

STATE NUCLEAR ELECTRIC POWER PALNNING DESIGN & RESEARCH INSTITUTE

KASAMA 330/66kV SUBSTATION PROJECT As Built DESIGN PHASE CATALOGUE NO. 1

RETRIEVE NUMBER

100-BA06221Z-D0201

ELECTRICAL PART ROLL NO. 2 VOLUME NO. 1 BOOK NO. TOTAL 2VOLUME TITLE 330kV switchgear Layout & Equipment InstallationQTY. 25 PAGE 0 VOLUME INSTRUCTION 0 VOLUME DETAILED LIST 0 VOLUMEAPPRD. 苏光 CHKD. 何冰2015 YEAR 10 MONTH 20 DAY RVED. 马忠坤 DSGD. 葛文捷

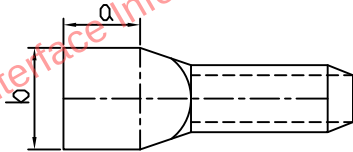
NO.	DWG.NO.	DWG.TITLE.	QTY.	ORIGINAL PROJECT TITLE, RETRIEVE NUMBER AND DWG.TITLE. FOR APPLICATION
1	BA06221Z-D0201-01	Volume Description	1	
2	BA06221Z-D0201-02	330kV Single Line Diagram	1	
3	BA06221Z-D0201-03	330kV Switchgear Arrangement Plan and Layout Drawing	1	
4	BA06221Z-D0201-04	330kV Transformer Bay Sectional Drawing	1	
5	BA06221Z-D0201-05	330kV PENSULO Line Bay Sectional Drawing	1	
6	BA06221Z-D0201-06	330kV Bus Coupler Bay Sectional Drawing	1	
7	BA06221Z-D0201-07	330kV Bus Shunt Reactor Bay Sectional Drawing	1	
8	BA06221Z-D0201-08	330kV Bus Plan and Sectional Drawing	1	
9	BA06221Z-D0201-09	List of 330kV Major Equipments and Materials	1	
10	BA06221Z-D0201-10	LTB420E2-50kA Type SF6 Circuit Breaker Installation Drawing	1	
11	BA06221Z-D0201-11	GW7B-363W Type Isolating switch (Un-Earthing) Installation Drawing	1	
12	BA06221Z-D0201-12	GW7B-363DW Type Isolating switch (Single-Earthing) Installation Drawing	1	
13	BA06221Z-D0201-13	AGU-363 Type Current Transformer Installation Drawing	1	
14	BA06221Z-D0201-14	VCU-363 Type Capacitor Voltage Transformer Installation Drawing	1	
15	BA06221Z-D0201-15	Y10W-300/727 Type Lightning Arrester Installation Drawing	1	
16	BA06221Z-D0201-16	ZSW-363/12.5K-4 Type Insulator Installation Drawing	1	
17	BA06221Z-D0201-17	29(XWP3-160) Type Single Insulator Tension String Drawing (Single-Conductor)	1	
18	BA06221Z-D0201-18	28(XWP3-100) Type Single Insulator Suspension String Drawing (with Strain Clamps, Single-Conductor)	1	
19	BA06221Z-D0201-19	29(XWP3-160) Type Single Insulator Tension String Drawing (Double-Conductor)	1	
20	BA06221Z-D0201-20	28(XWP3-100) Type Single Insulator Suspension String Drawing (with Strain Clamps, Double-Conductor)	1	
21	BA06221Z-D0201-21	28(XWP3-100) Type Single Insulator Suspension String Drawing (with Suspension Clamps, Double-Conductor)	1	
22	BA06221Z-D0201-22	2x29(XWP3-160) Type Double Insulator Tension String Drawing (Double-Conductor)	1	
23	BA06221Z-D0201-23	4(XWP3-70) Type Single Insulator Suspension String Drawing (Single-Conductor)	1	
24	BA06221Z-D0201-24	4(XWP3-70) Type Single Insulator Suspension String Drawing (Double-Conductor)	1	

Remark :

100-BA06221Z-D0201

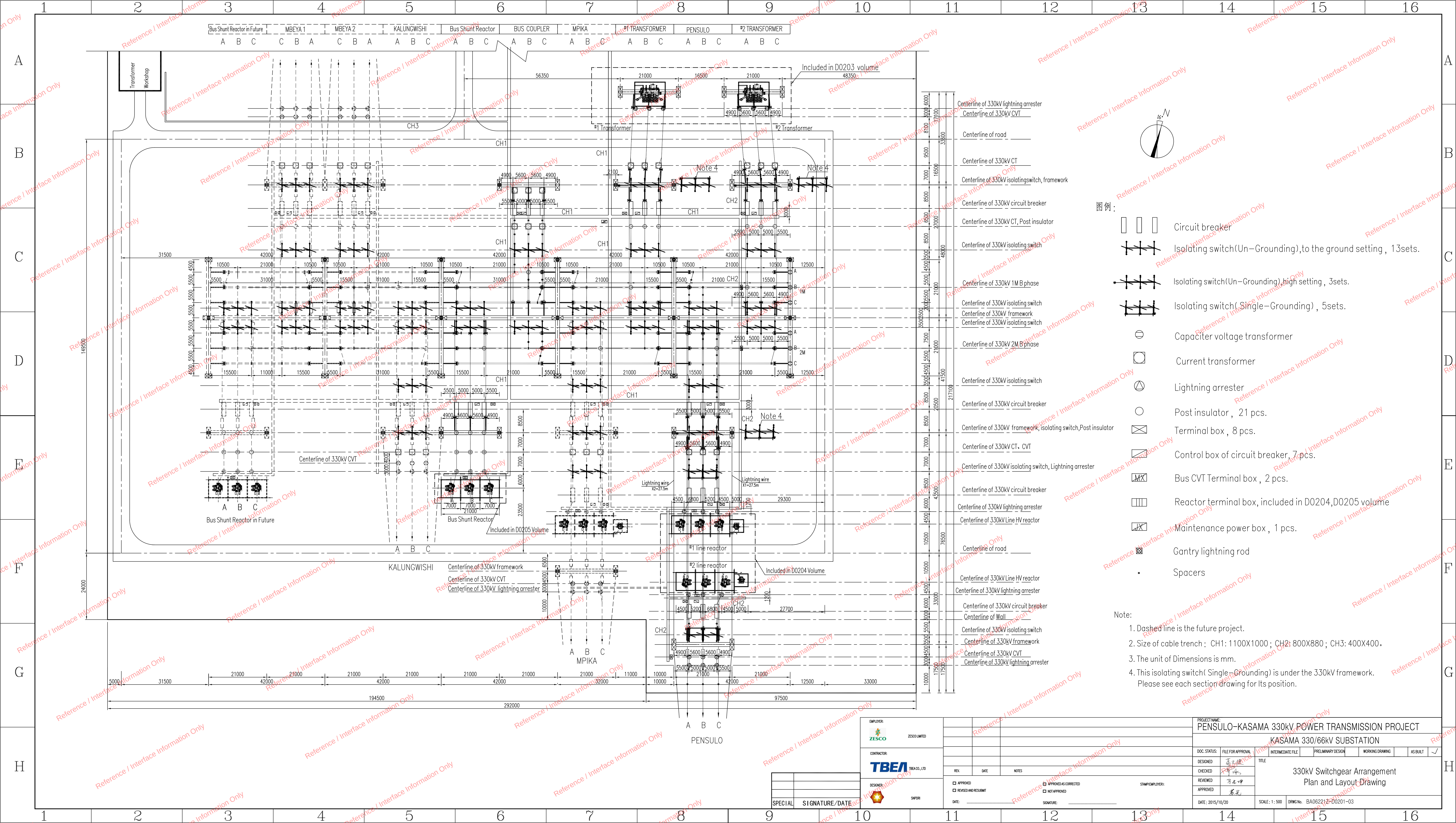
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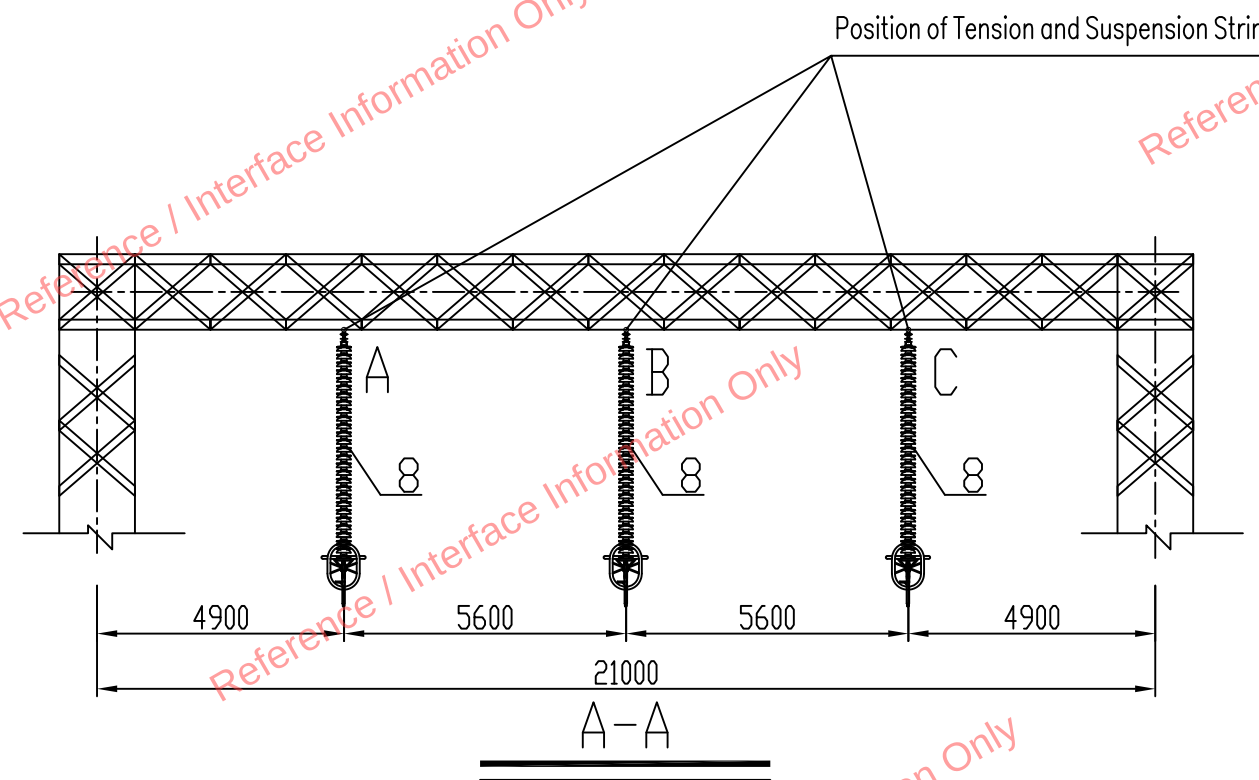
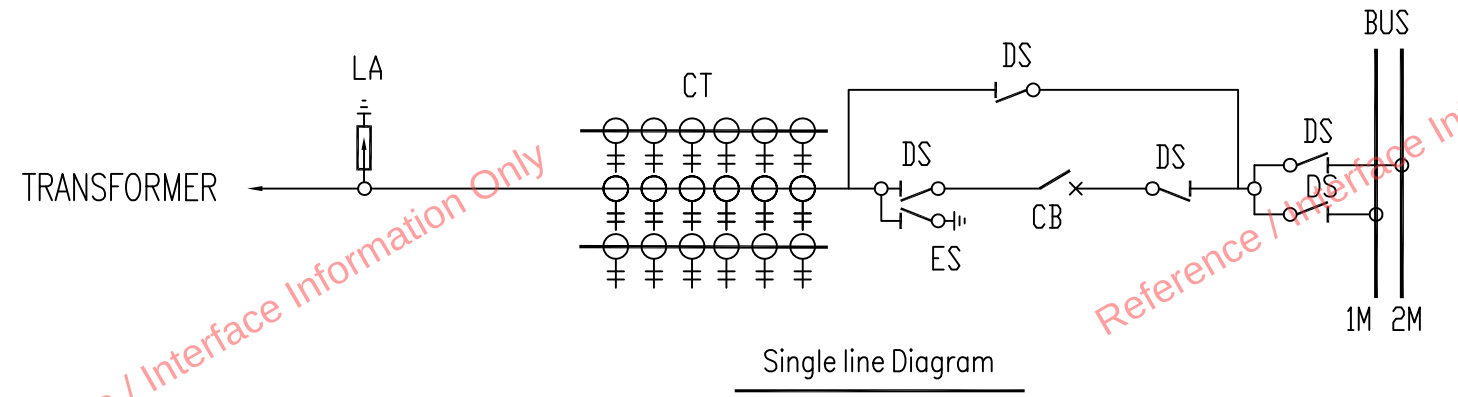
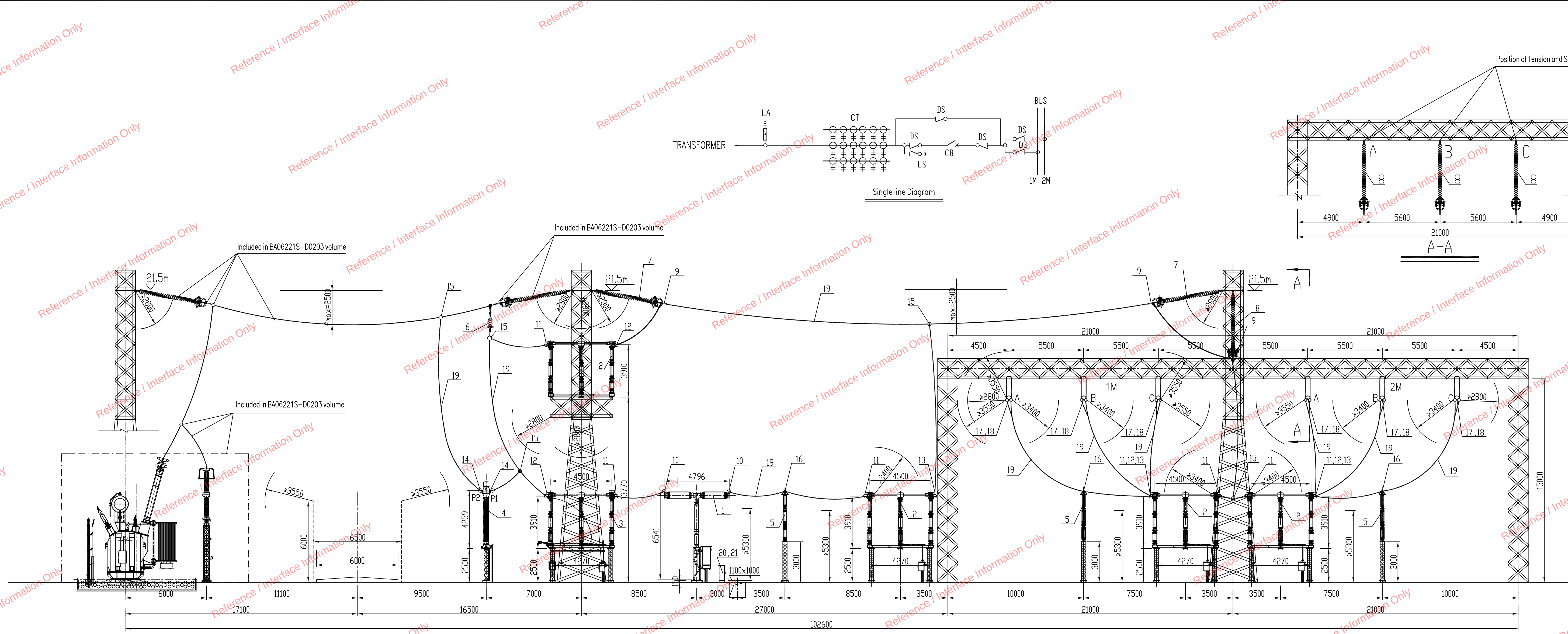
Remark :

	1	2	3	4	5	6																																																																											
A	Volume Description 1. This volume design range: The content of this volume includes 330kV single drawing, switchgear layout and sections, equipment installations, and so on. 2. All the electrical equipment and boxs should be reliably grounded , the grounding materials are included in D0208 volume. 3. The outer insulation of 330kV outdoor electrical equipment adjusted at 2000m altitude, the altitude of the site is 1350m. The minimum safety clearance of 330kV Outdoor equipments adjusted at 2000m altitude, as follows: <table><tr><td>item</td><td>A1</td><td>A2</td><td>B1</td><td>B2</td><td>C</td><td>D</td></tr><tr><td>Value(mm)</td><td>2800</td><td>3400</td><td>3550</td><td>2900</td><td>5300</td><td>4800</td></tr></table> The minimum safety clearance of the outdoor switchgear arrangement as follows, A1, (1) Phase-to- ground;(2) Position above the gauze railing and at 2500mm above ground -to- live part which above the gauze railing; A2 ,(1) Phase-to-phase;(2) Live parts of conductors which at two sides of the breaker and isolating switch. B1,(1) External outline of equipment-to- live part when transportation(2) Between the across live parts which not with railing when maintenance isn't at while cutting power at the same time.(3) Fence-to- insulator or live part; (4) Live part -to- ground when live-line working; B2, Gauze railing-to- live part; C, Bare conductor-to- ground or top of construction; D,(1) live part-to-border of construction;(2) Between the parallel live parts which not with railing when maintenance isn't at while cutting power at the same time. 4. The creepage distance of 330kV electrical equipment shuold ≥ 3.1cm/kV. 5. All steel components shall be made of galvanized corrosion protection, welds brushing rust brushing three times. 6. The axb in the device clamp model of this volume indicates the size of clamp, as shown below, please note that when ordering.  7. The installation distance of spacers for 330kV lead lines and equipment connection lines is 2m, split spacing is 200mm; the installation distance of spacers for 330kV overhead lines is 5m, split spacing is 400mm.						item	A1	A2	B1	B2	C	D	Value(mm)	2800	3400	3550	2900	5300	4800																																																													
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D	<table><tr><td>EMPLOYER:  ZESCO LIMITED</td><td></td><td></td><td></td><td colspan="3">PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT KASAMA 330/66kV SUBSTATION</td></tr><tr><td>CONTRACTOR:  TBEA CO., LTD</td><td></td><td></td><td></td><td>DOC. STATUS:</td><td>FILE FOR APPROVAL</td><td>INTERMEDIATE FILE</td><td>PRELIMINARY DESIGN</td><td>WORKING DRAWING</td><td>AS BUILT</td><td>✓</td></tr><tr><td rowspan="3">DESIGNER:  SNPDR</td><td>REV.</td><td>DATE</td><td>NOTES</td><td>DESIGNED</td><td>葛文捷</td><td colspan="5" rowspan="3">TITLE Volume Description</td></tr><tr><td></td><td></td><td></td><td>CHECKED</td><td>李永</td></tr><tr><td></td><td></td><td></td><td>REVIEWED</td><td>马志坤</td></tr><tr><td></td><td></td><td></td><td></td><td>APPROVED</td><td>苏光</td><td colspan="5"></td></tr><tr><td colspan="3">☐ APPROVED ☐ REVISED AND RESUBMIT</td><td colspan="3">☐ APPROVED AS CORRECTED ☐ NOT APPROVED</td><td colspan="2">STAMP(EMPLOYER):</td><td colspan="3">DATE: 2015/10/20</td><td>SCALE: 1: -</td><td>DRWG No. BA06221Z-D0201-01</td></tr><tr><td colspan="3">DATE:</td><td colspan="3">SIGNATURE:</td><td colspan="6"></td></tr></table>						EMPLOYER:  ZESCO LIMITED				PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT KASAMA 330/66kV SUBSTATION			CONTRACTOR:  TBEA CO., LTD				DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE	PRELIMINARY DESIGN	WORKING DRAWING	AS BUILT	✓	DESIGNER:  SNPDR	REV.	DATE	NOTES	DESIGNED	葛文捷	TITLE Volume Description								CHECKED	李永				REVIEWED	马志坤					APPROVED	苏光						☐ APPROVED ☐ REVISED AND RESUBMIT			☐ APPROVED AS CORRECTED ☐ NOT APPROVED			STAMP(EMPLOYER):		DATE: 2015/10/20			SCALE: 1: -	DRWG No. BA06221Z-D0201-01	DATE:			SIGNATURE:								
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EMPLOYER:  ZESCO LIMITED					PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT										
					KASAMA 330/66kV SUBSTATION										
CONTRACTOR:  TBEA CO., LTD					DOC. STATUS:	FILE FOR APPROVAL		INTERMEDIATE FILE		PRELIMINARY DESIGN		WORKING DRAWING		AS BUILT	☒
					DESIGNED	葛文捷	TITLE								
					CHECKED	李冰	330kV Single Line Diagram								
DESIGNER:  SNPDRI		☐ APPROVED	☐ APPROVED AS CORRECTED		STAMP(EMPLOYER):										
		☐ REVISED AND RESUBMIT	☐ NOT APPROVED												
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					DATE :2015/10/20			SCALE :1: -		DRWG No. BA06221Z-D0201-02					





Datasheet of wires construction										
Cross Wire of 330kV Transformer, LGKK-600/50 Distance L=33.6m fmax=2.5m										
Temperature t(°C)	40	35	30	25	20	15	10	5	0	-5
Horizontal Strength H(N)	10514.5	10528.7	10542.9	10557.1	10571.4	10585.7	10600.8	10615.3	10629.8	10644.4
Wire sag f(m)	2.482	2.478	2.475	2.472	2.468	2.465	2.462	2.458	2.455	2.451

Cross Wire of 330kV Transformer, LGKK-600/50 Distance L=48m fmax=2.5m										
Temperature t(°C)	40	35	30	25	20	15	10	5	0	-5
Horizontal Strength H(N)	11623	11648.6	11674.5	11700.5	11726.7	11753.1	11779.6	11806.4	11833.3	11860.4
Wire sag f(m)	2.471	2.468	2.460	2.454	2.449	2.444	2.438	2.432	2.427	2.421

Equipment Materials List					
No.	Name	Type	Q.	Unit	Remark
1	SF6 Circuit breaker	LTB420E2-50KA 4000A	1	set	
2	Isolating switch	GW7B-363W 2500A , Un-Grounding	4	set	
3	Isolating switch	GW7B-363DW 2500A , Single-Grounding	1	set	
4	Current transformer	AGU-363 600-1200/1A/0.1VA/PX/SP40 300-600/1A/0.1VA/0.2S, PX/PX/PX/SP40/0.2S/0.2S	3	set	10/10/10/10/10/10VA
5	Post insulator	ZSW-363/12.5K-4	5	pcs.	
6	Single Insulator Suspension String	4 (XWP3-70)	3	string	Single-Conductor See "BA06221S-D0201-23"
7	Single Insulator Tension String	29 (XWP3-160)	6	string	Single-Conductor See "BA06221S-D0201-17"
8	Single Insulator Suspension String	28 (XWP3-100)	3	string	Single-Conductor See "BA06221S-D0201-18"
9	Strain Clamps	NYH-600K/600K	9	set	With drainage Clamps,with mandrel
10	Terminal Clamps	SY-1400C-125x145	6	set	With Mandrel, use for LGKK- 600
11	Terminal Clamps	SY-1400A-110x102	17	set	With Mandrel, use for LGKK- 600
12	Terminal Clamps	SY-1400B-110x102	8	set	With Mandrel, use for LGKK- 600
13	Terminal Clamps	SY-1400C-110x102	5	set	With Mandrel, use for LGKK- 600
14	Terminal Clamps	SY-1400B-110x100	6	set	With Mandrel, use for LGKK- 600
15	T-Connectors(Type TLY)	TLY-600K/600K	15	set	
16	Supports for Single Cables(Type MDG)	MDG-51 ((4-Φ18)Φ127)	5	set	use for LGKK- 600
17	T-Connectors (Type TLS)	TLS-600K/400	6	set	
18	Terminal Clamps	SY-1400A- 125X125	6	set	With Mandrel, use for LGKK- 600
19	Al-Steel expanding hollow conductor	LGKK-600	580	m	
20	Terminal Box	XW1	1	pcs.	Included in Control Professional
21	Control Box of Circuit Breaker		1	pcs.	Provided by manufacturer

Explanation: 1. The material listed in the table are counted by one bay.
2. The unit of Dimensions is mm.

EMPLOYER:	ZESCO LIMITED	PROJECT NAME:	PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT					
CONTRACTOR:	TBEA CO., LTD	KASAMA 330/66 kV SUBSTATION						
DESIGNER:	SNPDRI	DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE	PRELIMINARY DESIGN	WORKING DRAWING	AS BUILT	✓
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REVISED AND RESUBMIT		DATE:	NOT APPROVED	SCALE: 1:150				
SIGNATURE/DATE		DATE:	SIGNATURE:	DRWG No. BA06221Z-D0201-04				

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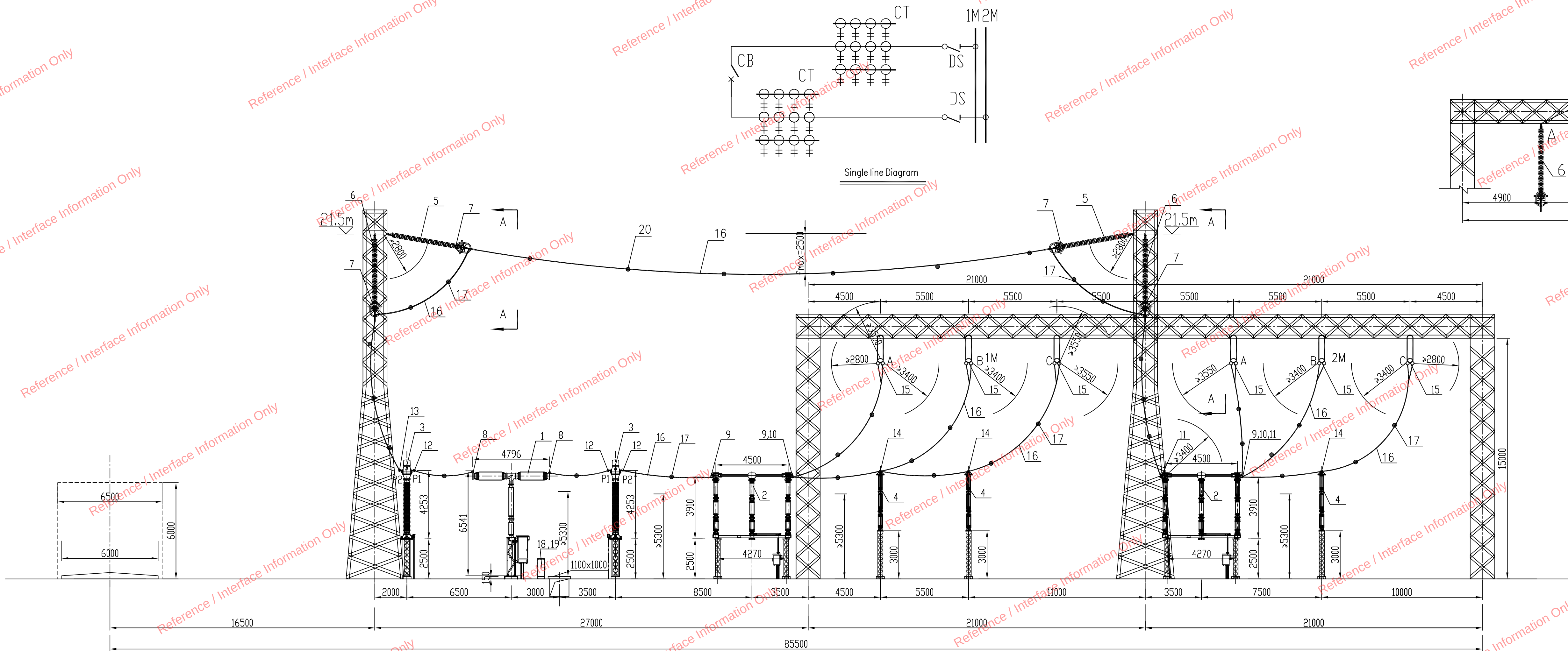
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Datasheet of wires construction										
Cross Wire of 330kV Bus Coupler, 2xLGKK-600/50 Distance L=48m fmax=2.5m										
Temperature t(°C)	40	35	30	25	20	15	10	5	0	-5
Horizontal Strength H(N)	14788.2	14828.8	14869.7	14911	14952.6	14994.6	15036.9	15079.6	15122.6	15166
Wire sag f(m)	2.464	2.457	2.450	2.443	2.437	2.430	2.423	2.416	2.409	2.402

Equipment Materials List					
No.	Name	Type	Q.	Unit	Remark
1	SF6 Circuit breaker	LTB420E2-50kA 4000A	1	set	
2	Isolating switch	GW7B-36.3W 2500A , Un-Grounding	2	set	
3	Current transformer	AGU-363 1200~2400/1A;10VA 0.25/PK/PK/PK 0.25 draw out 600~1200/1A;10VA	6	set	10/10/10/10VA
4	Post insulator	ZSW-363/12.5K-4	4	pcs.	
5	Single Insulator Tension String	29 (XWP3-160)	6	string	Double-Conductor See "BA062215-D0201-19"
6	Single Insulator Suspension String	28 (XWP3-100)	6	string	Double-Conductor See "BA062215-D0201-20"
7	Strain Clamps	NYH-600K/600K	24	set	With drainage Clamps,with mandrel
8	Terminal Clamps For Double-Bundle Conductor	SSY-1400/200C-125x145	6	set	With Mandrel , use for LGKK- 600
9	Terminal Clamps For Double-Bundle Conductor	SSY-1400/200A-110x102	6	set	With Mandrel , use for LGKK- 600
10	Terminal Clamps For Double-Bundle Conductor	SSY-1400/200B-110x102	2	set	With Mandrel , use for LGKK- 600
11	Terminal Clamps For Double-Bundle Conductor	SSY-1400/200C-110x102	4	set	With Mandrel , use for LGKK- 600
12	Terminal Clamps For Double-Bundle Conductor	SSY-1400/200A-115x200	9	set	With Mandrel , use for LGKK- 600
13	Terminal Clamps For Double-Bundle Conductor	SSY-1400/200B-115x200	3	set	With Mandrel , use for LGKK- 600
14	Supports for Double Cables (Type MSG)	MSG-51/200 ((4-Φ18)Φ127)	4	set	
15	T-Connectors (Type TLY)	TLY- 600K/600K	12	set	
16	Al-Steel expanding hollow conductor	2xLGKK-600	800	m	Has been converted into a single
17	Spacers	JS-600K/200	125	set	use for leading wire and conductor between equipments
18	Terminal Box	XW1	1	pcs.	Included in Control Professional
19	Control Box of Circuit Breaker		1	pcs.	Provided by manufacturer
20	Spacers	JS-600K/400	27	set	use for cross wire

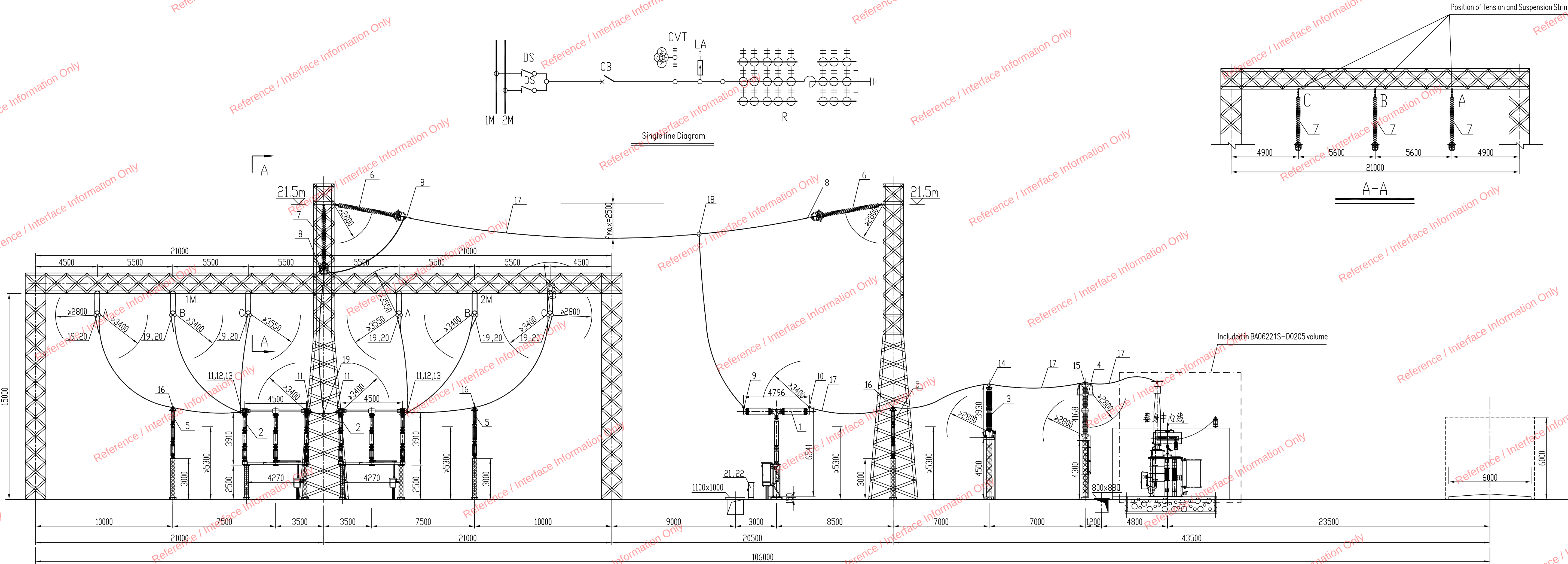
Explanation: 1. The material listed in the table are counted by one bay.
2. The unit of Dimensions is mm.

SPECIAL	SIGNATURE/DATE

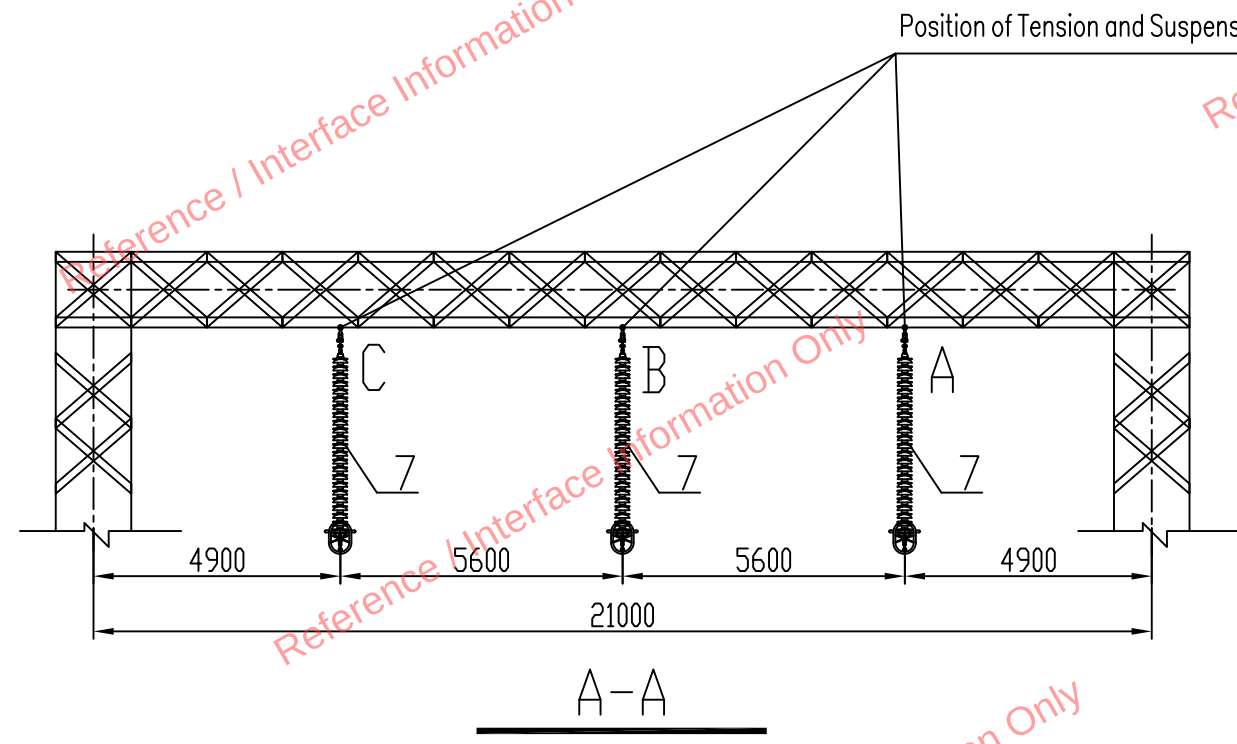
EMPLOYER:	ZESCO LIMITED
CONTRACTOR:	TBEA CO., LTD
DESIGNER:	SNPDRI

REV.	DATE	NOTES
APPROVED	APPROVED AS CORRECTED	STAMP(EMPLOYER):
REVISED AND RESUBMIT	NOT APPROVED	
DATE:	SIGNATURE:	

PROJECT NAME					
PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT					
KASAMA 330/66 kV SUBSTATION					
DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE	PRELIMINARY DESIGN	WORKING DRAWING	AS BUILT
DESIGNED	高文健	TITLE			
CHECKED	李永	330kV Bus Coupler Bay Sectional Drawing			
REVIEWED	马志坤				
APPROVED	苏光				
DATE: 2015/10/20		SCALE: 1:150	DWG No. BA06221Z-D0201-06		



Explanation: 1. The material listed in the table are counted by one bay.
2. The unit of Dimensions is mm.

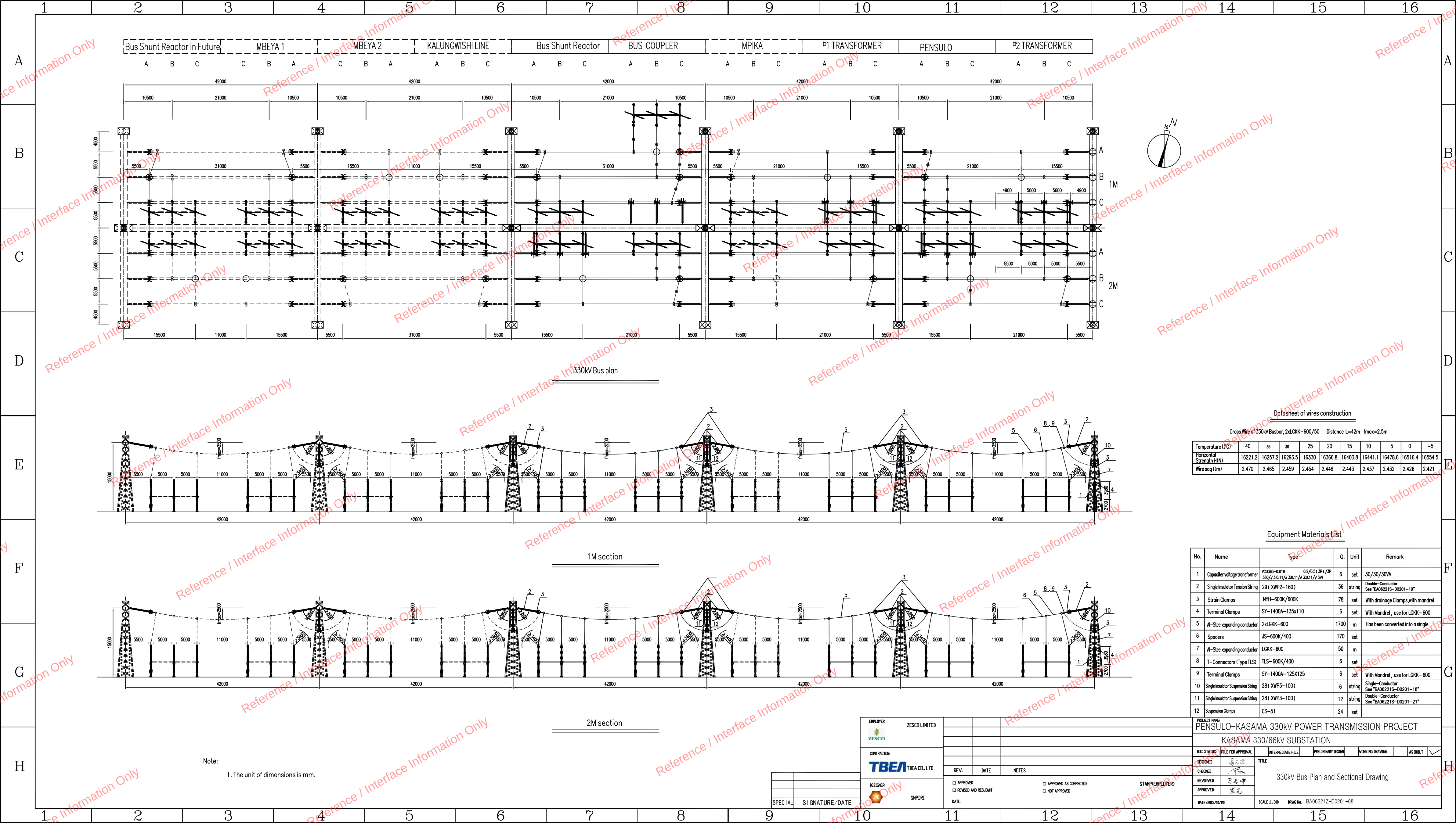


Datasheet of wires construction										
Cross Wire of 330kV Busbar reactor, LGKK-600 Distance L=41.5m fmax=2.5m										
Temperature t(°C)	40	35	30	25	20	15	10	5	0	-5
Horizontal Strength H(N)	9929.4	9944.1	9958.9	9973.8	9988.7	10003.6	10018.7	10033.8	10048.9	10064.2
Wire sag f(m)	2.481	2.478	2.474	2.470	2.467	2.463	2.459	2.455	2.452	2.448

Equipment Materials List					
No.	Name	Type	Q.	Unit	Remark
1	SF6 Circuit breaker	LTB420E2-50kA 4000A	1	set	
2	Isolating switch	GW7B-363W 2500A Un-Grounding	2	set	
3	Capacitor voltage transformer	VCU363-0.009H 0.2/0.5(3P)/3P 330/√3.0.11/√3.0.11/√3.0.11/√3kV	3	set	30/30/30VA
4	Lightning arrester	Y10W-300/727	3	set	
5	Post insulator	ZSW-363/12.5K-4	5	pcs.	
6	Single Insulator Tension String	29 (XWP3-160)	6	string	Single-Conductor See "BA06221S-D0201-17"
7	Single Insulator Suspension String	28 (XWP3-100)	3	sreing	Single-Conductor See "BA06221S-D0201-18"
8	Strain Clamps	NYH-600K/600K	9	set	With drainage Clamps,with mandrel
9	Terminal Clamps	SY-1400B-125x145	3	set	With Mandrel, use for LGKK- 600
10	Terminal Clamps	SY-1400C-125x145	3	set	With Mandrel, use for LGKK- 600
11	Terminal Clamps	SY-1400A-110x102	8	set	With Mandrel, use for LGKK- 600
12	Terminal Clamps	SY-1400B-110x102	2	set	With Mandrel, use for LGKK- 600
13	Terminal Clamps	SY-1400C-110x102	2	set	With Mandrel, use for LGKK- 600
14	T-Connectors(Type TL)	TL-600KA-135x110	3	set	
15	T-Connectors(Type TL)	TL-600KA-200x160	3	set	
16	Supports for Single Cables(Type MDC)	MDG-51 ((4-φ18)φ127)	5	set	use for LGKK- 600
17	Al-Steel expanding hollow conductor	LGKK-600	400	m	
18	T-Connectors(Type TLY)	TLY-600K/600K	6	set	
19	T-Connectors(Type TLS)	TLS-600K/400	6	set	
20	Terminal Clamps	SY-1400A-125K125	6	set	With Mandrel, use for LGKK- 600
21	Terminal Box	XW1	1	pcs.	Included in Control Professional
22	Control Box of Circuit Breaker		1	pcs.	Provided by manufacturer

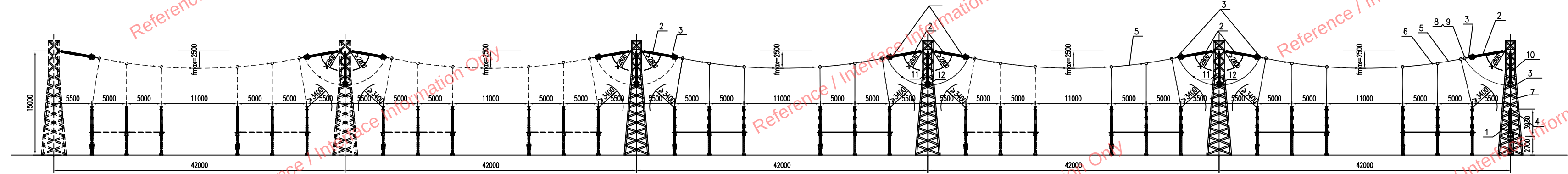
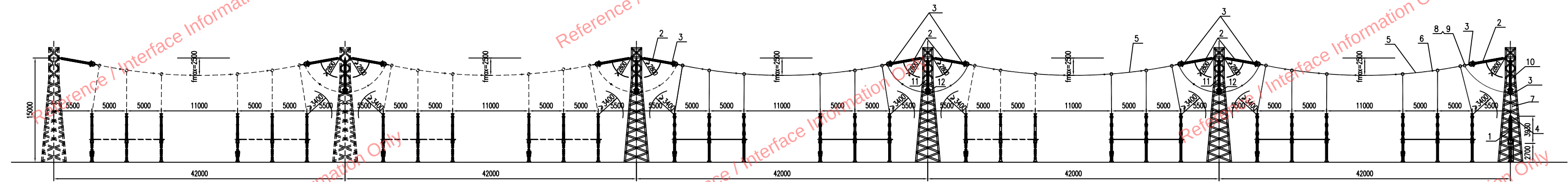
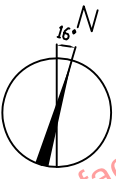
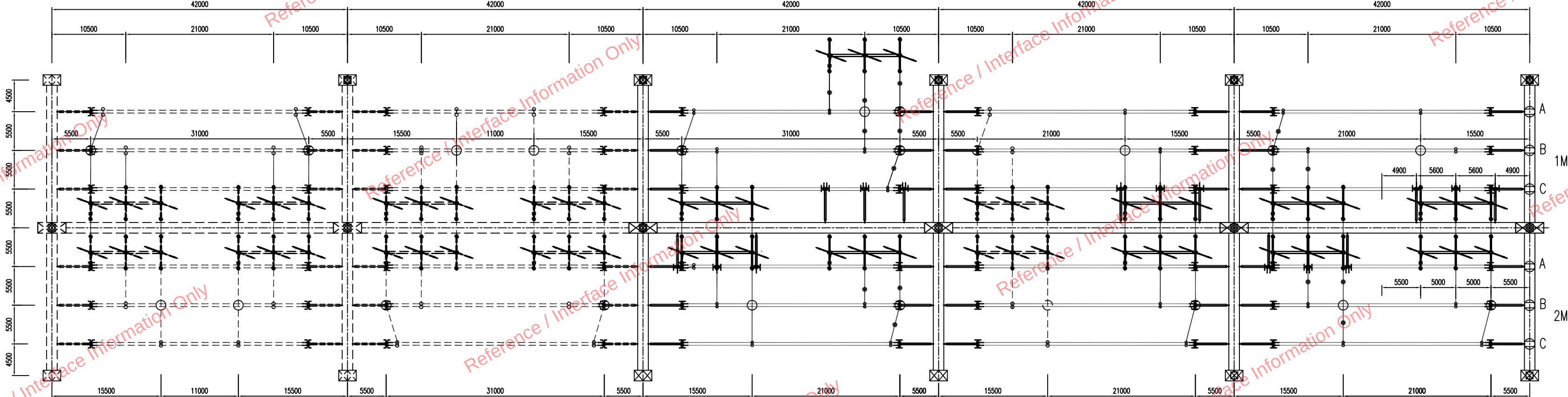
PROJECT NAME					
PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT					
KASAMA 330/66kV SUBSTATION					
DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE	PRELIMINARY DESIGN	WORKING DRAWING	AS BUILT
DESIGNED	高文捷	TITLE			
CHECKED	李冰	330kV Bus Shunt Reactor Bay Sectional Drawing			
REVIEWED	马志坤				
APPROVED	高文				
DATE: 2015/10/20		SCALE: 1:150	DRWG No. BA06221Z-D0201-07		

EMPLOYER:	ZESCO LIMITED		
CONTRACTOR:	TBEA CO., LTD		
DESIGNER:	SNPDRI		
REV.	DATE	NOTES	
☒ APPROVED		☐ APPROVED AS CORRECTED	
☐ REVISED AND RESUBMIT		☐ NOT APPROVED	
DATE:		SIGNATURE:	
SPECIAL		SIGNATURE/DATE	
		STAMP(EMPLOYER):	



Bus Shunt Reactor in Future MBEYA 1 MBEYA 2 KALUNGWISHI LINE Bus Shunt Reactor BUS COUPLER MPIKA #1 TRANSFORMER PENSULO #2 TRANSFORMER

A B C C B A C B A A B C A B C A B C A B C A B C



Datasheet of wires construction

Cross Wire of 330kV Busbar, 2xLGKK-600/50 Distance L=42m fmax=2.5m

Temperature t(°C)	40	35	30	25	20	15	10	5	0	-5
Horizontal Strength H(N)	16221.2	16257.2	16293.5	16330	16366.8	16403.8	16441.1	16478.6	16516.4	16554.5
Wire sag f(m)	2.470	2.465	2.459	2.454	2.448	2.443	2.437	2.432	2.426	2.421

Equipment Materials List

No.	Name	Type	Q.	Unit	Remark
1	Capacitor voltage transformer	VCU363-0.01H 330/√3.0.11/√3.0.11/√3.0.11/3M	0.2/0.5/1/3P	6	set 30/30/30VA
2	Single Insulator Tension String	29 (XWP2-160)		36	string Double-Conductor See "BA06221S-D0201-19"
3	Strain Clamps	NYH-600K/600K		78	set With drainage Clamps, with mandrel
4	Terminal Clamps	SY-1400A-135x110		6	set With Mandrel, use for LGKK-600
5	Al-Steel expanding conductor	2xLGKK-600		1700	m Has been converted into a single
6	Spacers	JS-600K/400		170	set
7	Al-Steel expanding conductor	LGKK-600		50	m
8	T-Connectors (Type TLS)	TLS-600K/400		6	set
9	Terminal Clamps	SY-1400A-125X125		6	set With Mandrel, use for LGKK-600
10	Single Insulator Suspension String	28 (XWP3-100)		6	string Single-Conductor See "BA06221S-D0201-18"
11	Single Insulator Suspension String	28 (XWP3-100)		12	string Double-Conductor See "BA06221S-D0201-21"
12	Suspension Clamps	CS-51		24	set

PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT
KASAMA 330/66kV SUBSTATION

DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE	PRELIMINARY DESIGN	WORKING DRAWING	AS BUILT
DESIGNED	马文建				
CHECKED	马文建				
REVIEWED	马文建				
APPROVED	马文建				
DATE:	2015/10/20				

TITLE: 330kV Bus Plan and Sectional Drawing

SCALE: 1:300 DRWG No: BA06221Z-D0201-08

EMPLOYER: ZESCO LIMITED

CONTRACTOR: TBEA TBEA CO., LTD

DESIGNER: SNPDRI

REV.	DATE	NOTES

DATE: 2015/10/20

STAMP(EMPLOYER):

Note:
1. The unit of dimensions is mm.

A

B

C

D

E

F

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12

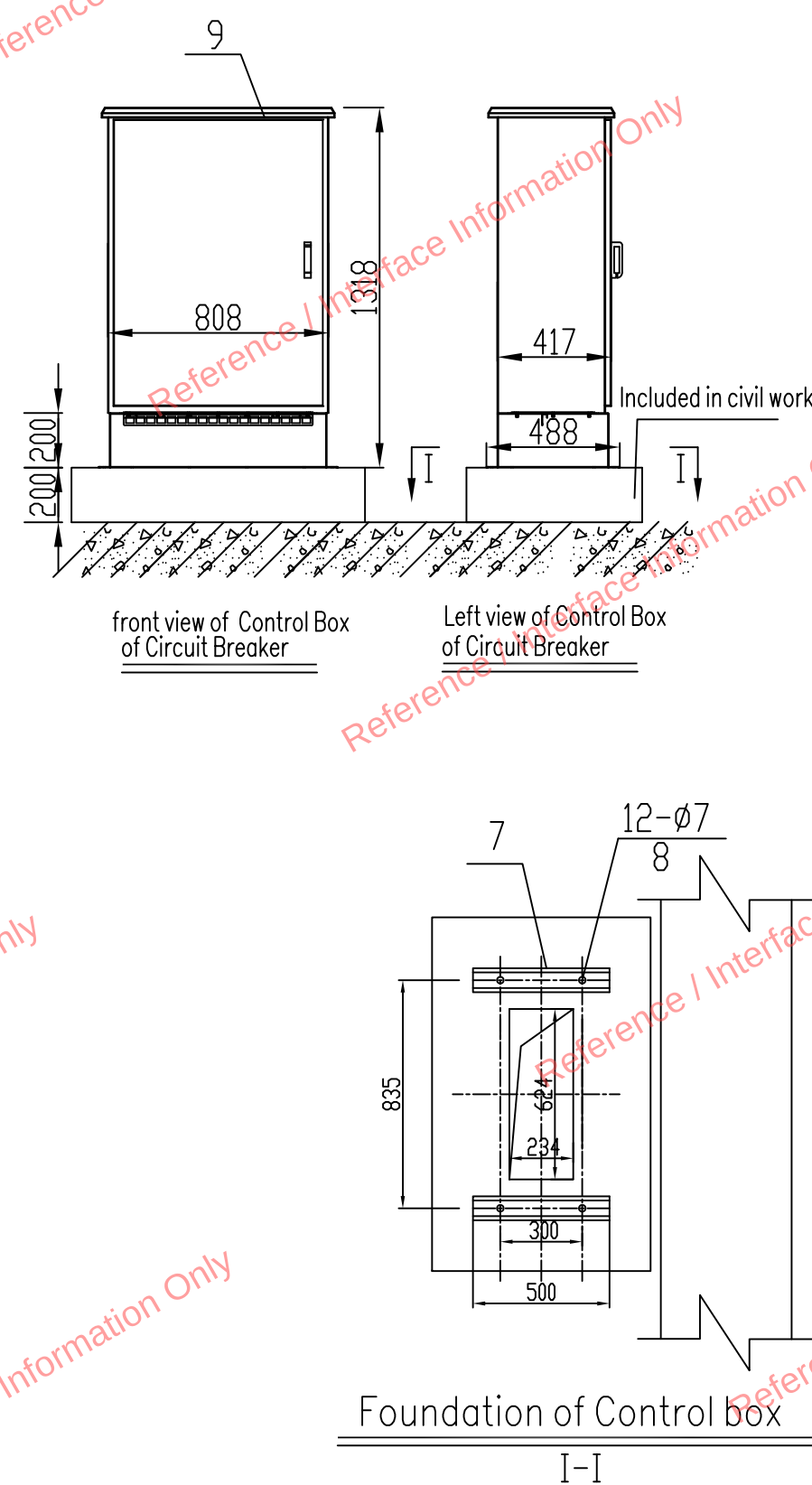
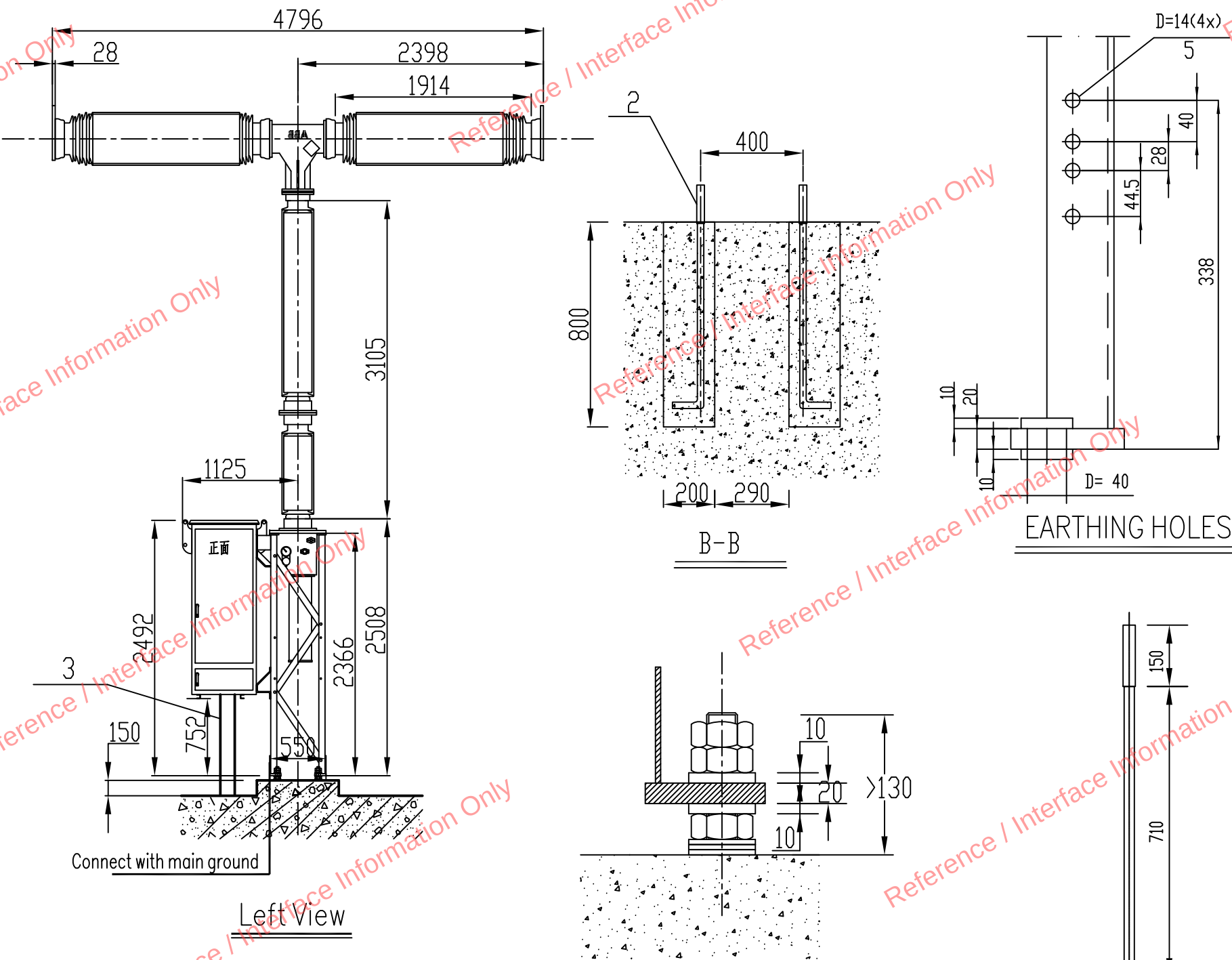
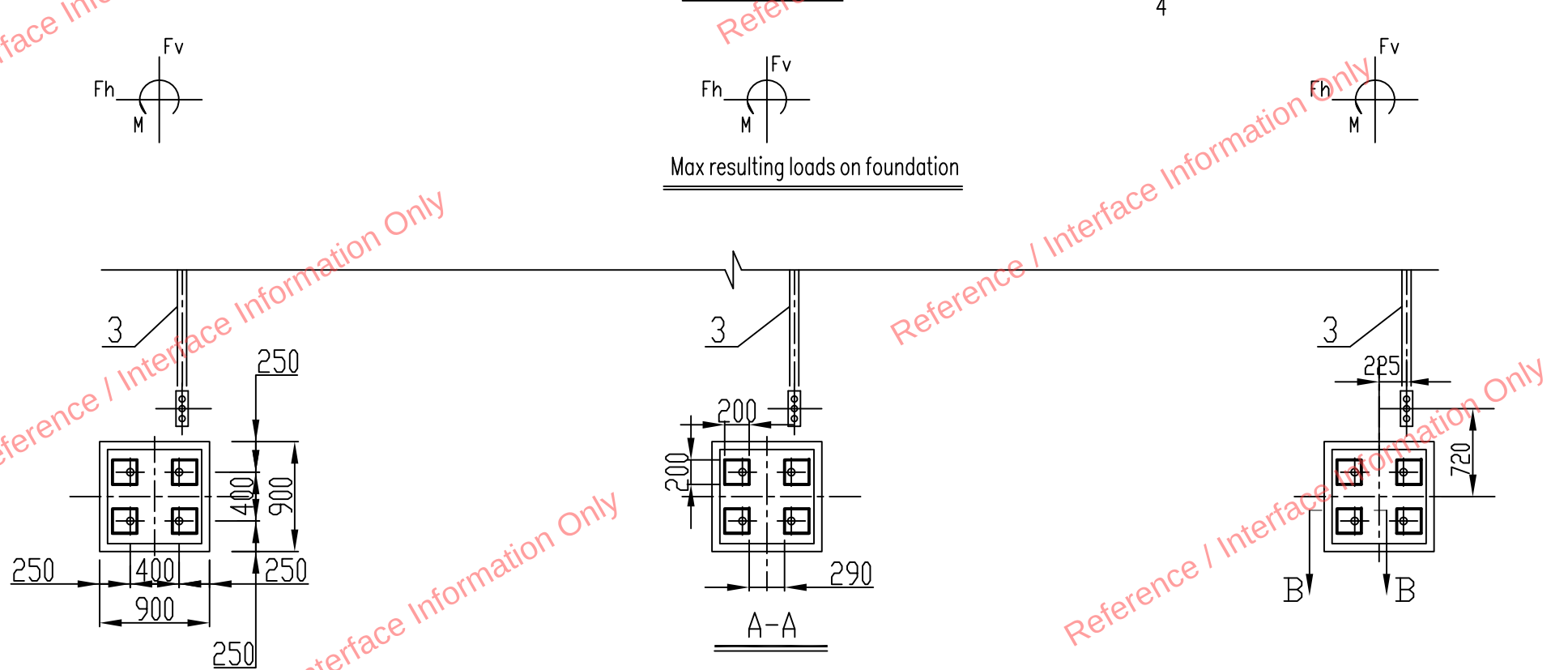
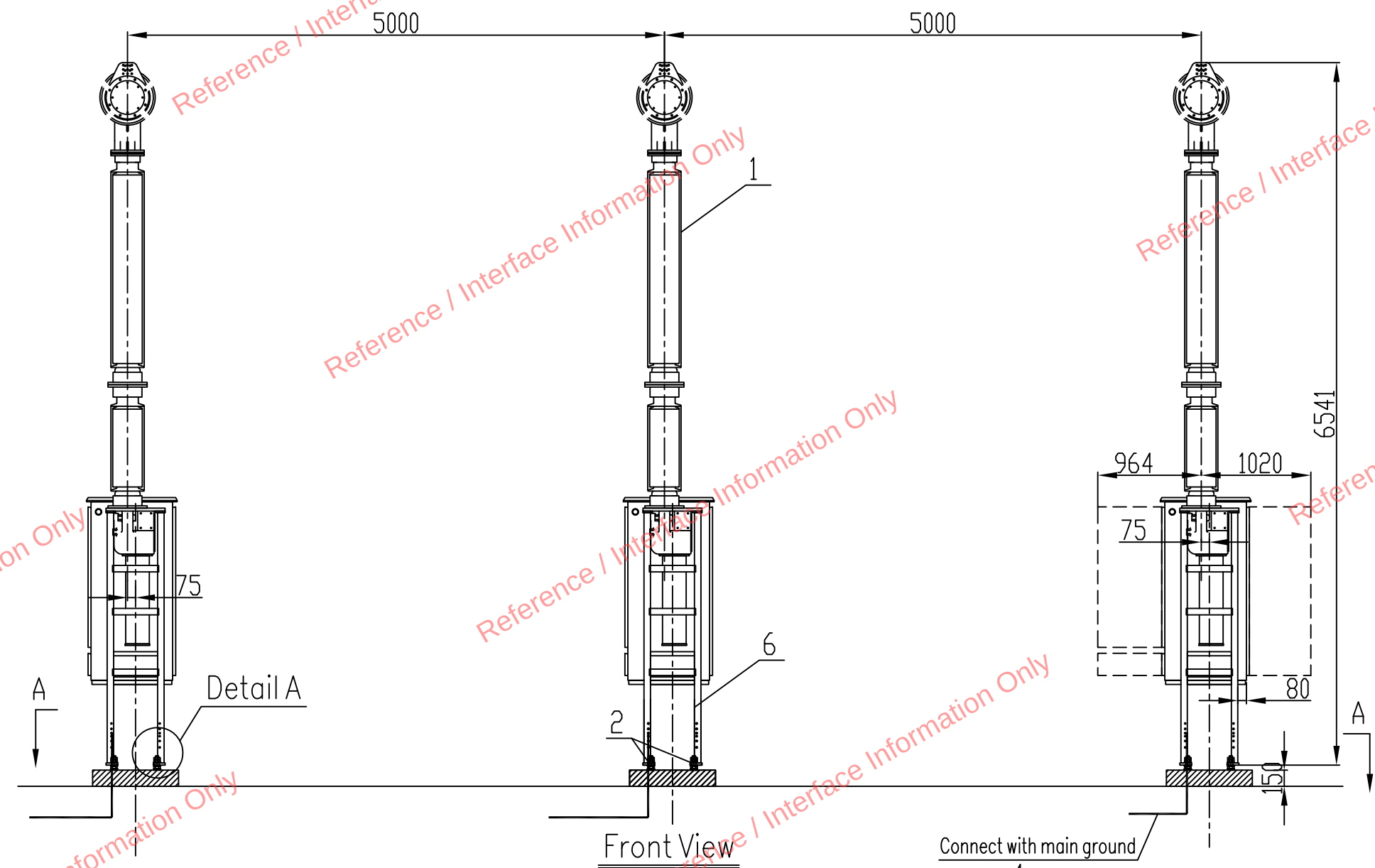
13

14

No.	Name	Type	Quantity					Unit	Total	Remark
			PENSULO LINE	#1 TR	#2 TR	BUS COUPLER	Busbar reactor	BUS		
1	SF6 Circuit breaker	LTB420E2-50kA 4000A	3	1	1	1	1		set	7 1 piece of Control Box for 1 set of Circuit breaker
2	Isolating switch	GW7B-363W 2500A , Un-Grounding	4	4	4	2	2		set	16
3	Isolating switch	GW7B-363DW 2500A , Single-Grounding	3	1	1				set	5
4	Current transformer	AGU-363,600~1200/1A;10VA;PX/5P40 300~600/1A;10VA;0.2S		3	3				set	6 10/10/10/10/10/10VA PX/PX/PX/5P40/0.2S/0.2S
5	Current transformer	AGU-363 1200~2400/1A;10VA 0.2S draw out 600~1200/1A;10VA	3						set	3 10/10/10/10/10/10VA PX/PX/PX/PX/0.2S/0.2S
6	Current transformer	AGU-363 1200~2400/1A;10VA 0.2S draw out 600~1200/1A;10VA				6			set	6 10/10/10/10VA 0.2S/PX/PX/PX
7	Capaciter voltage transformer	VCU363-0.005H 0.2/0.5(3P) /3P 330/√3 3.0.11/√3 3.0.11/√3 3kW	3				3		set	6 30/30/30VA
8	Capaciter voltage transformer	VCU363-0.01H 0.2/0.5(3P) /3P 330/√3 3.0.11/√3 3.0.11/√3 3kW						6	set	6 30/30/30VA
9	Lightnring arrester	Y10W-300/727	9				3		set	12
10	Post insulator	ZSW-363/12.5K-4	2	5	5	4	5		pcs.	21
11	Double Insulator Tension String	2x29(XWP3-160)	6						string	6 Double-Conductor See "BA06221S-D0201-22"
12	Single Insulator Tension String	29(XWP3-160)		6	6				string	18 Single-Conductor See "BA06221S-D0201-17"
13	Single Insulator Suspension String	28(XWP3-100)		3	3		3	6	string	15 Single-Conductor See "BA06221S-D0201-18"
14	Single Insulator Tension String	29(XWP3-160)	6			6		36	string	48 Double-Conductor See "BA06221S-D0201-19"
15	Single Insulator Suspension String	28(XWP3-100)	3			6			string	9 Double-Conductor See "BA06221S-D0201-20"
16	Single Insulator Suspension String	28(XWP3-100)	3						string	3 Double-Conductor See "BA06221S-D0201-21"
17	Single Insulator Suspension String	4(XWP3-70)		3	3				string	6 Single-Conductor See "BA06221S-D0201-23"
18	Single Insulator Suspension String	4(XWP3-70)	3						string	3 Double-Conductor See "BA06221S-D0201-24"
19	ACSR	LGJ-400/50	1800						m	1800 Has been converted into a single
20	Al-Steel expanding hollow conductor	LGKK-600/50	120	580	580	800	400	1750	m	4230 Has been converted into a single
21	Spacers	MRJ-5/400	75						set	75 use for cross wire
22	Spacers	MRJ-5/200	250						set	250 use for leading wire
23	Spacers	JS-600K/400				27		170	set	197 use for cross wire
24	Spacers	JS-600K/200				125			set	125 use for leading wire and conductor between equipments
25	Strain Clamps	NYG-400/50A	30						set	30 With drainage Clamps,R≥ 13mm
26	Strain Clamps	NYH-600K/600K		9	9	24	9	78	set	129 With drainage Clamps,with mandrel
27	T-Connectors(Type TLY)	TLY-600K/600K		15	15	12	6		set	48
28	T-Connectors(Type TLY)	TLY-600K/400	12						set	12
29	T-Connectors(Type TLS)	TLS-600K/400		6	6		6	6	set	24
29	T-Connectors(Type TY)	TY-400/50	60						set	60
30	T-Connectors(Type TL)	TL-600KA-200x160	6				3		set	9
31	T-Connectors(Type TL)	TL-600KA-135x110					3		set	3

Note:
The model of metal fittings reference
Siping Line Equipment Factory's product.

EMPLOYER:				PROJECT NAME:						
ZESCO LIMITED				PENSULO-KASAMA 330kv POWER TRANSMISSION PROJECT						
				KASAMA 330/66 KV SUBSTATION						
CONTRACTOR:				DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE	PRELIMINARY DESIGN	WORKING DRAWING	AS BUILT	☒
TBEA CO., LTD				DESIGNED	葛文捷	List of 330kV Major Equipments and Materials				
				CHECKED	肖林					
DESIGNER:				REVIEWED	马志坤					
SNPDRI				APPROVED	苏光					
	REV.	DATE	NOTES	STAMP(EMPLOYER)						
				☒ APPROVED ☐ REVISED AND RESUBMIT			☐ APPROVED AS CORRECTED ☐ NOT APPROVED			
				DATE:			SIGNATURE:			
				DATE: 2015/10/20			SCALE: 1: SCALE			



Equipment Materials List					
No.	NAME	TYPE	Unit	Q.	Remark
1	Circuit Breaker	LTB420E2-50kA	set	1	Included in section
2	foundation bolt	M30	set	12	
3	Cable Pipe	Ø50,L=6m	pcs.	18	Included in D0210
4	Ground wire		m		Included in D0208
5	Hexagon bolt	M12	set	12	With nut,spring washer
6	Bracket		set	3	Supplied by manufacturer
7	Channel steel	[8, L=500mm, Galvanized	pcs.	2	Included in civil work
8	Expansion bolts	M12	set	4	
9	Control Box of Circuit Breaker		pcs.	1	Supplied by manufacturer

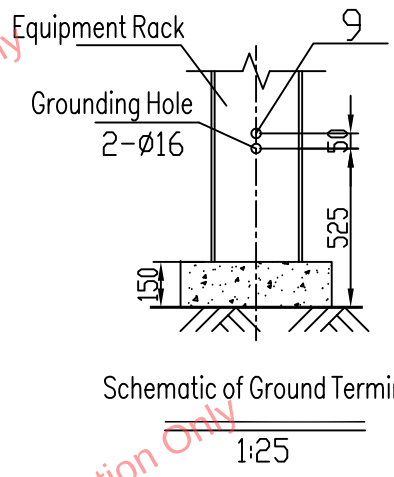
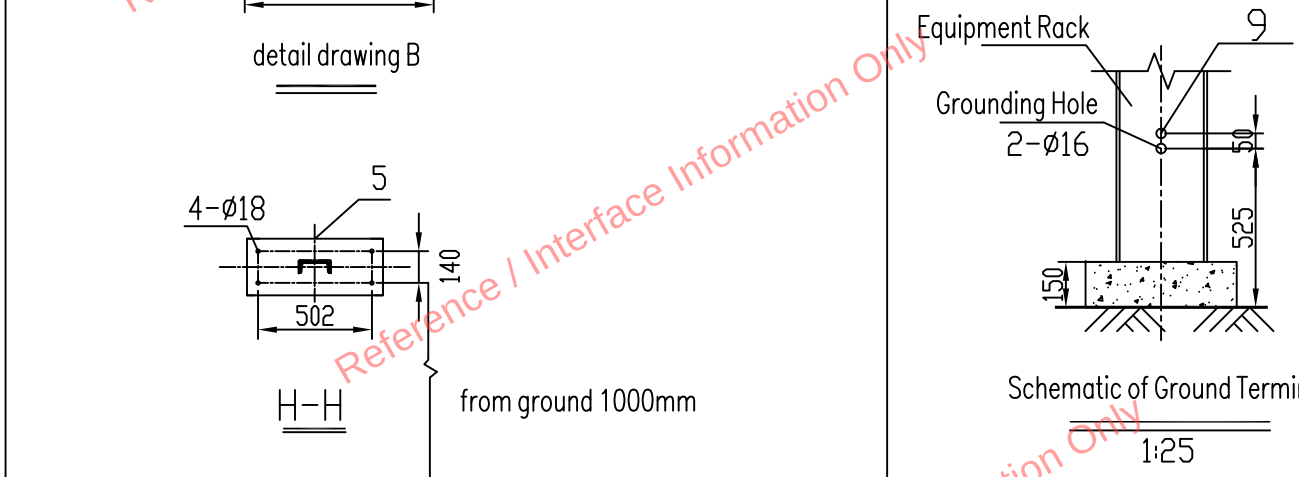
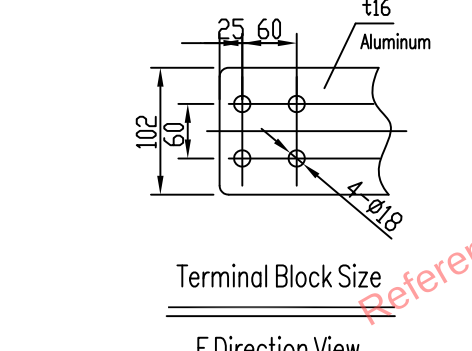
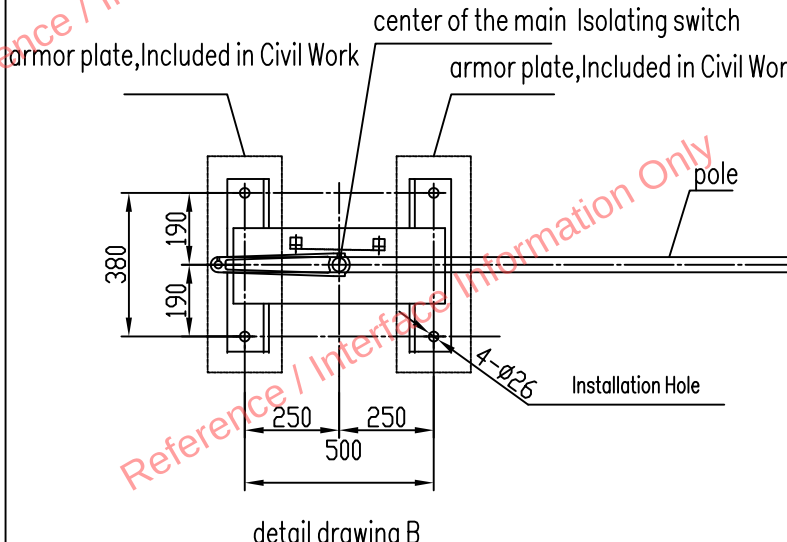
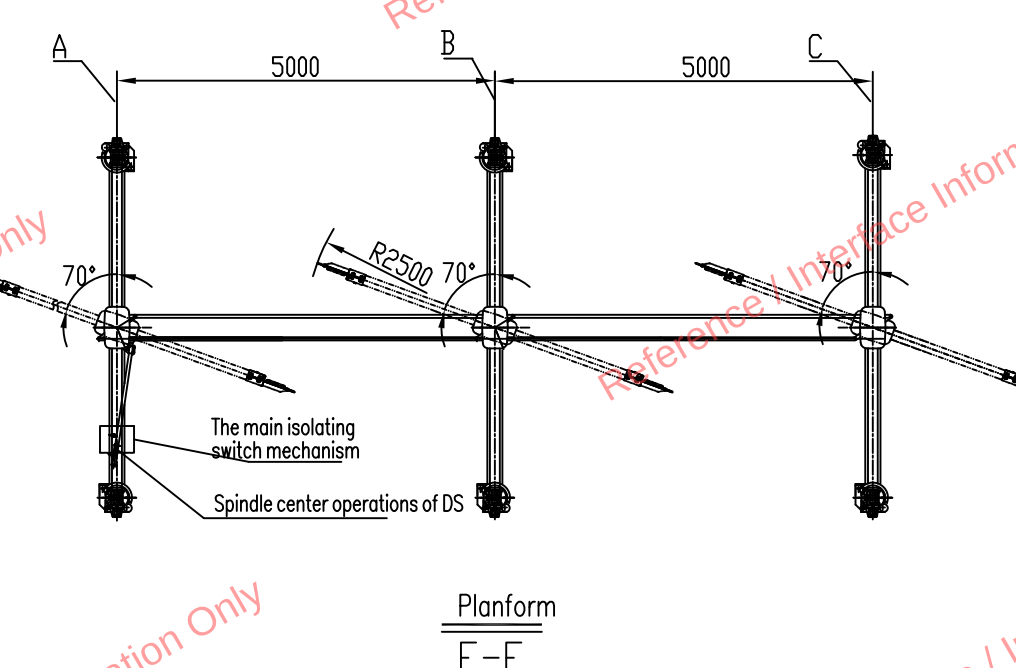
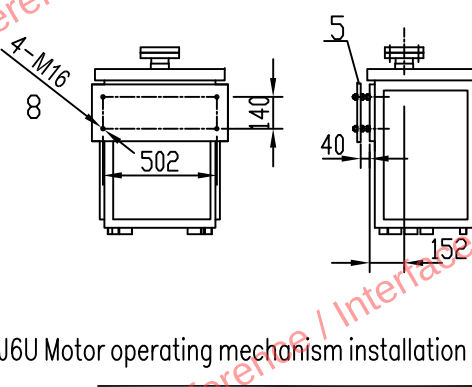
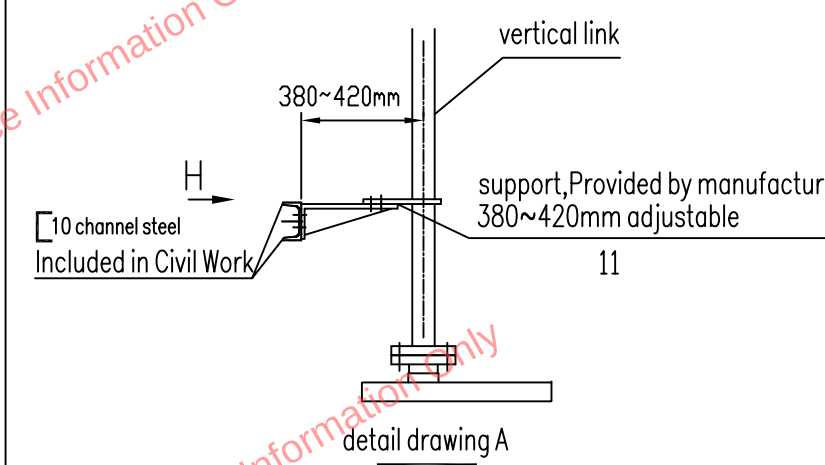
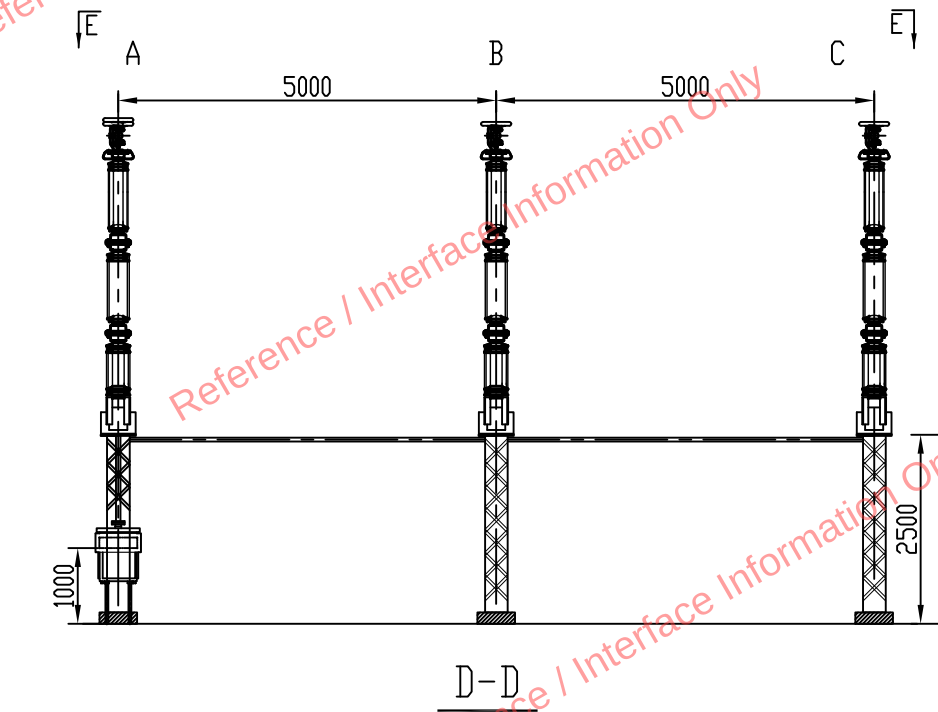
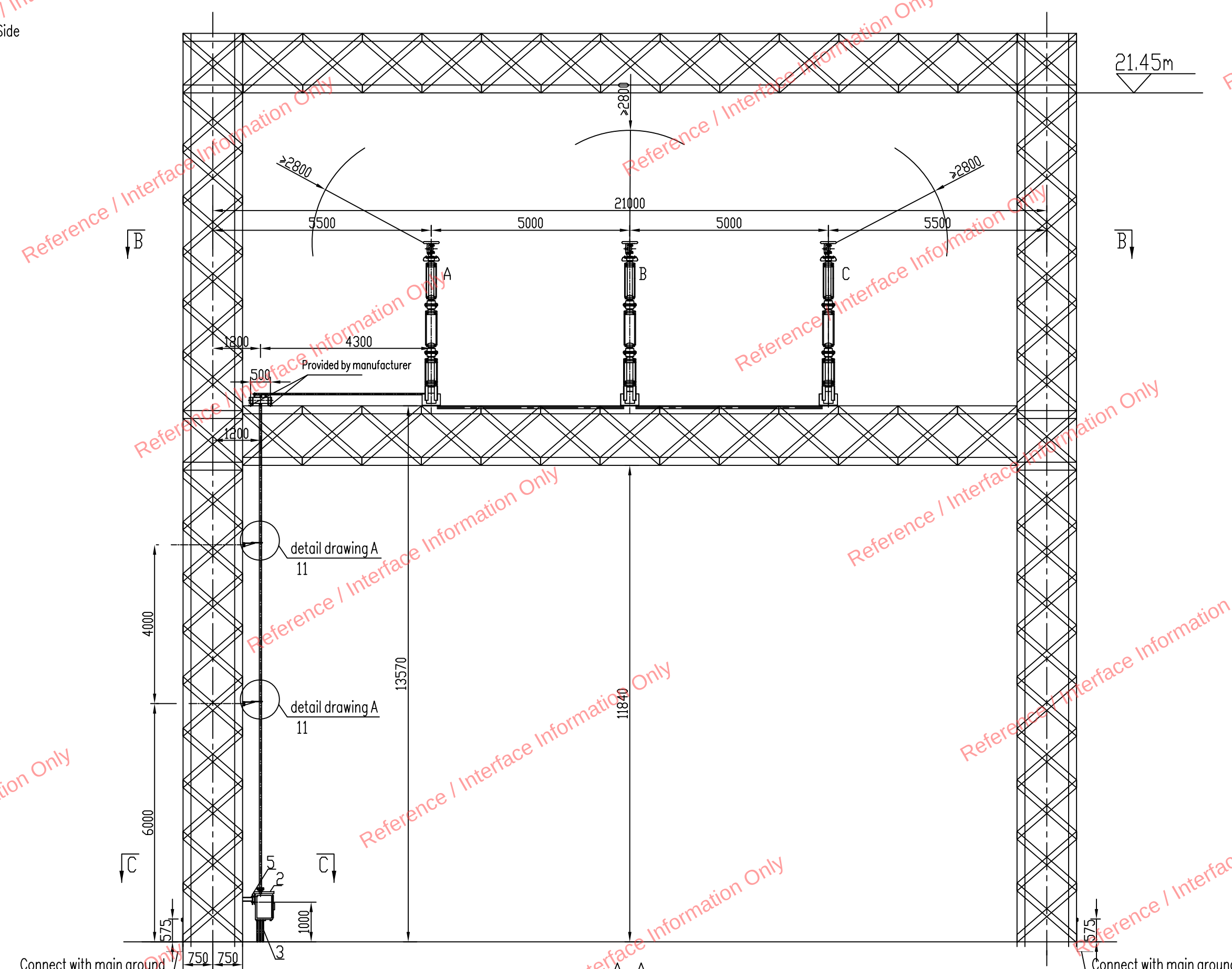
- Note: 1. Materials Statistiched By 1 set of circuit breaker.
2. Max resulting loads on foundation:
Vertical load $F_v = \pm 70000$ N
Horizontal load $F_h = \pm 14000$ N
Moment on foundation $M = \pm 55000$ Nm
3. See each section drawing for installation Direction.

PROJECT NAME:
PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT
KASAMA 330/66kV SUBSTATION

DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE	PRELIMINARY DESIGN	WORKING DRAWING	AS BUILT	
DESIGNED	葛文捷					TITLE
CHECKED	李永					
REVIEWED	马志坤					
APPROVED	苏光					
DATE: 2015/10/20		SCALE: 1:50	DRWG No.	BA06221Z-D0201-10		

EMPLOYER:	ZESCO LIMITED					
CONTRACTOR:	TBEA CO., LTD					
DESIGNER:	SNPDRI					
REV.	DATE	NOTES				
DATE:		SIGNATURE:	STAMP(EMPLOYER)			
SPECIAL		SIGNATURE/DATE				

LTB420E2-50kA Type SF6 Circuit Breaker
Installation Drawing



Note:

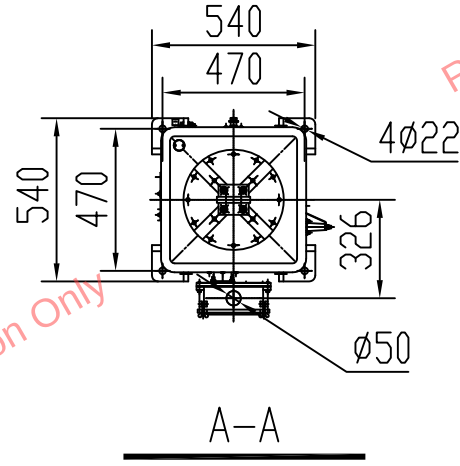
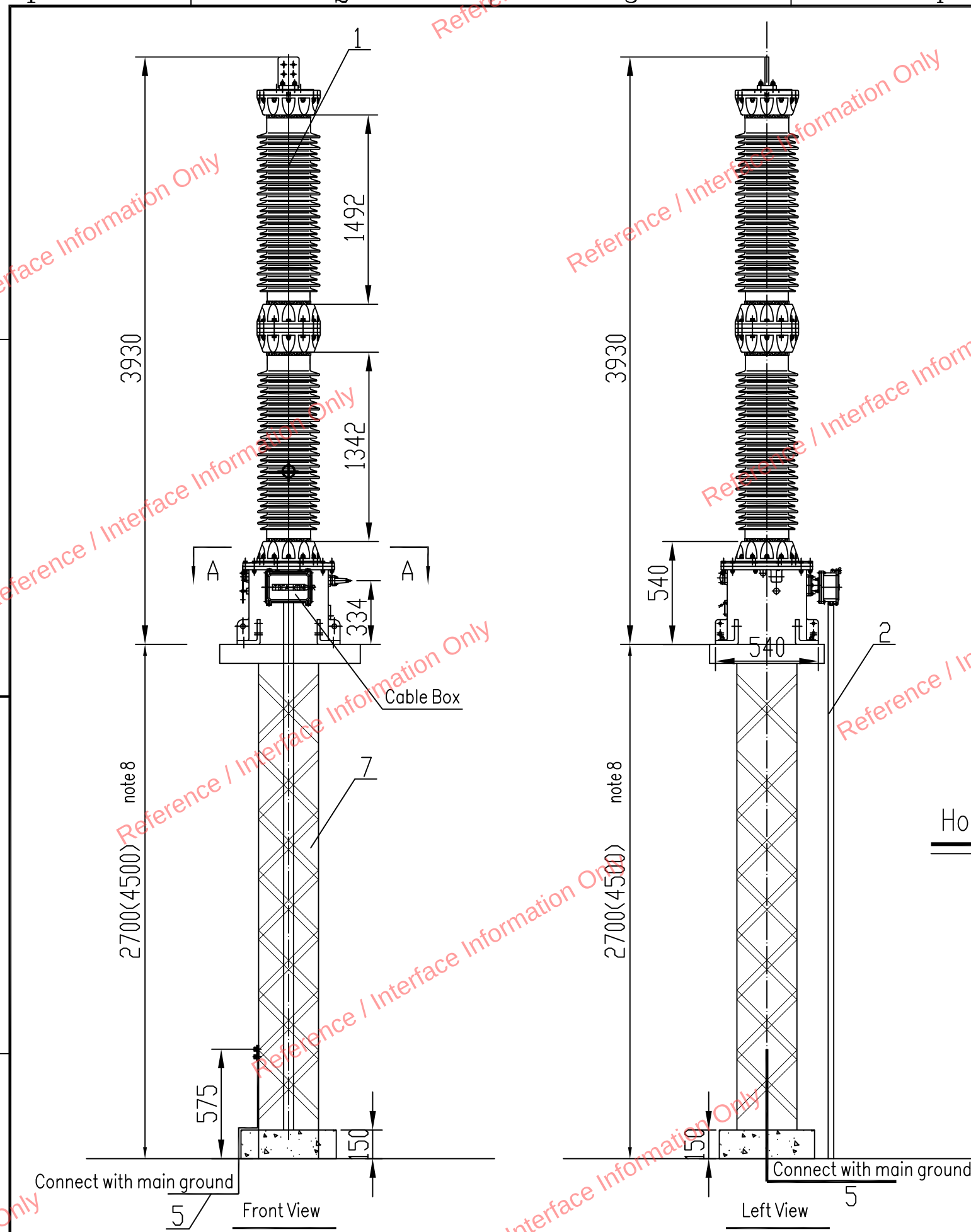
- 1.Post insulator should be perpendicular to the base plane, may be by regulating the base M24 x 220 whole stud pattern, so that the pillars of a high degree of change to meet the closing state of dynamic and static contact with good contact.
- 2.The main isolating switch is three-phase operation, performed with electric Cj6U bodies, mechanisms are fixed on the base of A phase.each phase is at a distance of 5000 mm.
- 3.Windward area: 3.8m , unipolar weight 1500kg.
- 4.Height of gravity : 1.9m.
- 5.Single between breaks is at a distance of 1765 mm
- 6.Framework for the design load operation: horizontal: 8kN, vertical: 11kN, turn away from: 18kN.m.
- 7.Mechanical load terminals rating: horizontal level of tension 1500N, the level of tension longitudinal 1000N, vertical pull 1500N.
8. Materials Statically By 1 set of Isolating switch.The Project have 2 set of Isolating switches(Un-earthing) installed on Frame.
9. [10 Channel steel,Included in Civil work.

Equipment Materials List					
No.	NAME	TYPE	Unit	Q.	Remark
1	Isolating switch	GW7B-363DW Single-earthing	set	1	Included in section
2	Motor operating mechanism CJ6U		set	1	Provided by manufacturer
3	Cable Pipe	φ50	pcs.	5	Included in D0210
4	Ground wire		m		Included in D0208
5	Steel plate		pcs.		Included in civil work
6	Bracket		set		Included in civil work
7	Hexagon bolt	M24	set	12	With nut,spring washer
8	Hexagon bolt	M16	set	4	With nut,spring washer
9	Hexagon bolt	M14 Galvanization	set	12	With nut,spring washer
10	steel	□10 Galvanization	set	12	
11	underlay		set	2	Provided by manufacturer

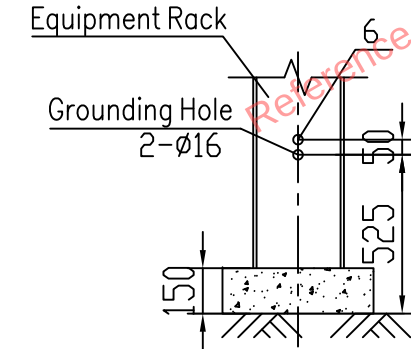
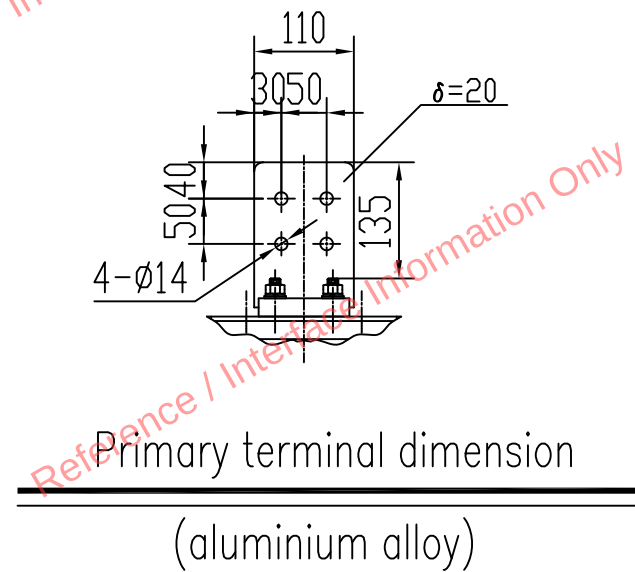
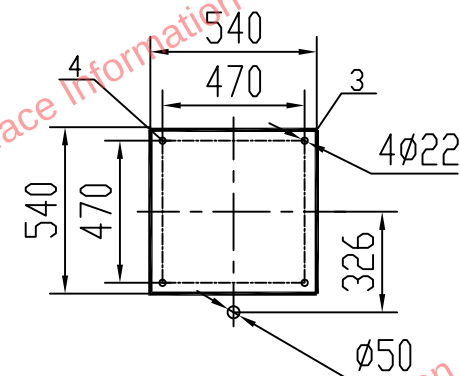
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KASAMA 330/66kV SUBSTATION										
DOC. STATUS:		FILE FOR APPROVAL		INTERMEDIATE FILE		PRELIMINARY DESIGN		WORKING DRAWING		AS BUILT ☒
DESIGNED		高文捷		TITLE GW7B-363W Type Isolating switch (Un-Earthing) Installation Drawing						
CHECKED		郭国伟								
REVIEWED		马建坤								
APPROVED		苏光								
DATE: 2015/10/20				SCALE: 1:100		DWG No. BA06221Z-D0201-11				

EMPLOYER:			
 ZESCO LIMITED			
CONTRACTOR:			
 TBEA CO., LTD			
DESIGNER:			
 SNPDRI			
	REV.	DATE	NOTES
	☐ APPROVED	☐ APPROVED AS CORRECTED	STAMP(EMPLOYER):
	☐ REVISED AND RESUBMIT	☐ NOT APPROVED	
	DATE:	SIGNATURE:	

SPECIAL	SIGNATURE/DATE



Hole dimension for top plate of bracket



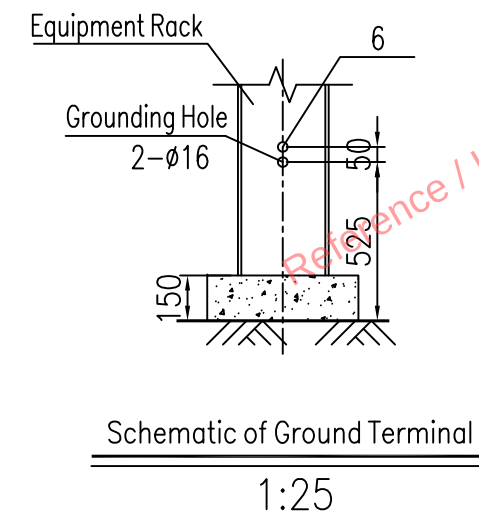
Schematic of Ground Terminal

- Note:
1. Transport dimensions: 1300x790x2170mm.
 2. The Weight of CVT used in outlet bay is 580kg, and the used for Busbar is 700kg.
 3. voltage ratio $\frac{330}{\sqrt{3}} / \frac{0.11}{\sqrt{3}} / \frac{0.11}{\sqrt{3}} / \frac{0.11}{\sqrt{3}}$ kV.
 4. Materials Statisticed By 1 set of Capaciter voltage transformer.
 5. Ground Spur one side connect with embedded steel, the other side welded with the main ground.
 6. All mounting iron parts shall be galvanized, welds should be painted rust.
 7. See each section drawing for installation Direction .
 8. See each section drawing for the height of each CVT bracket .

Equipment Materials List

No.	NAME	TYPE	Unit	Q.	Remark
1	Capaciter voltage transformer	VCU-363	set	1	TBEA KONCAR (Shenyang) Included in section
2	Cable Pipe	Ø50	pcs.	1	
3	Steel plate		pcs.	1	Included in civil work
4	Hexagon bolt	M20 Galvanization	set	4	With nut,spring washer
5	Ground wire		m		
6	Hexagon bolt	M14 Galvanization	set	2	With nut,spring washer
7	Bracket		set	1	Included in civil work

EMPLOYER:  ZESCO LIMITED	CONTRACTOR:  TBEA CO., LTD	DESIGNER:  SNPDRI	REV.	DATE	NOTES	DATE:	SIGNATURE:	STAMP(EMPLOYER):	PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT KASAMA 330/66kV SUBSTATION	DOC. STATUS: FILE FOR APPROVAL INTERMEDIATE FILE PRELIMINARY DESIGN WORKING DRAWING AS BUILT	TITLE: VCU-363 Type Capacitor Voltage Transformer Installation Drawing	SCALE: 1:25 DRWG No. BA06221Z-D0201-14
SPECIAL SIGNATURE/DATE												

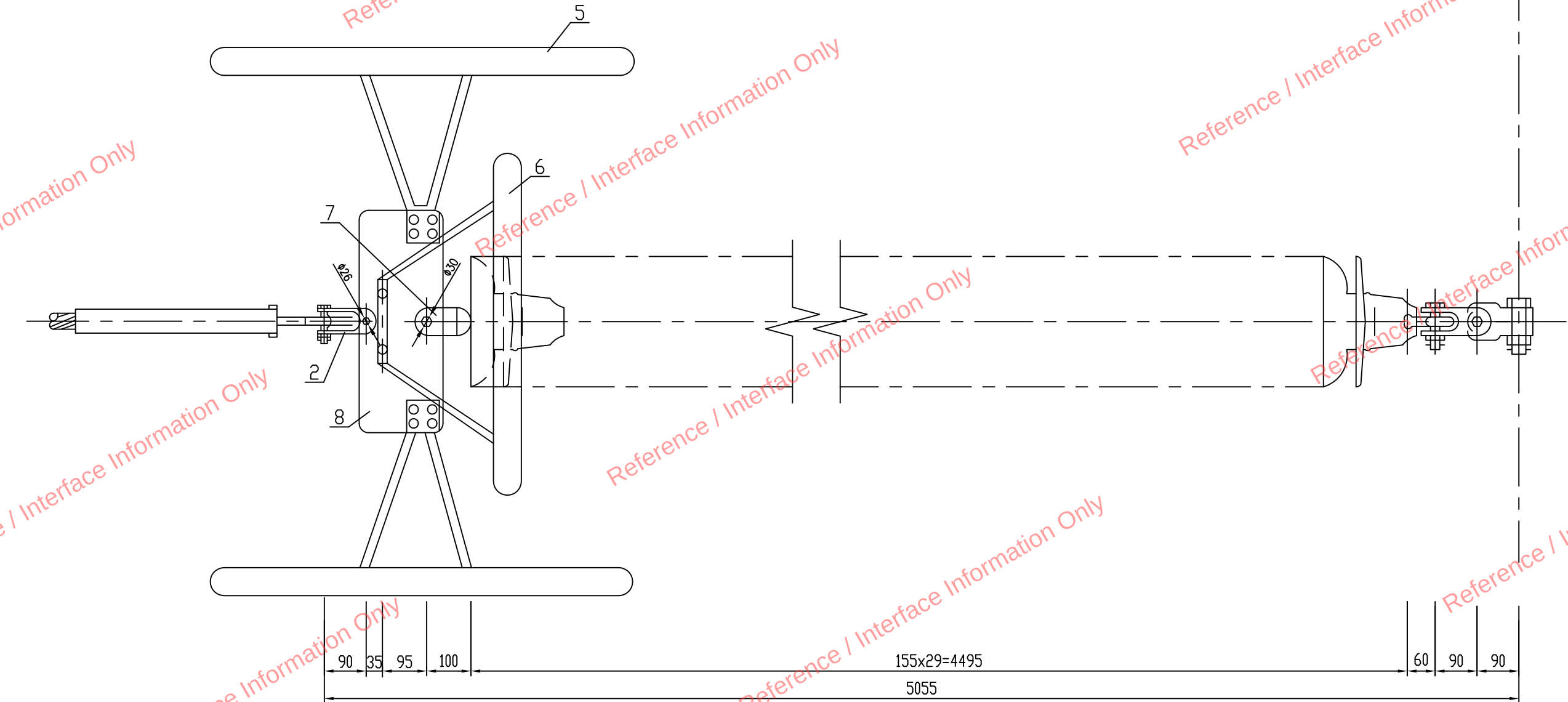
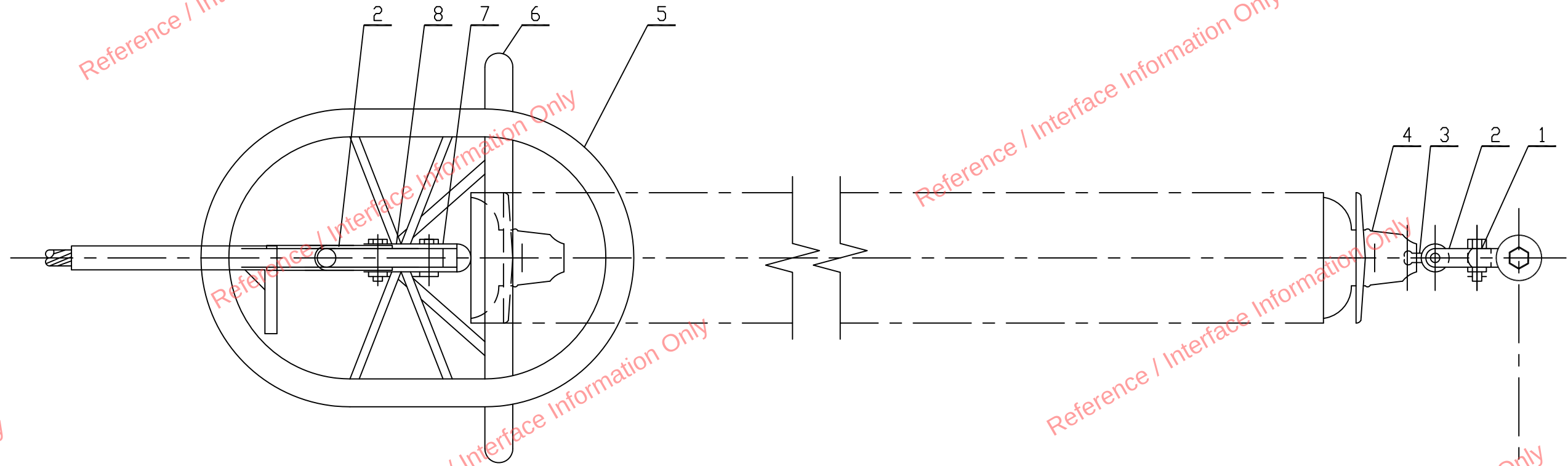


- Note: 1. Materials Statistised By 1 set of insulator.
2. All mounting iron parts shall be galvanized, welds should be painted rust.
 3. Ground Spur one side connect with embedded steel, the other side welded with the main ground.
 4. Insulators bending failure load not less than 12.5kN, and reversing failure load not less than 6kN.m.
 5. Creepage distance not less than 11260mm, dry arcing distance not less than 2800mm, the post insulators applied at altitude of 2000m.

Equipment Materials List

No.	NAME	TYPE	Unit	Q.	Remark
1	Insulator	ZSW-363/12.5K-4	pcs.	1	Included in section
2	Steel plate		pcs.	1	Included in civil work
3	Ground wire		m		Included in D0208
4	Bracket		set	1	Included in civil work
5	Hexagon bolt	M16 Galvanized	set	8	With nut,spring washer
6	Hexagon bolt	M14 Galvanized	set	2	With nut,spring washer

EMPLOYER:  ZESCO LIMITED				PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT										
				KASAMA 330/66kV SUBSTATION										
				DOC. STATUS:	FILE FOR APPROVAL		INTERMEDIATE FILE		PRELIMINARY DESIGN		WORKING DRAWING		AS BUILT	☒
CONTRACTOR:  TBEA CO., LTD				DESIGNED	葛文捷	TITLE ZSW-363/12.5K-4 Type Insulator Installation Drawing								
				CHECKED	马永坤									
	REV.	DATE	NOTES	REVIEWED	苏光									
DESIGNER:  SNPDRI	☐ APPROVED		☐ APPROVED AS CORRECTED		STAMP(EMPLOYER):									
	☐ REVISED AND RESUBMIT		☐ NOT APPROVED											
	DATE:		SIGNATURE:		DATE: 2015/10/20			SCALE: 1: 50		DRWG No. BA06221Z-D0201-16				



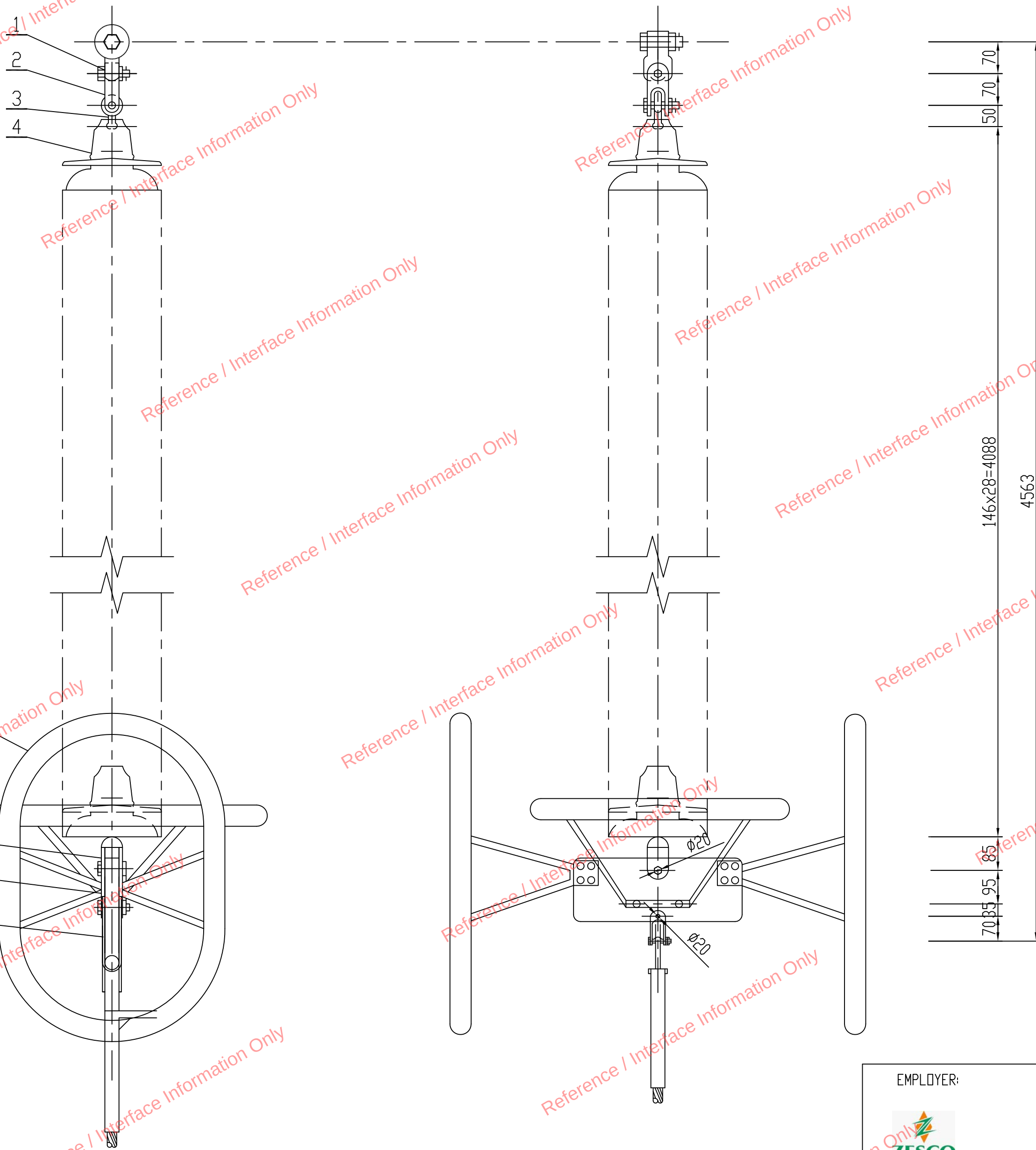
Equipment Materials List

No.	NAME	TYPE	Unit	Q.	Weight(kg)		Remark
					Single	Total	
1	Shackles(Type U)	U-16	pcs.	1	1.47	1.47	
2	Clevis-Clevises(Type Z)	Z-16	pcs.	2	2.38	2.38	
3	Ball Eyes(Type QP)	QP-16	pcs.	1	0.5	0.5	
4	Suspension Porcelain Insulator	XWP3-160	pcs.	29	8.6	249.4	
5	Shielding Rings(Type FP)	FP-1060x660S	pcs.	2	6.5	13.0	
6	Grading Rings(Type FJ)	FJ-660	pcs.	1	5.0	5.0	
7	Socket-Clevises(Type WS)	WS-21DF	pcs.	1	4.5	4.5	
8	Yoke Plates(Type LBD)	LBD-2040	pcs.	1	13	13	

- Note: 1. Civil reserved peg board thickness less than 24mm, aperture not less than 26mm,
the length of the edge of the hole center distance of not more than 60mm.
2.The total weight of single-joint tension insulator string is 289.81kg.
3. Applies to Transformer bay and Bus Reactor bay.

SPECIAL	SIGNATURE/DATE

EMPLOYER:  ZESCO LIMITED			PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT		
CONTRACTOR:  TBEA CO., LTD			KASAMA 330/66kV SUBSTATION		
DESIGNER:  SNPDRI			DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE
REV.			DATE	NOTES	
DATE:			DATE: 2015/10/20		
☐ APPROVED ☐ REVISED AND RESUBMIT			☐ APPROVED AS CORRECTED ☐ NOT APPROVED		
STAMP(EMPLOYER):			TITLE 29(XWP3-160) Type Single Insulator Tension String Drawing (Single-Conductor)		
SIGNATURE:			SCALE: 1:10 DRWG No. BA06221Z-D0201-17		

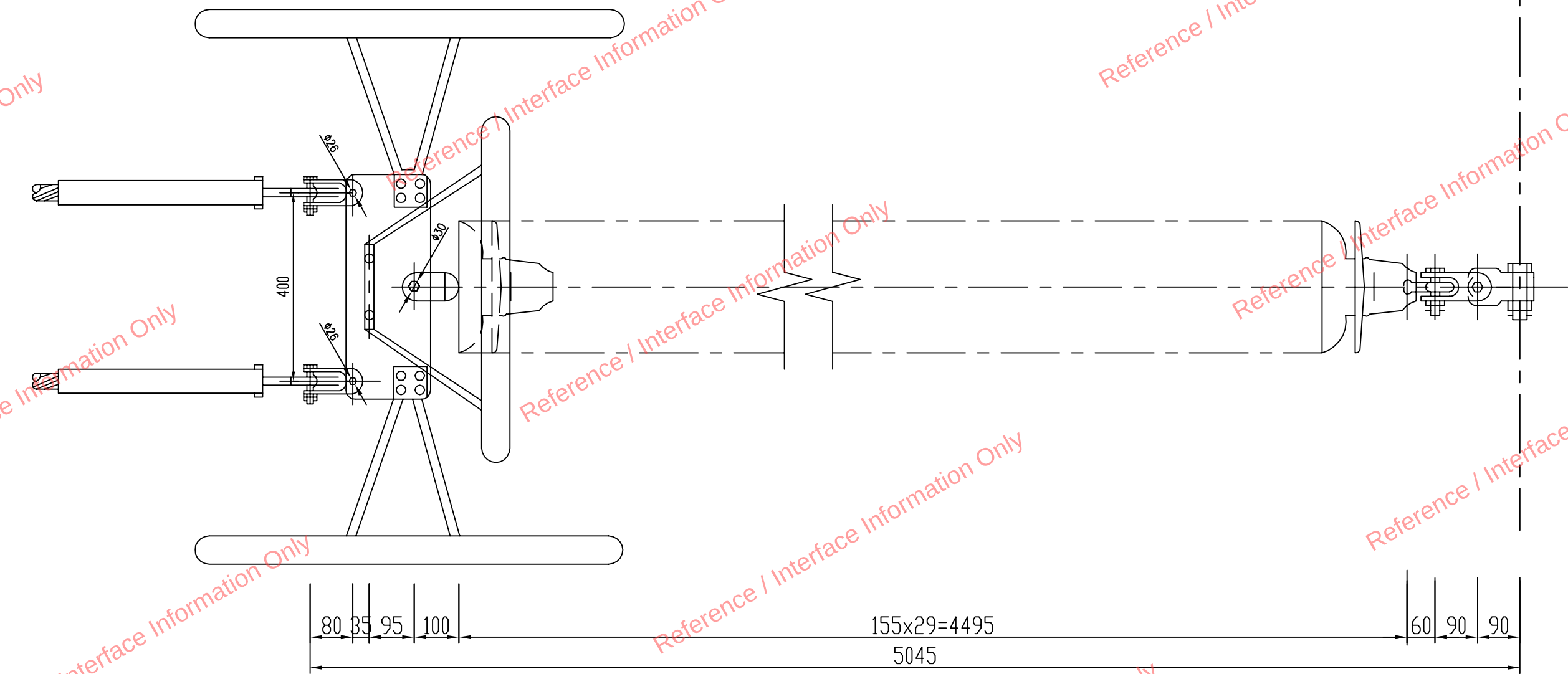
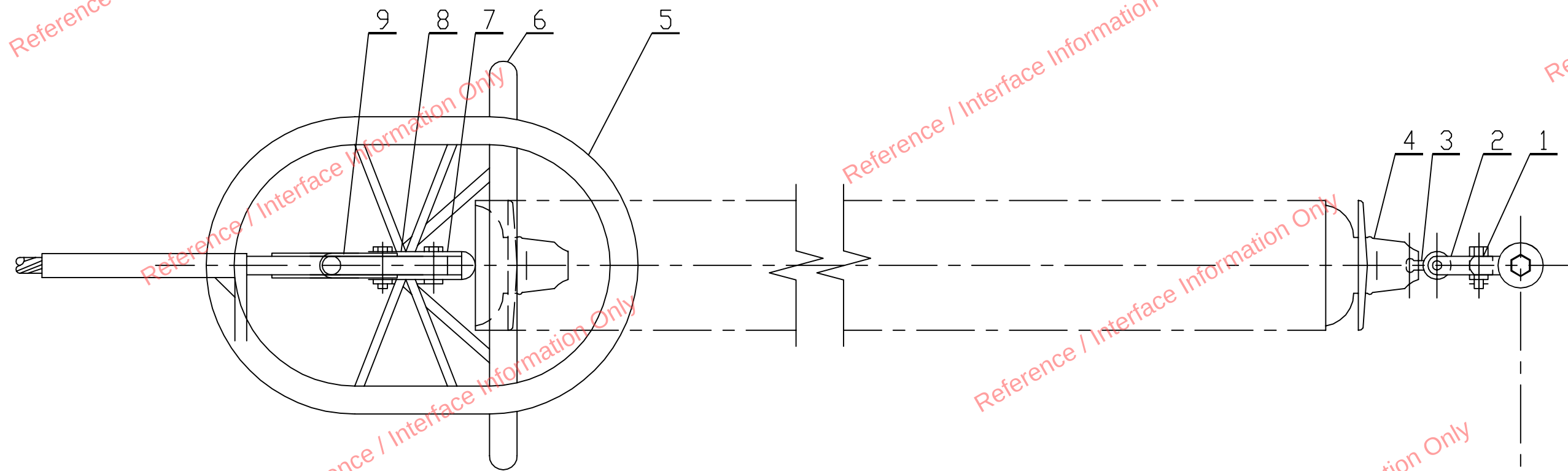


Equipment Materials List							
No.	NAME	TYPE	Unit	Q.	Weight(kg)		Remark
					Single	Total	
1	Shackles(Type U)	U-10	pcs.	1	0.54	0.54	
2	Clevis-Clevises(Type Z)	Z-10	pcs.	1	0.87	0.87	
3	Ball Eyes(Type QP)	QP-10	pcs.	1	0.32	0.32	
4	Suspension Porcelain Insulator	28(XWP3-100)	pcs.	28	7.9	221.2	
5	Shielding Rings(Type FP)	FP-1060x660S	pcs.	2	6.5	13.0	
6	Grading Rings(Type FJ)	FJ-660	pcs.	1	5.0	5.0	
7	Socket-Clevises(Type WS)	WS-10	pcs.	1	1.7	1.7	
8	Yoke Plates(Type LBD)	LBD-1240(φ1= 20 , φ2= 20)	pcs.	1	9	9	
9	Clevis-Clevises(Type Z)	Z-10	pcs.	1	0.87	1.74	

- Note: 1. Civil reserved peg board thickness less than 20mm, aperture not less than 20mm, the length of the edge of the hole center distance of not more than 56mm.
2.The total weight of single-joint tension insulator string is 252.5kg.
3. Applies to Busbar bay , Transformer bay and Bus Reactor bay.

SPECIAL	SIGNATURE/DATE

EMPLOYER:  ZESCO LIMITED				PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT KASAMA 330/66kV SUBSTATION
CONTRACTOR:  TBEA CO., LTD				DOC. STATUS: FILE FOR APPROVAL DESIGNED: 葛文捷 CHECKED: 马永坤 REVIEWED: 苏光 APPROVED: 苏光
DESIGNER:  SNPDRI	REV.	DATE	NOTES	TITLE 28(XWP3-100) Type Single Insulator Suspension String Drawing (with Strain Clamps, Single-Conductor)
	☐ APPROVED ☐ REVISED AND RESUBMIT		☐ APPROVED AS CORRECTED ☐ NOT APPROVED	SCALE: 1:15 DRWG No. BA06221Z-D0201-18
	DATE:		SIGNATURE:	DATE: 2015/10/20



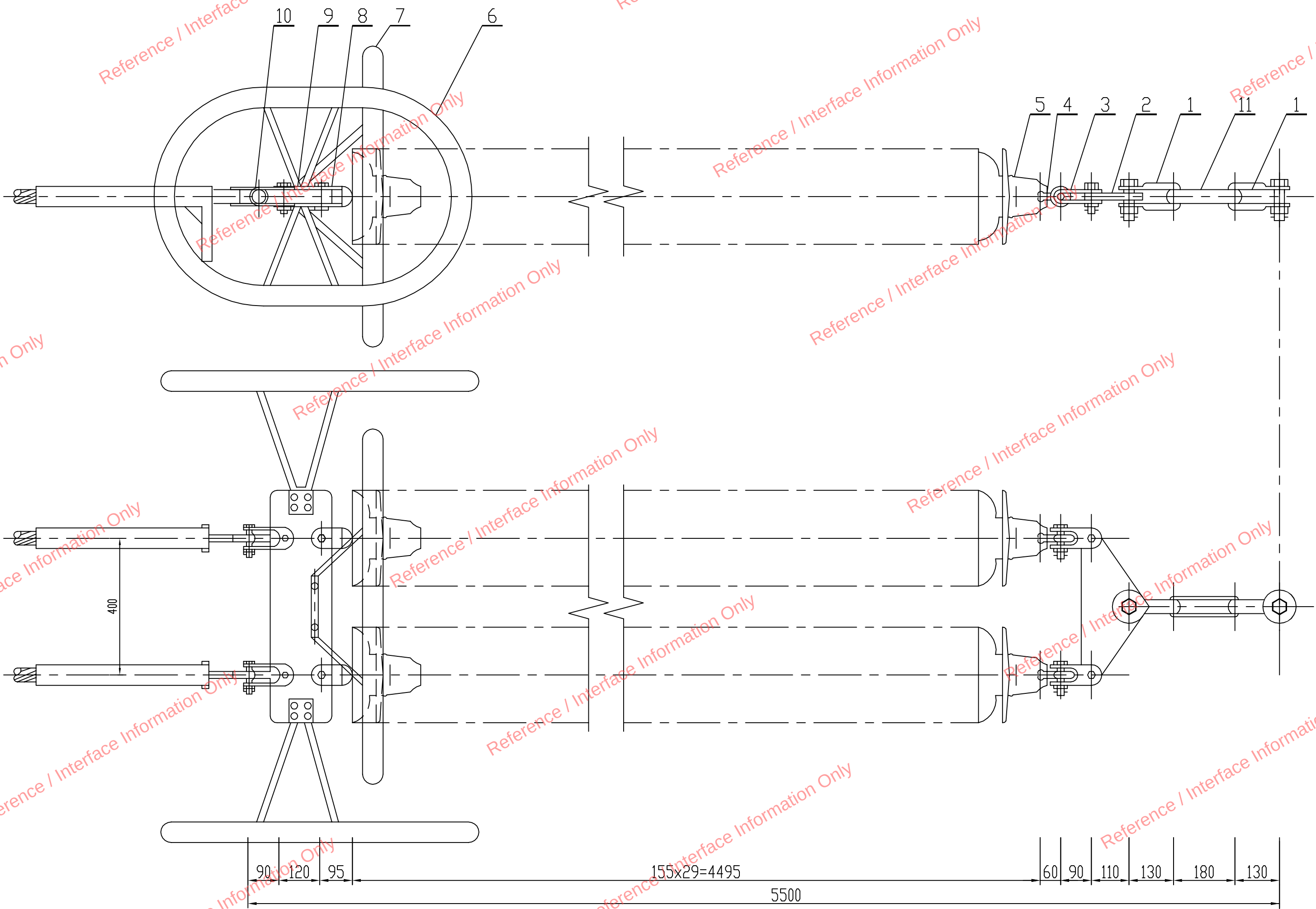
Equipment Materials List

No.	NAME	TYPE	Unit	Q.	Weight(kg)		Remark
					Single	Total	
1	Shackles(Type U)	U-16	pcs.	1	1.47	1.47	
2	Clevis-Clevises(Type Z)	Z-16	pcs.	1	2.38	2.38	
3	Ball Eyes(Type QP)	QP-16	pcs.	1	0.5	0.5	
4	Suspension Porcelain Insulator	XWP3-160	pcs.	29	8.6	249.4	
5	Shielding Rings(Type FP)	FP-1060x660S	pcs.	2	6.5	13.0	
6	Grading Rings(Type FJ)	FJ-660	pcs.	1	5.0	5.0	
7	Socket-Clevises(Type WS)	WS-21DF	pcs.	1	4.5	4.5	
8	Yoke Plates(Type LBD)	LBD-2040	pcs.	1	13	13	
9	Clevis-Clevises(Type Z)	Z-12	pcs.	2	1.16	2.32	

Note: 1. Civil reserved peg board thickness less than 24mm, aperture not less than 26mm,
the length of the edge of the hole center distance of not more than 60mm.
2.The total weight of single-joint tension insulator string is 291.57kg.
3. Applies to Busbar bay, Outgoing Lines bay and Bus Coupler bay.

SPECIAL	SIGNATURE/DATE

EMPLOYER:  ZESCO LIMITED	PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT KASAMA 330/66kV SUBSTATION
CONTRACTOR:  TBEA CO., LTD	DOC. STATUS: FILE FOR APPROVAL INTERMEDIATE FILE PRELIMINARY DESIGN WORKING DRAWING AS BUILT ✓
DESIGNER:  SNPDRI	DESIGNED: 高文捷 CHECKED: 李永 REVIEWED: 马志坤 APPROVED: 苏光 DATE: 2015/10/20
REV. DATE NOTES	STAMP(EMPLOYER): DATE: SIGNATURE:
29(XWP3-160) Type Single Insulator Tension String Drawing (Double-Conductor)	
SCALE: 1:10 DRWG No. BA06221Z-D0201-19	



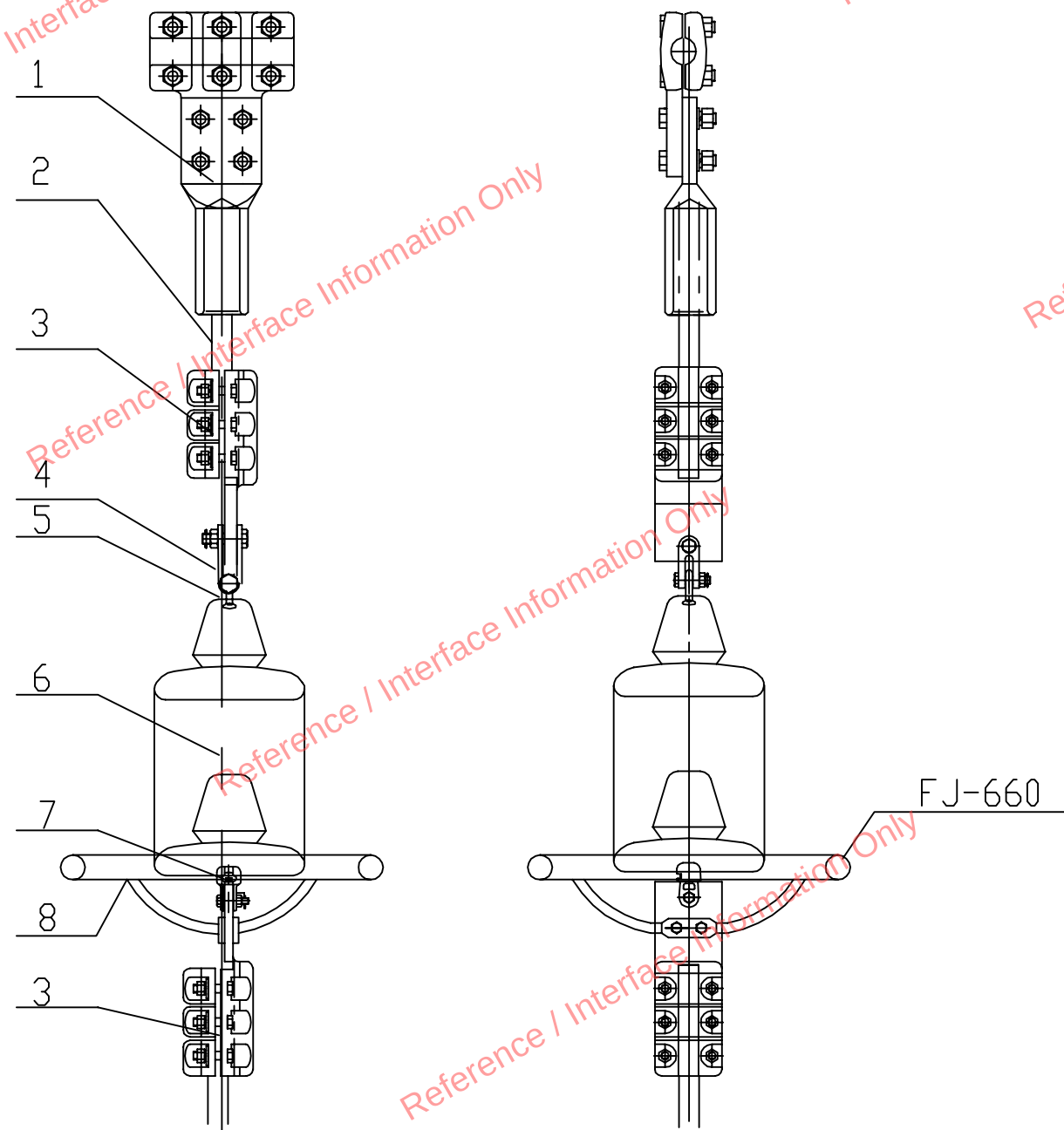
Note:
1. Civil reserved peg board thickness less than 36mm, aperture not less than 38mm, the length of the edge of the hole center distance of not more than 90mm.
2. The total weight of single-joint tension insulator string is 580.19kg.
3. Applies to Outgoing Lines bay.

Equipment Materials List

No.	NAME	TYPE	Unit	Q.	Weight(kg)		Remark
					Single	Total	
1	Shackles(Type U)	U-30	pcs.	2	3.75	7.5	
2	Yoke Plates(Type LB1)	LB1-3040	pcs.	1	13	13	
3	Clevis-Clevises(Type Z)	Z-16	pcs.	2	2.38	4.76	
4	Ball Eyes(Type QP)	QP-16	pcs.	2	0.5	1.0	
5	Suspension Porcelain Insulator	XWP3-160	pcs.	29X2	8.6	498.8	
6	Shielding Rings(Type FP)	FP-1060x660S	pcs.	2	6.5	13.0	
7	Grading Rings(Type FJ)	FJ-1026x676S	pcs.	1	8.5	8.5	
8	Socket-Clevises(Type WS)	WS-16	pcs.	2	2.64	5.28	
9	Yoke Plates(Type LBS)	LBS-3040	pcs.	1	21	21	
10	Clevis-Clevises(Type Z)	Z-16	pcs.	2	2.38	4.76	
11	Chain Links (Type PH)	PH-30	pcs.	1	2.59	2.59	

SPECIAL	SIGNATURE/DATE

EMPLOYER:  ZESCO LIMITED			PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT
CONTRACTOR:  TBEA CO., LTD			KASAMA 330/66kV SUBSTATION
DESIGNER:  SNPDRI	REV.	DATE	NOTES
☐ APPROVED ☐ REVISED AND RESUBMIT DATE:	☐ APPROVED AS CORRECTED ☐ NOT APPROVED SIGNATURE:	STAMP(EMPLOYER):	DOC. STATUS: FILE FOR APPROVAL INTERMEDIATE FILE PRELIMINARY DESIGN WORKING DRAWING AS BUILT ✓
			DESIGNED: 高文捷 CHECKED: 李永 REVIEWED: 马志坤 APPROVED: 苏光
			TITLE 2x29(XWP3-160) Type Double Insulator Tension String Drawing (Double-Conductor)
			DATE: 2015/10/20 SCALE: 1:10 DRWG No. BA06221Z-D0201-22



No.	NAME	TYPE	Unit	Q.	Weight(kg)		Remark
					Single	Total	
1	T-Connectors(Type TL)	TL-600K/600K	pcs.	1	9.8	9.8	
2	Al-Steel expanding hollow conductor	LGKK-600/50					
3	Terminal Clamps of Bolt Type (Type SL)	SL-600KA	pcs.	2	8	16	
4	Clevis-Clevises(Type Z)	Z-7	pcs.	1	0.56	0.56	
5	Ball Eyes(Type QP)	QP-7	pcs.	1	0.27	0.27	
6	Suspension Porcelain Insulator	XWP3-70	pcs.	4	4.6	18.4	
7	Socket-Clevises(Type WS)	WS-7	pcs.	1	0.97	0.97	
8	Grading Rings(Type FJ)	FJ-660	pcs.	1	5	5	

Note: 1. The total weight of single-joint insulator string is 51 kg.
2. Applies to Transformer bay.

DOC. STATUS:	FILE FOR APPROVAL	INTERMEDIATE FILE	PRELIMINARY DESIGN	WORKING DRAWING	AS BUILT	☒
DESIGNED	葛文捷	TITLE 4(XWP3-70) Type Single Insulator Suspension String Drawing (Single-Conductor)				
CHECKED	李永					
REVIEWED	马志坤					
APPROVED	苏光					
DATE : 2015/10/20		SCALE : 1:10	DRWG No. BA06221Z-D0201-23			

