

A

B

C

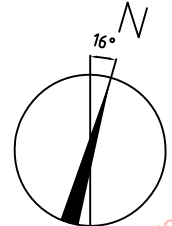
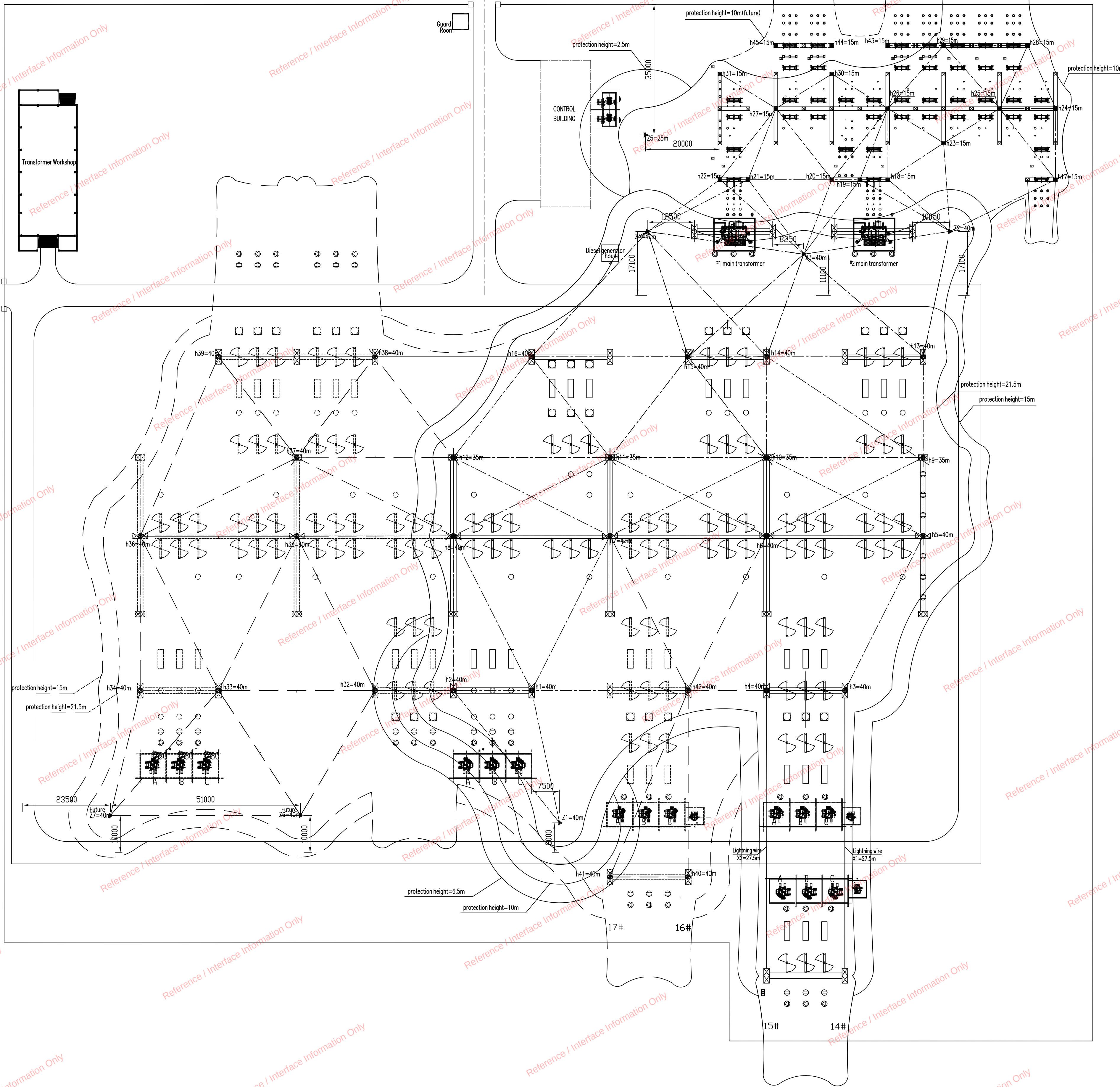
D

E

F

G

H



LEGEND

- Independent lightning rod
- Gantry lightning rod

Illustration

1. Rolling sphere method is considered in lightning protection caculation .

Area	radius
330kV switchgear area	45m
66kV switchgear area	30m

2. The lightning rods and lines in this project

	Height	QTY	Area
Independent lightning rod	40m	4	330kV switchgear area
Gantry lightning rod	40m	12	330kV switchgear area
Gantry lightning rod	35m	4	330kV switchgear area
lightning line	27.5m	2	330kV switchgear area
Independent lightning rod	25m	1	66kV switchgear area
Gantry lightning rod	15m	15	66kV switchgear area

The lightning rods and lines in future

	Height	QTY	Area
Independent lightning rod	40m	6	330kV switchgear area
Gantry lightning rod	40m	22	330kV switchgear area
Gantry lightning rod	35m	5	330kV switchgear area
lightning line	27.5m	2	330kV switchgear area
Independent lightning rod	25m	1	66kV switchgear area
Gantry lightning rod	15m	18	66kV switchgear area

3. The lightning protection method for the control building and the guard room: the steel roof of the building shall be consist of the air-termination system.

The lightning protection method for the transformer workshop: Lightning protection lines are set on the edge and top of the construction, consist of the air-termination system.

The air-termination system, down-conductor system, concrete iron and earth grid are reliable connection.

civil	
SPECIAL	SIGNATURE/DATE

EMPLOYER: ZESCO LIMITED	PROJECT NAME: PENSULO-KASAMA 330kV POWER TRANSMISSION PROJECT
CONTRACTOR: T BEA CO., LTD	KASAMA 330/66kV SUBSTATION
DESIGNER: SNPDRI	DOC. STATUS: FILE FOR APPROVAL
REV.	DATE
NOTES	DESIGNED: 高文捷
	CHECKED: 马志坤
	REVIEWED: 高文捷
	APPROVED: 高文捷
DATE: 2015/10/20	DATE: 2015/10/20
SCALE: 1:600	DRWG No. BA06221Z-D0208-02
THE SUBSTATION LIGHTNING PROTECTION DRAWING	

A

B

C

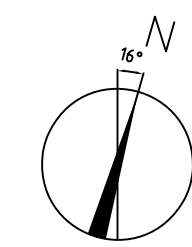
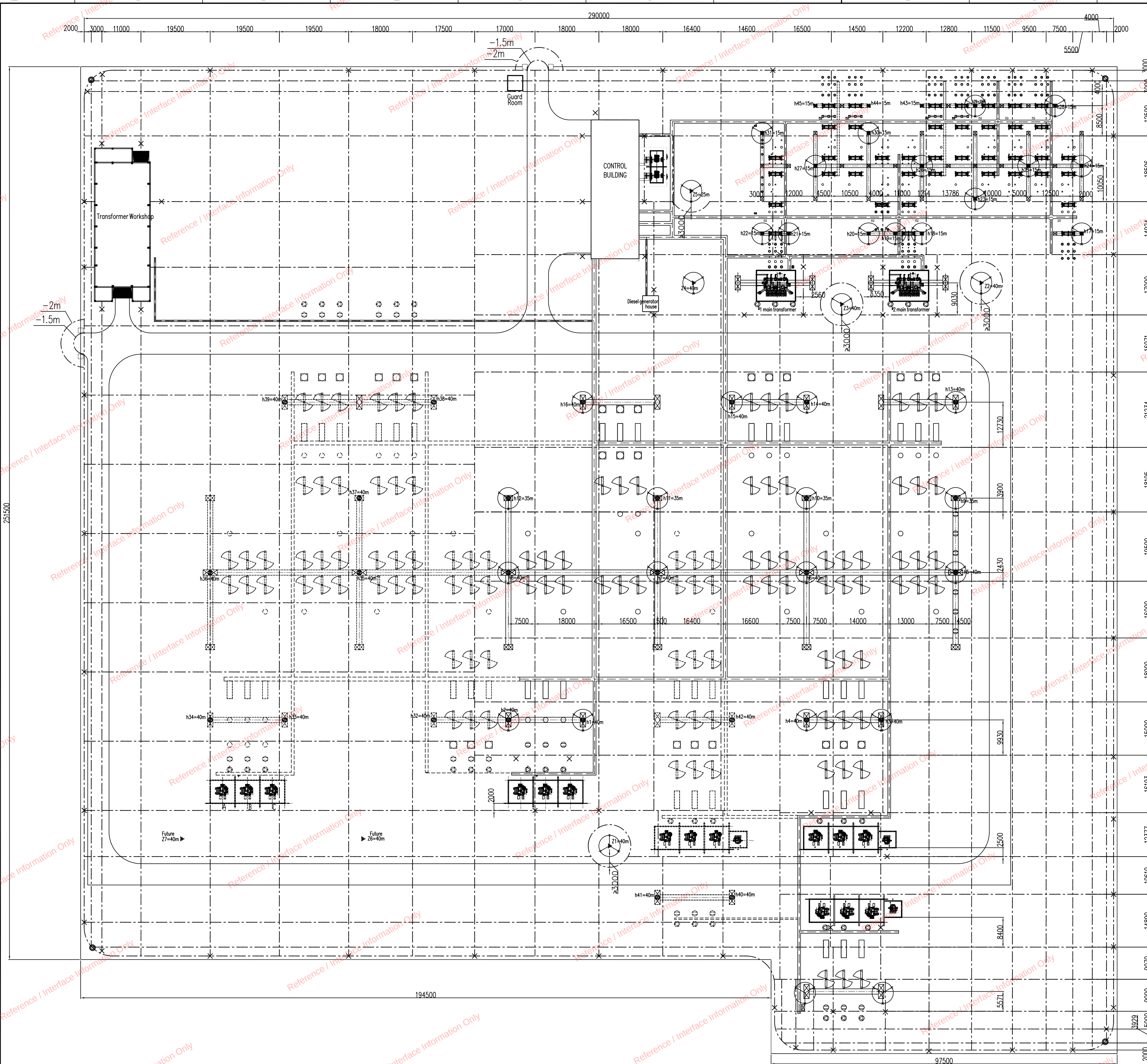
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Main material list

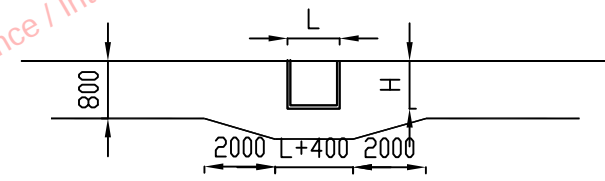
NO.	NAME	TYPE	UNIT	Q.	LEGEND	Remark
1	Vertical earthing rod	φ16 copper rod L=2500	pcs	82	×	
2	Centralized earthing device	TJ-150 copper wire 30m 3xφ16 copper rod L=2500	lot	38		
3	Horizontal earthing conductor	TJ-150 copper wire	m	15900	---	
4	Earthing down lead	TJ-185 copper wire	m	8000		
5	Copper wire	RBV-1x50	m	300		
6	Copper wire	RBV-1x120	m	300		
7	Copper wire	RBV-1x4	m	2000		
8	185 terminal	PL8 (Tin-Coated Copper)	pcs	600		
9	Earthing deep well	φ60 steel pipe, wall thickness=10mm L=10000mm	lot	4	●	

LEGEND

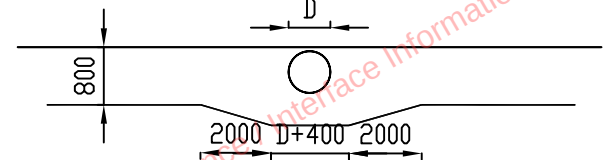
- Horizontal earthing conductor buried 800mm under the ground
- Horizontal earthing conductor laid on top support in cable trench

Illustration

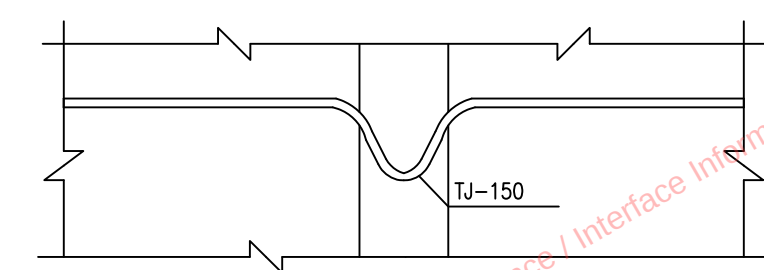
- The depth of buried outside Horizontal earthing conductors is -0.8m, or -1.0m crossing the road.
- The material of Horizontal earthing conductor is TJ-150 copper wire.
The material of earthing branch is TJ-185 copper wire.
- The borderline of the earth-electrode network should be smoothed, $\geq 5m$.
- High resistance material should be laid around the main transformers and outdoor equipment support operation area.
- The method of Horizontal earthing conductors crossing the cable trench nearby lightning rods shown as Fig:



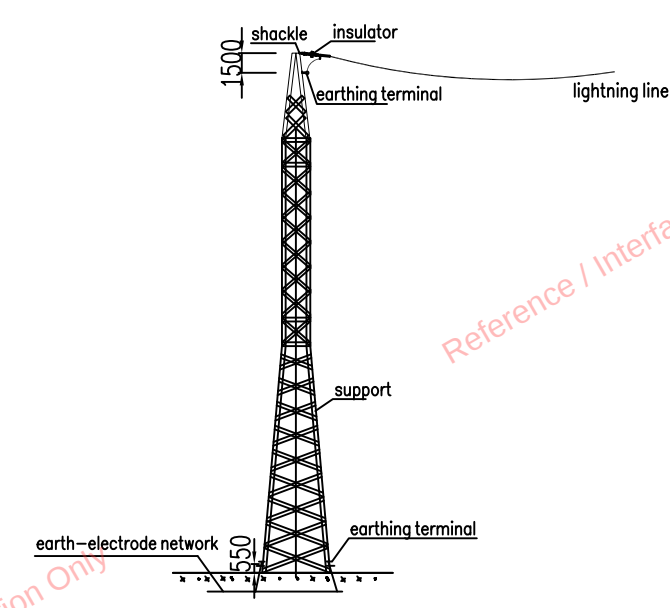
- The method of Horizontal earthing conductors crossing the hydraulic pipeline shown as Fig:



- The method of Horizontal earthing conductors crossing the expansion joints shown as Fig:



- The method of earth-electrode network connected to lightning lines from other substations shown as Fig:



9. The units of the dimension: mm.

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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 PRELIMINARY DESIGN WORKING DRAWING AS BUILT ✓		
REV. DATE NOTES			TITLE: THE SUBSTATION EARTH-ELECTRODE NETWORK DRAWING		
APPROVED AS CORRECTED NOT APPROVED			DATE: 2015/10/20		
DATE: SIGNATURE:			SCALE: 1:600 DRWG No. BA06221Z-D0208-03		