mm-sqr	15.982 - 15.982 7		m	Armor,PVC Sheathed.  SPL 43-5-46, IEC 60502- 2 : Copper conductor <xlpe isulated<="" td=""><td></td></xlpe>					
	Cable interkaneksi TPSS 20 kV, XLPE Insulation  Cable interkaneksi DSS 20 kV, XLPE Insulation	: Voksel	NZXSEBY , 3Cx50 mm-sqr FO & Wire	-	205 A, 20 kV	m lot	Amor, PVC Sheathed. SPL 435-46, IEC 60502-2: Copper conductor < XLPE Isulated Copper Tape Scree, PVC Inner Sheathed, Double Steel Tape Amor, PVC Sheathed.  SPL 43-5-46, IEC 60502-2: Copper conductor .XLPE Isulated Copper					
	Cuble interkoneksi TPSS 20 kV, XLPE Insulation  Cuble interkoneksi DSS 20 kV, XLPE Insulation  Embeded Bracket, cuble tragiladder & accessories  Control Cuble  Cable 20 kV (Va 3x95 mnsay) XLPE dari Switchgear 20 kV ke RTR  Cable 20 kV (Va 3x95 mnsay) XLPE dari Switchgear 20 kV ke RTR  Cable DC, I x Cu 300 mm2	Voksel     Jordahl, Hill     Voksel     Voksel     Voksel	N2XSEBY , 3Cx50 mm-sqr  FO & Wire  N2XSEBY , 3Cx 95 mm-sqr  N2XSY	15.982 7		m lot m	Armor, PVC Sheathed.  SPL 43-54 (E C65052-2 : Copper conductor <xlpe armor,="" copper="" double="" inner="" isulated="" pvc="" scree,="" sheathed,="" sheathed.<="" steel="" tape="" td=""><td></td></xlpe>					
	Cuble interkoneksi TPSS 20 kV, XLPE Insulation  Cuble interkoneksi DSS 20 kV, XLPE Insulation  Embedsed Bracket, cuble tragiladder & accessories  Coatrol Cuble  Cuble 20kV (Cu 3x95mnsay XLPE dart Switchgear 20kV ke RTR  Cuble 20kV (Tr. Sch. 300 mm.)  Cuble Power teganqua rendah TPSSDSS  Cuble Power teganqua rendah OCCC	Voksel     Jordahl, Hilti     Voksel     Voksel	NZXSEBY , 3Cx50 mm-sqr  FO & Wire  NZXSEBY , 3Cx 95 mm-sqr	15.982 7 640	205 A, 20 kV	m lot m	Amor, PVC Sheathed. SPL 435-46, IEC 60502-2: Copper conductor < XLPE Isulated Copper Tape Scree, PVC Inner Sheathed, Double Steel Tape Amor, PVC Sheathed.  SPL 43-5-46, IEC 60502-2: Copper conductor .XLPE Isulated Copper					
	Cuble interkoneksi TPSS 20 kV, XLPE Insulation  Cuble interkoneksi DSS 20 kV, XLPE Insulation  Enholede Bracket, cuble trayiladder & accessories  Control Cuble  Cuble 200 f Cu. 5:95 mmsay XLPE dari Switchgear 20kV ke RTR  Cuble DC, 1 x Cu 300 mm2  Cuble Dove regangam rendab TPSS/DSS	Voksel     Voksel	NZXSEBY , 3Cx50 mm-sqr  FO & Wire  NZXSEBY , 3Cx 95 mm-sqr  NZXY  NYY  NYY	15.982 7 640	205 A, 20 kV 307A, 20 kV	m lot m lot lot lot	Amor, PVC Sheathed. SPL 435-46, IEC 60502-2: Copper conductor < XLPE Isulated Copper Tape Scree, PVC Inner Sheathed, Double Steel Tape Amor, PVC Sheathed.  SPL 43-5-46, IEC 60502-2: Copper conductor .XLPE Isulated Copper	System Grip Loop Plus Rod Copper Deep				
	Cuble interkoneksi TPSS 20 kV, XLPE Insulation  Cuble interkoneksi DSS 20 kV, XLPE Insulation  Embedsel Bracket, cuble trag/ladder & accessories  Cantral Cuble  Cable 20kV (Cu 3x95 mnssq) XLPE dari Switchgear 20kV ke RTR  Cuble DCV, 1x Cu 300 mm2  Cuble Power tegangan rendah TPSS/DSS  Cuble Power tegangan rendah OCC  Material of Entribut, & bonding	Voksel Jordahl, Hill Voksel Voksel Voksel Voksel Voksel Voksel Voksel	NZXSEBY , 3Cx50 mm-sqr  FO & Wire  NZXSEBY , 3Cx 95 mm-sqr  NZXY  NYY	15.982 7 640	205 A, 20 kV	m lot m m lot	Amor, PVC Sheathed. SPL 435-46, IEC 60502-2: Copper conductor < XLPE Isulated Copper Tape Scree, PVC Inner Sheathed, Double Steel Tape Amor, PVC Sheathed.  SPL 43-5-46, IEC 60502-2: Copper conductor .XLPE Isulated Copper	System Grip Loop Plus Rod Copper De System Grip Reinforced Concrete Plus I				

	JAYA CM BIRO ENGINEERING			KNIS PROYE	K			Nomor : Halaman : Tanggal :
NAM	PROYEK	: LRT JABODEBEK						
PEMI	JK PROYEK	: Direktorat Jenderal Perkereta Apian : Struktur Elevated						
LOKA	SI	: Line -2 ( Cawang - Dukuh Atas)						
	DE PELAKSANAAN	: 2015 - 2019 , perpanjangan waktu sd 2021	Service Line	2 ( Cawang- (	Cibubur )			
NO	Description		Brand & Type	Volume	Capacity	Unit	Standard Code	Remark
7	Power Supply of Traction Power Substation (TPSS)	Brand	Туре	Quantity	Capacity	Unit	Standard Code	Remark
	Material of MV Switchgear Panel 20 KV :						l .	
	- Incoming MV Switchgear Panel 20 KV (DS & CB + Metering)	: ABB	Safe Ring / Safe Plus ( Gas Insulated )	2	630, 24 kV, 20 kA	set	I).Metal Enclosed Switchgear: IEC 62271-200, II).General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, IV).Switch Fuse Combination: IEC 62271-105, IV). Circuit Breakers: IEC 62271-108 vi). Comman Clouses: IEC 606044	Type Cubicle : Modular for installation
	- Outgoing interconnection TPSS MV Switchgear Panel 20 KV	: ABB	Safe Ring/Safe Plus ( Gas Insulated )	12	630 A, 24 kV, 20 kA	set	I).Metal Enclosed Switchgear: IEC 62271-200, II).General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, IV).Switch Fuse Combination: IEC 62271-105, IV). Circuit Breakers: IEC 62271-108 & IV). Comman Clouses: IEC 606044	Type Cubicle : Modular for installation
	- Outgoing Traction Transformer MV Switchgear Panel 20 KV	: ABB	Safe Ring /Safe Plus (Gas Insulated)	10	630 A, 24 kV, 20 kA	set	I).Metal Enclosed Switchgear: IEC 62271-200, II).General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, IV).Switch Fuse Combination: IEC 62271-105, IV). Circuit Breakers: IEC 62271-108 & IV). Comman Clouses: IEC 606044	Type Cubicle : Modular for installation
	Outgoing Auxiliary Transformer MV Switchgear Panel 20 KV (FLBS)	: ABB	Safe Ring / Safe Plus, Type F	7	200 A, 24 kV, LBS Fuse	set	I).Metal Enclosed Switchgear: IEC 62271-200, II).General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, IV).Switch Fuse Combination: IEC 62271-105, IV). Circuit Breakers: IEC 62271-108 & IV). Comman Clouses: IEC 60604	Type Cubicle : Modular
	- Outgoing interconnection DSS MV Switchgear Panel 20 KV (LBS)	: ABB	Safe Ring / Safe Plus,	4	630 A, 24 kV, 20 kA	set	I).Metal Encosed Switchgear: IEC 62271 - 200, II).General Purpose Switches: IEC 60265-1, III). Switches: 62271-102, Iv).Switch Fuse Combination: IEC 62271-105, v). Breakers: IEC 62271-100 & vi). Comman Clouses: IEC 60895	Type Cubicle : Modular
	- Surge Arester for MV Switchgear	: ABB	Polimer	26	20 kA, 26 kV	set	IEC 62271 / IEC 60265	Indoor LA
	Managed of Variables	:						
$\vdash$	Material of Transformator  Traction Transformer 20kV/2x0.59 kV ,3300 kVA	:					i). Railway Application, Fixed Installation Traction Transformer : EN	
	-	: LSIS	Cast Resin Dry ( AN )	10	3300 kVA	set	50329. ii). Semiconductor Convertors General Requirements and Line Commutated Convertors: EN 60146. & iii). Dry-Type Transformer:	Installation Indoor , Air Natural System
L-	- Auxiliary Transformer 20 kVA 20/0.38 kV TPSS	: Trafindo / Fortune	Cast Resin Dry ( AN )	_	20 kVA	set	IEC 60076-11  IEC 60076-11	Indoor
	Auxiliary Transformer 100 kVA 20/0.38 kV TPSS/DSS  - Auxiliary Transformer 400 kVA 20/0.38 kV OCC	: Trafindo / Fortune : Trafindo / Fortune	Cast Resin Dry ( AN ) Cast Resin Dry ( AN )	. 7	100 kVA 400 kVA	set set	IEC 60076-11	Indoor
	- Australia y Transportmen 400 kV A 2010.38 kV OCC.  Material of LV System  - Panel Distribusi Type Wall mounted LV 20 kVA						i). Standar of Voltages : IEC 60038. ii). Vocabulary : IEC 60050. iii).	
	- rance Distribusi Type rani mounted Lr 20 KrA  Pamel Distribusi Type Free Standing LV 100 kVA	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	7	20 kVA, 380 Volt	set	Insulation Co-Ordination: IEC 60071. Iv), Electrical Relays. v), Semi Conductor Converters: IEC 60146. vi), Low Voltages Fuses. Vii), Electrical Installation of Buildings: IEC 60364 & vii), Degrees of Projection Provided Enclosures (IP Code). IV), Standard Voltages: IEC 60038. III), Vocabulary: IEC 60050. III).	
	Panel Distribusi Type Free Standing LV OCC	: Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed		100 kVA, 380 Volt	set	Insulation Co-Ordination : IEC 60071. Iv). Electrical Relays. V). Semi Conductor Converters : IEC 60146. vi). Low Voltages Fuses. Vii). Electrical Installation of Buildings : IEC 60364 & vii). Degrees of Protection Provided Fancisques (IP Code). I). Standard Voltages : IEC 60038. II). Vocabulary : IEC 60050. Iii).	
	Automatic Change Over Switch 100 kl/A	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	7	400 kVA, 380 Volt	set	Insulation Co-Ordination: IEC 60071, Iv), Electrical Relays. v), Semi Conductor Converters: IEC 60146. vi), Low Voltages Fuses. Vii), Electrical Installation of Buildings: IEC 60364 & viii), Degrees of Protection Provided Enclosures (IP Code). In, Standar of Volfages: IEC 60038, Ini Vocabulary: IEC 60050, Iii).	
	Automatic Change Over Switch 400 kl/A OCC	: Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed		100 kVA,380 Volt	set	Insulation Co-Ordination: IEC 60071. Iv). Electrical Relays. v). Semi Conductor Converters: IEC 60146. vi). Low Voltages Fuses. Vi). Electrical Installation of Buildings: IEC 60364 & vii). Degrees of Protection Provided Enclosures (IP Code). J. Standard Voltages: IEC 60038: II). Vocabulary: IEC 60050. Iii).	
	- Material of Backup System	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed		400 kVA, 380 Volt	set	Insulation Co-Ordination : IEC 60971, Iv), Electrical Relays, v), Semi Conductor Converters : IEC 60146, vi), Low Voltages Fuses, Vi), Electrical Installation of Buildings : IEC 60394 & vii), Degrees of Protection Provided Enclosures (IP Code).	
	_ Industrial UPS 40 kVA complete with 2 hours back up battery	: Vertiv	Double Conversion True On Line UPS-System	7	40 kVA	set	IEC 62040-3	
	Industrial UPS 100 kVA complete with 2 hours back up battery	: Vertiv	Double Conversion True On Line UPS-System	-	100 kVA	set	IEC 62040-3	
	Generator Set capacity 50 kVA, complete with local panel control  Generator set capacity 100 kVA, complete with local panel control	: Engine Cummins & Generator Stamford : Engine Cummins & Generator Stamford	Silent Silent	6	50 kVA 100 kVA	set		
	Generator set capacity 300 kVA, complete with local panel control OCC     Batteries & charger for DC 110 Volt source and DC Switchboard 110 VDC	: Engine Cummins & Generator Stamford	Silent	- 7	300 kVA	set		
	Material of Rectifier & DC System	: Vertiv	Battery Type : V-FT, 12 V 100FC, Charger Type : 6 Pulse, Thyristor		25 Ampere	set	IEC60896-21/22,UL 1989, UL 94	
	- Rectifier 1.2 kV/AC/750 VDC, 3000 kW, 12 Pulse	: Secheron	Np + 1 ,Number of Pulse, Modular Fixed Indoor (CB type MBS 500 , Metal Clad)	10	3000 kW, 4000 A &750 Volt- DC	set	I). IEC 60146: Semiconductors. II).IEC 60146-1, Part 1-1: Specification of Basic Requirements. III). 60747: Semiconductor Devices IV). EN 50328: Railway Applications - Electronic Power Coverters for Substation	
	Incoming DC Switchgear 750 VDC Panel (HSCB)  Outgoing DC Switchgear 750 VDC Panel (HSCB)	: Secheron	HSCB UR40E-81S/ SEPCOS2	10	3000 kW, 4000 A &750 Volt- DC	set	I), EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Switchneck. Part 4: Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement Control & Protection. ), EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
	Negative Panel	: Secheron	HSCB UR40E-81S/ SEPCOS2, MBS 500	10	2600 A, 750 VDC	set	Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6:DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
		: Secheron	LBR		4000 A , 750 Volt-DC	set	I), EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
	Lightning arester for DC Switchgear	: Siemens	3EB2-010	35	1000 VDC	set	I), EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
_	Pl.C Panel/Control cubicle  DS for outgoing to third rail & support	: Siemens	SIMATIC IPC277E (NANOPANEL PC)		32 BIT	set	i). EN 61000-6-4 : Emitted Interference. Ii). EN 61000-6-2 : Interference Immunity	
				40			i). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
		: Secheron	SW-type	40	4000 A , 750 Volt-DC	set	Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6:DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
	Linked Break Device' intertriping system	: Secheron	SW-type Switch Type DS	40		set set	Disconnector, Part S. Surge Arrester, Part 6: DC Switchgear Assemblies, Part 7:Measurement, Control & Protection I), EN: 50123/ IEC 61932 Part 1: General, Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector, Part 4:Outdoor DC Switch Disconnector, Part 5: Surge Arrester, Part 6: DC Switchgear Assemblies, Part 7:Measurement, Control & Protection	
	Linked Break Device' intertriping system  Voluge Limiting Device			5 5	4000 A , 750 Volt-DC		Disconnector, Part S. Surge Arrester, Part S. CD Switchpaer Assembles, Part Arkeaumented, Coron & Protection () EN: 90123 / IEC 61992 Part 1: General, Part 2: Corous Breekens, Part 3 Indior D. C. Disconnector, Part 4: Oxfooto PC Switch Disconnector, Part 5: Surge Arrester, Part 6: DC Switchpaer Assembles, Part Arkeaumented, Coron & Protection () EN: 90506 2: voltage limiting device of classes 3 and 4, EN 50122- 1: Protective provision about Electrical Sately in VLD-F, VLD-O or Both Furtions.	
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station	: Secheron	Switch Type DS	5 5	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current :	set	Disconnector. Part S. Surge Ameriter. Part S. CD Switchpaer Assembles. Part T. Alexaurement, Corror & Protection J. EN. 5122 / IEC 61952. Part 1. General. Part 2. Cross Breakers. Part 3 Indion CD Chicomoretor. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 5. CD Switchpaer Assembles. Part T. Alexaurement, Corror & Protection J. EN. 50526 2: voltage limiting device of classes 3 and 4, EN 50122- 1. Productive provision about Electrical Safety in VLDF. VLD-O or Born Furtions. J. EN. 50023 / IEC 61992. Part 1. General. Part 2. Cross Breakers. Part 3 Indion Dr. O Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 6. DC Switchpaer Assemblies. Part 7 Measurement, Corror & Protection	Push Button
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station  - Track Bypass switch	: Secheron : Secheron	Switch Type DS  V Guard-H	5 5 16	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current :	set	Disconnector, Part S. Surge Amerister, Part S. CD Switchpear Assemblies, Part Measurement, Corroll & Protection 1), Ph. 90123 / IEC 61992 Part 1: General Part 2: Corcul Breakers. Part 3 indoor DC Disconnector, Part 4: Oxford Por Switch Disconnector, Part 5: Surge Amerister, Part 6: DC Switchpear Assemblies. Part Trabsaumented, Coroll & Protection 1), Ph. 9505-22 violage imming device of casses 3 and 4; BN 95122- 305 Part 10 in 1997 Part 10 in	Push Button
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station	: Secheron : Secheron : Secheron : Secheron : Secheron : Secheron	Switch Type DS  V Guard-H  LBS 130 Wall Mounted  House inside a polyester cabinet, motorized  NZXSEBY, 3Cx185 mm-sqr	5 5 5 16 10 10 4546 4546	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current : 1000 A  - 4000 A , 750 Volt-DC	set set m	Disconnector, Part S. Surge Ameriter, Part S. CD Switchpear Assembles, Part T. Alexaurement, Corror & Protection J. EN. 5122 / IEC 61992. Part 1. General. Part 2. Cross Breekers. Part 3 Indoor D. C. Disconnector, Part 4. Oxfooder D. Switch Disconnector, Part 5. Surge Ameriter, Part 5. CD Switchpear Assembles, Part 7. Messeurement, Corror & Protection J. EN. 50256 2: voltage limiting device of classes 3 and 4, EN 50122- 1. Protective provision about Electrical Safety in VLD-F, VLD-O or Born Funtions. J. EN. 5023 / IEC 61992 Part 1. General. Part 2. Cross Breekers. Part 3 Indoor D. CD Eleconnector, Part 4. Oxfood Dr. Switch Disconnector. Part 5. Surge Ameriter, Part 6. DC Switchpear Assemblies, Part 7 Messeurement, Corror & Protection J. EN. 50123 / IEC 61992 Part 1. General. Part 2. Cross Breekers. Part 3 Indoor D. Classonnector, Part 4. Oxfood Dr. Switch Disconnector. Part 5. Surge Ameriter, Part 6. DC Switchpear Assemblies, Part 7 Messeurement, Corror & 7 Protection Disconnector. Part 5. Surge Ameriter, Part 6. DC Switchpear Assemblies, Part 7 Messeurement, Corror & 7 Protection SWIL-56-44, IEC 69502-2. Copper conductor ~ XLPE Isulated Annor PDS Sheitine.	Push Button
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station  - Track Bypass switch  Material of Cable  Cable interkoneksi IPSN 20 81', XLPE Insulation  - Cable interkoneksi DSS 20 4V', XLPE Insulation	: Secheron : Secheron : Secheron : Secheron : Secheron : Secheron	Switch Type DS  V Guard-H  LBS 130 Wall Mounted  House inside a polyester cabinet, motorized	4.546	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current : 1000 A  - 4000 A , 750 Volt-DC	set set set m m	Disconnector Part S. Surge Annester Part S CD Switchpear Assembles Part Talkeaumented, Corrol & Protection 1), D.N. 50123 / IEC 61992 Part 1: General Part 2: Circuit Breaken. Part 3 indoor D CD Isconnector, Part 4: Oxford PC Switch Disconnector Part 5: Surge Annester, Part 6: DC Switchpear Assembles. Part 7 Alexaumented. Corrol & Protection 1), D.N. 50206-2: votage limiting device of casses 3 and 4, DN 50122- 1: Producting protein sout Disconnects of Protection 2008 Proteins. 1) Producting protein sout Disconnects Part 1: Corrol & Desiders 1), Ph. 51021 / IEC 61992 Part 1: General Part 1: Croud Breaken. 5) Ph. 51021 / IEC 61992 Part 1: General Part 1: Croud Breaken. 5) Ph. 51021 / IEC 61992 Part 1: General Part 1: Croud Breaken. 5) Ph. 51021 / IEC 61992 Part 1: General Part 2: Croud Breaken. 5) Ph. 51021 / IEC 61992 Part 1: General Part 2: Croud Breaken. 5) Ph. 51021 / IEC 61992 Part 1: General Part 2: Croud Breaken. 5) Ph. 51021 / IEC 61992 Part 1: General Part 2: Croud Breaken. 74 3 Indoor IEC Broomnector. Part 4: Oxford Part 1: Croud Breaken. 5 Part 3: Moreous College Part 1: General CO CS witching Disconnector. Part 5: Surge Annester Part 6: CD Switching Connectice. Part 7: Measurement. Corrol & Protection 574: 43-546, IEC 65002-2: Copper connector < ALP E Isulated Copper Tage Conne. PAC Inversional Connector < ALP E Isulated Copper Tage Conne. PAC Inversional Connector < All Protection 5000 Part 2000 Part 1: Comment 1: Part 2000 Part 1: Connector Part 2: Connector Part 2: Connector Part 2: Connector Part 3: Connector Part 3: Connector Part 3: Connector Part 4: Connector Part 4: Connector Part 4: Connector Part 5: Connector Part 6: Connector Part 6: Connector Part 7: Connector Part 6: Connector Part 6: Connector Part 7:	Push Button
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station  - Track Bypass switch  Material of Cable  Cable interkowcksi TPSS 20 kl', XLPE Insulation  Cable interkowcksi DSS 20 kl', XLPE Insulation  - Embeled Bracket, cable tray/ladder & accessories  - Control Cable  - Control Cable	: Secheron : Secheron : Secheron : Secheron : Secheron : Secheron	Switch Type DS  V Guard-H  LBS 130 Wall Mounted  House inside a polyester cabinet, motorized  NZXSEBY, 3Cx185 mm-sqr	4.546 11.110 7	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current : 1000 A  - 4000 A , 750 Volt-DC	set set m	Disconnector. Part S. Surge Annester. Part S. CD Switchpear Assembles. Part T. Meseurement, Corrot & Protection J. D. N. 90123 / IEC 61992. Part 1. General. Part 2. Circust Breekens. Part 3 Indoor D. CD Sconnector. Part 4. Octobor DC Switch Disconnector. Part 5. Surge Annester. Part 6. DC Switchpear Assembles. Part 7 Meseurement, Corrot & Protection J. D. N. 90256 2: votage limiting device of classes 3 and 4, EN 90122- 1. Protective protein south Electrical Safety in N.D.F. V.DO or Death Furdion. Dev. 10 Sept. 10 Sept	Push Button
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station  - Track Bypass switch  Moderial of Cable  Cuble interkoneksi TPSS 20 kV, XLPE Insulation  Cable interkoneksi DSS 20 kV, XLPE Insulation  - Embeded Bracket, cable tray/laddor & accessories	: Secheron : Secheron : Secheron : Secheron : Secheron : Sutrado : Sutrado : Jordali, Hill	Switch Type DS  V Guard-H  LBS 130 Wall Mounted  House inside a polyester cabinet, motorized  NZXSEBY, 3Cx185 mm-sqr  NZXSEBY, 3Cx50 mm-sqr	4.546	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current : 1000 A  - 4000 A , 750 Volt-DC	set set set m m	Disconnector Part S. Surge Amerister Part S. CD Switchpear Assemblies Part Tolkeaumented, Coron & Protection J. D. N. 50123 / IEC 61992 Part 1 Ceneral Part 2. Circus Breakers. Part 3 Indion O. D. Disconnector. Part 4. Oxfood p. CD Switch Disconnector. Part 5. Surge Amerister. Part 6. D. Switchpear Assemblies. Part Tolkeaumented. Coron 6. Protection J. D. N. 50256 2: votage limiting device of classes 3 and 4, EN 50122- 1: Protective protein solutification of the Color of the Color of the Device Part 1. Device Part 1. Coron Part 2. Circust Breakers. Part 3 Indion Or D. Disconnector. Part 4. Outdoor D. C. Switch Part 3 Indion Or D. Disconnector. Part 4. Outdoor D. C. Switch Part 3 Indion Or D. Disconnector. Part 4. Outdoor D. Switch Part 3 Indion Or D. Disconnector. Part 4. Outdoor D. Switch Part 3 Indion Or D. Disconnector. Part 4. Outdoor D. Switch Part 3. Disconnector. Part 4. Outdoor D. Switch Part 3. Disconnector. Part 4. Outdoor D. Switch Part 3. Disconnector. Part 4. Outdoor D. Switch Disconnector. Part 5. Dispose Part 1. Coron & Protection J. D. Switch Part 5. Dispose Part 1. Coron & Protection Special Part 7. Measurement. Cortrol & Protection Special Part 7. Measurement. Part 7. Measurem	Push Button
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station  - Track Bypass switch  Material of Cable  Cable interknicksi TPSS 20 kV, XLPE Insulation  - Cable interknicksi DSS 20 kV, XLPE Insulation  - Embeded Bracket, cable tray/ladder & accessories  - Control Cable  - Control Cable  - Cable Div Cus 494 mnnsq) XLPE dart Switchgear 20kV ke RTR  - Cable Div Cus 450 mnnsq) XLPE dart Switchgear 20kV ke RTR	: Secheron  : Secheron  : Secheron  : Secheron  : Secheron  : Sutrado  : Sutrado  : Jurdani, Hilli : Sutrado  : Sutrado  : Sutrado  : Sutrado	Switch Type DS  V Guard-H  LBS 130 Wall Mounted  House inside a polyester cabinet, motorized  NZXSEBY ,3Cx185 mm-agr  NZXSEBY ,3Cx85 mm-agr  FO 4. Wire type  NZXSEBY ,5Cx 95 mm-agr	4.546 11.110 7	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current : 1000 A  4000 A , 750 Volt-DC  453 A , 20 kV	set set set m m m iot m m	Disconnector. Part S. Surge Ameriter. Part S. CD Switchpear Assemblies. Part N. Alexaurement, Corror & Protection J. Eh. S1123 / IEC 61992. Part 1. General. Part 2. Croxul Breakers. Part 3 Indoor OD Chicomoretor. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 5. CD Switchpear Assemblies. Part N. Alexaurement, Corror & Protection J. Eh. S0502 2: voltage limiting device of classes 3 and 4, EN 50122- 1. Productive province about Electrical Safety in VLD-F, VLD-O or Born Funtions. J. Eh. S0123 / IEC 61992 Part 1. General. Part 2. Circust Breakers. Part 3 Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 6. DC Switchpear Assemblies. Part Natesurement, Corror & Protector J. Eh. S0123 / IEC 61992 Part 1. General. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 6. DC Switchpear Assemblies. Part 7. Holesumenter. Corror of A Protection SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper Tipes Scene. PVC Inner Sheathed, Double Steel Tape Amnor. PVC Sweathed. SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper Tipes Scene. PVC Inner Sheathed, Double Steel Tape Amnor. PVC Sweathed. SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor. VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor. VLPE I suitated Copper SPL 4.5-46, IEC 69502-2. Copper conductor. VLPE I suitated Copper	Push Button
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station  - Track Bypass switch  Material of Cable  Cable interkoneksi TPSS 20 kV, XLPE Insulation  - Linke interkoneksi TSS 20 kV, XLPE Insulation  - Embeded Bracket, cable tray/ladder & accessories  - Control Cable  - Cable 20kV (Ca 3x94mnsay) XLPE dust Switchgear 20kV ke RTR  - Cable Dev I S Ca 340 mm2  - Cable Power tegangen rendak TPSS DSS  - Cable Power tegangen rendak TPSS DSS	: Secheron  : Secheron  : Secheron  : Secheron  : Secheron  : Sutrado  : Sutrado  : Jurdan, Hill : Sutrado  : Sutrado	Switch Type DS  V Guard-H  LBS 130 Wall Mounted  House inside a polyester cabinet, motorized  NZXSEBY, 3Cx185 mm-sqr  NZXSEBY, 3Cx50 mm-sqr  FO 5. Wire type  NZXSEBY, 3Cx 95 mm-sqr	4.546 11.110 7 800	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current : 1000 A  4000 A , 750 Volt-DC  453 A , 20 kV	set set set m m m iot m	Disconnector. Part S. Surge Ameriter. Part S. CD Switchpear Assemblies. Part N. Alexaurement, Corror & Protection J. Eh. S1123 / IEC 61992. Part 1. General. Part 2. Croxul Breakers. Part 3 Indoor OD Chicomoretor. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 5. CD Switchpear Assemblies. Part N. Alexaurement, Corror & Protection J. Eh. S0502 2: voltage limiting device of classes 3 and 4, EN 50122- 1. Productive province about Electrical Safety in VLD-F, VLD-O or Born Funtions. J. Eh. S0123 / IEC 61992 Part 1. General. Part 2. Circust Breakers. Part 3 Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 6. DC Switchpear Assemblies. Part Natesurement, Corror & Protector J. Eh. S0123 / IEC 61992 Part 1. General. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 6. DC Switchpear Assemblies. Part 7. Holesumenter. Corror of A Protection SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper Tipes Scene. PVC Inner Sheathed, Double Steel Tape Amnor. PVC Sweathed. SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper Tipes Scene. PVC Inner Sheathed, Double Steel Tape Amnor. PVC Sweathed. SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor. VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor. VLPE I suitated Copper SPL 4.5-46, IEC 69502-2. Copper conductor. VLPE I suitated Copper	Push Button
	Linked Break Device' intertriping system  Voltage Limiting Device  - Blue Light Station  - Track Bypass switch  Motorial of Cable  Cable interkoneksi TPSS 20 &F, XLPE Insulation  - Cable interkoneksi TPSS 20 &F, XLPE Insulation  - Embeded Bracket, cable traffindder & accessories  - Control Cable  Cable 20 W (*Cu \$49* Insulation August 10 August	: Secheron  : Secheron  : Secheron  : Secheron  : Secheron  : Secheron  : Sutrado  : Sutrado	Switch Type DS  V Guard-H  LBS 130 Wall Mounted  House inside a polyester cabinet, motorized  NZXSEBY, 3Cx185 mm-sqr  NZXSEBY, 3Cx50 mm-sqr  FO & Wire type  NZXSEBY, 3Cx 95 mm-sqr  NZXY  NYY	4.546 11.110 7 800	4000 A , 750 Volt-DC  4000 A , 750 Volt-DC  Thermal Nominal Current : 1000 A  4000 A , 750 Volt-DC  453 A , 20 kV	set set set m m m iot m m iot lot lot lot lot lot lot lot lot lot l	Disconnector. Part S. Surge Ameriter. Part S. CD Switchpear Assemblies. Part N. Alexaurement, Corror & Protection J. Eh. S1123 / IEC 61992. Part 1. General. Part 2. Croxul Breakers. Part 3 Indoor OD Chicomoretor. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 5. CD Switchpear Assemblies. Part N. Alexaurement, Corror & Protection J. Eh. S0502 2: voltage limiting device of classes 3 and 4, EN 50122- 1. Productive province about Electrical Safety in VLD-F, VLD-O or Born Funtions. J. Eh. S0123 / IEC 61992 Part 1. General. Part 2. Circust Breakers. Part 3 Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 6. DC Switchpear Assemblies. Part Natesurement, Corror & Protector J. Eh. S0123 / IEC 61992 Part 1. General. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 2. Circust Breakers. Part 3. Indoor DC Disconnector. Part 4. Oxfood PC Switch Disconnector. Part 5. Surge Ameriter. Part 6. DC Switchpear Assemblies. Part 7. Holesumenter. Corror of A Protection SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper Tipes Scene. PVC Inner Sheathed, Double Steel Tape Amnor. PVC Sweathed. SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper Tipes Scene. PVC Inner Sheathed, Double Steel Tape Amnor. PVC Sweathed. SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor. VLPE I suitated Copper SPL 4.5-44, IEC 69502-2. Copper conductor. VLPE I suitated Copper SPL 4.5-46, IEC 69502-2. Copper conductor. VLPE I suitated Copper	Push Button  Push Button  System Grip Loop Plus Rod Copper Deep

	BIRO ENGINEERING			KNIS PROYE	K .			Nomor : Halaman : Tanggal :
NAM		: LRT JABODEBEK	11031	NOF OK 1 AOI				ranggar .
PEMI		: Direktorat Jenderal Perkereta Apian : Struktur Elevated						
LOKA	DE PELAKSANAAN	: Line -3 ( Cawang - Bekasi Timur)						
NO	Description	: 2015 - 2019 , perpanjangan waktu sd 2021	Service Line	-3 ( Cawang- C	Cibubur )			Remark
	-		Brand & Type	Volume	Capacity	Unit	Standard Code	
7	Power Supply of Traction Power Substation (TPSS)	Brand	Туре	Quantity	Capacity	Unit	Standard Code	Remark
	Material of MV Switchgear Panel 20 KV :  - Incoming MV Switchgear Panel 20 KV (DS & CB + Metering)	: ABB	Safe Ring / Safe Plus (Gas Insulated)	4	630 A, 24 kV, 20 kA	set	i).Metal Enclosed Switchgear: IEC 62271-200, ii).General Purpose Switches: IEC 60265-1, iii). Disconnectors and Earthing Switches: 62271-102, iv).Switch Fuse Combination: IEC 62271-105, iv).Circuit Breakers: IEC 62271-104	Type Cubicle : Modular
	Outgoing interconnection TPSS MV Switchgear Panel 20 KV	: ABB	Safe Ring/Safe Plus (Gas Insulated)	22	630 A, 24 kV, 20 kA	set	I).Metal Enclosed Switchgear: IEC 62271 -200, II).General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, Iv).Switch Fuse Combination: IEC 62271-105, v). Circuit Breakers: IEC 62271-10	Type Cubicle : Modular
	Outgoing Traction Transformer MV Switchgear Panel 20 KV	: ABB	Safe Ring /Safe Plus (Gas Insulated)	9	630 A, 24 kV, 20 kA	set	I).Metal Enclosed Switchgear: IEC 62271-200, III).General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, IV,Switch Fuse Combination: IEC 62271-105, V. Circuit Breakers: IEC 62271-100 & vi). Comman Clouses: IEC 60694	Type Cubicle : Modular
	Outgoing Auxiliary Transformer MV Switchgear Panel 20 KV (FLBS)	: ABB	Safe Ring/Safe Plus (Gas Insulated)	11	200 A, 24 kV, LBS Fuse	set	I) Metal Enclosed Switchgear: IEC 62271 - 200, II) General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, IV). Switch Fuse Combination: IEC 62271-105, IV). Circuit Breakers: IEC 62271-100 & IV). Comman Clouses: IEC 602694	Type Cubicle : Modular
	Outgoing interconnection DSS MV Switchgear Panel 20 KV (LBS)	: ABB	Safe Ring / Safe Plus, Type F	36	630 A, 24 kV, 20 kA	set	i), Metal Encosed Switchgeer: IEC 62271 - 200, ii), General Purpose Switches: IEC 602651, iii), Switches: 62271-102, iv), Switch Fuse Combination: IEC 62271-105, v). Breakers: IEC 62271-100 & vi). Comman Clouses: IEC 60694	Type Cubicle : Modular
	- Surge Arester for MV Switchgear	: ABB	Polimer		20 kA, 26 kV	set	IEC 62271 / IEC 60265	Indoor LA
	Material of Transformator  Traction Transformer 20kV/2x0.59 kV ,3300 kVA	:		9			i). Railway Application, Fixed Installation Traction Transformer : EN	
	-	: LSIS	Cast Resin Dry ( AN )		3300 kVA	set	50329. ii). Semiconductor Convertors General Requirements and Line Commutated Convertors : EN 60146. & iii). Dry-Type Transformer : IEC 60076-11	Installation Indoor , Air Natural System
	<ul> <li>Auxiliary Transformer 20 kVA 20/0.38 kV TPSS</li> <li>Auxiliary Transformer 100 kVA 20/0.38 kV TPSS/DSS</li> </ul>	: Trafindo / Fortune : Trafindo / Fortune	Cast Resin Dry ( AN ) Cast Resin Dry ( AN )	6	20 kVA 100 kVA	set set	IEC 60076-11 IEC 60076-11	
	- Auxiliary Transformer 400 kVA 20/0.38 kV OCC Material of LV System	: Trafindo / Fortune	Cast Resin Dry ( AN )	1	400 kVA	set	IEC 60076-11	
	- Panel Distribusi Type Wall mounted LV 20 kVA	: Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	6	20 kVA, 380 Volt	set	<ol> <li>Standar of Voltages: IEC 80038. II) Vocabulary: IEC 80050. II).</li> <li>Insulation Co-Ordination: IEC 80071. Iv). Electrical Relays. V). Semi Conductor Converters: IEC 80148. IV). Low Voltages Fuses. VII). Electrical Installation of Bullifors IEC 80384. 8 VIII). Degrees of Protection Provided Enclosures (IP Code).</li> <li>Standard Voltages: IEC 80308. II) Vocabulary: IEC 80050. II).</li> </ol>	
	Punel Distribusi Type Free Standing LV 100 kVA  Punel Distribusi Type Free Standing LV OCC	: Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	1	100 kVA, 380 Volt	set	Insulation Co-Ordination: IEC 60071. iv). Electrical Relays. v). Semi Conductor Converters: IEC 60146. vi). Low Voltages Fuses. Vii). Electrical Installation of Buildings: IEC 60384 & viii). Degrees of Protection. Provided Enclosures. IP. Code). III. Standar of Voltages: IEC 60038. III. Vocabulary: IEC 60050. III.	
	Automatic Change Over Switch 100 kVA	: Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	5	400 kVA, 380 Volt	set	Insulation Co-Ordination: IEC 60071. Iv. Electrical Relays, v). Semi Conductor Converters: IEC 60146. v). Low Voltages Fuses. vi). Electrical Installation of Buildings: IEC 60364 & viii). Degrees of Protection Provided Encolouses (IPC code). 1). Standard of Voltages: IEC 60038. II). Vocabulary: IEC 60050. II). Insulation Co-Ordination: IEC 60071. Iv.) Electrical Relays. v). Semi Insulation Co-Ordination: IEC 60071. Iv.) Electrical Relays. v). Semi	
		: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed		100 kVA,380 Volt	set	Conductor Converters : IEC 60146. vi). Low Voltages Fuses. Vii). Electrical Installation of Buildings: :IEC 60364 & viii). Degrees of	
	Automatic Change Over Switch 400 kl/A OCC - Material of Backup System	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	1	400 kVA, 380 Volt	set	Embertion Provided Enclosues (IP Code)  1). Standar of Vottages: IEC 60038. II) Vocabulary: IEC 60050. II). Insulation Co-Ordination: IEC 60071. Iv). Electrical Relays. v). Semi Conductor Converters: IEC 60146. v). Low Voltages Fuses. vii). Electrical Installation of Buildings: IEC 60364 & viii). Degrees of Protection Provided Enclosuers (IP Code).	
	_ Industrial UPS 40 kVA complete with 2 hours back up battery	: Vertiv	Double Conversion True On Line UPS-System	5	40 kVA	set	IEC 62040-3	
	Industrial UPS 100 kVA complete with 2 hours back up battery	: Vertiv	Double Conversion True On Line UPS-System	1	100 kVA	set	IEC 62040-3	
	Generator Set capacity 50 kVA, complete with local panel control Generator set capacity 100 kVA, complete with local panel control	: Engine Cummins & Generator Stamford : Engine Cummins & Generator Stamford	Silent Silent	. 5	50 kVA 100 kVA	set set		
	- Generator set capacity 300 kVA, complete with local panel control OCC - Batteries & charger for DC 110 Volt source and DC Switchboard 110 VDC	: Engine Cummins & Generator Stamford : Vertiv	Silent Battery Type : V-FT, 12 V 100FC, Charger Type : 6 Pulse, Thyristor	1 12	300 kVA 25 Ampere	set set	IEC60896-21/22,UL 1989, UL 94	
	Material of Rectifier & DC System - Rectifier 1.2 kVAC/750 VDC, 3000 kW, 12 Pulse	: Secheron	Np + 1 ,Number of Pulse, Modular Fixed Indoor (CB type MBS 500 , Metal Clad)	9	3000 kW, 4000 A &750 Volt- DC	set	i). IEC 60146: Semiconductors. Ii).IEC 60146-1. Part 1-1: Spedification of Basic Requirements. Iii). 60747: Semiconductor Devices IV). FO 50328: Railway Applications - Electronic Power	
	Incoming DC Switchgear 750 VDC Panel (HSCB)	: Secheron	HSCB UR40E-81S/ SEPCOS2	9	3000 kW, 4000 A &750 Volt- DC	set	Coverters for Substation  1). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7: Measurement. Control & Protection	
	Outgoing DC Switchgear 750 VDC Panel (HSCB)	: Secheron	HSCB UR40E-81S/ SEPCOS2, MBS 500	45	2600 A, 750 VDC	set	I). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
	Negative Panel	: Secheron	LBR	9	4000 A , 750 Volt-DC	set	i). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
	Lightning arester for DC Switchgear	: Siemens	3EB2-010	54	1000 VDC	set	EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.     Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch     Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear     Assemblies. Part 7:Measurement, Control & Protection	
	PLC Panel/Control cubicle  DS for outgoing to third rail & support	: Siemens	SIMATIC IPC277E (NANOPANEL PC)	79	32 BIT	set	i). EN 61000-6-4: Emitted Interference. Ii). EN 61000-6-2: Interference Immunity     ii). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
	Linked Break Device' intertriping system	: Secheron	SW-type	9	4000 A , 750 Volt-DC	set	Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6:DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
	Voltage Limiting Device	: Secheron	Switch Type DS	9	4000 A , 750 Volt-DC	set	I). EN: 50123 / IEC 61992. Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7: Measurement, Control & Protection I). EN: 50526-2: voltage limiting device of classes 3 and 4, EN 50122-	
	- Blue Light Station	: Secheron	V Guard-H	27	Thermal Nominal Current : 1000 A	set	Protective provision about Electrical Safety in VLD-F, VLD-O or Both Funtions.      EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
	- Track Bypass switch	: Secheron	LBS 130 Wall Mounted	18	-	set	<ol> <li>EN: 59123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.</li> <li>Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assembles. Part 7:Measurement, Control &amp; Protection</li> <li>EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.</li> </ol>	Push Button
	Meterial of Cable	: Secheron	House inside a polyester cabinet, motorized		4000 A, 750 Volt-DC	set	Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6:DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
	Cable interkoneksi TPSS 20 kV, XLPE Insulation	: Jembo	N2XSEBY, 3Cx185 mm-sqr	18.922	453 A, 20 kV	m	SPL 43-5-46, IEC 60502- 2 : Copper conductor <xlpe isulated<br="">Copper Tape Scree, PVC Inner Sheathed, Double Steel Tape</xlpe>	
	Cable interkoneksi DSS 20 kV, XLPE Insulation	: Jembo	N2XSEBY . 3Cx50 mm-sar	10.608	205 A. 20 kV	m	Armor, PVC Sheathed.  SPL 43-5-46, IEC 60502-2: Copper conductor <xlpe copper="" double="" inner="" isulated="" pvc="" scree,="" sheathed,="" steel="" tape="" tape<="" td=""><td></td></xlpe>	
	- Embeded Bracket, cable tray/ladder & accessories	: Jembo : Jordahl, Hilti	NZAGEDT , SUXXV HIII-SQI	18.922	200 A, 20 KV	m m	Armor,PVC Sheathed.	
	- Control Cable Cable 20kV (Cu 3x95mmsq) XLPE dari Switchgear 20kV ke RTR	: Jembo	FO & type wire  N2XSEBY, 3Cx 95 mm-sqr	12 720	307A, 20 kV	lot m	SPL 43-5-46, IEC 60502- 2 : Copper conductor ,XLPE Isulated Copper Tape Scree, PVC Inner Sheathed, Double Steel Tape Armor,PVC	
	- Cable DC, 1 x Cu 300 mm2	: Jembo	N2XY	22.500		m	Sheathed.	
	- Cable Power tegangan rendah TPSS/DSS - Cable Power tegangan rendah OCC	: Jembo : Jembo	NYY NYY	11		lot		
	Material of Earthing & bonding  Grounding for TPSS	: Furse	Bare Copper Wire & Rod Copper	9	20 kA	lot		System Grip Loop Plus Rod Copper Deep
	Wayside structure Earthing & Bonding	: Jembo	Bare Copper Wire & Rod Copper	37.600	20 kA	m		System Grip Reinforced Concrete Plus Rod Deep
		:						L '

JAYA CM BIRO ENGINEERING			KNIS PROYE	к			Nomor : Halaman : Tanggal :
NAMA PROYEK PEMILIK	: LRT JABODEBEK : Direktorat Jenderal Perkereta Apian						
JENIS PROYEK	: Struktur Elevated : DEPO						
PERIODE PELAKSANAAN	: 2015 - 2019 , perpanjangan waktu sd 2021						T
NO Description		Brand & Type	Volume	Capacity	Unit	Standard Code	Remark
7 Power Supply of Traction Power Substation (TPSS)	Brand	Туре	Quantity	Capacity	Unit	Standard Code	Remark
Material of MV Switchgear Panel 20 KV :							I
Incoming MV Switchgear Panel 20 KV (DS & CB + Metering)	: ABB	Safe Ring / Safe Plus ( Gas Insulated )	-	630, 24 kV, 20 kA	set	I).Metal Enclosed Switchgear: IEC 62271-200, II),General Purpose Switches: IEC 60265-1, III). Disconnectors and Earthing Switches: 62271-102, Iv).Switch Fuse Combination: IEC 62271-105, IV. Circuit Breakers: IEC 62271-100 & IV). Comman Clouses: IEC 60694	Type Cubicle : Modular
Outgoing interconnection TPSS MV Switchgear Panel 20 KV	: ABB	Safe Ring/Safe Plus ( Gas Insulated )	3	630 A, 24 kV, 20 kA	set	i).Metal Enclosed Switchgear: IEC 62271 -200, ii).General Purpose Switches: IEC 60265-1, iii). Disconnectors and Earthing Switches: 62271-102, M.,Switch Fuse Combination: IEC 62271-105, y). Circuit Breakers: IEC 62271-100 & vi). Comman Clouses: IEC 60694	Type Cubicle : Modular
Outgoing Traction Transformer MV Switchgear Panel 20 KV	: ABB	Safe Ring /Safe Plus ( Gas Insulated )	2	630 A, 24 kV, 20 kA	set	i).Metal Enclosed Switchgear: IEC 62271 -200, ii).General Purpose Switches: IEC 60265-1, iii). Disconnectors and Earthing Switches: 62271-102, iv).Switch Fuse Combination: IEC 62271-105, v). Circuit Breakers: IEC 62271-100 & w). Comman Clouses: IEC 60694	Type Cubicle : Modular
Outgoing Auxiliary Transformer MV Switchgear Panel 20 KV (FLBS)	: ABB	Safe Ring/Safe Plus ( Gas Insulated )	-	200 A, 24 kV, LBS Fuse	set	i).Metal Enclosed Switchgear: IEC 62271 - 200, iii).General Purpose Switches: IEC 60265-1, iii).Disconnectors and Earthing Switches: 62271-102, iv).Switch Fuse Combination: IEC 62271-105, v). Circuit Breakers: IEC 62271-10	Type Cubicle : Modular
Outgoing interconnection DSS MV Switchgear Panel 20 KV (LBS)	: ABB	Safe Ring / Safe Plus, Type F	-	630 A, 24 kV, 20 kA	set	i).Metal Encosed Switchgear: IEC 62271 -200, II).General Purpose Switches: IEC 60265-1, III). Switches: 62271-102, Iv).Switch Fuse Combination: IEC 62271-105, v). Breakers: IEC 62271-100 & vi). Comman Clouses: IEC 60694	Type Cubicle : Modular
- Surge Arester for MV Switchgeer	: ABB	Polimer	5	20 kA, 26 kV	set	IEC 62271 / IEC 60265	Indoor LA
Material of Transformator  Traction Transformer 20k1/2x0.59 kV,3300 kVA  -	: LSIS	Cast Resin Dry ( AN )	2	3300 kVA	set	Railway Application, Fixed Installation Traction Transformer : EN 50329: II). Semiconductor Convertors General Requirements and Line Commutated Convertors : EN 60146. & IIII) Py Type Transformer :	Installation Indoor , Air Natural System
- Auxiliary Transformer 20 kVA 20/0.38 kV TPSS	: Trafindo / Fortune	Cast Resin Dry ( AN )		20 kVA	set	IEC 60076-11	
Auxiliary Transformer 100 kVA 20/0.38 kV TPSS/DSS  - Auxiliary Transformer 400 kVA 20/0.38 kV OCC	: Trafindo / Fortune : Trafindo / Fortune	Cast Resin Dry ( AN ) Cast Resin Dry ( AN )		100 kVA 400 kVA	set set	IEC 60076-11 IEC 60076-11	
Auxiliary Transformer 1600 kVA 20/0.38 kV DEPO Material of LV System	Trafindo / Fortune	Cast Resin Dry (AN)	1	1600 Kva		ii). Standar of Voltages : IEC 60038. ii). Vocabulary : IEC 60050. iii).	
Panel Distribusi 1600 A Type free standing LV DEPO	: Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	1	1600 A, 380 Volt	set	<ol> <li>Standar of Voltages: IEC 60038. II). Vocabulary: IEC 60050. III).</li> <li>Insulation Co-Ordination: IEC 60071. Iv). Electrical Relays. V). Semi Conductor Converters: IEC 60146. VI). Low Voltages Fuses. VII). Electrical Installation of Buildings: IEC 60364 &amp; 4 VIII). Degrees of Protection Provided Enciosures: IIP Code).</li> <li>Standard Of Voltages: IEC 60038. III) Vocabulary: IEC 60050. III).</li> </ol>	
Panel Distribusi 1000 A Type free standing LV DEPO	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	1	1000 A, 380 Volt	set	I), startast of voltages: IEC 60051, IV/scabulary : IEC 60050, IV/s Insulation Co-Ordination : IEC 60071, IV/s Electrical Relays. V). Semi Conductor Converters : IEC 60146. vi), Low Voltages Fuses. Vii). Electrical Installation of Bullidrags : IEC 60054 & viii). Degrees of Protection Provided Fonciagues (IP Code) I). Standard Of Voltages : IEC 60034 ii). Vocabulary : IEC 60050. iii).	
Panel Distribusi 630 A Type free standing LV DEPO	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	1	630 A, 380 V	set	I), startiard to Voltages: IEC 60035, III, Vocabulary : IEC 60050, III), Insulation Co-Ordination : IEC 60071, IV), Electrical Relays, V), Semi Conductor Converters : IEC 60146, VI), Low Voltages Fuses, VII), Electrical Installation of Buildings : IEC 60364 & VIII). Degrees of Protection Provided Footogastress (IP Code).  I), Standard Of Voltages: IEC 60038, III, Vocabulary : IEC 60050, III).	
- Panel Distribusi 250 A Type free standing LV DEPO	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	1	250 A, 380 Volt	set	Insulation Co-Ordination: IEC 60071. Iv), Electrical Relays. v), Semi Conductor Converters: IEC 60071. Iv), Liow Voltages Fuses. Vii), Electrical Installation of Buildings: IEC 60084. 8 viii), Degrees of Protection Provided Enclosures (IP Code). IV, Standard Ovltages: IEC 60038. III, Vocabulary: IEC 60095. III).	
- Panel Distribusi 100 A Type free standing LV DEPO	: Schenelder	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	1	100 A, 380 Volt	set	I), Startiard of Vollages: IEC6 0003-1, I), Electrical Relays. V), Senii Insulation Co-Ordination: IEC 60071. IV), Electrical Relays. V), Senii Conductor Converters: IEC 60146. V), Low Voltages Fuses. Vii), Electrical Installation of Buildings: IEC 60364 & viii). Degrees of Protection Provided Enclosures (IP Code).	
Automatic Change Over Switch 1600 EVA DEPO	Scheneider	Type of Cubicle Shall Be Free Standing With Indoor Type and Metal Sheet Enclosed	1	1600 kVA 380 Volt			
Material of Backup System  Industrial UPS 40 kVA complete with 2 hours back up battery	: Vertiv	Double Conversion True On Line UPS-System	1	40 kVA	set	IEC 62040-3	
Industrial UPS 100 kVA complete with 2 hours back up battery  Industrial UPS 100 kVA complete with 2 hours back up battery	: Vertiv	Double Conversion True On Line UPS-System	-	100 kVA	set	IEC 62040-3	
Generator Set capacity 50 kVA, complete with local panel control Generator set capacity 100 kVA, complete with local panel control	: Engine Cummins & Generator Stamford : Engine Cummins & Generator Stamford	Silent Silent	-	50 kVA 100 kVA	set set		
- Generator Set capacity 2000 kVA, complete with local panel control DEPO - Batteries & charger for DC 110 Volt source and DC Switchboard 110 VDC Material of Rectifier & DC System - Rectifier 1 2 kV4/C775 VDC 3000 kW 12 Pulse - Rectifier 1 2 kV4/C775 VDC 3000 kW 12 Pulse	: Engine Cummins & Generator Stamford : Vertiv	Silent Battery Type: V-FT, 12 V 100FC, Charger Type: 6 Pulse, Thyristor	1	300 kVA 25 Ampere	set set	IEC60896-21/22,UL 1989, UL 94	
h.coming DC Switchgear 750 VDC Panel (HSCB)	: Secheron	Np + 1 ,Number of Pulse, Modular Fixed Indoor (CB type MBS 500 , Metal Clad)	2	3000 kW, 4000 A &750 Volt- DC	set	I). IEC 60146: Semiconductors. II). IEC 60146-1, Part 1-1: Specification of Basic Requirements. III). 60747: Semiconductor Devices (V). EN 50328: Rallway Applications - Electronic Power Coverters for Substation II). EN. 50723: IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
Outgoing DC Switchgear 750 VDC Panel (HSCB)	: Secheron	HSCB UR40E-81S/ SEPCOS2	2	3000 kW, 4000 A &750 Volt- DC	set	Part 3.Indoor DC Disconnector. Part 4.Cutdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblase. Part 7:Measurement Control & Protection. I), EN: 50123 / IEC 61992. Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Switchnecker. Part 4:Cutdor DC Switch.	
Negative Panel	: Secheron	HSCB UR40E-81S/ SEPCOS2, MBS 500	5	2600 A, 750 VDC	set	Part 3: Indoor De Cavillet  Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear  Assemblies. Part 7: Measurement, Control & Protection  I). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
Lighming arester for DC Switchgear	: Secheron	LBR	1	4000 A , 750 Volt-DC	set	Part 3.Indoor DC Disconnector. Part 4.Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
PLC Panel/Control cubicle	: Siemens	3EB2-010 SIMATIC IPC277E (NANOPANEL PC)	6	1000 VDC	set	Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection i). EN 61000-6-4: Emitted Interference. ii). EN 61000-6-2:	
DS for outgoing to third rail & support	. semens	SIMATIO IFO277E (NANOPANEL PG)	<u> </u>	J£ 011	set	Interference Immunity i). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
Linked Break Device/ intertriping system	: Secheron	SW-type	16	4000 A , 750 Volt-DC	set	Part 3.Indoor DC Disconnector. Part 4.Outdoor DC Switch Disconnector. Part 5. Surge Arrester. Part 6: DC Switchgear Assemblies. Part 7:Measurement, Control & Protection  i). EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
Voltage Limiting Device	: Secheron	Switch Type DS	1	4000 A, 750 Volt-DC	set	Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6:DC Switchgear Assemblies. Part 7:Measurement, Control & Protection i). EN: 50526-2: voltage limiting device of classes 3 and 4, EN 50122-	
- Blue Light Station	: Secheron	V Guard-H	1	Thermal Nominal Current : 1000 A	set	Protective provision about Electrical Safety in VLD-F, VLD-O or Both Funtions.      EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	
- Track Bypass switch	: Secheron	LBS 130 Wall Mounted	16	-	set	D. E.N. 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers. Part 3:Indoor DC Switcher. Part 4:Didoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6: IDC Switchgear Assemblies. Part 7: Measurement. Control & Protection  II. EN: 50123 / IEC 61992 Part 1: General. Part 2: Circuit Breakers.	Push Button
Material of Cable	: Secheron	House inside a polyester cabinet, motorized	2	4000 A, 750 Volt-DC	set	Part 3:Indoor DC Disconnector. Part 4:Outdoor DC Switch Disconnector. Part 5: Surge Arrester. Part 6:DC Switchgear Assemblies. Part 7:Measurement, Control & Protection	
Cable interkoneksi TPSS 20 kV, XLPE Insulation  Cable interkoneksi DSS 20 kV, XLPE Insulation  Cable interkoneksi DSS 20 kV, XLPE Insulation	: Jembo	NZXSEBY, 3Cx185 mm-sqr  NZXSEBY, 3Cx50 mm-sqr	3.300 1.650	453 A, 20 kV 205 A, 20 kV	m m	SPL 43-5-46, IEC 60502-2: Copper conductor <xlpe 43-5-46,="" 60502-2:="" <xlpe="" armor,="" conductor="" copper="" double="" iec="" inner="" isulated="" pvc="" scree,="" sheathed,="" sheathed.="" spl="" steel="" tape="" tape<="" td=""><td></td></xlpe>	
- Embeded Bracket, cable tray/ladder & accessories - Embeded Bracket, cable tray/ladder & accessories	: Jembo : Jordahl, Hilti	NZASEBT , SUXBU HER-SQF	1.650 3.300	203 M, 20 KV	m	Copper Tape Scree, PVC Inner Sheathed, Double Steel Tape Armor.PVC Sheathed.	
Control Cable     Cable 20kV (Cu 3x95mmsq) XLPE dari Switchgear 20kV ke RTR	: Jembo		2		lot	SPL 43-5-46, IEC 60502- 2 : Copper conductor ,XLPE Isulated Copper	
- Cable DC, 1x Cu 300 mm2	: Jembo : Jembo	N2XSEBY, 3Cx 95 mm-sqr N2XY	150 4.000	307A, 20 kV	m m	Tape Scree, PVC Inner Sheathed, Double Steel Tape Armor, PVC Sheathed.	
Cable Power tegangan rendah TPSS/DSS	: Jembo : Jembo	NZXY NYY NYY	4.000		lot lot		
Cable Power tegangan rendah OCC  Material of Earthing & bonding Grounding for TPSS	: Jembo	Bare Copper Wire & Rod Copper		20 kA	lot	Bare Copper Wire & Rod Copper	System Grip Loop Plus Rod Copper Deep
- Wayside structure Earthing & Bonding	: Furse : Jembo	Bare Copper Wire & Rod Copper  Bare Copper Wire & Rod Copper	3.300	20 KA 20 KA	m	Bare Copper Wire & Rod Copper  Bare Copper Wire & Rod Copper	System Grip Loop Mus Rod Copper Deep System Grip Reinforced Concrete Plus Roi Deen
<u> </u>	:				_		

	<b>回</b> JAYA CM				DATA	TEKNIS	PROYEK	Nomor : Halaman :
	KADIRAT OPS				TF	RANSPOR	TASI	Tanggal :
	IA PROYEK	: LRT JABODEBEK						
	IILIK	: Direktorat Jenderal Perkereta Apian						
-	IS PROYEK	: Struktur Elevated						
	ASI	: Line-1 ( Cawang - Cibubur)						
PER	IODE PELAKSANAAN	: 2015 - 2019 , perpanjangan waktu sd 2021						
NO	Description				Service Lin	ne -1 ( Cav	wang - Cibubur )	Remark
NO	Description		Brand & Type	Volume	Capacity	Unit	Standard Code	Remark
8	Third Rail of Conductor Power Supply DC Traction System	Brand	Туре	Quantity	Capacity	Unit	Standard Code	Remark
	Material of Power Rail System	:		-				
	- Conductor Rail	: Railtech	Co-Extruded CR	29.896	4000 A, 750 Volt-DC	m	j). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iv).IEC 60: High voltage test techniques. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.vi). 60243-1: Electrical strength of insulating materials- test method. viii). EN 10025: Hot rolled products of structureal steels. General technical delevery conditions.	Type Cubicle : Modular
	- High Speed Ramp	: Railtech	RAS REF 432765	4	4000 A, 750 Volt-DC	pcs	j). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. Ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation. Iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iv).IEC 60: High voltage test techniques. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose. vi). 60243-1: Electrical strength of insulating materials- test method. viii). EN 10025: Hot rolled products of structureal steels. General technical delevery conditions.	
	- Expansion joint	: Railtech	RAS REF 432790	1.994	4000 A, 750 Volt-DC	pcs	j). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. Ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iv).IEC 60: High voltage test techniques. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.vi). 60243-1: Electrical strength of insulating materials- test method. viii). EN 10025: Hot rolled products of structureal steels. General technical delevery conditions.	
	- Bracket	: Railtech	RAS REF 432635	6.644	-	pcs	<ol> <li>ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.</li> </ol>	
	- Insulator	: Railtech	RAS REF 432766	6.644	Above Megaohm	pcs	<ol> <li>ASTM D495 : Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.ii). ASTM B633 : Standard specification for electrodeposited coatings of zinc on iron and steel.iii).IEC 60 : High voltage test techniquesiv). 60243-1 : Electrical strength of insulating materials- test method. v). ISO 50124 : Railway applications - insulator coordination.</li> </ol>	
	- Cover	: Railtech	RAS REF 432766	29.896		m	i). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel. ii). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.iii). EN 10025: Hot rolled products of structureal steels. General technical delevery conditions.	For Protection Conductor 3rd
	- Cable terminal of Power Feed Point	: Railtech	RAS REF 432766	168	4000 A, 750 Volt-DC	pcs	i). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.ii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iii).IEC 60: High voltage test techniquesiv). 60243-1: Electrical strength of insulating materials- test method. v). ISO 50124: Railway applications - insulator coordination.	Size Cable DC 1Cx400 mm-sqr ( 12 (1Cx400 mm-sqr at Power Feed Point Conductor Third Rail & 7 ( 1Cx400 mm-sqr of Track Rail )
				<u> </u>			I .	IOI TTACK RAII )

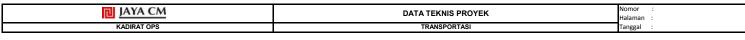
	<b></b> JAYA CM		ι	DATA TEKNIS PROY	EK			Nomor : Halaman :
	KADIRAT OPS			TRANSPORTASI				Tanggal :
	A PROYEK	: LRT JABODEBEK						
PEMI		: Direktorat Jenderal Perkereta Apian						
	S PROYEK	: Struktur Elevated						
LOKA	ASI ODE PELAKSANAAN	: Line -2 of ( Cawang - Dukuh Atas )						
PERI	ODE PELAKSANAAN	: 2015 - 2019 , perpanjangan waktu sd 2021						
NO	Description			Line -2 of ( Cawang -	<u> </u>			Remark
			Brand & Type	Volume	Capacity	Unit	Standard Code	
8	Third Rail of Conductor Power Supply DC Traction System	Brand	Туре	Quantity	Capacity	Unit	Standard Code	Remark
	Material of Power Rail System	:						
	- Conductor Rail	: Railtech	Co-Extruded CR	21.816	4000 A, 750 Volt-DC	m	<ol> <li>ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications.</li> <li>ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatinos of zinc on iron and steel iv). IEC</li> </ol>	
	- High Speed Ramp	: Railtech	RAS REF 432765	8	4000 A, 750 Volt-DC	pcs	i). ASTM A240 : Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. li). ASTM D495 : Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633 : Standard specification for electrodeposited coatings of zinc on iron and steel iv) IEC	
	- Expansion joint	: Railtech	RAS REF 432790	1.455	4000 A, 750 Volt-DC	pcs	i). ASTM A240 : Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. li). ASTM D495 : Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633 : Standard specification for electrodeposited coatings of zinc on iron and steel iv) IEC	
	- Bracket	: Railtech	RAS REF 432635	4.850	-	pcs	i). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.	
	- Insulator	: Railtech	RAS REF 432766	4.850	Giga - ohm <	pcs	i). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.ii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iii).IEC 60: High voltage test techniques. iv). 60243-1: Electrical strength of insulating materials: test method. v). ISO 50124: Railway applications -	
	- Cover	: Railtech	RAS REF 432766	21.816		m	i). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel. ii). EN 10088-2: Technical delivery conditions for sheet/folds and string for corresion resisting steels for gangal purpose iii).	
	- Power Feed point of Cable terminal	: Railtech	RAS REF 432766	60	4000 A, 750 Volt-DC	pcs	i). ASTM D495 : Standard test method for high-voltage , low current, dry arc resistance od solid electrical insulation.ii). ASTM B633 : Standard	Size Cable DC 1Cx400 mm-sqr ( 12 (1Cx400 mm-sqr at Power Feed Point Conductor Third Rail & 7 ( 1Cx400 mm-sqr

	□ JAYA CM				DATA TEKNIS PRO	YEK		Nomor : Halaman :
	KADIRAT OPS				TRANSPORTASI			Tanggal :
PEM	A PROYEK ILIK S PROYEK	: LRT JABODEBEK : Direktorat Jenderal Perkereta Apian : Struktur Elevated						•
LOK		: Line -3 (Cawang - Bekasi Timur)						
PER	ODE PELAKSANAAN	: 2015 - 2019 , perpanjangan waktu sd 2021						
NO	Description		Brand & Type	Ser Volume	vice Line -3 of (Cawang	- Bekasi Unit	Timur ) Standard Code	Remark
8	Third Rail of Conductor Power Supply DC Traction System	Brand	Type	Quantity	Capacity	Unit	Standard Code Standard Code	Remark
	Material of Power Rail System	:						
	- Conductor Rail	: Railtech	Co-Extruded CR	37.976	4000 A, 750 Volt-DC	m	i). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. Ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steely. JEC 60: High voltage test techniques. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.vi). 60243-1: Electrical strength of insulating materials- test method. viii). EN 10025: Hot rolled products of structureal steels. General technical delevery conditions.	
	- High Speed Ramp	: Railtech	Co-Extruded CR	6	4000 A, 750 Volt-DC	pcs	i). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. Ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iv). IEC 60: High voltage test techniques. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.vi). 60243-1: Electrical strength of insulating materials- test method. vii). EN 10025: Hot rolled products of structureal steels. General technical	
	- Expansion joint	: Railtech	RAS REF 432765	2.532	4000 A, 750 Volt-DC	pcs	j). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iv).IEC 60: High voltage test techniques. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.vi). 60243-1: Electrical strength of insulating materials- test method. vii). EN 10025: Hot rolled products of structureal steels. General technical delevery conditions.	
	- Bracket	: Railtech	RAS REF 432790	8.442	-	pcs	i). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.	
	- Insulator	: Railtech	RAS REF 432635	8.442	Giga - ohm <	pcs	i). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.ii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iii).IEC 60: High voltage test techniquesiv). 60243-1: Electrical strength of insulating materials- test method. v). ISO 50124: Railway applications - insulator coordination.	
	- Cover	: Railtech	RAS REF 432635	37.976	-	m	i). ASTM B633 : Standard specification for electrodeposited coatings of zinc on iron and steel. ii). EN 10088-2 : Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.iii). EN 10025 : Hot rolled products of structureal steels. General technical delevery conditions.	
	- Cable terminal of Power Feed Point	: Railtech	RAS REF 432766	216	4000 A, 750 Volt-DC	pcs	i). ASTM D495 : Standard test method for high-voltage , low current, dry arc resistance od solid electrical insulation.ii). ASTM B633 : Standard specification for electrodeposited coatings of zinc on iron and steel.iii).IEC 60 : High voltage test techniquesiv). 60243-1 : Electrical strength of insulating materials- test method. v). ISO 50124 : Railway applications - insulator coordination.	Size Cable DC 1Cx400 mm-sqr ( 12 (1Cx400 mm-sqr at Power Feed Point Conductor Third Rail & 7 ( 1Cx400 mm-sqr of Track Rail )

□ JAYA CM	DATA TEKNIS PROYEK	Nomor : Halaman :
KADIRAT OPS	TRANSPORTASI	Tanggal :

NAMA PROYEK: LRT JABODEBEKPEMILIK: Direktorat Jenderal Perkereta ApianJENIS PROYEK: Struktur ElevatedLOKASI: DEPOPERIODE PELAKSANAAN: 2015 - 2019, perpanjangan waktu sd 2021

FER	RIODE PELAKSANAAN	: 2015 - 2019 , perpanjangan w	aniu su 2021					
NO	Description				Service Line -3 o	f Depo		Remark
	Securipaen	E	Brand & Type	Volume	Capacity	Unit	Standard Code	Kemark
8	Third Rail of Conductor Power Supply DC Traction System	Brand	Туре	Quantity	Capacity	Unit	Standard Code	Remark
	Material of Power Rail System	:						
	- Conductor Rail	: Railtech	Co-Extruded CR	11.800	4000 A, 750 Volt-DC	m	i). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. Ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iv).IEC 60: High voltage test techniques, v). EN 10088-2: Technical	
	- High Speed Ramp	: Railtech	RAS REF 432765	-	4000 A, 750 Volt-DC	pcs	i). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. Ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iv).IEC 60: High voltage test techniques. v). EN 10088-2: Technical	
	- Expansion joint	: Railtech	RAS REF 432790	788	4000 A, 750 Volt-DC	pcs	i). ASTM A240: Standard spicication for chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications. Ii). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.iii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iv).IEC 60: High voltage test techniques. v). EN 10088-2: Technical	
	- Bracket	: Railtech	RAS REF 432635	2.650	-	pcs	<ol> <li>ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel. v). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose.</li> </ol>	
	- Insulator	: Railtech	RAS REF 432766	2.650	Above Megaohm	pcs	i). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.ii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iii).IEC 60: High voltage test techniquesiv). 60243-1 Electrical strength of insulating materials- test method. v). ISO 50124: Railway applications - insulator coordination.	
	- Cover	: Railtech	RAS REF 432766	11.800		m	i). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel. ii). EN 10088-2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purpose iii). EN 10025: Hot rolled products of structureal.	
	- Power Feed point of Cable terminal	: Railtech	RAS REF 432766	240	4000 A, 750 Volt-DC	pcs	i). ASTM D495: Standard test method for high-voltage, low current, dry arc resistance od solid electrical insulation.ii). ASTM B633: Standard specification for electrodeposited coatings of zinc on iron and steel.iii).IEC 60: High voltage test techniquesiv). 60243-1 Electrical strength of insulating materials- test method. v). ISO 50124: Railway applications - insulator coordination.	Size Cable DC 1Cx400 mm-sqr ( 12 (1Cx400 mm-sqr at Power Feed Point Conductor Third Rail & 7 (1Cx400 mm-sqr of Track Rail )



 NAMA PROYEK
 : LRT JABODEBEK

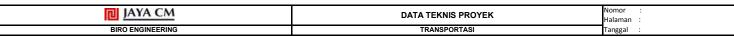
 PEMILIK
 : Direktorat Jenderal Perkereta Apian

 JENIS PROYEK
 : Struktur Elevated

 LOKASI
 : Cibur - Cawang - Dukuh Atas - Bekasi Barat

 PERIODE PELAKSANAAN
 : 2015 - 2019 , pengnjangan waktu sd 2021

PER	ODE PELAKSANAAN	:	2015 - 2019 , perp		sd 2021				
NO	DESKRIPSI		CAWANG -	CIBUBUR					KETERANGAN
	Scada Sistem		VOLUME MERK	SATUAN TYPE	JUMLAH	KAPASITAS	SATUAN	CODE STANDARD	KETERANGAN
$\vdash$	SCADA SISTEM	H							
	Material of Power and facility For OCC		Siemens		1		Server		Physical 2 server
	-	:	Dell Tower		7		Server		
-	-	:	Dell CTO		2		Set		
-	-	H							
	-	:							
	Material of RTU Traction SS		Siemens		22		RTU		Physical 28 RTU
-	-	-	Ruggedcom Siemens	RTUswitch	18 6		set set		
		Ì	Siemens	RTU Sicam	20		set		
			Siemens	RTU Sicam	24		set		
-	_	H	HP	Printer	8		set		
	Material of RTU Distribution SS		Siemens		7		RTU		Physical 8 RTU
	-								
$\vdash$	-	H							
$\vdash$	Material of Portable Work Station	H	Dell		2		Notebook PC		For OCC & BOCC
	-	:	ServerPowerE		14		Set		
	-	븨	Storage		2		set		
$\vdash$		H	Rack		2		set		
	Material of Power and facility For Backup OCC	$\dot{\Box}$	Dell		1		Server		Physical 2 server
-	-	:							
	-	-							
	Material Spare part Service line 1		Cable		14		Drum		
	-	:	Cable Ruggedcom	STP Switch	43 18		Roll Set		
	-		Ruggeucom	SWILCIT	10		Set		
	Material Spare part service line 2		-						
	-	÷							
	-								
	Material Spare part service line 3	:	-						
	-	÷							
	-								
-	Material Instalasi Power and facility SCADA		-						
	-	:							
-	- Material Instalasi RTU Traction SS	:							
	-	÷	-						
	-	÷							
$\vdash$			-						
	-	Ė							
H		H							
-	Tools & Sistem Integrasi Service Line 1	-	-						
	-	:							
$\vdash$	-	H							
	Tools & Sistem Integrasi Service Line 2	÷	-						
<u> </u>	-								
E	<u> -</u>								<u> </u>
	Tools & Sistem Integrasi Service Line 3	$\equiv$	-						
$\vdash$	-	-							
	-	÷							
$\vdash$	Tools & Material Training Service Line 1	H	-						
-	-	H							
	-	Ξ							
$\vdash$	Tools & Material Training Service Line 2		-						
L	-	H							
	-	:							
-	Tools & Material Training Service Line 3	:	-						
	-	Ė							



 NAMA PROYEK
 :
 LRT JABODEBEK

 PEMILIK
 :
 Direktorat Jenderal Perkereta Apian

 JENIS PROYEK
 :
 Struktur Elevated

 LOKASI
 :
 Cibubur - Cawang - Dukuh Atas - Bekasi Barat

 PERIODE PELAKSANAAN
 :
 2015 - 2019 , perpanjangan waktu sd 2021

LOKA PERIO	DDE PELAKSANAAN			ibur - Cawang - Dukuh Atas - Bekasi Barat i - 2019 , perpanjangan waktu sd 2021						
	<u>.</u>	_	CAWANG -		50 E0E 1				VETERANCAN	
NO	DESKRIPSI		VOLUME	SATUAN					KETERANGAN	
10	Telecommunication		MERK	TYPE	JUMLAH	KAPASITAS	SATUAN	CODE	KETERANGAN	
	TELECOMMUNICATION							STANDARD		
	TELECOMMUNICATION	:								
1	Material of Communication Backbone Network Service Line 1	:	OTN System	MPLS-TP	286		unit			
	-	:	XTRAN Power Cable		39	8320	unit m			
	-	:	Grounding Cable			2680	m			
			UTP/STP cables FO 48core			31500 30668	m m			
			FO 12core			30639	m			
			FO 6 core Rack Mounted	FO 48core	16	33118	m unit			
			Rack Mounted Rack Mounted	FO 12core FO 6 core	16 14		unit unit			
			Cable tray	3m	405		unit			
2	Material of Telephone System Service Line 1	:	Avaya	Main PABX	3		unit			
	-	÷		Sub PABX IP Phone	8 200		unit unit			
	-									
3	Material of Radio Communication System Service Line 1	:	Teltronic	RTP300 Indoor M	8 4		unit unit			
				Indoor S	4		unit			
	-		Antenna Pole UPS	12m Laplace	5 5		unit unit			
			Battery UPS		10		unit			
4	- Material of Passenger Information Display System Service Line 1	:	Simpleway	Master Clock	1		unit			
=		-	Simpleway Samsung	NTP Signage	2 53		unit unit			
	-	:	Samsung	Signage	23		unit			
			Infotec Infotec	55" TFT LED Clock	16 16		unit unit			
			Infotec	55" TFT	59		unit			
			Infotec Infotec	Analog Digital	59 175		unit unit			
			Infotec	Analog Digital	4 5		unit			
	-	:	Infotec				unit			
5	Material of Clock System Service Line 1		Brandywine	Analog Digital	13 38		unit unit			
	-	:		Double Side	59		unit			
6	- Material of CCTV System Service Line 1	:	BOSCH	Fix Dome	728		unit			
Ť	-	:	5000.1	PTZ Dome	182		unit			
	-									
7	Material of Public Address System Service Line 1	÷	BOSCH	PowerAmp	25		unit	96		
	-	:		SoundP Loudspeaker	91 289		unit unit	381 1183		
	-	:		Noise Cancel	17		unit	55		
8	Material of Intercom System Service Line 1		TVM	Helios2B	41		unit			
	water an or intercom by stem ber rice zame i			Helios1B	60		unit			
	-	:		HeliosE Indoor	77 22		unit unit			
9		:	BOSCH	Access Reader			unit			
	-			Access Control Lock	64 255		unit unit			
	-	:		Brake Glass	255		unit			
10	Material of Fire Alarm System Service Line 1		BOSCH	AlarmModule Main Control	23 20		unit unit			
	Water in VII it common system service blue I		FPA5000	Display	108		unit			
				Detector Bell	2468 318		unit unit			
		:		Strobe Manual call	318 318		unit unit			
				Keypad	26		unit			
1	- Material of Communication Backbone Network Service Line 2		OTN System	MPLS-TP						
	-	:	XTRAN	20 11						
		:							<u>                                     </u>	
2		:	Avaya	Main PABX Sub PABX						
	- -	:		Sub PABX IP Phone						
3		:		RTP300						
J	- States of Raulo Communication System Service Lille 2	:	renorme	1111 000						
4		:	Simpleway							
	-	:						1		
_		:	Brandwine		_					
J	Material of Clock System Service Line 2	:	Brandywine							
		:								
6		:	BOSCH							
	-									
_	-	:								
7	Material of Public Address System Service Line 2		Bosch							
	-	:								
8	- Material of Intercom System Service Line 2	:	TVM	Helios						
		:		IP Force						
	- -	:								
9	Material of Access Control System Service Line 2	:	Bosch							
	-	:								
10	- Material of Fire Alarm System Service Line 2	:	Bosch							
٠.	- STATE CHART SQUEEN SETTICE EINE &	:	DOOUT							
	•	:						<u> </u>	1	

	DESKRIPSI		CAWANG -	CIBUBUR				KETERANGAN	
NO	DESKRIPSI		VOLUME	SATUAN				RETERANGAN	
	-								
1	Material of Communication Backbone Network Service Line 3	• •	OTN System	MPLS-TP					
	<u> </u>	:	XTRAN						
	-	-							
2	Material of Telephone System Service Line 3	÷	Avaya	Main PABX					
2	Material of Telephone System Service Line 3	÷	Avaya	Sub PABX					
		÷		IP Phone					
	•	÷		11 1 110110					
3	Material of Radio Communication System Service Line 3	:	Teltronic	RTP300					
	-	:							
	-	٠.							
	-	:							
4	Material of Passenger Information Display System Service Line 3	:	Simpleway						
	-	:							
	•	:							
5	- Material of Clock System Service Line 3	-	Brandywine						
5	Material of Clock System Service Line 3	÷	Brandywine						
-	-	÷							
-		÷							
6	Material of CCTV System Service Line 3	÷	BOSCH						
	-	:							
	-	:							
	-	• •							
7	Material of Public Address System Service Line 3	• •	Bosch						
	-	:							
	-	:							
	-	-	T) () (	11-8					
8	Material of Intercom System Service Line 3	-	TVM	Helios IP Force					
	•	÷		IP Force					
$\rightarrow$		÷							
9	Material of Access Control System Service Line 3	÷	Bosch						
	-	÷							
	•	:							
	-	:							
10	Material of Fire Alarm System Service Line 3	٠.	Bosch		_				
	-	:			·			-	
	-	:							
	-	:							
,		1:							



TRANSPORTASI

Nomor : Halaman :

Tanggal :

NAM	A PROYEK	.	LRT JABODEBE	K								
PEMILIK  JENIS PROYEK  LOKASI  PERIODE PELAKSANAAN		: Direktorat Jenderal Perkereta Apian										
			: Struktur Elevated									
				ng - Dukuh Atas	- Bekasi Barat							
	DE L'ELANGIANI		2015 - 2019 , perpanjangan waktu sd 2021  CAWANG - CIBUBUR									
NO	DESKRIPSI	-	CAWAITO - CIDODOIX						KETERANGAN			
11	SIGNALING SYSTEM		MERK	TYPE	JUMLAH	KAPASITAS	SATUAN	CODE STANDARD	KETERANGAN			
<del> </del>	Material of OCC Signaling System	1 - 1										
	- OCC Equipment complete with all accessories				1		set	I	ATS, ATP, maviola, Video wall			
_	- Backup OCC Equipment complete with all accessories			+	1		set		7110, 7111 , maviola, video wall			
<del>                                     </del>	Buckup OCC Equipment complete with all accessories	H			<u> </u>		301					
	Material of Wayside Signaling System	:										
	- Fixed Balise complete with all accessories	:	Siemens	Trainguard Eurobalises S2 1	612							
	- Euroloop complete with all accessories	: [	NA	-	-							
	- Switchable Balise complete with all accessories		NA	-	-							
	- Lineside Electronic Unit (LEU) complete with all accessories											
	- Axle Counter System Complete with Evaluator and all accessories	:	Siemens	ZP D43	164		set	siemens standart				
	- Signal Head - complete with pole and accessories	:	Siemens	LD160PE	114		set	EN 60529 EN12368 EN600682- 27/30/60 EN60259				
	- Signal Head + Shunting - complete with pole and accessories	:										
	- Shunting Aspect - complete with pole and accessories	:										
	- Semboyan 8 E - Shunt Limit Marker	:	local									
	- Semboyan 10 A - Home Signal	:	local	visual	14		unit	PM44				
	- Semboyan 10 G - Station Stop Limit	:	local	visual	16		unit	PM44				
	- Stop Marker complete with all accessories	:	local	visual	2		unit	PM44				
	- Fixed Speed Limit Marker - complete with all accessories	:	local	visual	48		unit	PM44				
	- Electric Point Control System /Point/Switch Machine - complete with all accessories	:	Siemens	BSG9	46		unit					
	- Grounding Material				3		set/line	PM44				
	- Signal Head - Cross Aspect						3331110	1				
	access Point		Siemens	TGM-A44	215		set	IEEE802.3				
		$\vdash$	2.2.710110				301					
	Material of Station Signaling System	H										
	- Interlocking System for Cawang - Cibubur Line	$\vdash$	Siemens	Westrack II	4		set	IEC 62280-1				
	- Interlocking System for Cawang - Dukuh Atas Line	$\vdash$	Siemens	Westrack II	8		set	EB50128				
	- Interlocking System for Cawang - Bekasi Timur Line	H	Siemens	Westrack II	5		set	EB50128 EN50129				
	- Local Control Workstation complete with all accessories		Dell	VVCGUACK II	<u>3</u> 1		set	11130127				
	- Communication System		air link		1			IEC 60793-1				

NO	DESKRIPSI	一	CAWANG - CIBUBUR						KETERANGAN
NO	DESKRIPSI								KETERANGAN
11	SIGNALING SYSTEM		MERK	TYPE	JUMLAH	KAPASITAS	SATUAN	CODE STANDARD	KETERANGAN
	- Power Supply System from LVMDP to SDP	:	scheneider	TCSS	17		set	EN 60529 IEC62128-1 IEC6050-1 PUIL	
	- Dwelling Time Display System	1:		,	1				
		: 1	1	<u>,                                     </u>	<u> </u>				
	Material of On Board Signaling System	ات		<u> </u>					
	- Trainborne / On-board ATP system complete with accessories for each trainset	:	Siemens		31	1	set	EN50155	31 trainset
	- Balise Antenna complete with accessories	1 :	Siemens		31x2		pcs	EN60950-1	
	- Display Machine Interface - DMI complete with accessories		Dell		31x2		pcs	DIN41494	
	- Radar Equipment - complete with accessories	1:	Siemens		31x2		pcs	EN50155	
	- Odometer - complete with accessories		Siemens		31x2		pcs	DIN41494	
				<u></u> '					
			1	<u> </u>					

JAYA CM  KADIRAT OPS				D	Nomor : Halaman : Tanggal :						
			TRANSPORTASI Tanggal :								
NAMA PROYEK		:	: LRT JABODEBEK								
PEMILIK		:	Direktorat Jenderal Perkereta Apian								
JENIS PROYEK		:	Struktur Elevated								
LOKASI		:	Cibubur - Cawang - Dukuh Atas - Bekasi Barat								
PERIODE PELAKSANAAN			2015 - 2019 , perpanjangan waktu sd 2021								
NO	DESKRIPSI		CAWANG -	CAWANG - CIBUBUR					KETERANGAN		
NO	DESKRIF SI		VOLUME	SATUAN					RETERANGAN		
12	Half Height Platform Screen Door (HHPSD)		MERK	TYPE	JUMLAH	KAPASITAS	SATUAN	CODE STANDARD	KETERANGAN		
	Material HALF HEIGHT PLATFORM SCREEN DOOR (HHPSD)	:	STE assembling	HHPSD	Jumlah berdasarkan stasiun						
	Material Half Height Platform Screen Door (HHPSD) & Material Grounding Cibubur	:		dedicatedd	17		set				
	-	:									
	-	:									