

ELECTRICITY GENERATING AUTHORITY OF THAILAND



**BIDDING DOCUMENTS
FOR
SUPPLY AND CONSTRUCTION OF TRANSMISSION LINES
500 kV NAN - DEN CHAI (FROM KM.63 TO DEN CHAI) AND
SECTIONALIZING OF 500 kV MAE MOH 3 - THA TAKO TO DEN CHAI SUBSTATION**

**TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES
FOR POWER PURCHASE FROM LAO PDR PROJECTS**

**VOLUME II OF IV
DRAWINGS AND DATA**

EGAT'S FUND

BIDDER :

DRAWINGS AND DATA

The drawings and data listed below are made a part of the Contract Documents. Among all the drawings, some plan & profile drawings showing representative conditions along the transmission line are included. However, a complete set of plan & profile drawings are available for examination by the Bidders at the office of EGAT. The Contractor will be furnished a complete set of plan & profile drawings and additional drawings as may be required in the opinion of EGAT to complete the work after confirmation of Letter of Award of Contract.

<u>DRAWING NO.</u>	<u>DESCRIPTION</u>
1	E01-193 LOCATION MAP
2	E01-194 LOCATION MAP
3	- CLIMATOLOGICAL DATA OBSERVED AT NAN
4	- CLIMATOLOGICAL DATA OBSERVED AT PHRAE
<u>KEY MAP, PLAN & PROFILE AND LINE TERMINATION FOR 500 KV NAN – DEN CHAI (KM.63 – DEN CHAI) TRANSMISSION LINE</u>	
5	T01-005 KEY MAP (STA. 12+503.621(BK.) / STA. 0+000.000(AH.) – STA. 11+890.993(BK.) / STA. 0+000.000(AH.))
6	T01-006 KEY MAP (STA. 11+890.806 – STA. 11+890.993(BK.) / STA. 0+000.000(AH.) – STA. 25+822.504))
7	T01-007 KEY MAP (STA. 25+822.504 – STA. 25+822.790(BK.) / STA. 0+000.000(AH.) – STA. 17+800.000)
8	T01-008 KEY MAP (STA. 17+800.000 – STA. 25+982.452)
9	T02-045 PLAN & PROFILE (STA. 12+503.621(BK.) / STA. 0+000.000(AH.) – STA. 0+023.671 – STA. 1+300.000)
10	T02-046 PLAN & PROFILE (STA. 1+300.000 – STA. 2+800.000)
11	T02-047 PLAN & PROFILE (STA. 2+800.000 – STA. 4+300.000)
12	T02-048 PLAN & PROFILE (STA. 4+300.000 – STA. 5+800.000)
13	T02-049 PLAN & PROFILE (STA. 5+800.000 – STA. 7+300.000)
14	T02-050 PLAN & PROFILE (STA. 7+300.000 – STA. 8+800.000)
15	T02-051 PLAN & PROFILE (STA. 8+800.000 – STA. 10+300.000)
16	T02-052 PLAN & PROFILE (STA. 11+300.000 – STA. 11+890.806 – STA. 11+890.993(BK.) / STA. 0+000.000(AH.))
17	T02-053 PLAN & PROFILE (STA. 11+890.806 – STA. 11+890.993(BK.) / STA. 0+000.000(AH.) – STA. 2+800.000)
18	T02-054 PLAN & PROFILE (STA. 2+800.000 – STA. 5+800.000)
19	T02-055 PLAN & PROFILE (STA. 5+800.000 – STA. 8+800.000)
20	T02-056 PLAN & PROFILE (STA. 8+800.000 – STA. 11+800.000)
21	T02-057 PLAN & PROFILE (STA. 11+800.000 – STA. 14+800.000)
22	T02-058 PLAN & PROFILE (STA. 14+800.000 – STA. 17+800.000)
23	T02-059 PLAN & PROFILE (STA. 17+800.000 – STA. 20+800.000)
24	T02-060 PLAN & PROFILE (STA. 20+800.000 – STA. 23+800.000)
25	T02-061 PLAN & PROFILE (STA. 23+800.000 – STA. 25+822.790(BK.) / STA. 0+000.000(AH.))
26	T02-062 PLAN & PROFILE (STA. 25+822.504 – STA. 25+822.790(BK.) / STA. 0+000.000(AH.) – STA. 2+800.000)

DRAWING NO.

DESCRIPTION

27	T02-063	PLAN & PROFILE (STA. 2+800.000 – STA. 5+800.000)
28	T02-064	PLAN & PROFILE (STA. 5+800.000 – STA. 8+800.000)
29	T02-065	PLAN & PROFILE (STA. 8+800.000 – STA. 11+800.000)
30	T02-066	PLAN & PROFILE (STA. 11+800.000 – STA. 14+800.000)
31	T02-067	PLAN & PROFILE (STA. 14+800.000 – STA. 17+800.000)
32	T02-068	PLAN & PROFILE (STA. 17+800.000 – STA. 20+800.000)
33	T02-069	PLAN & PROFILE (STA. 20+800.000 – STA. 23+800.000)
34	T02-070	PLAN & PROFILE (STA. 23+800.000 – STA. 25+982.452)
35	T04-001	LINE TERMINATION AT DEN CHAI JUNCTION (WEST) 3
36	T04-002	LINE TERMINATION AT DEN CHAI

INTERFACING WORK FOR 500 KV NAN – DEN CHAI (KM.63 – DEN CHAI) TRANSMISSION LINE

37	T05-001	INTERFACING WORK AT KM 63
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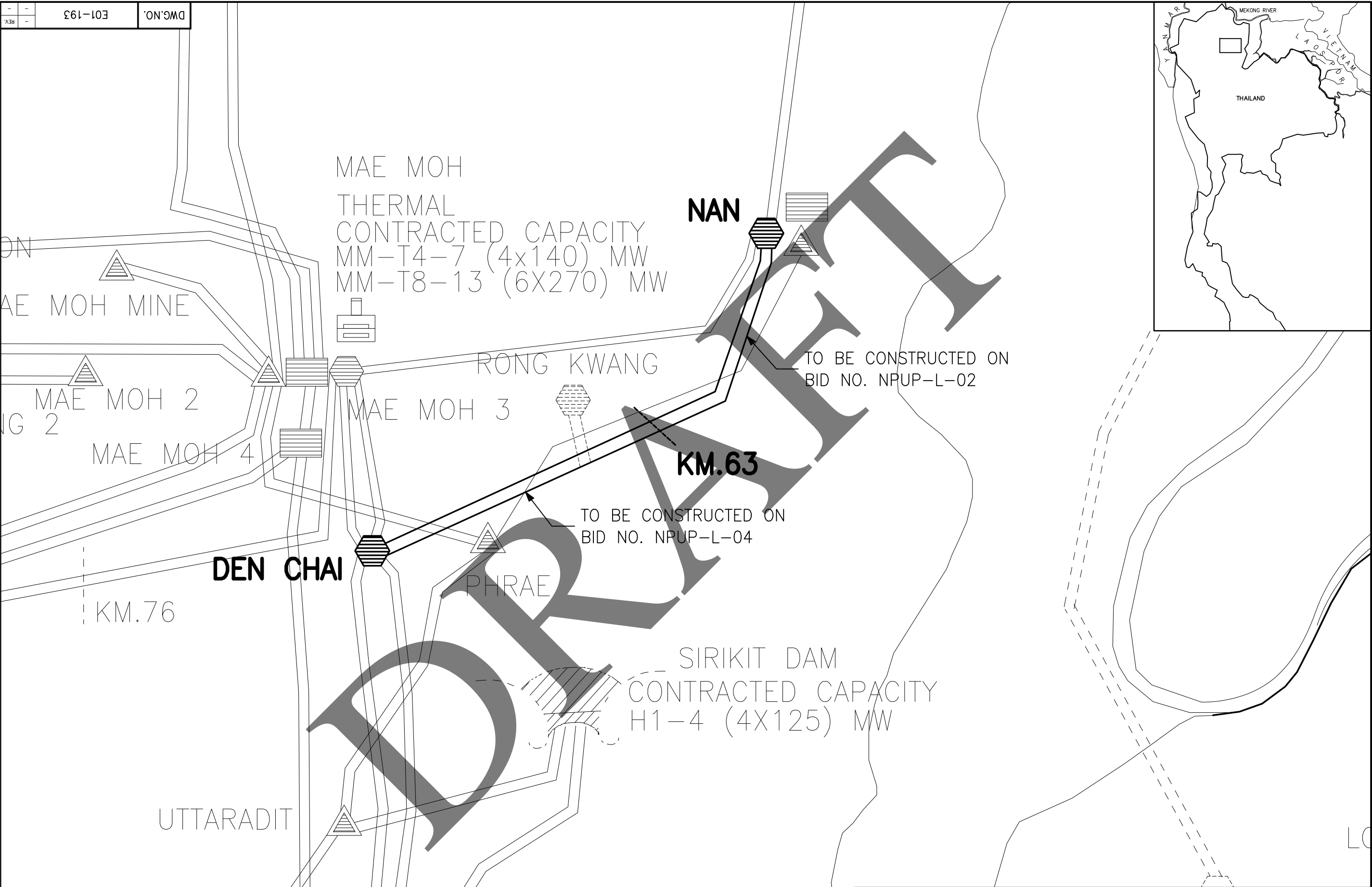
TOWERS

38	C01-045	CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQV3
39	C01-046	CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQV9(3)
40	C01-048	CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQTR
41	C01-049	CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQT20
42	C01-050	CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQT40
43	C01-051	CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQT60
44	C01-052	CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQT90
45	C02-003	LOADING DIAGRAM TOWER TYPE DQV3
46	C02-004	LOADING DIAGRAM TOWER TYPE DQV3
47	C02-005	LOADING DIAGRAM TOWER TYPE DQV9
48	C02-006	LOADING DIAGRAM TOWER TYPE DQV9
49	C02-007	LOADING DIAGRAM TOWER TYPE DQT20
50	C02-008	LOADING DIAGRAM TOWER TYPE DQT20
51	C02-009	LOADING DIAGRAM TOWER TYPE DQT40
52	C02-010	LOADING DIAGRAM TOWER TYPE DQT40
53	C02-011	LOADING DIAGRAM TOWER TYPE DQT60
54	C02-012	LOADING DIAGRAM TOWER TYPE DQT60
55	C02-013	LOADING DIAGRAM TOWER TYPE DQT60
56	C02-014	LOADING DIAGRAM TOWER TYPE DQT60
57	C02-015	LOADING DIAGRAM TOWER TYPE DQT60
58	C02-016	LOADING DIAGRAM TOWER TYPE DQT60
59	C02-017	LOADING DIAGRAM TOWER TYPE DQT90
60	C02-018	LOADING DIAGRAM TOWER TYPE DQT90
61	C02-019	LOADING DIAGRAM TOWER TYPE DQT90
62	C02-020	LOADING DIAGRAM TOWER TYPE DQT90

<u>DRAWING NO.</u>	<u>DESCRIPTION</u>
63	C02-021
64	C02-022
65	C02-023
66	C02-024
<u>TOWER FOUNDATION</u>	
67	C21-011
68	C21-025
69	C25-013 (REV. 2)
70	JOB NO.-F-01
<u>DISMANTLING WORK</u>	
71	C06-164
<u>ELECTRICAL AND GROUND CLEARANCE</u>	
72	E03-049.1
73	E03-049.2
74	E05-135
75	E05-136
76	E05-141
77	E05-142
78	E05-143
79	E05-144
80	E05-145
81	E07-096
82	E08-002
83	E11-024
84	E11-197
85	E11-198
86	E11-203
87	E11-204
88	E11-205
89	E11-206
90	E11-207
91	E11-208
92	E21-037

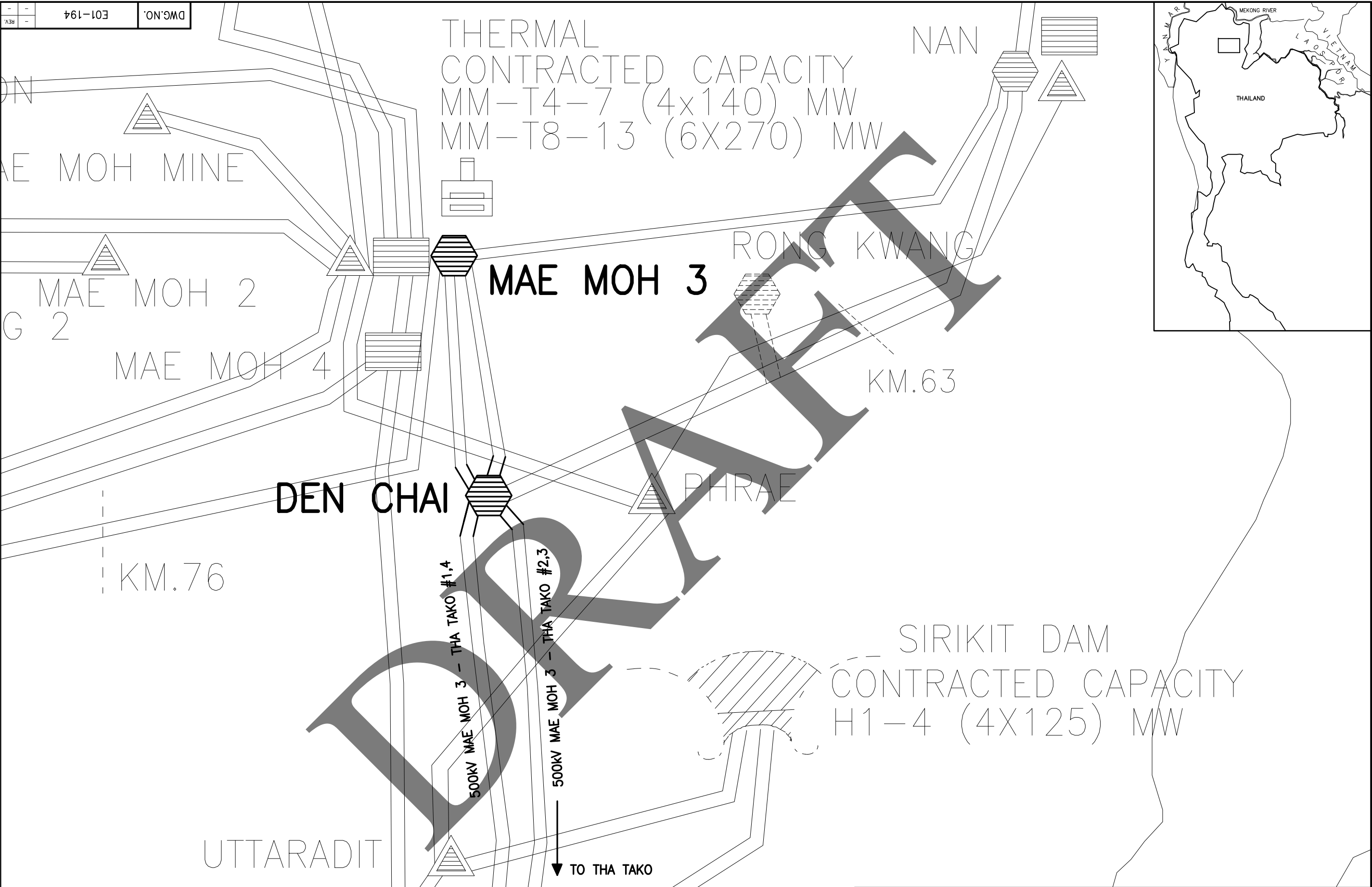
<u>DRAWING NO.</u>	<u>DESCRIPTION</u>
93	E31-003 (REV. 1)
94	500-EHV-T-15.2 (REV. 1)
<u>OPTICAL FIBER TRANSMISSION SYSTEM</u>	
95	DW-FOT-D01-202-01 (REV. 2)
96	DW-FOT-D01-202-02 (REV. 8)
97	DW-FOT-D01-207-01 (REV. 4)
98	DW-FOT-D01-211-01 (REV. 2)
99	DW-FOT-D01-212-01 (PAGE NO. P1, REV. 3)
100	DW-FOT-D01-212-01 (PAGE NO. P3, REV. 1)
101	DW-FOT-D01-213-01 (REV. 2)
102	DW-FOT-D01-214-01 (REV. 2)
103	DW-FOT-D01-218-02
104	DW-FOT-D01-221-01 (REV. 2)
105	DW-FOT-D01-233-01 (REV. 2)
106	OPGW-T04-002-DC
107	OPGW-T04-002-DC(J)
<u>TYPICAL DRAWING</u>	
108	TP-109A
109	TP-135C (REV.2)
110	TP-150B (REV.1)
111	TP-150.1
112	TP-152 (REV.1)
113	TP-602B
114	TP-161C
115	-

REV.	-	DWG.NO.	E01-193
-	-	-	-



REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN		RECOMMENDED AND VALIDATED		DRAWING NAME					
DESIGNED		CONCURRED		500 kV NAN - DEN CHAI					
VERIFIED		APPROVED		DESCRIPTION OF DETAIL DRAWING					
				LOCATION MAP					
				JOB NO.		REPLACING DWG.NO.		DWG.NO.	
				NPUP-01-L02		-		E01-193	



REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN ARNON W.		RECOMMENDED AND VALIDATED EtiPONG		DRAWING NAME SECTIONALIZING OF 500KV MAE MOH 3 - THA TAKO TO DEN CHAI					
DESIGNED Santana S.		CONCURRED		DESCRIPTION OF DETAIL DRAWING LOCATION MAP					
VERIFIED Akanachy D.		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		JOB NO. NPUP-01-L03		REPLACING DWG.NO. -		DWG.NO. E01-194	
APPROVED		DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE 25 Jul 2025					

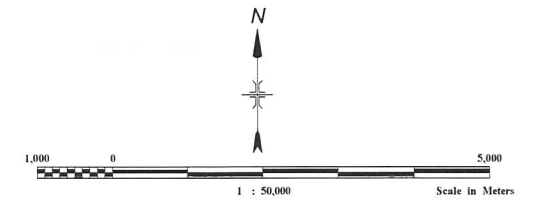
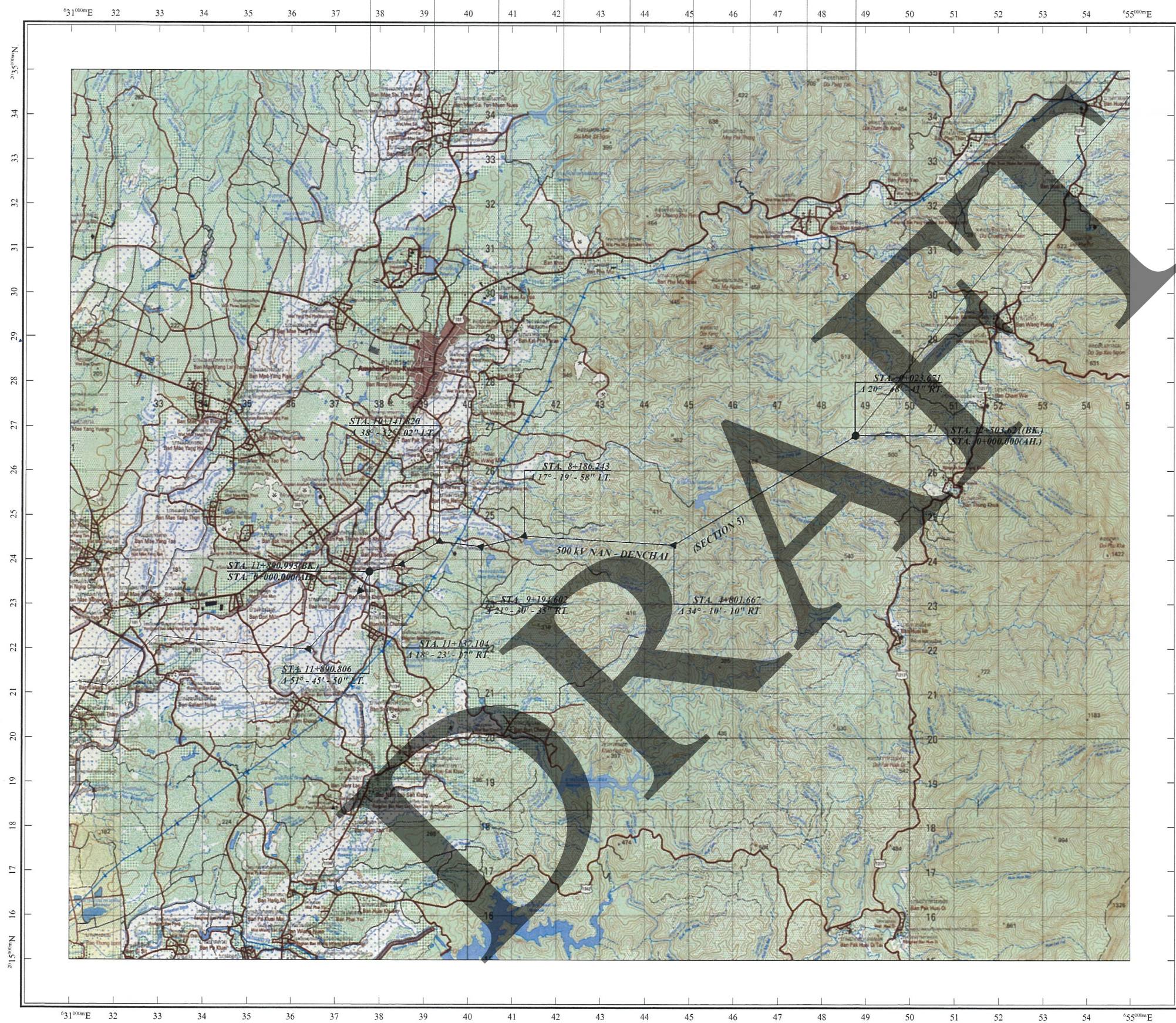
TABLE 1
CLIMATOLOGICAL DATA FOR THE PERIOD 1968 - 1997
NAN

	MONTH												
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR
RAINFALL (mm)													
Mean	8.9	13	31.9	100	168.8	139.8	216.1	258.6	184.2	77.5	20.5	6.9	1226.2
Mean Rainy Day	1.4	1.7	3.6	8.7	16.2	15.5	19.3	22.5	17	10	3.7	1.2	120.8
Daily Maximum	41	42.3	65	77.2	98.8	93.6	155.2	135.6	189.7	80.1	89.2	72.6	189.7
THUNDER STORM (Days)	0.3	0.9	3.4	8.6	12.5	8.8	7.4	10.5	10.1	4.3	0.5	0.2	67.5
TEMPERATURE (Celsius)													
Mean	20.8	23	26.4	28.7	28.5	28.1	27.4	27	27	26.1	23.6	20.5	25.6
Mean (Max.)	30	32.8	35.5	36.6	34.8	33.1	32	31.6	32.4	32.1	30.6	29.1	32.6
Mean (Min.)	13.7	14.9	18.7	22.2	23.7	24.3	24	23.8	23.4	21.9	18.5	14.3	20.3
Ext. (Max.)	35.2	38.3	40.6	43	42	40.3	37.8	38.4	36.3	35.7	34.9	34.6	43
Ext. (Min.)	3.5	7	9.1	17.3	18.5	20.1	19.6	19.4	18.8	12.1	6.2	4.6	3.5
WIND (Knots)													
Mean Wind Speed	0.6	0.8	1	1.1	1	1.1	1	0.9	0.7	0.6	0.5	0.5	-
Max. Wind Speed	16	21	40	40	35	35	22	22	40	20	15	12	40
Prevailing Wind	SE	S	S	S	S	S	S	S	S	N,SE	N	SE	-

TABLE 2
CLIMATOLOGICAL DATA FOR THE PERIOD 1968 - 1997
PHRAE

	MONTH												
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR
RAINFALL (mm)													
Mean	6.9	8.1	24.7	71.5	179.2	125.3	153.6	226.1	180.4	86.9	21.8	7.1	1091.6
Mean Rainy Day	1.1	1.4	2.4	6.3	14	15.6	18.1	20	16.9	10.5	3.4	0.9	110.6
Daily Maximum	33.4	50.9	88.4	181.7	130.8	118.8	123.3	167.2	120.3	74.3	73.5	85.7	181.7
THUNDER STORM (Days)	0.2	0.9	2.4	8.7	14.8	9.3	8.7	11.2	13.6	8.2	1.3	0.2	79.5
TEMPERATURE (Celsius)													
Mean	22	24.3	27.8	29.9	29	28.2	27.6	27.2	27.1	26.4	24.4	21.8	26.3
Mean (Max.)	30.8	33.4	36.1	37.4	35.3	33.4	32.4	32	32.2	32	31	29.9	33
Mean (Min.)	15	16.7	20.8	23.8	24.4	24.4	24.1	24	23.7	22.6	19.3	15.3	21.2
Ext. (Max.)	35.6	38.5	41	43.6	42.8	39.7	39.2	37.5	35.8	36.5	35.1	35.2	43.6
Ext. (Min.)	4.6	9.4	9.9	18.1	16.1	20	20	20.5	18.5	14.5	8.8	5.4	4.6
WIND (Knots)													
Mean Wind Speed	1.1	1.5	2.3	2.8	2.1	2.3	2.2	1.9	1.3	1.1	1.1	1.1	-
Max. Wind Speed	25	21	40	48	45	40	35	47	35	30	23	18	48
Prevailing Wind	S	S	SW	SW	SW	SW	SW	SW	SW	N,NE	NE	NE	-

STA. 10+300.000 - STA. 11+890.806 - STA. 11+890.993(BK.) - STA. 0+000.000(AH.) - SHEET No.52
STA. 8+800.000 - STA. 7+300.000 - STA. 5+800.000 - STA. 4+300.000 - STA. 2+800.000 - STA. 1+300.000 - STA. 0+000.000(AH.) - SHEET No.51
STA. 8+800.000 - STA. 7+300.000 - STA. 5+800.000 - STA. 4+300.000 - STA. 2+800.000 - STA. 1+300.000 - STA. 0+000.000(AH.) - SHEET No.50
STA. 8+800.000 - STA. 7+300.000 - STA. 5+800.000 - STA. 4+300.000 - STA. 2+800.000 - STA. 1+300.000 - STA. 0+000.000(AH.) - SHEET No.49
STA. 8+800.000 - STA. 7+300.000 - STA. 5+800.000 - STA. 4+300.000 - STA. 2+800.000 - STA. 1+300.000 - STA. 0+000.000(AH.) - SHEET No.48
STA. 8+800.000 - STA. 7+300.000 - STA. 5+800.000 - STA. 4+300.000 - STA. 2+800.000 - STA. 1+300.000 - STA. 0+000.000(AH.) - SHEET No.47
STA. 8+800.000 - STA. 7+300.000 - STA. 5+800.000 - STA. 4+300.000 - STA. 2+800.000 - STA. 1+300.000 - STA. 0+000.000(AH.) - SHEET No.46
STA. 12+503.621(BK.) - STA. 0+000.000(AH.) - SHEET No.45



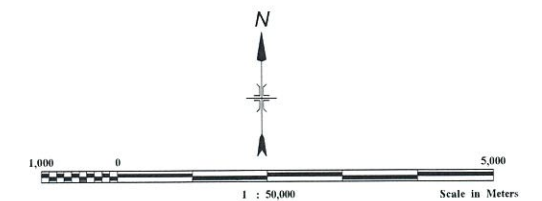
NOTE : This index is a part of RTSD. Topographic map
series L7018 (WGS. 84) Sheet No. 5045 I, 5045 II, 5045 III, 5045 IV

FOR BIDDING

SHEET No. 5 OF 8

No.	DATE	REVISION	CONCURRED	APPROVED
ELECTRICITY GENERATING AUTHORITY OF THAILAND				
500 kV TRANSMISSION LINE NAN - DENCHAI (SECTION 5)				
KEY MAP				
STA. 12+503.621(BK.) - STA. 11+890.993(BK.) STA. 0+000.000(AH.) - STA. 0+000.000(AH.)				
SUBMITTED		SUBMITTED		
CHIEF, SURVEY DEPARTMENT		CHIEF, TRANS. LINE ENGINEERING DEPARTMENT		
APPROVED		APPROVED		
DIRECTOR, SURVEY DEPARTMENT		DIRECTOR, TRANS. LINE ENGINEERING DEPARTMENT		
JOB No.		DWG No.		
NPUP-01-L02		T01-005		
		REV.		

STA. 23+800.000 - STA. 25+822.790(BK.) - STA. 0+000.000(AH.) SHEET No.61
STA. 20+800.000 - STA. 23+800.000 SHEET No.60
STA. 17+800.000 - STA. 20+800.000 SHEET No.59
STA. 14+800.000 - STA. 17+800.000 SHEET No.58
STA. 11+800.000 - STA. 14+800.000 SHEET No.57
STA. 8+800.000 - STA. 11+800.000 SHEET No.56
STA. 5+800.000 - STA. 8+800.000 SHEET No.55
STA. 2+000.000 - STA. 5+800.000 SHEET No.54
STA. 11+890.806 - STA. 11+890.993(BK.) - STA. 0+000.000(AH.) - STA. 2+800.000 SHEET No.53



NOTE : This index is a part of RTSD. Topographic map
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FOR BIDDING

SHEET No. 6 OF 8

No.	DATE	REVISION	CONCURRED	APPROVED
ELECTRICITY GENERATING AUTHORITY OF THAILAND				
500 kV TRANSMISSION LINE NAN - DENCHAI (SECTION 6)				
KEY MAP				
STA. 11+890.806 - STA. 11+890.993(BK.) - STA. 25+822.504 STA. 0+000.000(AH.)				
SUBMITTED:		SUBMITTED: 61-61-PONG 20 Nov 25		
CHIEF, SURVEY DEPARTMENT		CHIEF, TRANS. LINE ENGINEERING DEPARTMENT		
APPROVED:		CONCURRED:		
DIRECTOR, SURVEY DIVISION		DIRECTOR, TRANS. SYSTEM ENGINEERING DIVISION		
JOB No.		DWG No.		REV.
NPUP-01-L02		T01-006		



STA. 25+822.504 -
STA. 25+822.790 (BK.)
STA. 0+000.000 (AH.)
STA. 2+800.000
SHEET No.62

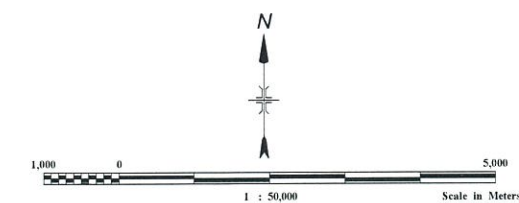
STA. 2+000.000 -
STA. 5+800.000
SHEET No.63

STA. 5+800.000 -
STA. 8+800.000
SHEET No.64

STA. 8+800.000 -
STA. 11+800.000
SHEET No.65

STA. 11+800.000 -
STA. 14+800.000
SHEET No.66

STA. 14+800.000 -
STA. 17+800.000
SHEET No.67

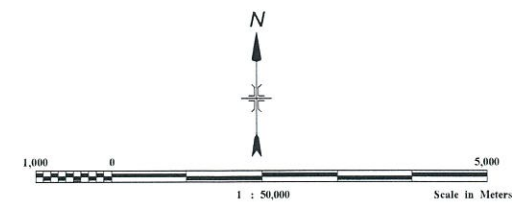
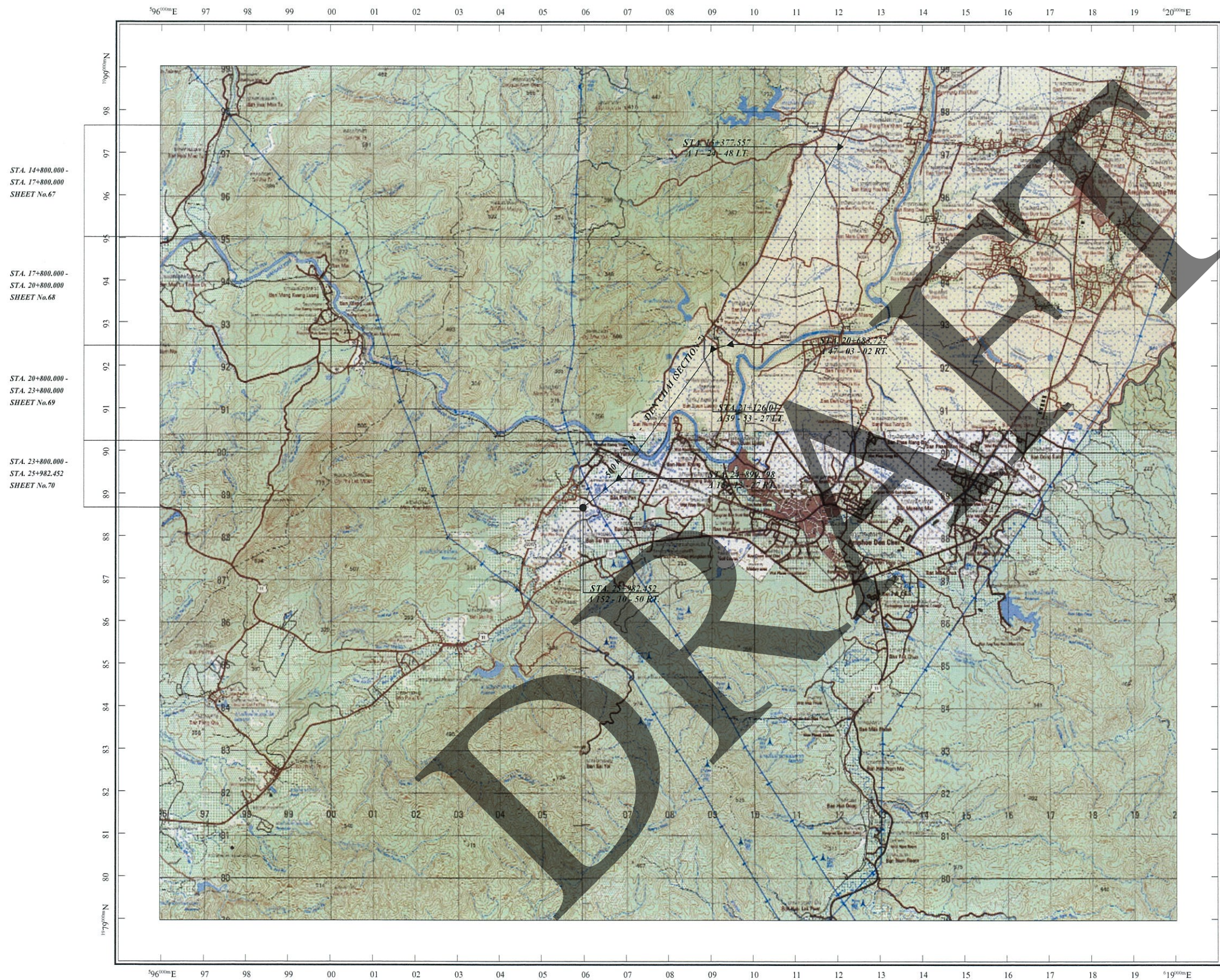


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series L7018 (WGS. 84) Sheet No. 4944 I,4944 IV,4945 II,4945 III

FOR BIDDING

SHEET No. 7 OF 8

No.	DATE	REVISION	CONCURRED	APPROVED
ELECTRICITY GENERATING AUTHORITY OF THAILAND				
500 kV TRANSMISSION LINE NAN - DEN CHAI (SECTION 7)				
KEY MAP				
STA. 25+822.504 - STA. 25+822.790 (BK.) - STA. 17+800.000 STA. 0+000.000 (AH.)				
SUBMITTED:		SUBMITTED:		
L. PONG 20 Nov 25		L. PONG 20 Nov 25		
CHIEF, SURVEY DEPARTMENT		CHIEF, TRANS. LINE ENGINEERING DEPARTMENT		
DATE		DATE		
APPROVED:		APPROVED:		
DIRECTOR, SURVEY DIVISION		DIRECTOR, TRANS. SYSTEM ENGINEERING DIVISION		
DATE		DATE		
JOB No. NPUP-01-L02		DWG. No. T01-007		REV.

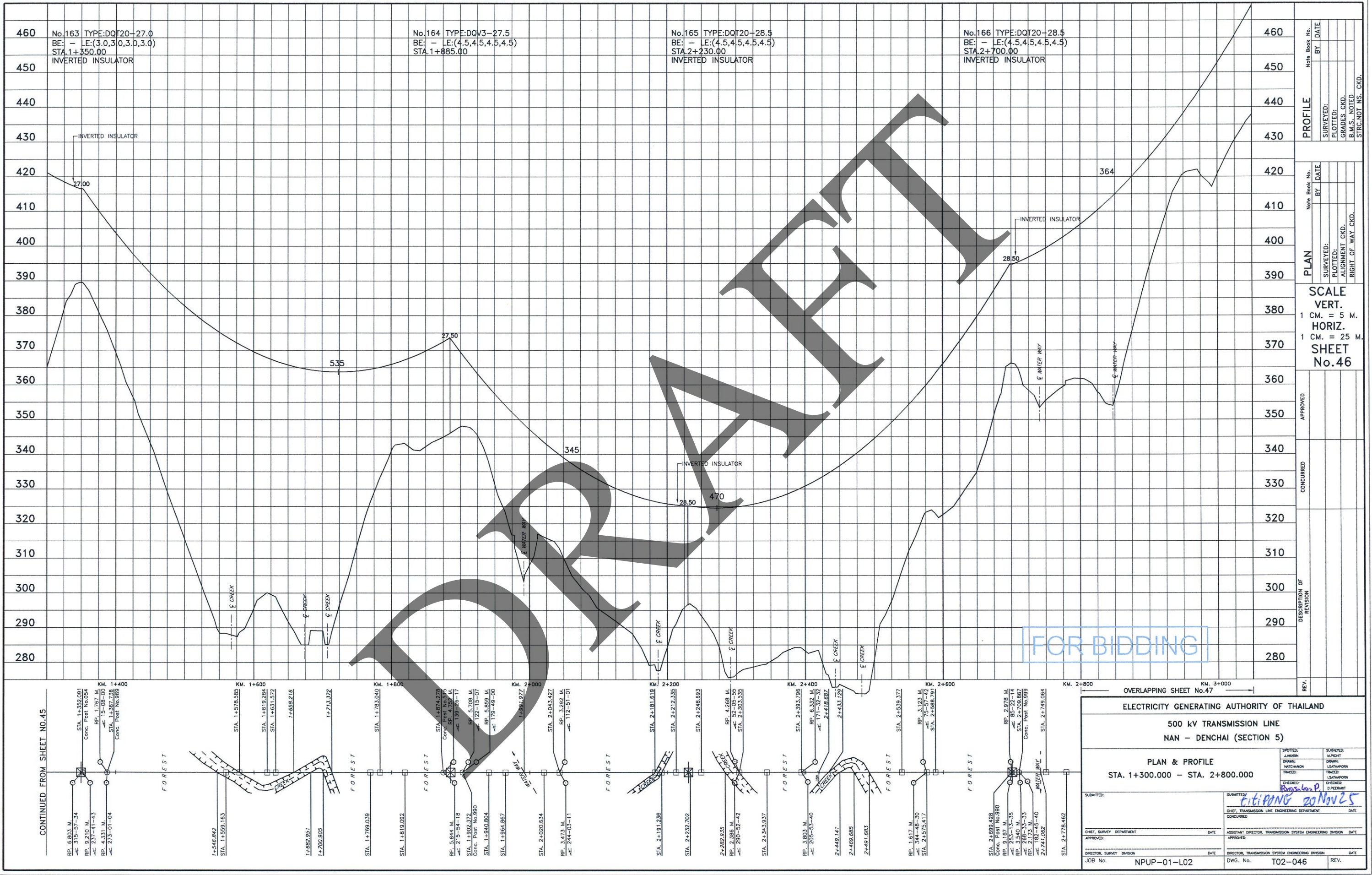


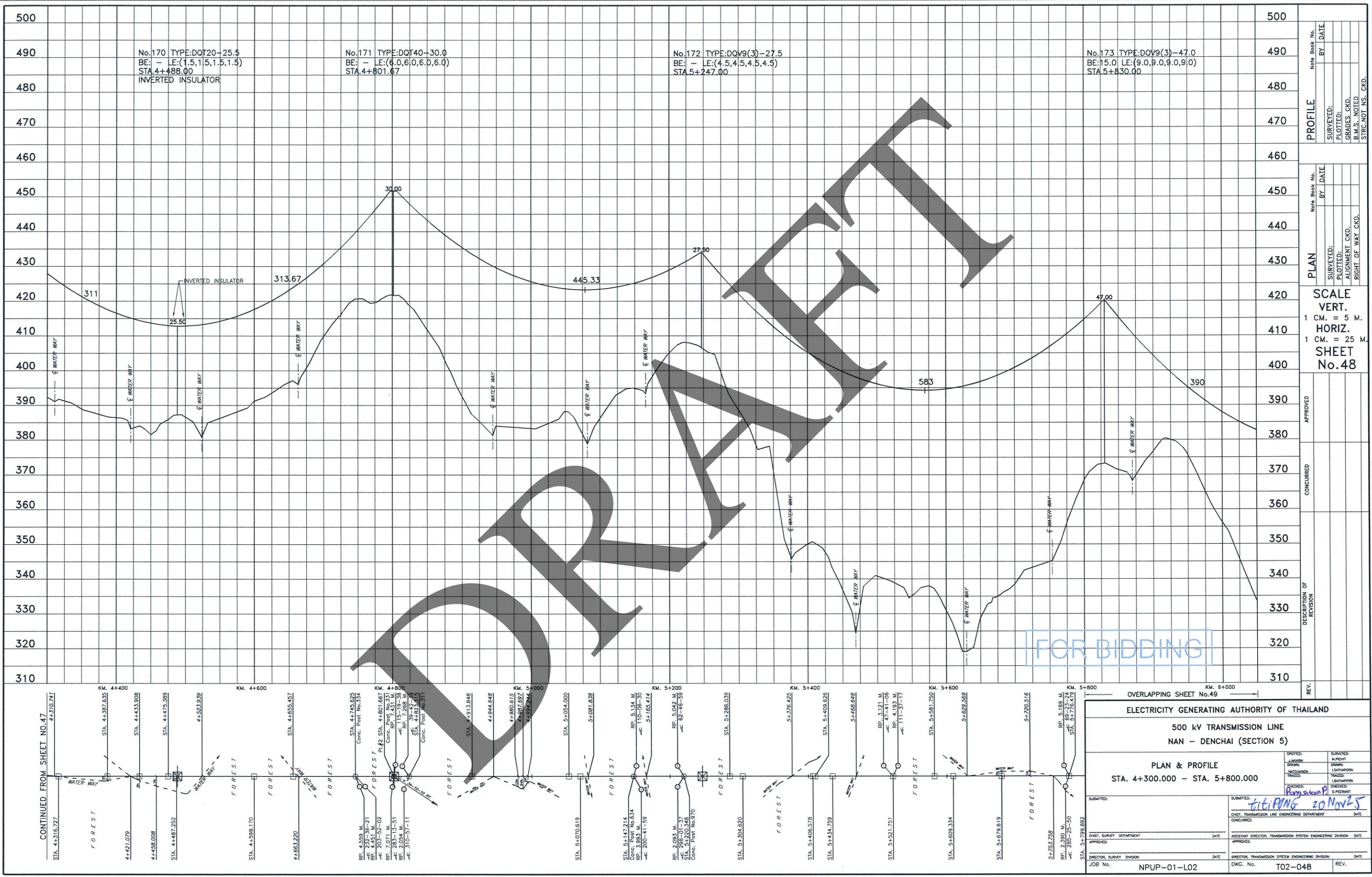
NOTE : This index is a part of RTSD. Topographic map
series L7018 (WGS. 84) Sheet No. 4944 I, 4944 IV, 4945 II, 4945 III

FOR BIDDING

SHEET No. 8 OF 8

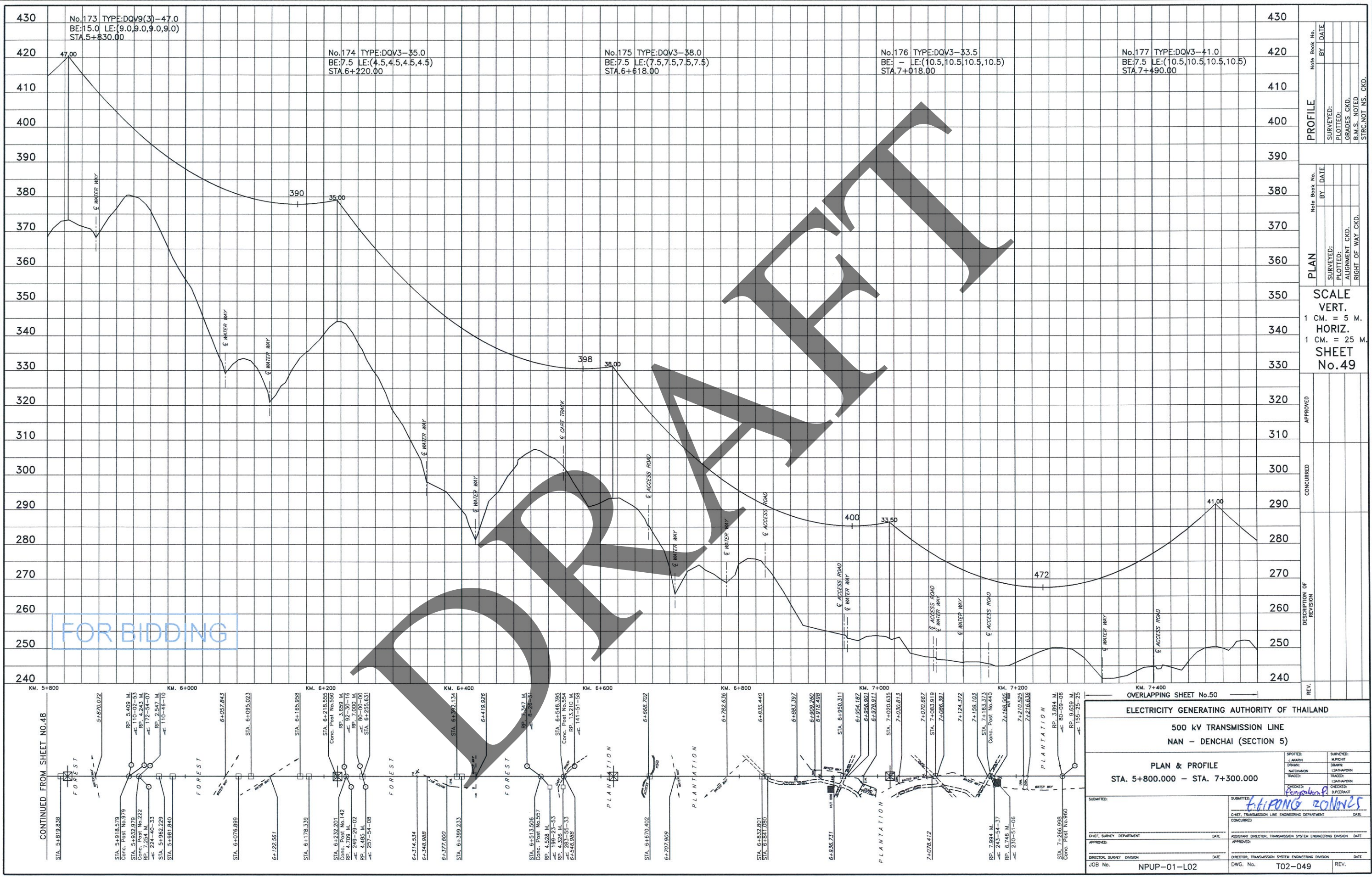
No.		DATE	REVISION	CONCURRED	APPROVED
ELECTRICITY GENERATING AUTHORITY OF THAILAND					
500 kV TRANSMISSION LINE NAN - DEN CHAI (SECTION 7)					
KEY MAP STA. 17+800,000 - STA. 25+982,452					
SUBMITTED:		SUBMITTED:		SUBMITTED:	
CHIEF, SURVEY DEPARTMENT		CHIEF, TRANS. LINE ENGINEERING DEPARTMENT		CHIEF, TRANS. SYSTEM ENGINEERING DEPARTMENT	
DATE		DATE		DATE	
APPROVED:		APPROVED:		APPROVED:	
DIRECTOR, SURVEY DIVISION		DIRECTOR, TRANS. SYSTEM ENGINEERING DIVISION		DIRECTOR, TRANS. SYSTEM ENGINEERING DIVISION	
DATE		DATE		DATE	
JOB No.		NPUP-01-L02		DWG No.	
				T01-008	
				REV.	





REV.	DESCRIPTION OF REVISION	CONCURRED	APPROVED	SCALE VERT. 1 CM. = 5 M. HORIZ. 1 CM. = 25 M. SHEET No.48	PLAN		Note Book No.		PROFILE	Note Book No.
					BY	DATE	BY	DATE		
					SURVEYED:				SURVEYED:	
					PLOTTED:				PLOTTED:	
					ALIGNMENT CKD.				GRADES CKD.	
					RIGHT OF WAY CKD.				B.M.S. NOTED	
									STEC. NOT NS. CKD.	

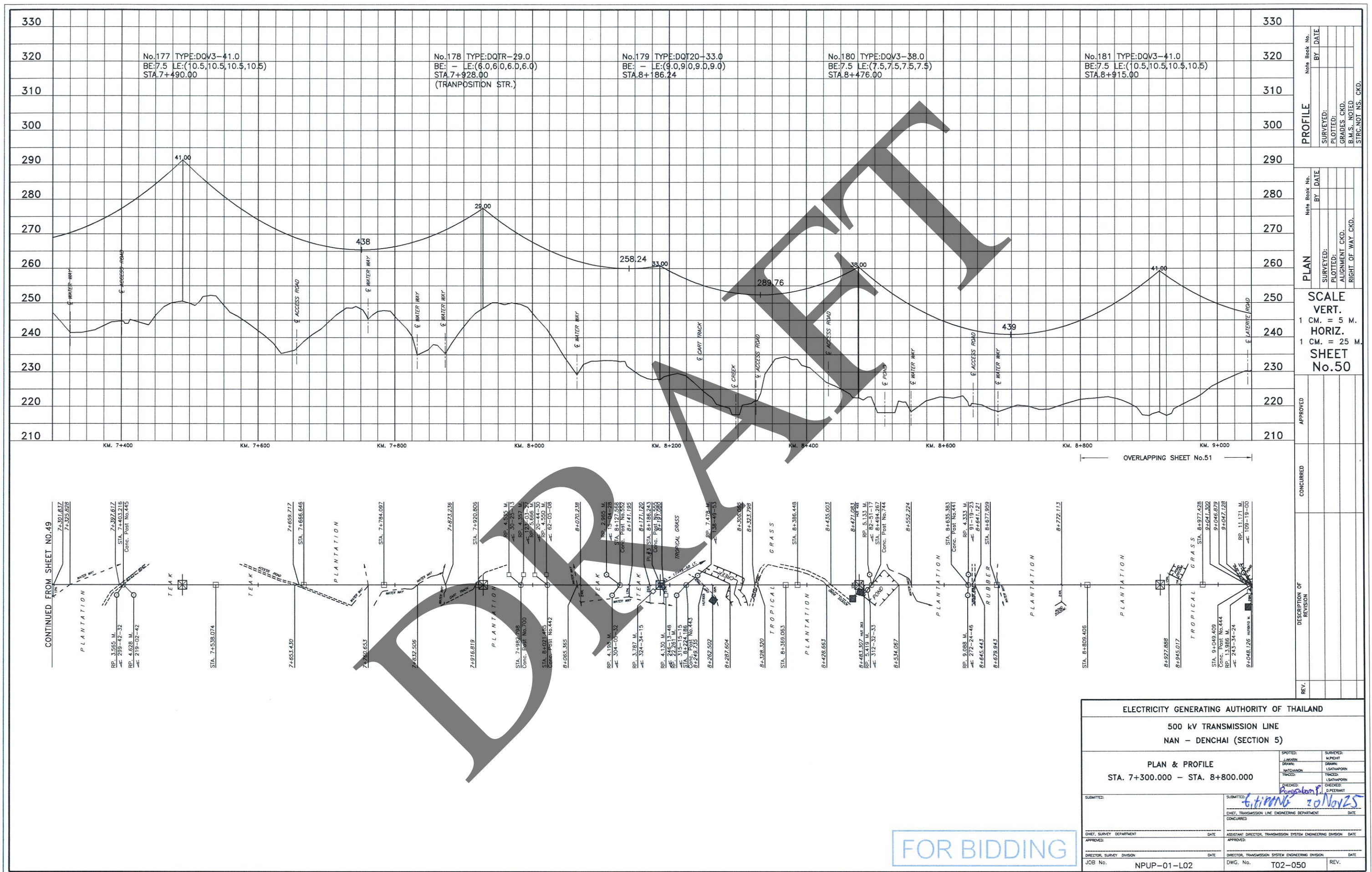
ELECTRICITY GENERATING AUTHORITY OF THAILAND	
500 kV TRANSMISSION LINE	
NAN - DENCHAI (SECTION 5)	
PLAN & PROFILE	
STA. 4+300.000 - STA. 5+800.000	
SUBMITTED:	DATE:
CHEF, SURVEY DEPARTMENT	DATE:
APPROVED:	DATE:
DIRECTOR, SURVEY DEPARTMENT	DATE:
SUBMITTED:	
DATE:	
CHEF, TRANSMISSION LINE ENGINEERING DEPARTMENT	
APPROVED:	
DATE:	
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	
DATE:	
JOB No.	REV.
NPUP-01-L02	T02-048

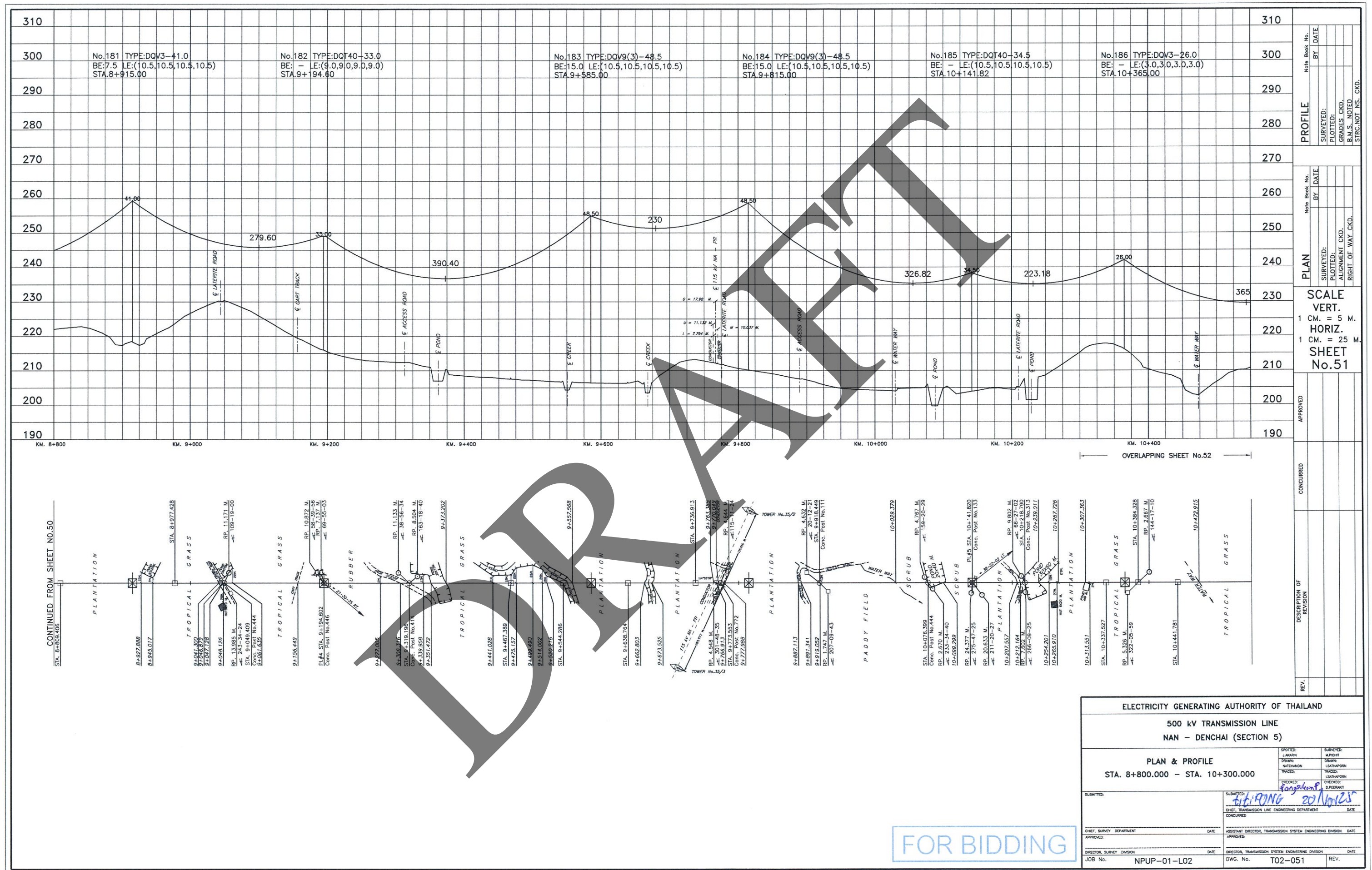


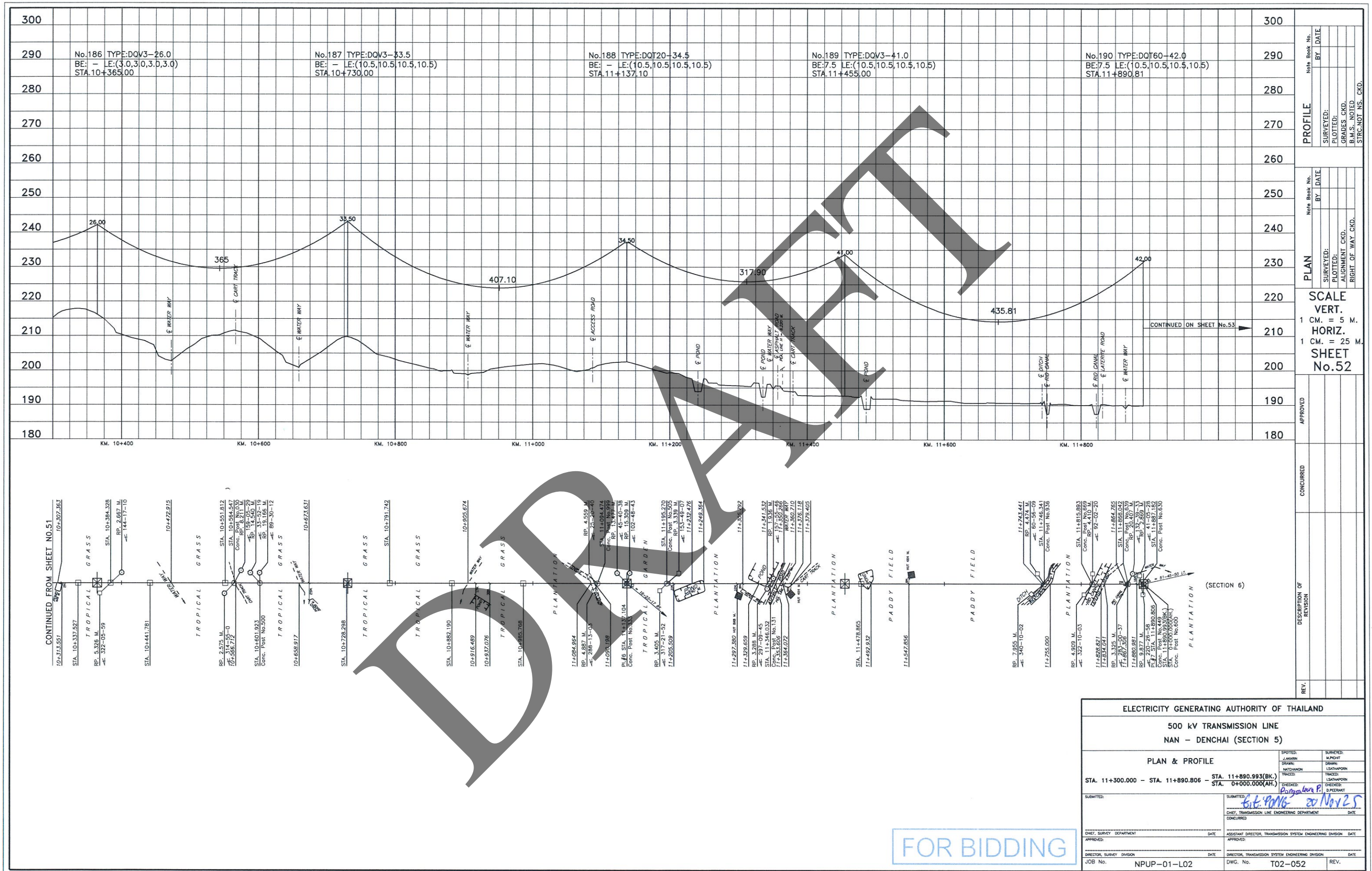
PROFILE		PLAN		APPROVED	CONCURRED	DESCRIPTION OF REVISION
Note Book No.	BY DATE	Note Book No.	BY DATE			
SURVEYED:		SURVEYED:				
GRADES CKD.		PLOTTED:				
B.M.S. NOTED		ALIGNMENT CKD.				
STRC. NOT NS. CKD.		RIGHT OF WAY CKD.				

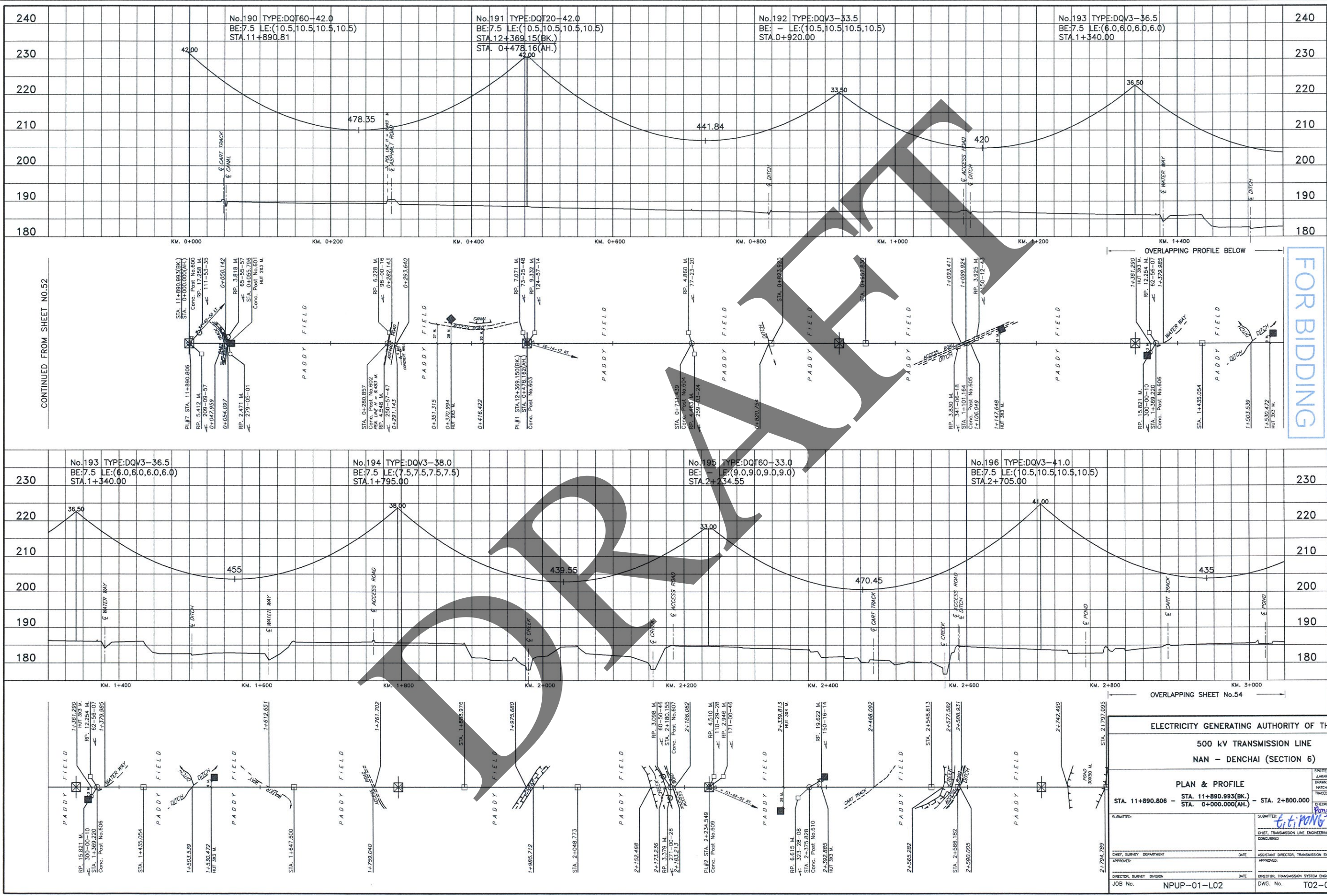
SCALE
VERT.
1 CM. = 5 M.
HORIZ.
1 CM. = 25 M.
SHEET
No. 49

ELECTRICITY GENERATING AUTHORITY OF THAILAND	
500 kV TRANSMISSION LINE	
NAN - DENCHAI (SECTION 5)	
PLAN & PROFILE	
STA. 5+800.000 - STA. 7+300.000	
SUBMITTED:	DATE:
CHEF, SURVEY DEPARTMENT	DATE:
APPROVED:	DATE:
DIRECTOR, SURVEY DIVISION	DATE:
JOB No.	NPUP-01-L02
SUBMITTED:	DATE:
ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	DATE:
APPROVED:	DATE:
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	DATE:
DWG. No.	T02-049
REV.	









CONTINUED FROM SHEET NO.52

FOR BIDDING

SCALE		VERT.	1 CM. = 5 M.	HORIZ.	1 CM. = 25 M.	SHEET No.53	REV.	DESCRIPTION OF REVISION	CONCURRED	APPROVED	PLAN & PROFILE		
Note Book No.											BY	DATE	
SURVEYED:													
PLOTTED:													
GRADES CKD.													
ALIGNMENT CKD.													
RIGHT OF WAY CKD.													

SCALE
VERT.
1 CM. = 5 M.
HORIZ.
1 CM. = 25 M.
SHEET
No.53

Electricity Generating Authority of Thailand

500 kV TRANSMISSION LINE

NAN - DENCHAI (SECTION 6)

PLAN & PROFILE

STA. 11+890.806 - STA. 11+890.993(BK.) - STA. 2+800.000

STA. 0+000.000(AH.)

Submitted: *Eti Pong* 20 May 25

Chief, Transmission Line Engineering Department

Approved: _____

Submitted: _____

Chief, Survey Department

Approved: _____

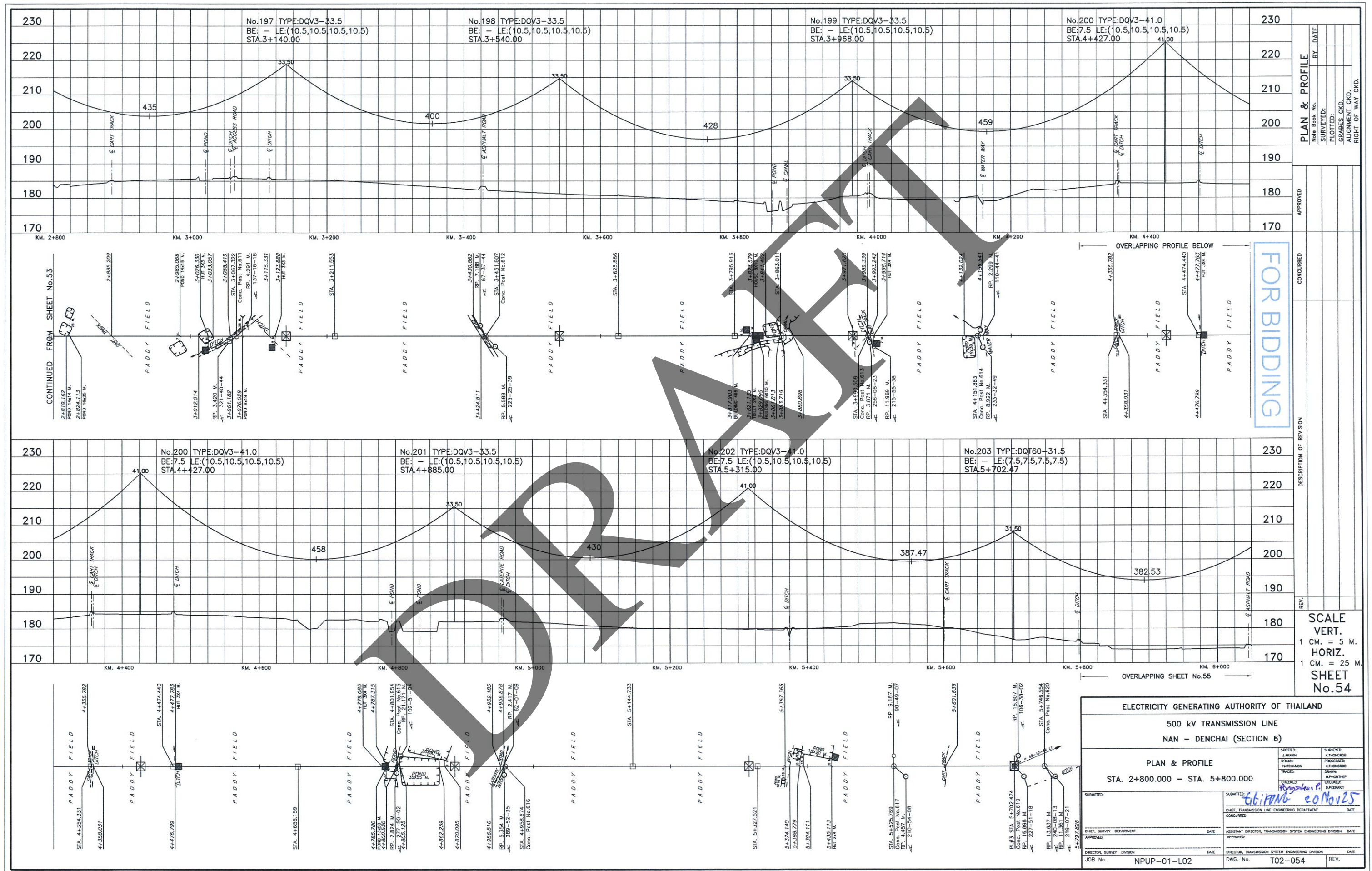
Director, Survey Division

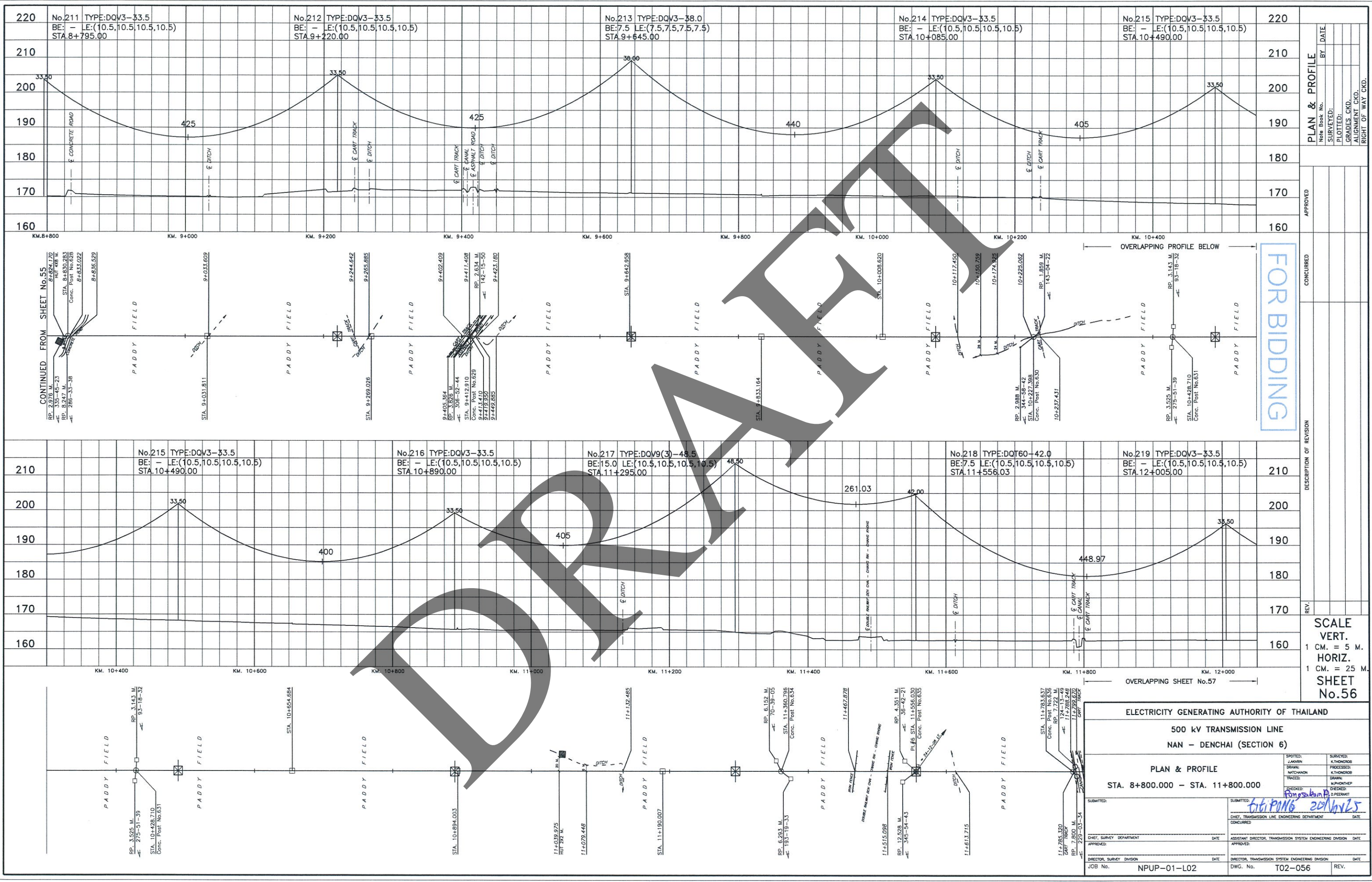
Director, Transmission System Engineering Division

Job No. NPUP-01-L02

DWG. No. T02-053

Rev. _____





PLAN & PROFILE	
BY	DATE
SURVEYED	
PLOTTED	
GRADES CKD.	
ALIGNMENT CKD.	
RIGHT OF WAY CKD.	

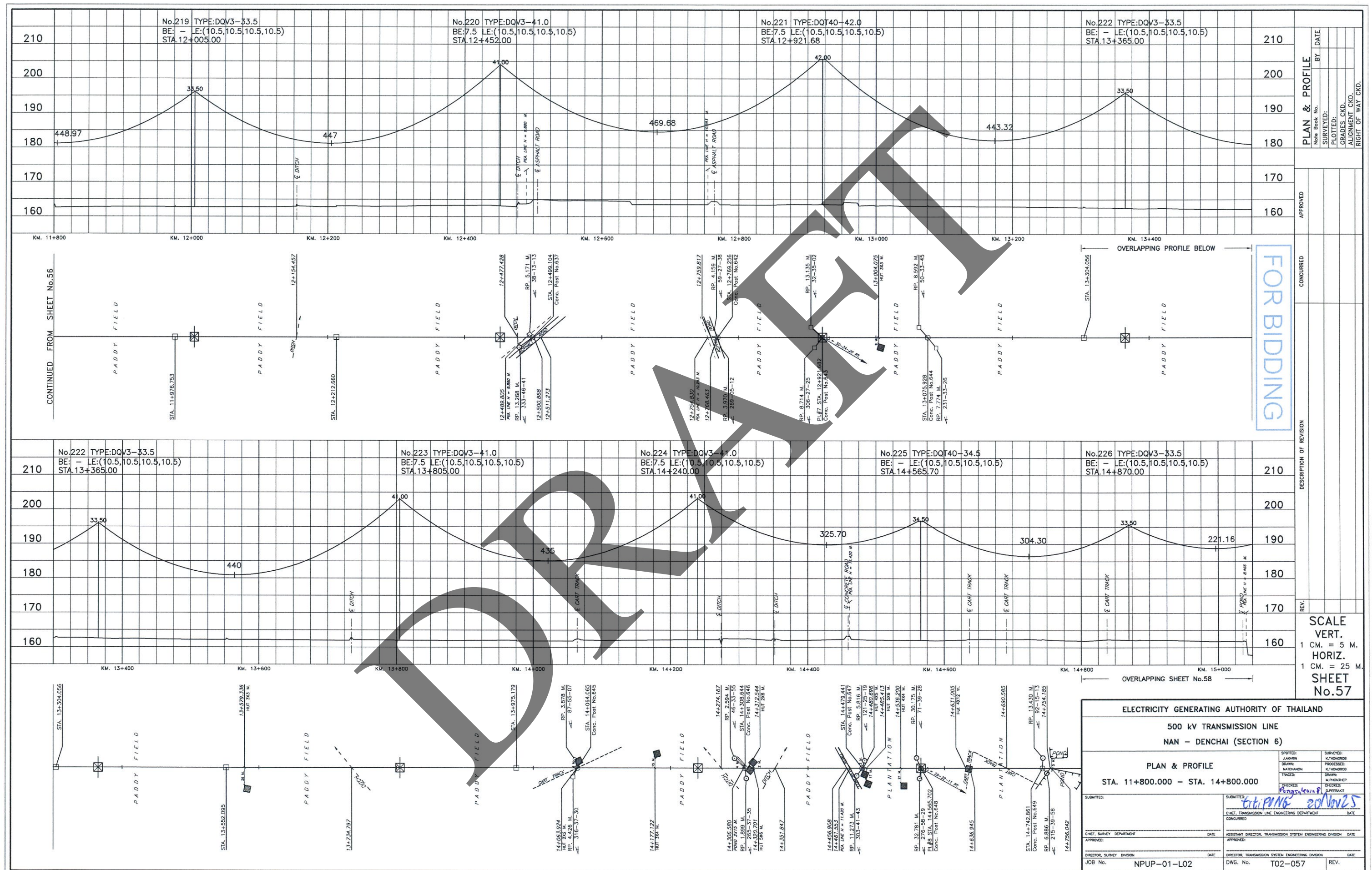
APPROVED

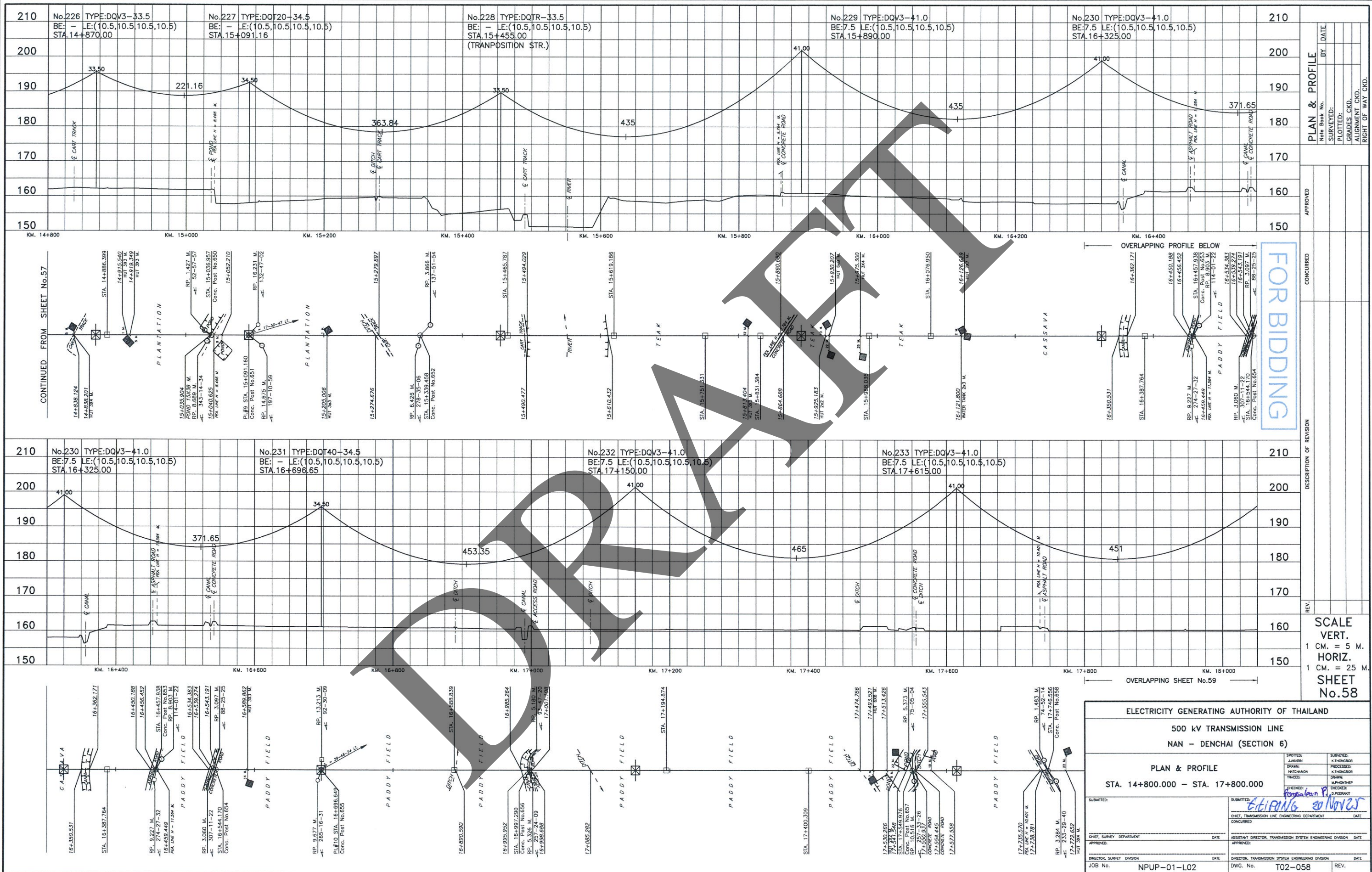
CONCURRED

DESCRIPTION OF REVISION

SCALE
VERT.
1 CM. = 5 M.
HORIZ.
1 CM. = 25 M.
SHEET
No.56

ELECTRICITY GENERATING AUTHORITY OF THAILAND	
500 kV TRANSMISSION LINE	
NAN - DENCHAI (SECTION 6)	
PLAN & PROFILE	
STA. 8+800.000 - STA. 11+800.000	
SUBMITTED: CHIEF, SURVEY DEPARTMENT DATE	SUBMITTED: CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT DATE
APPROVED: DIRECTOR, SURVEY DIVISION DATE	APPROVED: ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION DATE
JOB No. NPU-01-L02	DWG. No. T02-056
REV.	





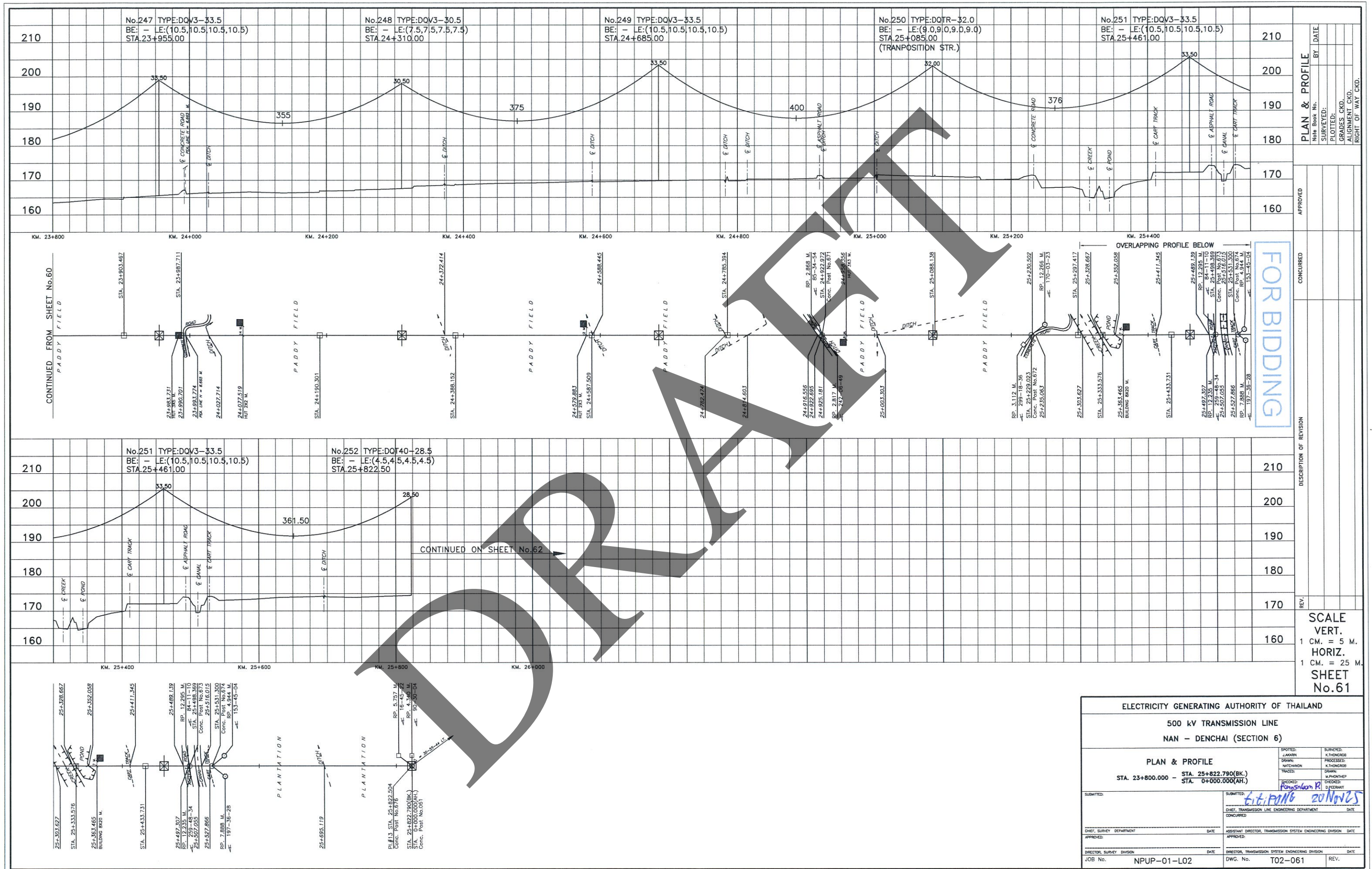
PLAN & PROFILE	
BY DATE	
SURVEYED	
PLOTTED	
GRADES CKD.	
ALIGNMENT CKD.	
RIGHT OF WAY CKD.	

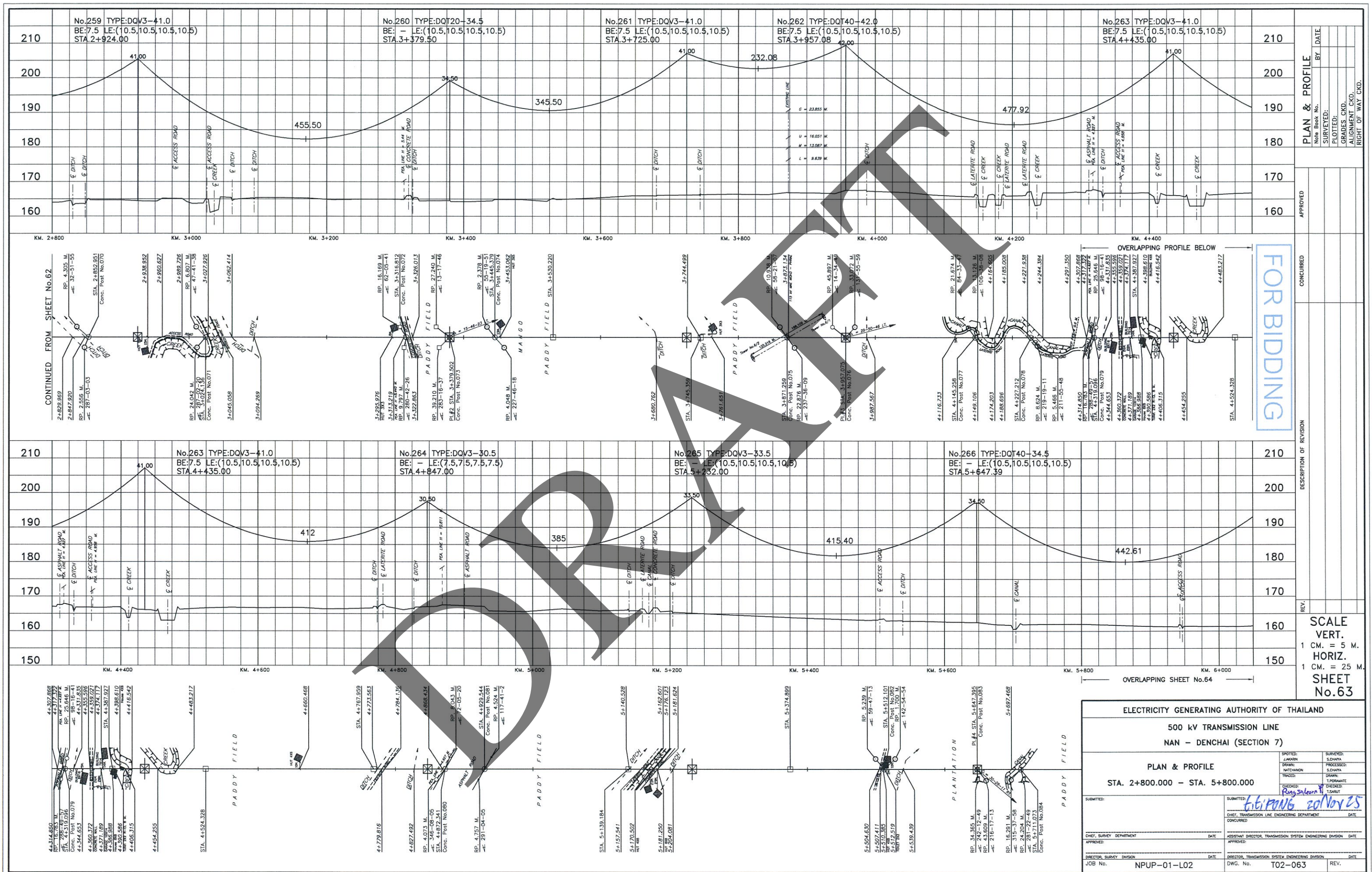
CONCURRED	
APPROVED	

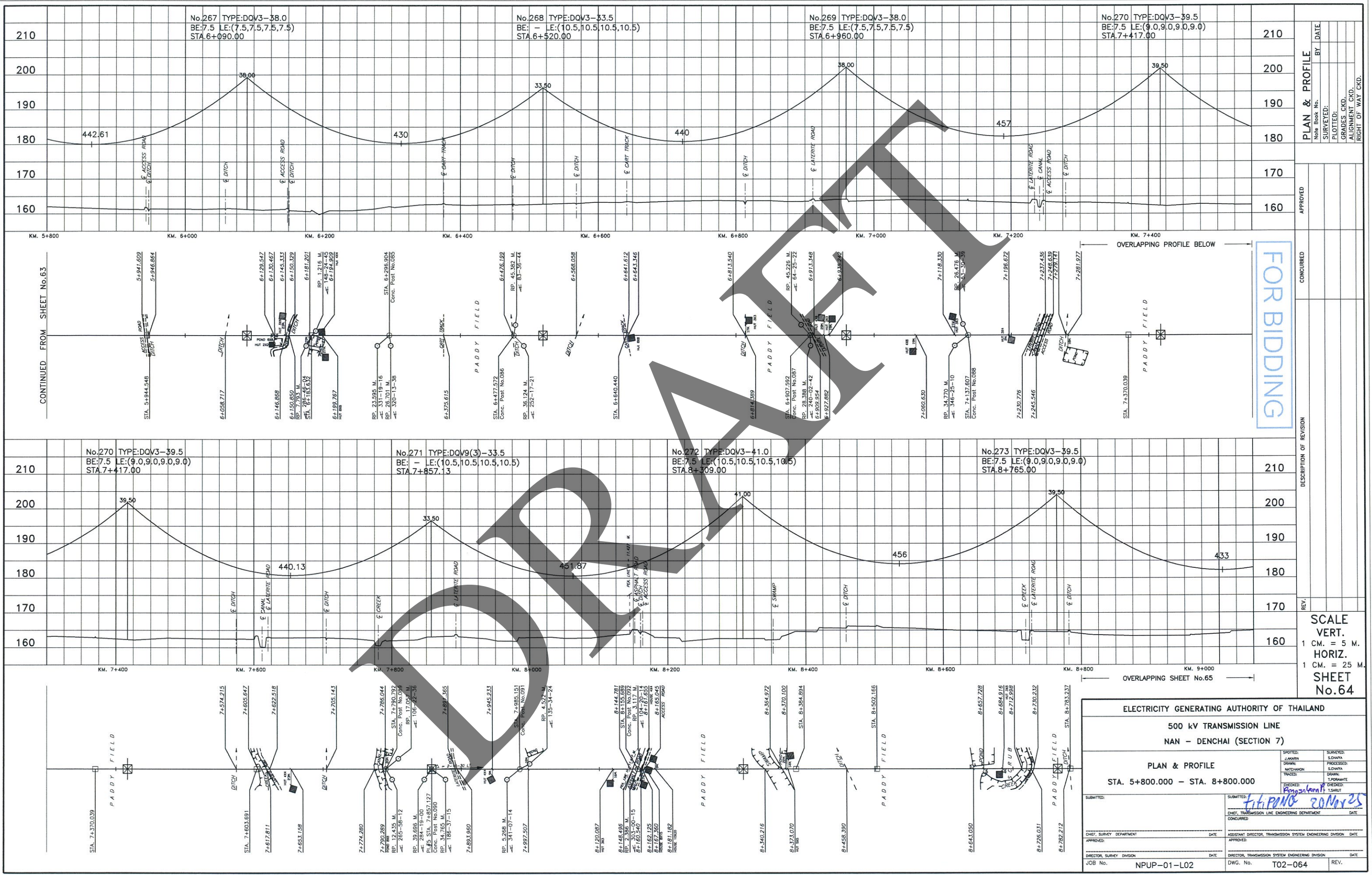
DESCRIPTION OF REVISION	
REV.	

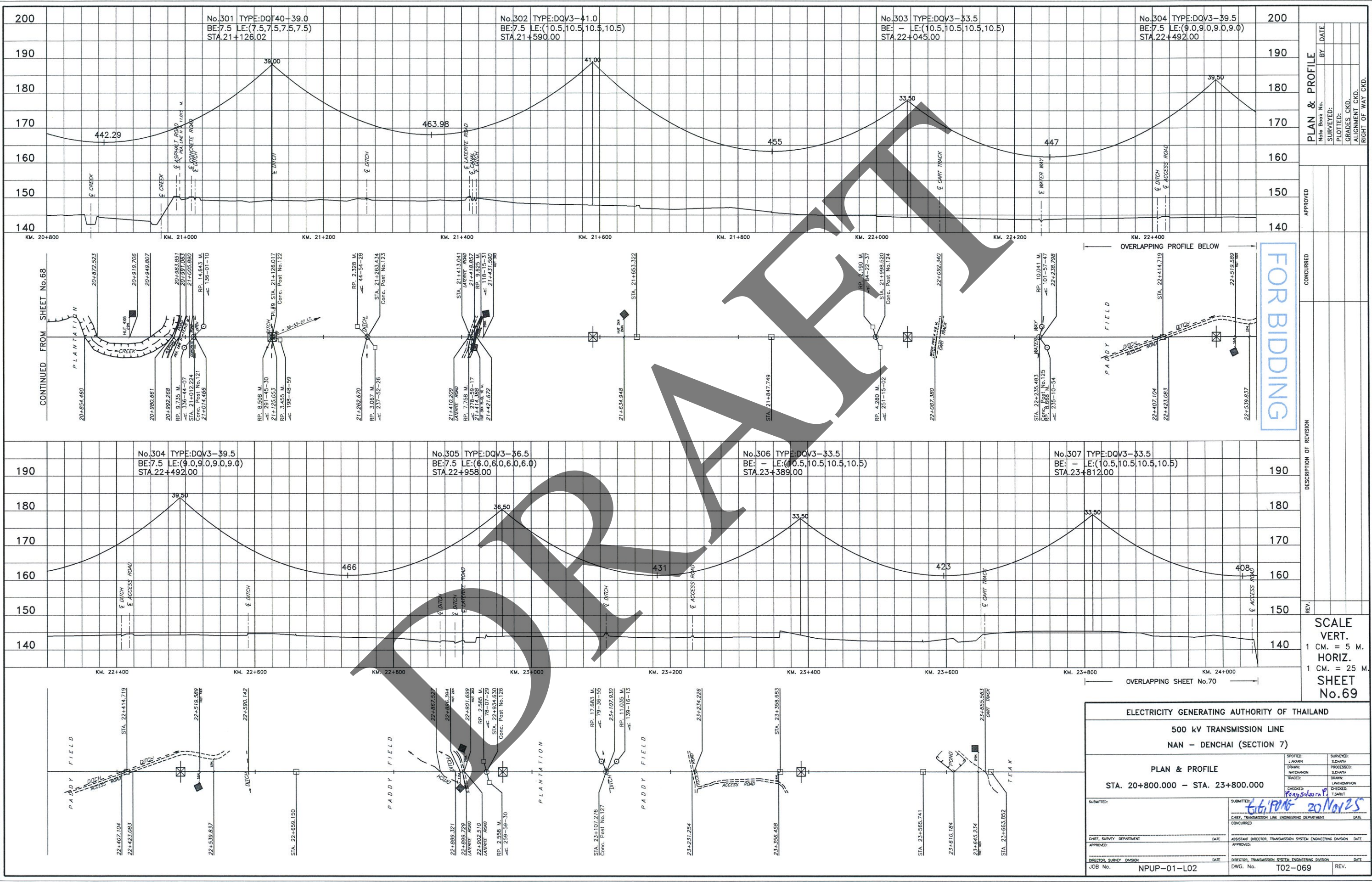
SCALE	
VERT.	1 CM. = 5 M.
HORIZ.	1 CM. = 25 M.
SHEET No.58	

ELECTRICITY GENERATING AUTHORITY OF THAILAND	
500 kV TRANSMISSION LINE	
NAN - DENCHAI (SECTION 6)	
PLAN & PROFILE	
STA. 14+800.000 - STA. 17+800.000	
SUBMITTED:	DATE:
CHIEF, SURVEY DEPARTMENT	DATE:
APPROVED:	DATE:
DIRECTOR, SURVEY DIVISION	DATE:
JOB No. NPOP-01-L02	DATE:
SUBMITTED:	DATE:
CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT	DATE:
APPROVED:	DATE:
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	DATE:
DWG. No. T02-058	DATE:
REV.	









PLAN & PROFILE	
BY DATE	
SURVEYED:	
PLOTTED:	
GRADES CKD.	
ALIGNMENT CKD.	
RIGHT OF WAY CKD.	

APPROVED	
CONCURRED	
DESCRIPTION OF REVISION	



REV.	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

SCALE
VERT.
1 CM. = 5 M.
HORIZ.
1 CM. = 25 M.
SHEET
No.69

ELECTRICITY GENERATING AUTHORITY OF THAILAND	
500 kV TRANSMISSION LINE	
NAN - DENCHAI (SECTION 7)	
PLAN & PROFILE	
STA. 20+800.000 - STA. 23+800.000	
SUBMITTED:	DATE
CHIEF, SURVEY DEPARTMENT	DATE
APPROVED:	DATE
DIRECTOR, SURVEY DIVISION	DATE
JOB No.	NPUP-01-L02
SUBMITTED:	DATE
CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT	DATE
CONCURRED:	DATE
ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	DATE
APPROVED:	DATE
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	DATE
DWG. No.	T02-069
REV.	





	EXISTING
	TO BE DISMANTLED
	TO BE CONSTRUCTED
	FUTURE

SCALE 1 : 2,500

ISO
9001
TSE : 2015

DO NOT AMEND
MANUALLY36

500 kV NAN - KM.63

Job No. NPUP-01-L02

Bid No. NPUP-L-02

500 kV NAN - DEN CHAI SECTION 4

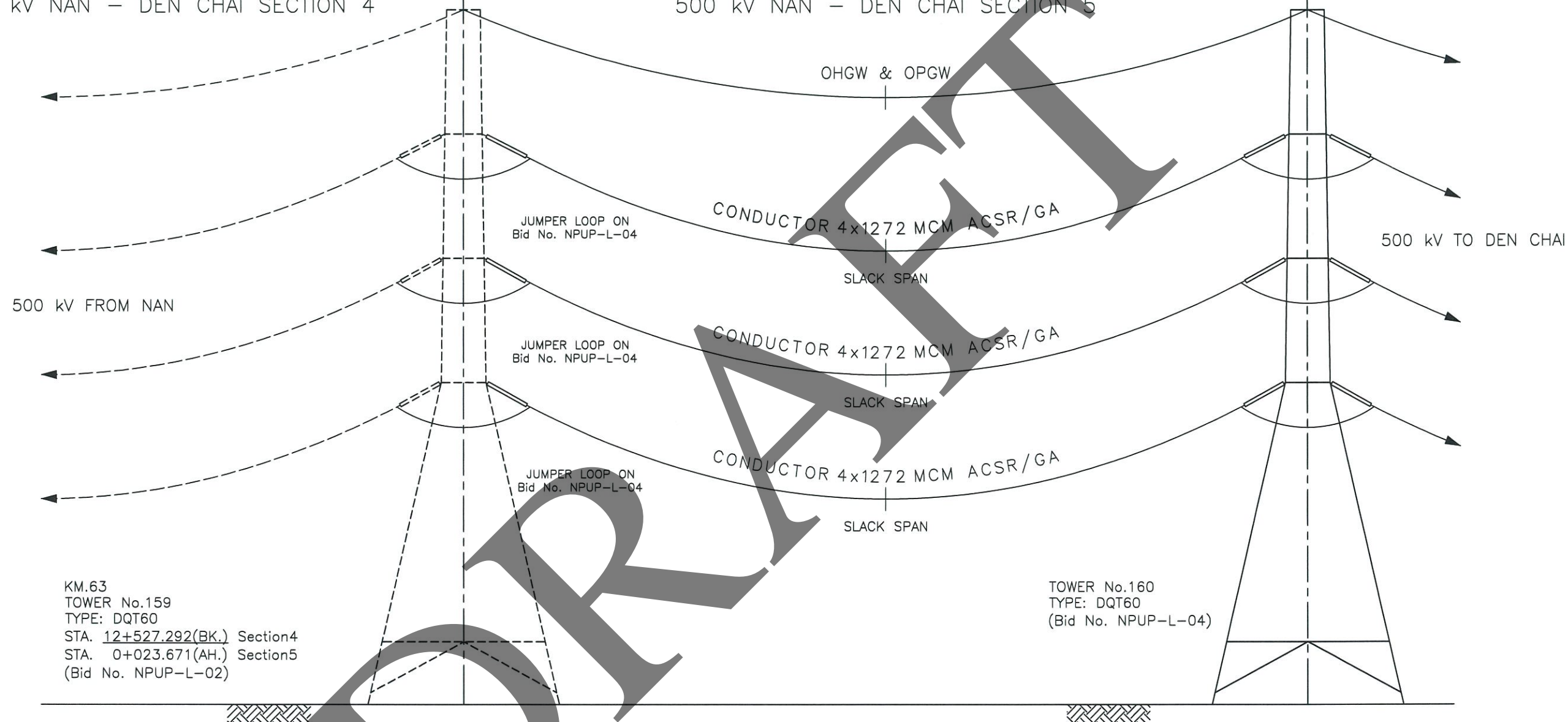
500 kV KM.63 - DEN CHAI

Job No. NPUP-01-L02

Bid No. NPUP-L-04

500 kV NAN - DEN CHAI SECTION 5

FOR BIDDING



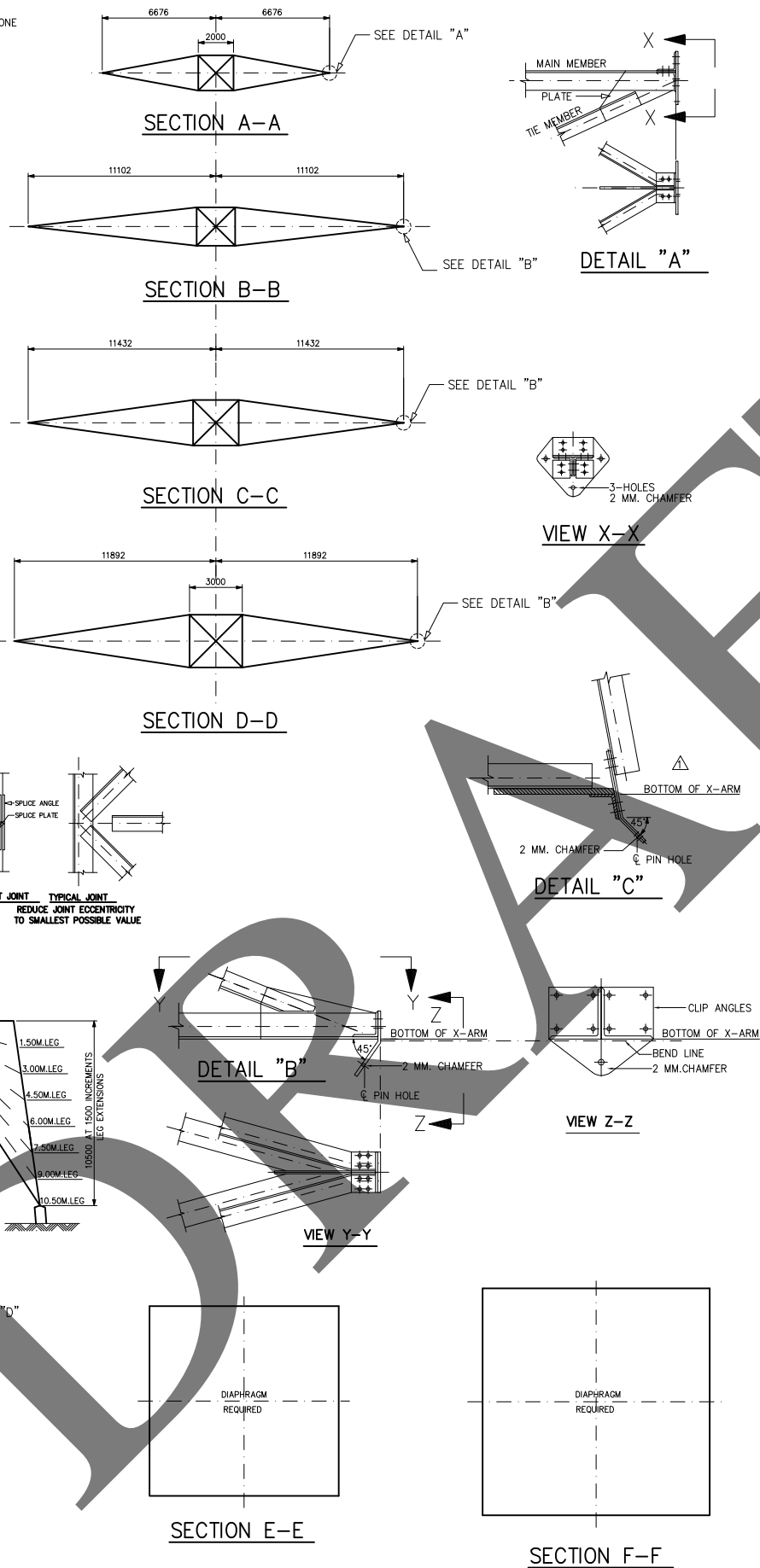
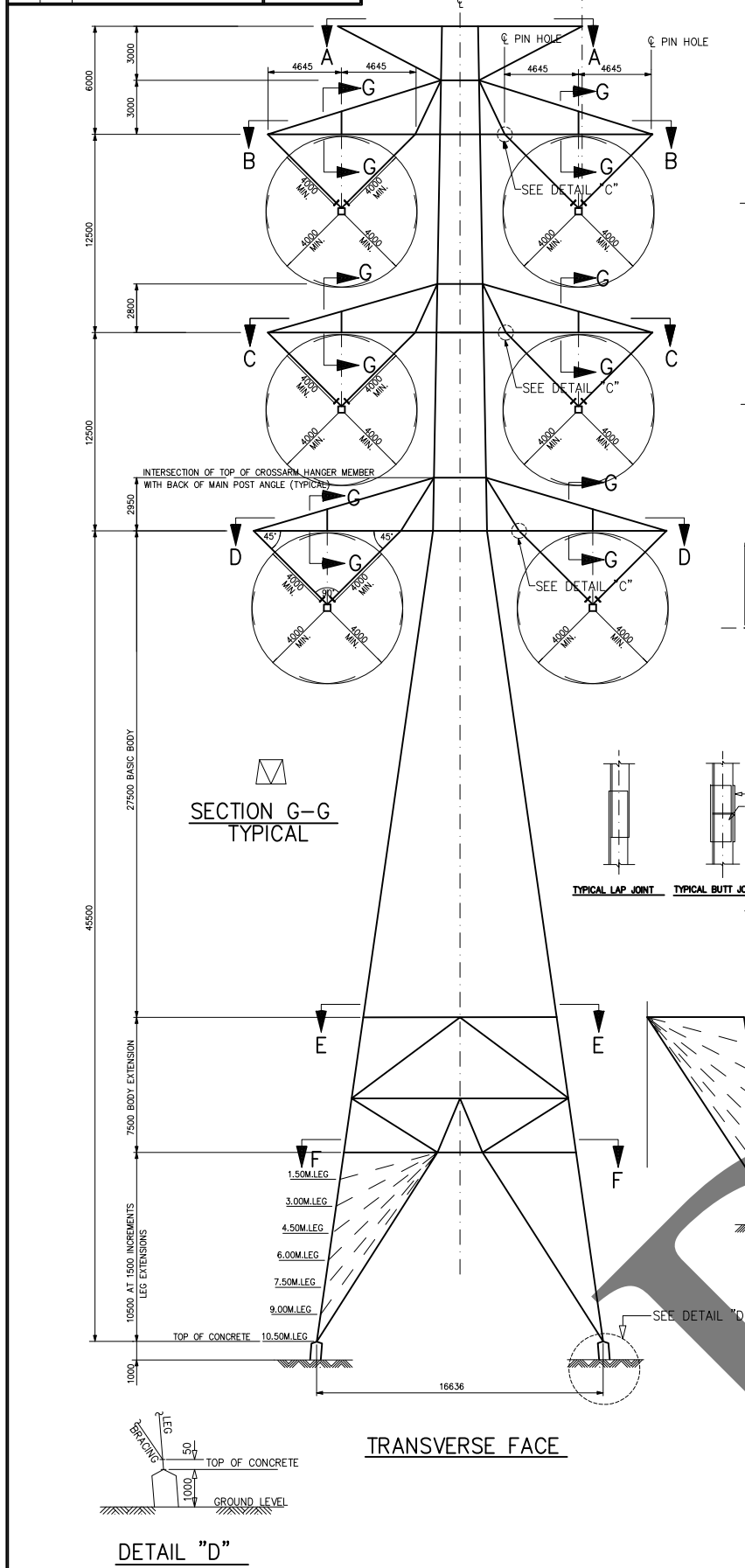
LEGEND

- SCOPE OF Bid No. NPUP-L-02
- SCOPE OF Bid No. NPUP-L-04

INTERFACE BETWEEN 500 kV NAN - KM.63 (Tower No.159) AND 500 kV KM.63 (Tower No.159) - DEN CHAI

REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN	JAKARIN	RECOMMENDED AND VALIDATED	E. EPONE	500 kV TRANSMISSION LINE					
DESIGNED	JAKARIN	CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT		NAN - DEN CHAI					
VERIFIED	Pongsakorn P.			INTERFACING WORK AT KM 63					
APPROVED				JOB No.	NPUP-01-L02	DWG. No.	T05-001	REV.	
				BID No.	NPUP-L-02/NPUP-L-04				



LOADING CASES

- I EXTREME TRANSVERSE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSION. WITH A TRANSVERSE WIND OF 140 KG/M² ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATORS. L.F.=1.15 (SEE NOTES B, D)
- II EXTREME LONGITUDINAL WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS. WITH A LONGITUDINAL WIND OF 156 KG/M² ACTING ON TRANSVERSE FACES OF THE TOWER, NO WINDS ON WIRES. L.F.=1.15 (SEE NOTES B, D)
- III EXTREME OBLIQUE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS WITH A TRANSVERSE WIND OF 140 KG/M² ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATOR, WIND BLOWING AT 75°, 60° AND 45° TO LINE. L.F.=1.15 (SEE NOTES A, B, D)
- IV FAILURE CONTAINMENT**
ALL WIRES INTACT AT 27°C FINAL WIRES TENSIONS. WITH A TRANSVERSE WIND OF 91 KG/M² ON SHIELD WIRES, 76 KG/M² ON CONDUCTORS, 101.5 KG/M² ON TOWER AND INSULATOR, PLUS AN UNBALANCED LONGITUDINAL LOAD APPLIED AT ANY ONE WIRE ATTACHMENT LOCATIONS EQUAL TO 100% IN THE TENSION IN THE SHIELD WIRE OR 70% OF THE TENSION IN THE CONDUCTOR PHASE BUNDLE. (SEE NOTE E)
- V STRINGING AND MAINTENANCE**
ALL WIRES INTACT AT 4°C INITIAL WIRE TENSIONS. WITH A TRANSVERSE WIND OF 27.5 KG/M² ACTING ON SHIELD WIRES, 23 KG/M² ON CONDUCTORS, 29.4 KG/M² ON TOWER AND INSULATORS. WITH AN ADDITIONAL VERTICAL LOAD AT ANT OR ALL OF THE WIRE ATTACHMENT POINTS SIMULTANEOUSLY OF 1,000 KG. PLUS 33% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. AND WITH AN ADDITIONAL LONGITUDINAL LOAD ANY ONE WIRE ATTACHMENT LOCATION SIMULTANEOUSLY OF 50% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. (SEE NOTES E, F)
- VI HIGH INTENSITY**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSIONS. PRESSURE OF 306.25 KG/M² ACTING ON TOWER AND INSULATORS WITH NO WIND ON SHIELD WIRE OR CONDUCTORS. WIND BLOWING AT 90°, 75°, 60°, 45°, 0° TO LINE. (SEE NOTE B)

NOTES

- FOR WIND AT ANGLE θ TO WIRES. WIND PRESSURE TO BE REDUCED BY $\sin^2(\theta)$
- WIND PRESSURE ON TOWER APPLIED ON 3.2 TIMES MOST EXPOSED FACE. FOR WIND AT AN ANGLE θ TO A FACE PRESSURE HAS BEEN ADDITIONALLY INCREASED BY $[1+0.2 \times \sin^2(2\theta)]$; WIND LOAD IS ASSUMED IN THE DIRECTION OF THE WIND.
- ALL ELEMENT OF TOWER ARE TO BE DESIGNED TO 0.92 CAPACITY.
- L.F. DENOTED LOAD FACTOR APPLYING TO STATISTIC LOAD SUCH AS WIND LOADS.
- FOR LOADING CASED IV. AND V THE ADDITIONAL LONGITUDINAL LOADS MAY BE ASSUMED TO ACT AT ANY ONE WIRE ATTACHMENT LOCATIONS.
- LOCATIONS OF THE ADDITIONAL VERTICAL STRINGING LOADS SPECIFIED IN LOADING CASE V ARE INDEPENDENT OF THE LOCATIONS OF THE ADDITIONAL LONGITUDINAL STRINGING LOADS. APPLY ADDITIONAL LONGITUDINAL LOAD AT ANY ONE WIRE ATTACHMENT LOCATION.

GENERAL NOTES

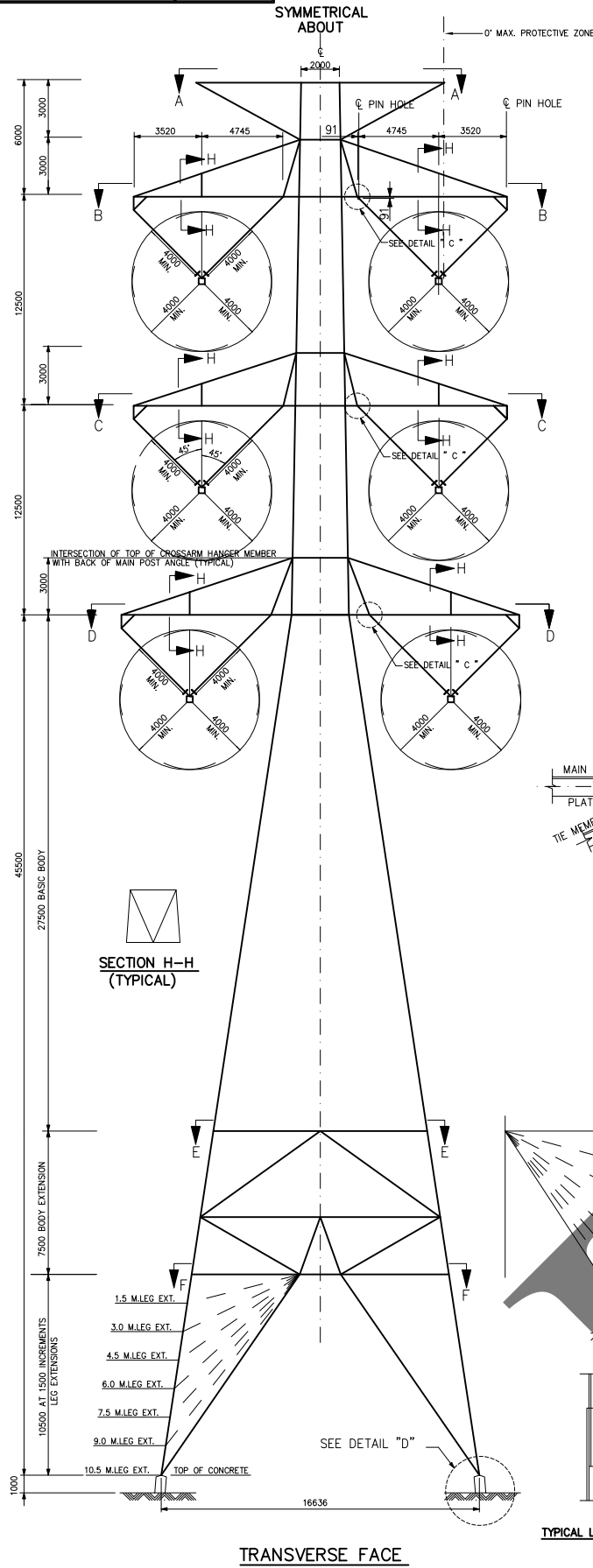
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGES OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR CONDUCTOR HARDWARE.
- ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
- ALL DIMENSIONS ON TOWER ARE TO THE WORKING LINES EXCEPT AS OTHERWISE NOTED.
- CONDUCTOR DATA : 1272 MCM, 42/7 ACSR/GA, WT=2.04 KG/M, DIA=33.91 MM, RATED BREAKING STRENGTH=14,050 KG. (4 SUB-CONDUCTORS PER PHASE BUNDLE)
- SHIELD WIRE DATA : 7 NO.8 ALUMINUM-CLAD STEEL, WT=0.39 KG/M, DIA=9.78 MM, RATED BREAKING STRENGTH=7,227 KG. OR 3/8 INCH EHS CLASS A, WT=0.406 KG/M, DIA=9.14 MM, RATED BREAKING STRENGTH=6,985 KG.
- TOWER SHALL BE DESIGNED FOR ONE OR BOTH CIRCUITS INSTALLED, FOR THE PURPOSES OF TOWER DESIGN, EACH CIRCUIT SHALL BE DEFINED AS THE THREE PHASE BUNDLES AND THE CORRESPONDING SHIELD WIRE VERTICALLY ADJACENT TO ONE ANOTHER ON ONE SIDE OF THE TOWER.
- TOWER SHALL BE DESIGNED FOR MAINTENANCE LOADS (SAME AS HEAVY PHASE VERTICAL LOADS FROM CASE VI) APPLIED DIRECTLY ABOVE CONDUCTOR SUPPORT POINTS.
- TOWERS ARE DESIGNED FOR USE OF ANY COMBINATION OF LEG EXTENSION HEIGHTS RESULTING IN A MAXIMUM DIFFERENTIAL OF LEG HEIGHT OF SIX METERS BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

TOWER APPLICATIONS

RULING SPAN = 440 M.
MAXIMUM WIND SPAN = 460 M. AT 0° AND 355 M. AT 3°
MAXIMUM WEIGHT SPAN = 690 M.
MAXIMUM DEVIATION ANGLE = 3°
DESIGN CRITERIA BASED ON RIGHT OF WAY = 60 M.
SHIELD WIRE ; 3/8" EHS CLASS A OR 7 NO.8 ALUMINUM-CLAD STEEL OR OPGW 36 CORES (13.5 MM. DIAMETER)
CONDUCTOR ; 4 x 1272 MCM. ACSR/GA

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN ARKET		RECOMMENDED AND VALIDATED titipong		DRAWING NAME 500 kV TRANSMISSION LINE		DESCRIPTION OF DETAIL DRAWING CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQV3			
DESIGNED P.sit		CONCURRED CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT		JOB NO.		REPLACING DWG.NO.		DWG.NO. C01-045	
VERIFIED Viwat.m		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE 24/04/2025		REV.		-	
APPROVED Soaruch		DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE		REV.		-	



LOADING CASES

- EXTREME TRANSVERSE WIND
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSION. WITH A TRANSVERSE WIND OF 140 KG/M² ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATORS. L.F.=1.15 (SEE NOTES B, D)
- EXTREME LONGITUDINAL WIND
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS. WITH A LONGITUDINAL WIND OF 156 KG/M² ACTING ON TRANSVERSE FACES OF THE TOWER, NO WINDS ON WIRES. L.F.=1.15 (SEE NOTES B, D)
- EXTREME OBLIQUE WIND
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS WITH A TRANSVERSE WIND OF 140 KG/M² ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATOR, WIND BLOWING AT 75°, 60° AND 45° TO LINE. L.F.=1.15 (SEE NOTES A, B, D)
- FAILURE CONTAINMENT
ALL WIRES INTACT AT 27°C FINAL WIRES TENSIONS. WITH A TRANSVERSE WIND OF 91 KG/M² ON SHIELD WIRES, 76 KG/M² ON CONDUCTORS, 101.5 KG/M² ON TOWER AND INSULATOR, PLUS AN UNBALANCED LONGITUDINAL LOAD APPLIED AT ANY ONE WIRE ATTACHMENT LOCATIONS EQUAL TO 100% IN THE TENSION IN THE SHIELD WIRE OR 70% OF THE TENSION IN THE CONDUCTOR PHASE BUNDLE. (SEE NOTE E)
- STRINGING AND MAINTENANCE
ALL WIRES INTACT AT 4°C INITIAL WIRE TENSIONS. WITH A TRANSVERSE WIND OF 27.5 KG/M² ACTING ON SHIELD WIRES, 23 KG/M² ON CONDUCTORS, 29.4 KG/M² ON TOWER AND INSULATORS. WITH AN ADDITIONAL VERTICAL LOAD AT ANT OR ALL OF THE WIRE ATTACHMENT POINTS SIMULTANEOUSLY OF 1,000 KG. PLUS 33% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. AND WITH AN ADDITIONAL LONGITUDINAL LOAD ANY ONE WIRE ATTACHMENT LOCATION SIMULTANEOUSLY OF 50% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. (SEE NOTES E, F)
- HIGH INTENSITY
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSIONS. PRESSURE OF 306.25 KG/M² ACTING ON TOWER AND INSULATORS WITH NO WIND ON SHIELD WIRE OR CONDUCTORS, WIND BLOWING AT 90°, 75°, 60°, 45°, 0° TO LINE. (SEE NOTE B)

NOTES

- FOR WIND AT ANGLE β° TO WIRES. WIND PRESSURE TO BE REDUCED BY $\sin^2(\beta)$
- WIND PRESSURE ON TOWER APPLIED ON 3.2 TIMES MOST EXPOSED FACE. FOR WIND AT AN ANGLE β° TO A FACE PRESSURE HAS BEEN ADDITIONALLY INCREASED BY $[1 + 0.2 \times \sin^2(2\beta)]$; WIND LOAD IS ASSUMED IN THE DIRECTION OF THE WIND.
- ALL ELEMENT OF TOWER ARE TO BE DESIGNED TO 0.92 CAPACITY.
- L.F. DENOTED LOAD FACTOR APPLYING TO STATISTIC LOAD SUCH AS WIND LOADS.
- FOR LOADING CASES IV. AND V THE ADDITIONAL LONGITUDINAL LOADS MAY BE ASSUMED TO ACT AT ANY ONE WIRE ATTACHMENT LOCATIONS.
- LOCATIONS OF THE ADDITIONAL VERTICAL STRINGING LOADS SPECIFIED IN LOADING CASE V ARE INDEPENDENT OF THE LOCATIONS OF THE ADDITIONAL LONGITUDINAL STRINGING LOADS. APPLY ADDITIONAL LONGITUDINAL LOAD AT ANY ONE WIRE ATTACHMENT LOCATION.

GENERAL NOTES

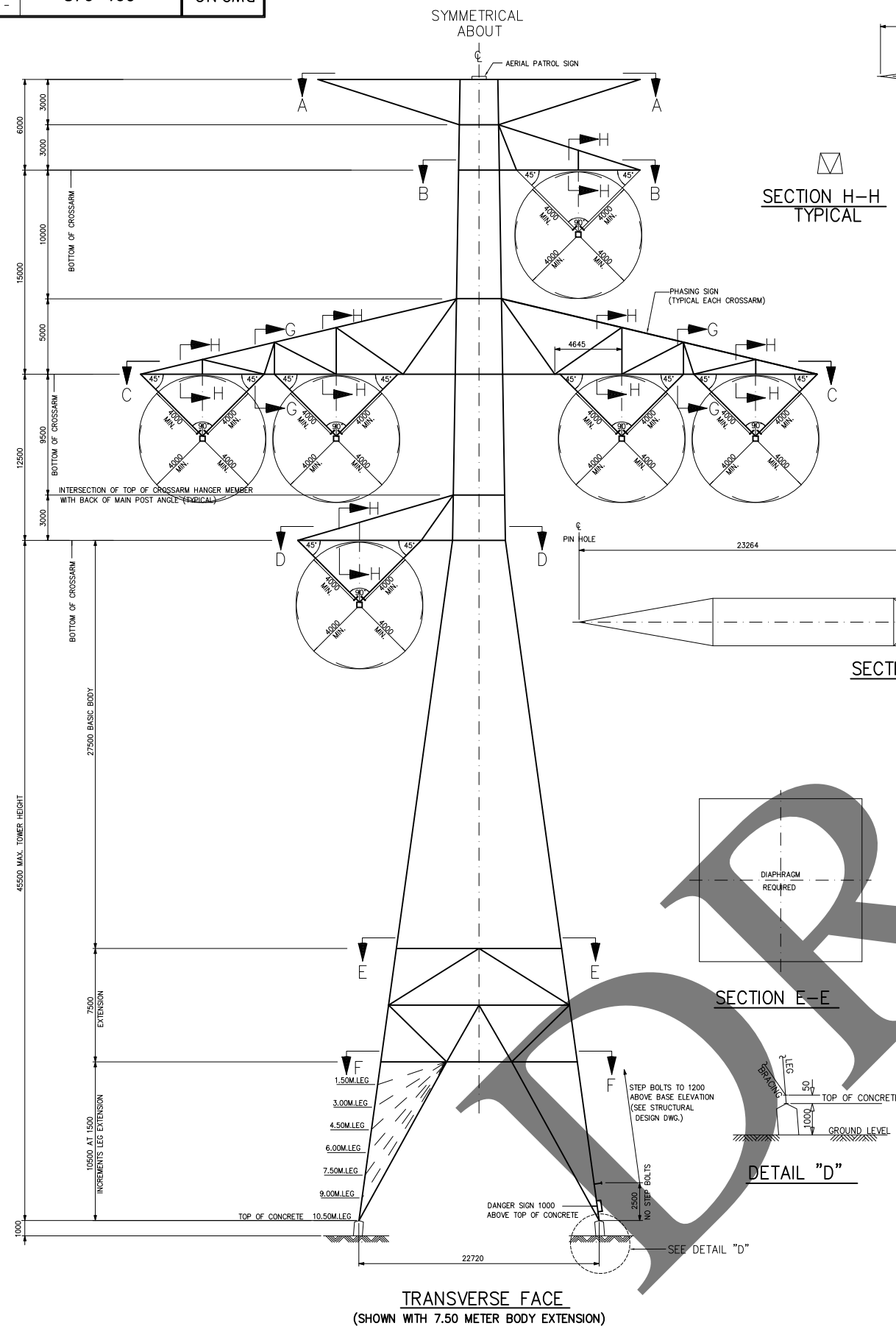
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGES OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR CONDUCTOR HARDWARE.
- ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
- ALL DIMENSIONS ON TOWER ARE TO THE WORKING LINES EXCEPT AS OTHERWISE NOTED.
- CONDUCTOR DATA : 1272 MCM, 42/7 ACSR/GA, WT=2.04 KG/M, DIA=33.91 MM, RATED BREAKING STRENGTH=14,050 KG. (4 SUB-CONDUCTORS PER PHASE BUNDLE)
- SHIELD WIRE DATA : 7 NO.8 ALUMINUM-CLAD STEEL, WT=0.39 KG/M, DIA=9.78 MM, RATED BREAKING STRENGTH=7,227 KG. OR 3/8 INCH EHS CLASS A, WT=0.406 KG/M, DIA=9.14 MM, RATED BREAKING STRENGTH=6,985 KG.
- TOWER SHALL BE DESIGNED FOR ONE OR BOTH CIRCUITS INSTALLED, FOR THE PURPOSES OF TOWER DESIGN, EACH CIRCUIT SHALL BE DEFINED AS THE THREE PHASE BUNDLES AND THE CORRESPONDING SHIELD WIRE VERTICALLY ADJACENT TO ONE ANOTHER ON ONE SIDE OF THE TOWER.
- TOWER SHALL BE DESIGNED FOR MAINTENANCE LOADS (SAME AS HEAVY PHASE VERTICAL LOADS FROM CASE VI) APPLIED DIRECTLY ABOVE CONDUCTOR SUPPORT POINTS.
- TOWERS ARE DESIGNED FOR USE OF ANY COMBINATION OF LEG EXTENSION HEIGHTS RESULTING IN A MAXIMUM DIFFERENTIAL OF LEG HEIGHT OF SIX METERS BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

TOWER APPLICATIONS

RULING SPAN = 440 M.
MAXIMUM WIND SPAN = 650 M. AT 0° AND 335 M. AT 9°
MAXIMUM WEIGHT SPAN = 1300 M.
MAXIMUM DEVIATION ANGLE = 9°
DESIGN CRITERIA BASED ON RIGHT OF WAY = 60 M.
SHIELD WIRE : 3/8" EHS CLASS A OR 7 NO.8 ALUMINUM-CLAD STEEL OR OPGW 36 CORES (13.5 MM. DIAMETER)
CONDUCTOR : 4 x 1272 MCM. ACSR/GA

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN ARKET		RECOMMENDED AND VALIDATED titipong		DRAWING NAME 500 kV TRANSMISSION LINE		DESCRIPTION OF DETAIL DRAWING CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQV9(3)			
DESIGNED P.sit		CONCURRED		CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT		JOB NO.			
VERIFIED V.wat.m		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE 24/04/2025		REPLACING DWG.NO.		DWG.NO. C01-046	
APPROVED S.saruch		DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE		REV.		REV.	



LOADING CASES

- I EXTREME TRANSVERSE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSION. WITH A TRANSVERSE WIND OF 140 KG/M²
ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATORS. L.F.=1.15 (SEE NOTES B, D)
- II EXTREME LONGITUDINAL WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS. WITH A LONGITUDINAL WIND OF 156 KG/M²
ACTING ON TRANSVERSE FACES OF THE TOWER, NO WINDS ON WIRES. L.F.=1.15 (SEE NOTES B, D)
- III EXTREME OBLIQUE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS WITH A TRANSVERSE WIND OF 140 KG/M²
ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER
AND INSULATOR, WIND BLOWING AT 75°, 60° AND 45° TO LINE. L.F.=1.15
(SEE NOTES A, B, D)
- IV FAILURE CONTAINMENT**
ALL WIRES INTACT AT 27°C FINAL WIRES TENSIONS. WITH A TRANSVERSE WIND OF 91 KG/M²
ON SHIELD WIRES, 76 KG/M² ON CONDUCTORS, 101.5 KG/M² ON TOWER AND INSULATOR, PLUS AN UNBALANCED LONGITUDINAL LOAD
APPLIED AT ANY ONE WIRE ATTACHMENT LOCATIONS EQUAL TO 100% IN THE TENSION IN THE SHIELD WIRE OR 70%
OF THE TENSION IN THE CONDUCTOR PHASE BUNDLE. (SEE NOTE E)
- V STRINGING AND MAINTENANCE**
ALL WIRES INTACT AT 4°C INITIAL WIRE TENSIONS. WITH A TRANSVERSE WIND OF 27.5 KG/M² ACTING ON SHIELD WIRES, 23 KG/M²
ON CONDUCTORS, 29.4 KG/M² ON TOWER AND INSULATORS. WITH AN ADDITIONAL VERTICAL LOAD AT ANT OR ALL OF THE WIRE ATTACHMENT
POINTS SIMULTANEOUSLY OF 1000 KG. PLUS 33% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. AND WITH AN ADDITIONAL LONGITUDINAL
LOAD ANY ONE WIRE ATTACHMENT LOCATION SIMULTANEOUSLY OF 50% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. (SEE NOTES E, F)
- VI HIGH INTENSITY**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSIONS. PRESSURE OF 306.25 KG/M² ACTING ON TOWER AND INSULATORS WITH NO WIND ON
SHIELD WIRE OR CONDUCTORS. WIND BLOWING AT 90°, 75°, 60°, 45°, 0° TO LINE. (SEE NOTE B)

NOTES

- A. FOR WIND AT ANGLE β' TO WIRES, WIND PRESSURE TO BE REDUCED BY $\sin^2(\beta)$
- B. WIND PRESSURE ON TOWER APPLIED ON 3.2 TIMES MOST EXPOSED FACE. FOR WIND AT AN ANGLE β' TO A FACE PRESSURE HAS BEEN ADDITIONALLY INCREASED BY $[1 + 0.2 \times \sin^2(2\beta)]$; WIND LOAD IS ASSUMED IN THE DIRECTION OF THE WIND.
- C. ALL ELEMENT OF TOWER ARE TO BE DESIGNED TO 0.92 CAPACITY.
- D. L.F. DENOTED LOAD FACTOR APPLYING TO STATISTIC LOAD SUCH AS WIND LOADS.
- E. FOR LOADING CASED IV. AND V THE ADDITIONAL LONGITUDINAL LOADS MAY BE ASSUMED TO ACT AT ANY ONE WIRE ATTACHMENT LOCATIONS.
- F. LOCATIONS OF THE ADDITIONAL VERTICAL STRINGING LOADS SPECIFIED IN LOADING CASE V ARE INDEPENDENT OF THE LOCATIONS OF THE ADDITIONAL LONGITUDINAL STRINGING LOADS. APPLY ADDITIONAL LONGITUDINAL LOAD AT ANY ONE WIRE ATTACHMENT LOCATION.

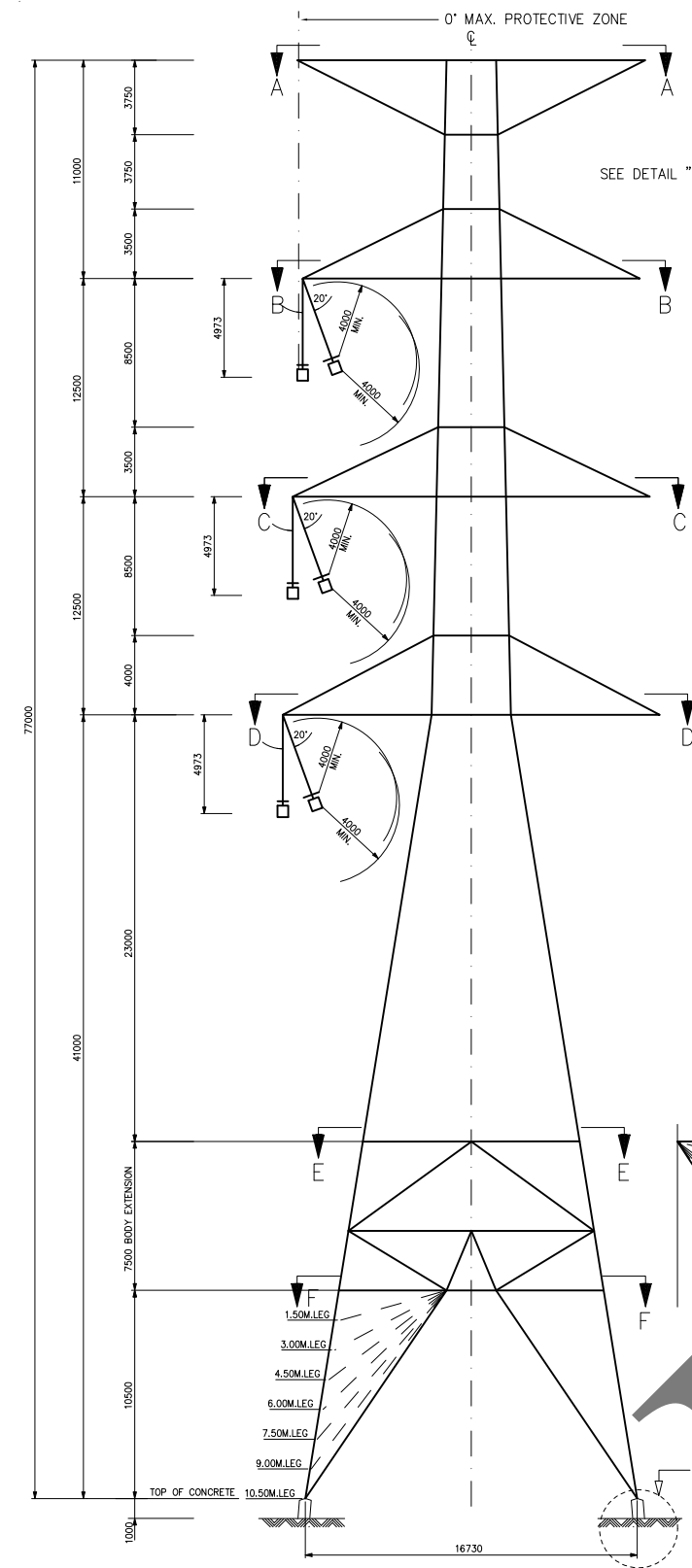
GENERAL NOTES

1. CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGES OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR CONDUCTOR HARDWARE.
2. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
3. ALL DIMENSIONS ON TOWER ARE TO THE WORKING LINES EXCEPT AS OTHERWISE NOTED.
4. CONDUCTOR DATA : 1272 MCM, 42/7 ACSR/GA, WT=2.04 KG/M, DIA=33.91 MM, RATED BREAKING STRENGTH=14,050 KG. (4 SUB-CONDUCTORS PER PHASE BUNDLE)
5. SHIELD WIRE DATA : 7 NO.8 ALUMINUM-CLAD STEEL, WT=0.39 KG/M, DIA=9.78 MM, RATED BREAKING STRENGTH=7,227 KG. OR 3/8 INCH EHS CLASS A , WT=0.406 KG/M, DIA=9.14 MM, RATED BREAKING STRENGTH=6,985 KG.
6. TOWER SHALL BE DESIGNED FOR ONE OR BOTH CIRCUITS INSTALLED, FOR THE PURPOSES OF TOWER DESIGN, EACH CIRCUIT SHALL BE DEFINED AS THE THREE PHASE BUNDLES AND THE CORRESPONDING SHIELD WIRE VERTICALLY ADJACENT TO ONE ANOTHER ON ONE SIDE OF THE TOWER.
7. TOWERS ARE DESIGNED FOR USE OF ANY COMBINATION OF LEG EXTENSION HEIGHTS RESULTING IN A MAXIMUM DIFFERENTIAL OF LEG HEIGHT OF SIX METERS BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

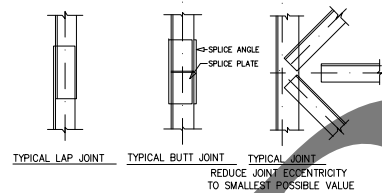
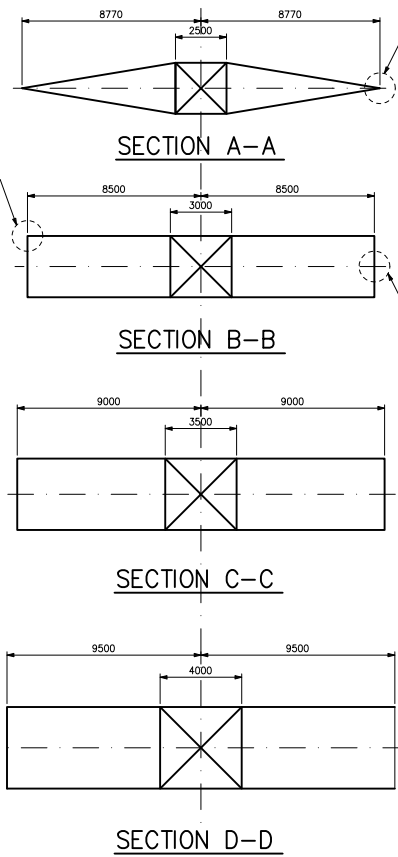
TOWER APPLICATIONS

RULING SPAN = 440 M.
 MAXIMUM WIND SPAN = 460 M. AT 0° AND 355 M. AT 3°
 MAXIMUM WEIGHT SPAN = 690 M.
 MAXIMUM DEVIATION ANGLE = 3°
 DESIGN CRITERIA BASED ON RIGHT OF WAY = 60 M.
 SHIELD WIRE ; 3/8" EHS CLASS A OR 7 NO.8 ALUMINUM-CLAD STEEL OR OPGW 36 CORES (13.5 MM. DIAMETER)
 CONDUCTOR ; 4 x 1272 MCM. ACSR/GA

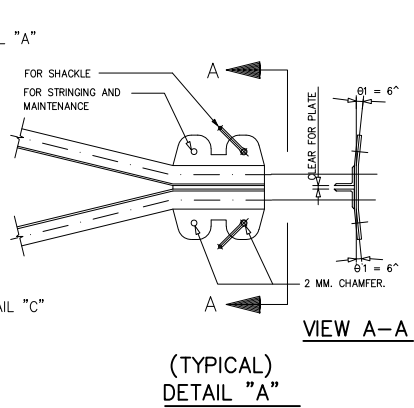
DRAWN		ARKET		RECOMMENDED AND VALIDATED		titipONG		DRAWING NAME		500 kV TRANSMISSION LINE	
DESIGNED		P.sit		CONCURRED		[Signature]		DESCRIPTION OF DETAIL DRAWING		CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQTR	
VERIFIED		Vivat.M		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		[Signature]		JOB NO.		REPLACING DWG.NO.	
APPROVED		[Signature]		DATE		24/04/2025		DWG.NO.		C01-048	
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION								REV.			
								-			



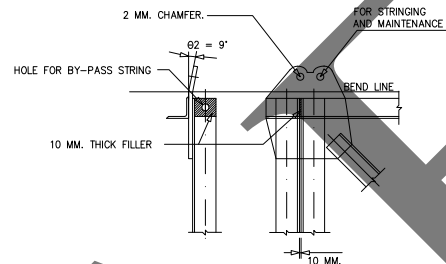
TRANSVERSE FACE



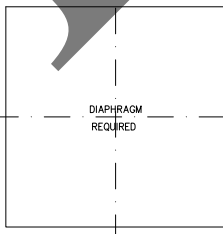
DETAIL "D"



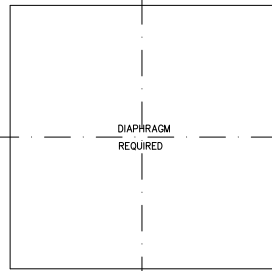
(TYPICAL) DETAIL "B"



(TYPICAL) DETAIL "C"



SECTION E-E



SECTION F-F

LOADING CASES

- EXTREME TRANSVERSE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSION. WITH A TRANSVERSE WIND OF 140 KG/M² ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATORS. L.F.=1.15 (SEE NOTES B, D)
- EXTREME LONGITUDINAL WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS. WITH A LONGITUDINAL WIND OF 156 KG/M² ACTING ON TRANSVERSE FACES OF THE TOWER, NO WINDS ON WIRES. L.F.=1.15 (SEE NOTES B, D)
- EXTREME OBLIQUE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS WITH A TRANSVERSE WIND OF 140 KG/M² ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATOR, WIND BLOWING AT 75°, 60° AND 45° TO LINE. L.F.=1.15 (SEE NOTES A, B, D)
- FAILURE CONTAINMENT**
ALL WIRES INTACT AT 27°C FINAL WIRES TENSIONS. WITH A TRANSVERSE WIND OF 91 KG/M² ON SHIELD WIRES, 76 KG/M² ON CONDUCTORS, 101.5 KG/M² ON TOWER AND INSULATOR, PLUS AN UNBALANCED LONGITUDINAL LOAD EQUAL TO 100% OF THE TENSION IN THE SHIELD WIRE OR CONDUCTOR PHASE BUNDLE. (SEE NOTE E) OF THE TENSION IN THE CONDUCTOR PHASE BUNDLE. (SEE NOTE E)
- STRINGING AND MAINTENANCE**
ALL WIRES INTACT AT 4°C INITIAL WIRE TENSIONS. WITH A TRANSVERSE WIND OF 27.5 KG/M² ACTING ON SHIELD WIRES, 23 KG/M² ON CONDUCTORS, 29.4 KG/M² ON TOWER AND INSULATORS. WITH AN ADDITIONAL VERTICAL LOAD AT ANT OR ALL OF THE WIRE ATTACHMENT POINTS OF EITHER ONE (BUT NOT BOTH) OF THE CIRCUITS. THE ADDITIONAL VERTICAL LOAD SHALL BE EQUAL TO 1,500 KG. PLUS 33% OF THE SHIELD WIRE OR PHASE TENSION, SIMULTANEOUSLY, ADDITIONAL LONGITUDINAL LOADS SHALL BE APPLIED AT ANY OR ALL OF THE WIRE ATTACHMENT POINTS OF THE SAME CIRCUIT EQUAL TO 100% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. (SEE NOTE F)
- HIGH INTENSITY**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSIONS. PRESSURE OF 306.25 KG/M² ACTING ON TOWER AND INSULATORS WITH NO WIND ON SHIELD WIRE OR CONDUCTORS. WIND BLOWING AT 90°, 75°, 60°, 45°, 0° TO LINE. (SEE NOTE B)
- UPLIFT LOADS**
CROSSARM MEMBERS WILL BE DESIGNED TO WITHSTAND VERTICAL UPLIFT LOADS EQUAL TO 100% OF THE DESIGN WEIGHT SPAN ACTING ON ALL ATTACHMENT, IN EACH LOADING CASE.

NOTES

- FOR WIND AT ANGLE β ° TO WIRES. WIND PRESSURE TO BE REDUCED BY $\sin^2(\beta)$
- WIND PRESSURE ON TOWER APPLIED ON 3.2 TIMES MOST EXPOSED FACE. FOR WIND AT AN ANGLE β ° TO A FACE PRESSURE HAS BEEN ADDITIONALLY INCREASED BY $[1 + 0.2 \times \sin^2(2\beta)]$; WIND LOAD IS ASSUMED IN THE DIRECTION OF THE WIND.
- ALL ELEMENT OF TOWER ARE TO BE DESIGNED TO 0.79 CAPACITY.
- L.F. DENOTED LOAD FACTOR APPLYING TO STATISTIC LOAD SUCH AS WIND LOADS.
- FOR LOADING CASED IV. AND V THE ADDITIONAL LONGITUDINAL AND / OR VERTICAL LOADS MAY BE ASSUMED TO ACT AT ANY TWO WIRE ATTACHMENT LOCATIONS SIMULTANEOUSLY IN THE CASE OF BOTH CURCUITS INSTALLED, IN THE CASE OF ONLY ONE CURCUIT INSTALLED, APPLY THE ADDITIONAL LONGITUDINAL AND / OR VERTICAL LOAD AT ANY ONE WIRE ATTACHMENT LOCATION.
- LOCATIONS OF THE ADDITIONAL VERTICAL STRINGING LOADS SPECIFIED IN LOADING CASE V ARE INDEPENDENT OF THE LOCATIONS OF THE ADDITIONAL LONGITUDINAL STRINGING LOADS. APPLY ADDITIONAL LONGITUDINAL LOAD AT ANY ONE WIRE ATTACHMENT LOCATION.

GENERAL NOTES

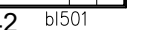
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGES OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR CONDUCTOR HARDWARE.
- ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
- ALL DIMENSIONS ON TOWER ARE TO THE WORKING LINES EXCEPT AS OTHERWISE NOTED.
- CONDUCTOR DATA : 1272 MCM, 42/7 ACSR/GA, WT=2.04 KG/M, DIA=33.91 MM, RATED BREAKING STRENGTH=14,050 KG. (4 SUB-CONDUCTORS PER PHASE BUNDLE)
- SHIELD WIRE DATA : 7 NO.8 ALUMINUM-CLAD STEEL, WT=0.39 KG/M, DIA=9.78 MM, RATED BREAKING STRENGTH=7,227 KG. OR 3/8 INCH EHS CLASS A , WT=0.406 KG/M, DIA=9.14 MM, RATED BREAKING STRENGTH=6,985 KG.
- TOWER SHALL BE DESIGNED FOR ONE OR BOTH CIRCUITS INSTALLED, FOR THE PURPOSES OF TOWER DESIGN, EACH CIRCUIT SHALL BE DEFINED AS THE THREE PHASE BUNDLES AND THE CORRESPONDING SHIELD WIRE VERTICALLY ADJACENT TO ONE ANOTHER ON ONE SIDE OF THE TOWER.
- TOWERS ARE DESIGNED FOR USE OF ANY COMBINATION OF LEG EXTENSION HEIGHTS RESULTING IN A MAXIMUM DIFFERENTIAL OF LEG HEIGHT OF SIX METERS BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

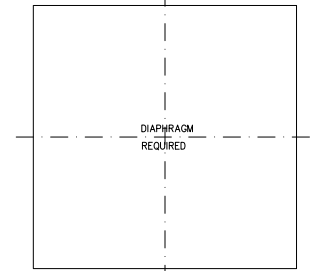
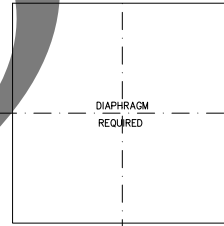
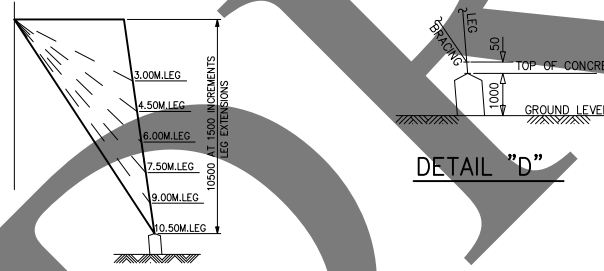
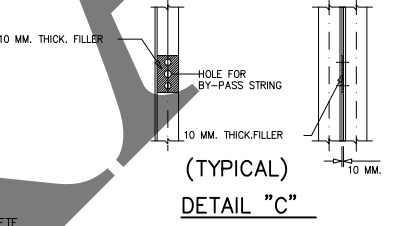
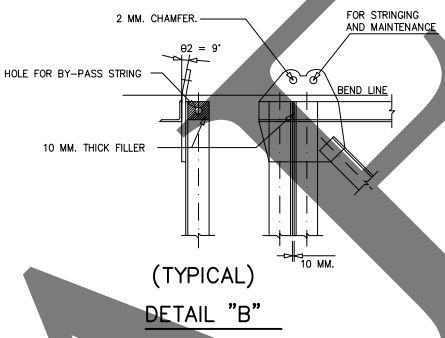
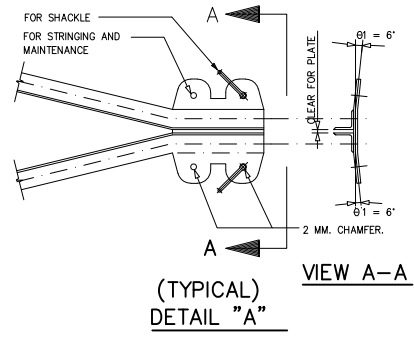
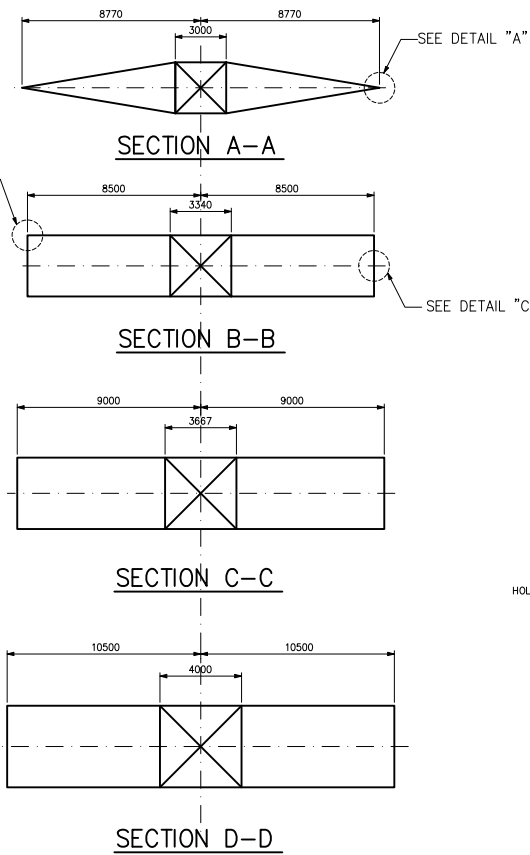
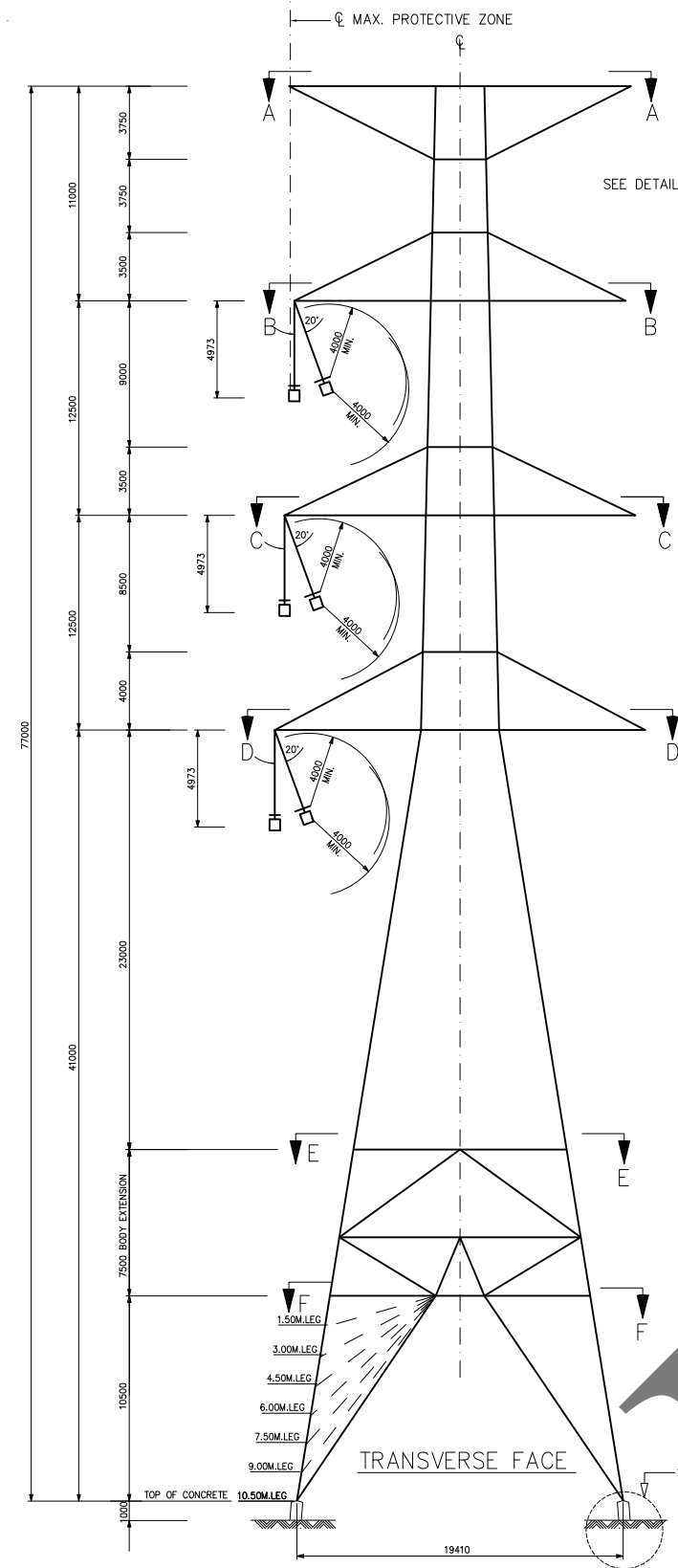
TOWER APPLICATIONS

RULING SPAN = 440 M.
MAXIMUM WIND SPAN = 460 M. AT 20°
MAXIMUM WEIGHT SPAN = 690 M.
MAXIMUM DEVIATION ANGLE = 20°
DESIGN CRITERIA BASED ON RIGHT OF WAY = 60 M.
SHIELD WIRE : 3/8 EHS CLASS A OR 7 NO.8 ALUMINUM-CLAD STEEL OR OPGW 36 CORES (13.5 MM. DIAMETER)
CONDUCTOR : 4 x 1272 MCM. ACSR/GA

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN ARKET		RECOMMENDED AND VALIDATED		DRAWING NAME		500 kV TRANSMISSION LINE			
DESIGNED P.sit		CONCURRED		DESCRIPTION OF DETAIL DRAWING		CONFIGURATION AND DESIGN CRITERIA			
VERIFIED V.wat.m		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		JOB NO.		REPLACING DWG.NO.		DWG.NO.	
APPROVED S.sarwich		DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE 24/04/2025		C01-049		REV.	





LOADING CASES

- EXTREME TRANSVERSE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSION. WITH A TRANSVERSE WIND OF 140 KG/M² ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATORS. L.F.=1.15 (SEE NOTES B, D)
- EXTREME LONGITUDINAL WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS. WITH A LONGITUDINAL WIND OF 156 KG/M² ACTING ON TRANSVERSE FACES OF THE TOWER, NO WINDS ON WIRES. L.F.=1.15 (SEE NOTES B, D)
- EXTREME OBLIQUE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS WITH A TRANSVERSE WIND OF 140 KG/M² ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATOR, WIND BLOWING AT 75°, 60° AND 45° TO LINE. L.F.=1.15 (SEE NOTES A, B, D)
- FAILURE CONTAINMENT**
ALL WIRES INTACT AT 27°C FINAL WIRES TENSIONS. WITH A TRANSVERSE WIND OF 91 KG/M² ON SHIELD WIRES, 76 KG/M² ON CONDUCTORS, 101.5 KG/M² ON TOWER AND INSULATOR, PLUS AN UNBALANCED LONGITUDINAL LOADS EQUAL TO 100% OF THE TENSION IN THE SHIELD WIRE OR CONDUCTOR PHASE BUNDLE. (SEE NOTE E) OF THE TENSION IN THE CONDUCTOR PHASE BUNDLE. (SEE NOTE E)
- STRINGING AND MAINTENANCE**
ALL WIRES INTACT AT 4°C INITIAL WIRE TENSIONS. WITH A TRANSVERSE WIND OF 27.5 KG/M² ACTING ON SHIELD WIRES, 23 KG/M² ON CONDUCTORS, 29.4 KG/M² ON TOWER AND INSULATORS. WITH AN ADDITIONAL VERTICAL LOAD AT ANT OR ALL OF THE WIRE ATTACHMENT POINTS OF EITHER ONE (BUT NOT BOTH) OF THE CIRCUITS. THE ADDITIONAL VERTICAL LOAD SHALL BE EQUAL TO 1,500 KG. PLUS 33% OF THE SHIELD WIRE OR PHASE TENSION, SIMULTANEOUSLY, ADDITIONAL LONGITUDINAL LOADS SHALL BE APPLIED AT ANY OR ALL OF THE WIRE ATTACHMENT POINTS OF THE SAME CIRCUIT EQUAL TO 100% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. (SEE NOTE F)
- HIGH INTENSITY**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSIONS. PRESSURE OF 306.25 KG/M² ACTING ON TOWER AND INSULATORS WITH NO WIND ON SHIELD WIRE OR CONDUCTORS. WIND BLOWING AT 90°, 75°, 60°, 45°, 0° TO LINE. (SEE NOTE B)
- UPLIFT LOADS**
CROSSARM MEMBERS WILL BE DESIGNED TO WITHSTAND VERTICAL UPLIFT CLOADS EQUAL TO 100% OF THE DESIGN WEIGHT SPAN ACTING ON ALL ATTACHMENT, IN EACH LOADING CASE.

NOTES

- FOR WIND AT ANGLE β TO WIRES. WIND PRESSURE TO BE REDUCED BY $\sin^2(\beta)$
- WIND PRESSURE ON TOWER APPLIED ON 3.2 TIMES MOST EXPOSED FACE. FOR WIND AT AN ANGLE β TO A FACE PRESSURE HAS BEEN ADDITIONALLY INCREASED BY $[1 + 0.2 \times \sin^2(2\beta)]$; WIND LOAD IS ASSUMED IN THE DIRECTION OF THE WIND.
- ALL ELEMENT OF TOWER ARE TO BE DESIGNED TO 0.79 CAPACITY.
- L.F. DENOTED LOAD FACTOR APPLYING TO STATISTIC LOAD SUCH AS WIND LOADS.
- FOR LOADING CASES IV. AND V THE ADDITIONAL LONGITUDINAL AND / OR VERTICAL LOADS MAY BE ASSUMED TO ACT AT ANY TWO WIRE ATTACHMENT LOCATIONS SIMULTANEOUSLY IN THE CASE OF BOTH CIRCUITS INSTALLED, IN THE CASE OF ONLY ONE CIRCUIT INSTALLED, APPLY THE ADDITIONAL LONGITUDINAL AND / OR VERTICAL LOAD AT ANY ONE WIRE ATTACHMENT LOCATION.
- LOCATIONS OF THE ADDITIONAL VERTICAL STRINGING LOADS SPECIFIED IN LOADING CASE V ARE INDEPENDENT OF THE LOCATIONS OF THE ADDITIONAL LONGITUDINAL STRINGING LOADS. APPLY ADDITIONAL LONGITUDINAL LOAD AT ANY ONE WIRE ATTACHMENT LOCATION.

GENERAL NOTES

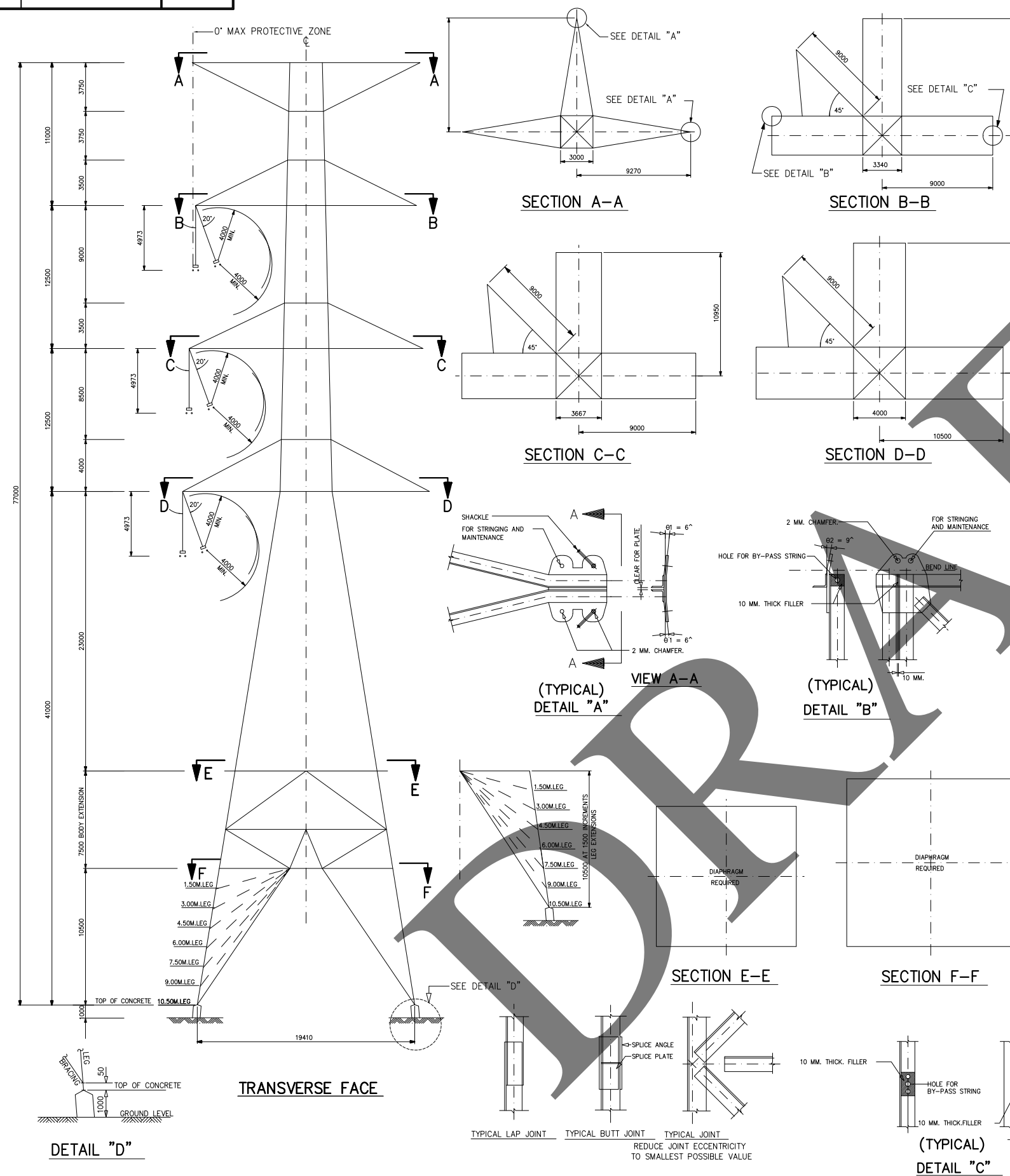
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGES OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR CONDUCTOR HARDWARE.
- ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
- ALL DIMENSIONS ON TOWER ARE TO THE WORKING LINES EXCEPT AS OTHERWISE NOTED.
- CONDUCTOR DATA : 1272 MCM, 42/7 ACSR/GA, WT=2.04 KG/M, DIA=33.91 MM, RATED BREAKING STRENGTH=14,050 KG. (4 SUB-CONDUCTORS PER PHASE BUNDLE)
- SHIELD WIRE DATA : 7 NO.8 ALUMINUM-CLAD STEEL, WT=0.39 KG/M, DIA=9.78 MM, RATED BREAKING STRENGTH=7,227 KG. OR 3/8 INCH EHS CLASS A , WT=0.406 KG/M, DIA=9.14 MM, RATED BREAKING STRENGTH=6,985 KG.
- TOWER SHALL BE DESIGNED FOR ONE OR BOTH CIRCUITS INSTALLED, FOR THE PURPOSES OF TOWER DESIGN, EACH CIRCUIT SHALL BE DEFINED AS THE THREE PHASE BUNDLES AND THE CORRESPONDING SHIELD WIRE VERTICALLY ADJACENT TO ONE ANOTHER ON ONE SIDE OF THE TOWER.
- TOWERS ARE DESIGNED FOR USE OF ANY COMBINATION OF LEG EXTENSION HEIGHTS RESULTING IN A MAXIMUM DIFFERENTIAL OF LEG HEIGHT OF SIX METERS BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

TOWER APPLICATIONS

RULING SPAN = 440 M.
MAXIMUM WIND SPAN = 460 M. AT 60°
MAXIMUM WEIGHT SPAN = 690 M.
MAXIMUM DEVIATION ANGLE = 60°
DESIGN CRITERIA BASED ON RIGHT OF WAY = 60 M.
SHIELD WIRE ; 3/8 EHS CLASS A 7 NO.8 ALUMINUM-CLAD STEEL OR OPGW 36 CORES (13.5 MM. DIAMETER)
CONDUCTOR ; 4 x 1272 MCM. ACSR/GA

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN ARKET		RECOMMENDED AND VALIDATED titipong		DRAWING NAME 500 kV TRANSMISSION LINE					
DESIGNED P.sit		CONCURRED CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT		DESCRIPTION OF DETAIL DRAWING CONFIGURATION AND DESIGN CRITERIA TOWER TYPE DQT60					
VERIFIED Vivat.M		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		JOB NO.		REPLACING DWG.NO.		DWG.NO.	
APPROVED Sangwich		DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE 24/04/2025		C01-051		- REV.	



LOADING CASES

- I** **EXTREME TRANSVERSE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSION. WITH A TRANSVERSE WIND OF 140 KG/M²
ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER AND INSULATORS. L.F.=1.15 (SEE NOTES B, D)
- II** **EXTREME LONGITUDINAL WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS. WITH A LONGITUDINAL WIND OF 156 KG/M²
ACTING ON TRANSVERSE FACES OF THE TOWER, NO WINDS ON WIRES. L.F.=1.15 (SEE NOTES B, D)
- III** **EXTREME OBLIQUE WIND**
ALL WIRES INTACT AT 27°C, FINAL WIRES TENSIONS WITH A TRANSVERSE WIND OF 140 KG/M²
ACTING ON SHIELD WIRES, 115 KG/M² ON CONDUCTORS, 156 KG/M² ON TOWER
AND INSULATOR, WIND BLOWING AT 75°, 60° AND 45° TO LINE. L.F.=1.15
(SEE NOTES A, B, D)
- IV** **FAILURE CONTAINMENT**
ALL WIRES INTACT AT 27°C FINAL WIRE TENSIONS. WITH A TRANSVERSE WIND OF 91 KG/M²
ON SHIELD WIRES, 76 KG/M² ON CONDUCTORS, 101.5 KG/M² ON TOWER AND INSULATOR, PLUS AN UNBALANCED LONGITUDINAL LOADS
EQUAL TO 100% OF THE TENSION IN THE SHIELD WIRE OR CONDUCTOR PHASE BUNDLE. (SEE NOTE E)
OF THE TENSION IN THE CONDUCTOR PHASE BUNDLE. (SEE NOTE E)
- V** **STRINGING AND MAINTENANCE**
ALL WIRES INTACT AT 4°C INITIAL WIRE TENSIONS. WITH A TRANSVERSE WIND OF 27.5 KG/M² ACTING ON SHIELD WIRES, 23 KG/M²
ON CONDUCTORS, 29.4 KG/M² ON TOWER AND INSULATORS. WITH AN ADDITIONAL VERTICAL LOAD AT ANY OR ALL OF THE WIRE ATTACHMENT
POINTS OF EITHER ONE (BUT NOT BOTH) OF THE CIRCUITS. THE ADDITIONAL VERTICAL LOAD SHALL BE EQUAL TO 1,500 KG. PLUS 33% OF
THE SHIELD WIRE OR PHASE TENSION, SIMULTANEOUSLY, ADDITIONAL LONGITUDINAL LOADS SHALL BE APPLIED AT ANY OR ALL OF THE
WIRE ATTACHMENT POINTS OF THE SAME CIRCUIT EQUAL TO 100% OF THE SHIELD WIRE OR PHASE BUNDLE TENSION. (SEE NOTE F)
- VI** **HIGH INTENSITY**
ALL WIRES INTACT AT 27°C, FINAL WIRE TENSIONS. PRESSURE OF 306.25 KG/M² ACTING ON TOWER AND INSULATORS WITH NO WIND ON
SHIELD WIRE OR CONDUCTORS. WIND BLOWING AT 90, 75, 60, 45, 0 TO LINE. (SEE NOTE B)
- VII** **UPLIFT LOADS**
CROSSARM MEMBERS WILL BE DESIGNED TO WITHSTAND VERTICAL UPLIFT LOADS EQUAL TO 100% OF THE DESIGN
WEIGHT SPAN ACTING ON ALL ATTACHMENT, IN EACH LOADING CASE.

NOTES

- A. FOR WIND AT ANGLE β^* TO WIRES. WIND PRESSURE TO BE REDUCED BY $\sin^2(\beta^*)$
- B. WIND PRESSURE ON TOWER APPLIED ON 3.2 TIMES MOST EXPOSED FACE. FOR WIND AT AN ANGLE β^* TO A FACE PRESSURE HAS BEEN ADDITIONALLY INCREASED BY $[1 + 0.2 \times \sin^2(2\beta^*)]$; WIND LOAD IS ASSUMED IN THE DIRECTION OF THE WIND.
- C. ALL ELEMENT OF TOWER ARE TO BE DESIGNED TO 0.79 CAPACITY.
- D. L.F. DENOTED LOAD FACTOR APPLYING TO STATISTIC LOAD SUCH AS WIND LOADS.
- E. FOR LOADING CASED IV. AND V THE ADDITIONAL LONGITUDINAL AND / OR VERTICAL LOADS MAY BE ASSUMED TO ACT AT ANY TWO WIRE ATTACHMENT LOCATIONS SIMULTANEOUSLY IN THE CASE OF BOTH CURCITS INSTALLED, IN THE CASE OF ONLY ONE CURCUIT INSTALLED, APPLY THE ADDITIONAL LONGITUDINAL AND / OR VERTICAL LOADS AT ANY ONE WIRE ATTACHMENT LOCATION.
- F. LOCATIONS OF THE ADDITIONAL VERTICAL STRINGING LOADS SPECIFIED IN LOADING CASE V ARE INDEPENDENT OF THE LOCATIONS OF THE ADDITIONAL LONGITUDINAL STRINGING LOADS. APPLY ADDITIONAL LONGITUDINAL LOAD AT ANY ONE WIRE ATTACHMENT LOCATION.

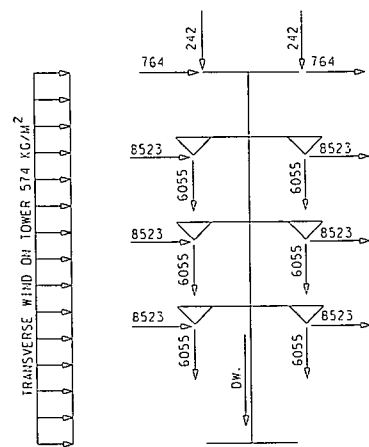
GENERAL NOTES

1. CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGES OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR CONDUCTOR HARDWARE.
2. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
3. ALL DIMENSIONS ON TOWER ARE TO THE WORKING LINES EXCEPT AS OTHERWISE NOTED.
4. CONDUCTOR DATA : 1272 MCM, 42/7 ACSR/GA, WT=2.04 KG/M, DIA=33.91 MM, RATED BREAKING STRENGTH=14,050 KG. (4 SUB-CONDUCTORS PER PHASE BUNDLE)
5. SHIELD WIRE DATA : 7 N0.8 ALUMINUM-CLAD STEEL, WT=0.39 KG/M, DIA=9.78 MM, RATED BREAKING STRENGTH=7,227 KG. OR 3/8 INCH EHS CLASS A , WT=0.406 KG/M, DIA=9.14 MM, RATED BREAKING STRENGTH=6,985 KG.
6. TOWER SHALL BE DESIGNED FOR ONE OR BOTH CIRCUITS INSTALLED, FOR THE PURPOSES OF TOWER DESIGN, EACH CIRCUIT SHALL BE DEFINED AS THE THREE PHASE BUNDLES AND THE CORRESPONDING SHIELD WIRE VERTICALLY ADJACENT TO ONE ANOTHER ON ONE SIDE OF THE TOWER.
7. TOWERS ARE DESIGNED FOR USE OF ANY COMBINATION OF LEG EXTENSION HEIGHTS RESULTING IN A MAXIMUM DIFFERENTIAL OF LEG HEIGHT OF SIX METERS BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

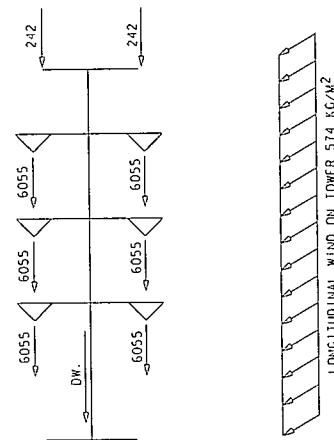
TOWER APPLICATIONS

RULING SPAN = 440 M.
 MAXIMUM WIND SPAN = 460 M. AT 90°
 MAXIMUM WEIGHT SPAN = 690 M.
 MAXIMUM DEVIATION ANGLE = 90°
 DESIGN CRITERIA BASED ON RIGHT OF WAY = 60 M.
 SHIELD WIRE ; 3/8 EHS CLASS A OR 7 NO.8 ALUMINUM-CLAD STEEL OR OPGW 24 CORES (10.5 MM. DIAMETER)
 CONDUCTOR ; 4 x 1272 MCM. ACSR/GA

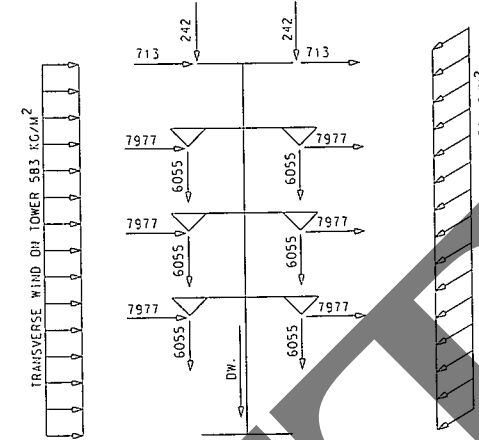
												ELECTRICITY GENERATING AUTHORITY OF THAILAND											
												DRAWN	ARKET	RECOMMENDED AND VALIDATED	EtiPONG	DRAWING NAME	500 kV TRANSMISSION LINE						
												DESIGNED	P.sit	CONCURRED	CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT	DESCRIPTION OF DETAIL DRAWING	CONFIGURATION AND DESIGN CRITERIA						
												VERIFIED	Vivat.m		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		TOWER TYPE DQT90						
												APPROVED	Songwich		DATE	24/04/2025	JOB NO.	REPLACING DWG.NO.	DWG.NO.				
												DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION							CO#4052	-	RE		
																				-	-		
REV.NO.	JOB NO.	JOB DESCRIPTION				DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE										



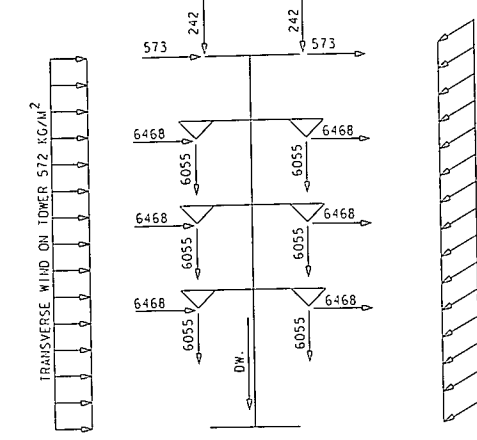
CASE I



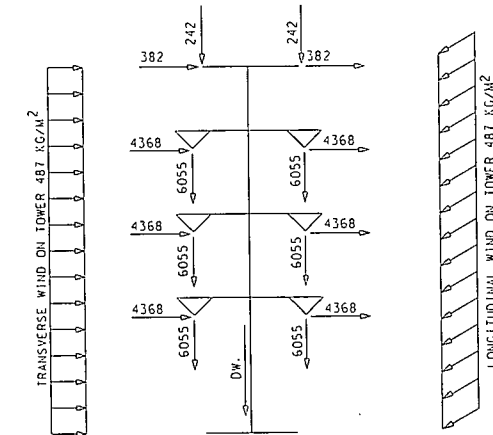
CASE II



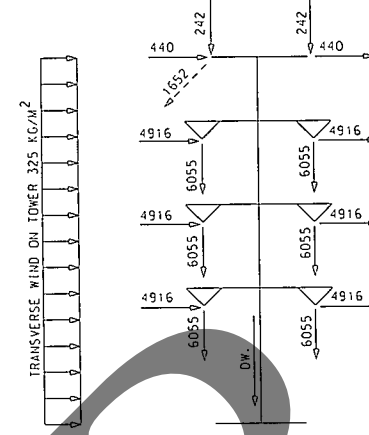
CASE III(1)



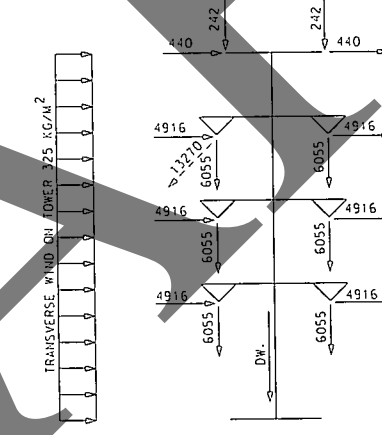
CASE III(2)



CASE III(3)



CASE IV(1)



CASE IV(2)

LOADING CASES

- CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
CASE III EXTREME OBLIQUE WIND
(1) $\beta = 75^\circ$
(2) $\beta = 60^\circ$
(3) $\beta = 45^\circ$
CASE IV FAILURE CONTAINMENT
(1) ANY ONE OF OHG. WIRE.
(2) ANY ONE OF CONDUCTOR.

NOTES

- ALL SPECIFIED LOADS ARE DESIGN LOADS (INCLUDING LOAD FACTORS) IN KILOGRAMS EXCEPT AS OTHERWISE INDICATED.
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- β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
- DW. DENOTES DEAD WEIGHT OF THE TOWER.
- THE TOWER SHALL BE DESIGNED FOR USE WITH ANY COMBINATION OF DIFFERENT LEG EXTENSIONS, RESULTING IN A MAXIMUM DIFFERENTIAL OF SIX METERS IN HEIGHT, BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

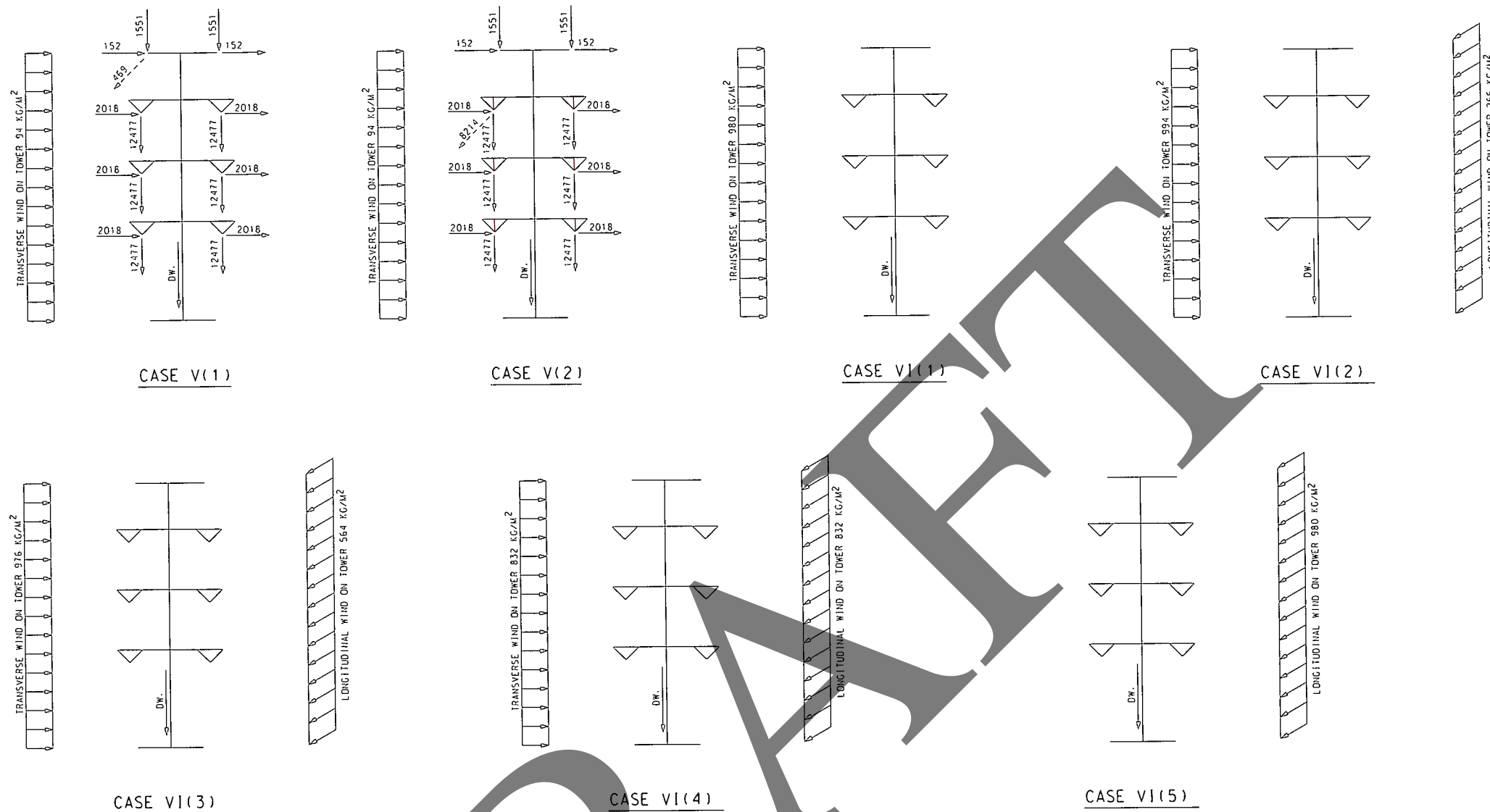
ELECTRICITY GENERATING AUTHORITY OF THAILAND

500 KV TRANSMISSION LINE

LOADING DIAGRAM
TOWER TYPE DOV3

DESIGNED BY SAKUT
VERIFIED BY Than
APPROVED

DATE
REPLACING Dwg. No.
Dwg. No. C02 - 003



LOADING CASES

CASE V STRINGING AND/OR MAINTENANCE

- (1) ANY ONE OF OHG. WIRE.
- (2) ANY ONE OF CONDUCTOR.

CASE VI HIGH INTENSITY

- (1) $\beta = 90^\circ$
- (2) $\beta = 75^\circ$
- (3) $\beta = 60^\circ$
- (4) $\beta = 45^\circ$
- (5) $\beta = 0^\circ$

NOTES

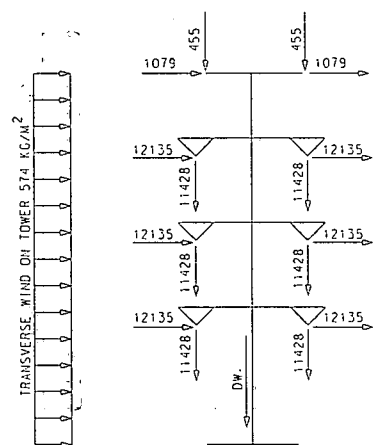
1. ALL SPECIFIED LOADS ARE DESIGN LOADS (INCLUDING LOAD FACTORS) IN KILOGRAMS EXCEPT AS OTHERWISE INDICATED.
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ELECTRICITY GENERATING AUTHORITY OF THAILAND

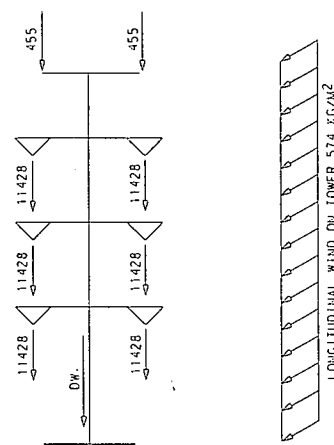
DRYNT	CHALEE	VALIDATED	18.04.05	500 KV TRANSMISSION LINE
DESIGNED	SPRUT	RECOMMENDED		LOADING DIAGRAM
VERIFIED	Shan	CONCURRED		TOWER TYPE DOV3
APPROVED				
ASSISTANT ENGINEER - TRANSMISSION SYSTEM ENGINEERING				

REV. NO. JOB NO. JOB DESCRIPTION DRAWN DESIGNED VERIFIED VALIDATED RECOMMENDED CONCURRED APPROVED DATE

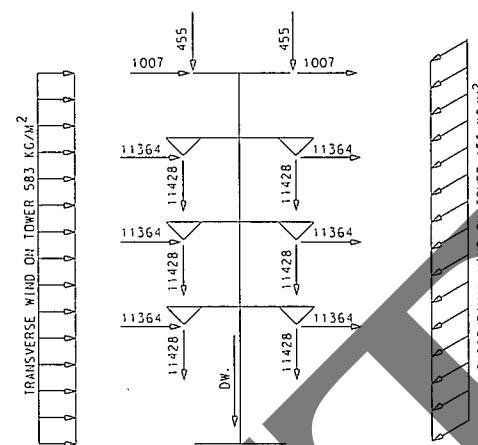
4x1272 MCM ACSR/GA, RULING SPAN 440 M.



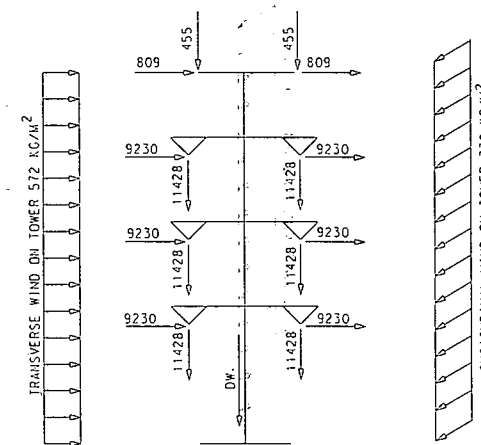
CASE VI(1)
CASE I



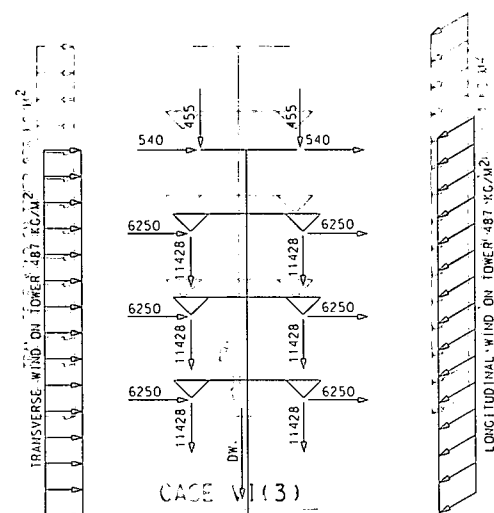
CASE VI(2)
CASE II



CASE VI(1)
CASE III(1)

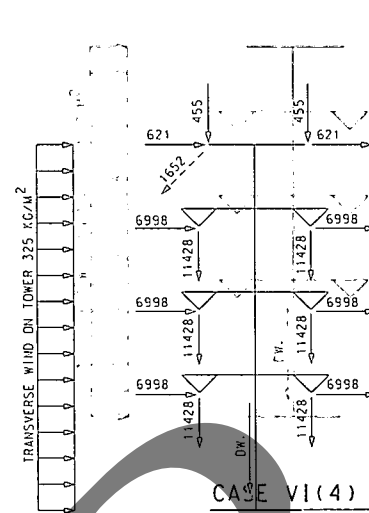


CASE VI(2)
CASE III(2)



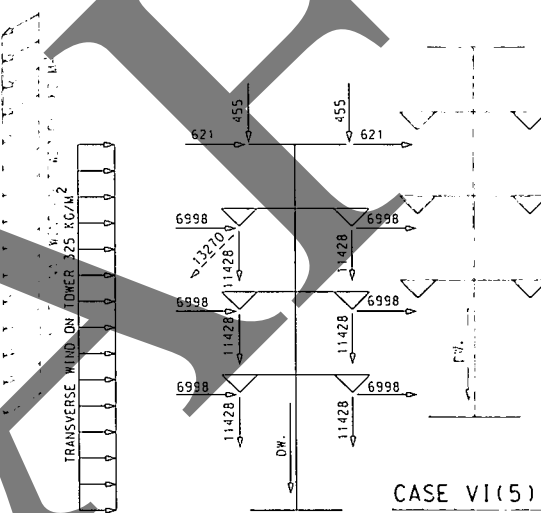
CASE VI(3)

CASE III(3)



CASE VI(4)

CASE IV(1)



CASE VI(5)

CASE IV(2)

LOADING CASES

CASE V - EXTREME WIND FOR MAINTENANCE

LOADING CASES

- CASE I - EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
- CASE II - EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
- CASE III - EXTREME OBLIQUE WIND
 - (1) $\beta = 75^\circ$
 - (2) $\beta = 60^\circ$
 - (3) $\beta = 45^\circ$

CASE IV - FAILURE CONTAINMENT

- (1) ANY ONE OF OHG. WIRE.
- (2) ANY ONE OF CONDUCTOR.

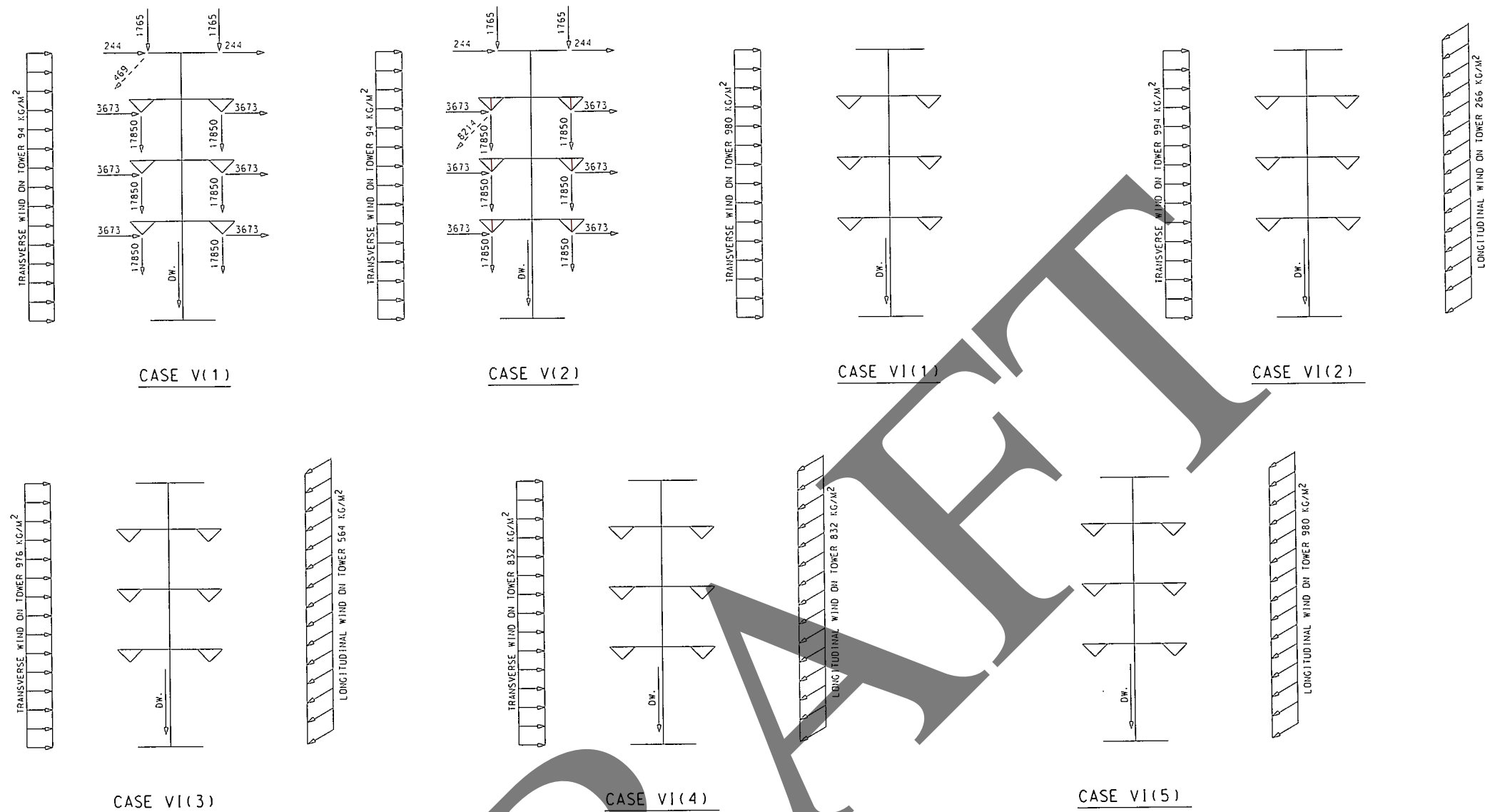
NOTES

NOTES

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4. β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
5. DW. DENOTES DEAD WEIGHT OF THE TOWER.
6. THE TOWER SHALL BE DESIGNED FOR USE WITH ANY COMBINATION OF DIFFERENT LEG EXTENSIONS, RESULTING IN A MAXIMUM DIFFERENTIAL OF SIX METERS IN HEIGHT, BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DESIGNED	SAWIT	DESIGNED	SAWIT
VERIFIED	Tham	VERIFIED	Tham
APPROVED		APPROVED	
DATE		DATE	
JOB NO.		JOB NO.	
REPLACING DWG. NO.		REPLACING DWG. NO.	
DWG. NO.		DWG. NO.	
C02 - 005		C02 - 005	



LOADING CASES

CASE V STRINGING AND/OR MAINTENANCE

- (1) ANY ONE OF OHG. WIRE.
- (2) ANY ONE OF CONDUCTOR.

CASE VI HIGH INTENSITY

- (1) $\beta = 90^\circ$
- (2) $\beta = 75^\circ$
- (3) $\beta = 60^\circ$
- (4) $\beta = 45^\circ$
- (5) $\beta = 0^\circ$

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ELECTRICITY GENERATING AUTHORITY OF THAILAND

500 KV TRANSMISSION LINE

LOADING DIAGRAM
TOWER TYPE DOV9

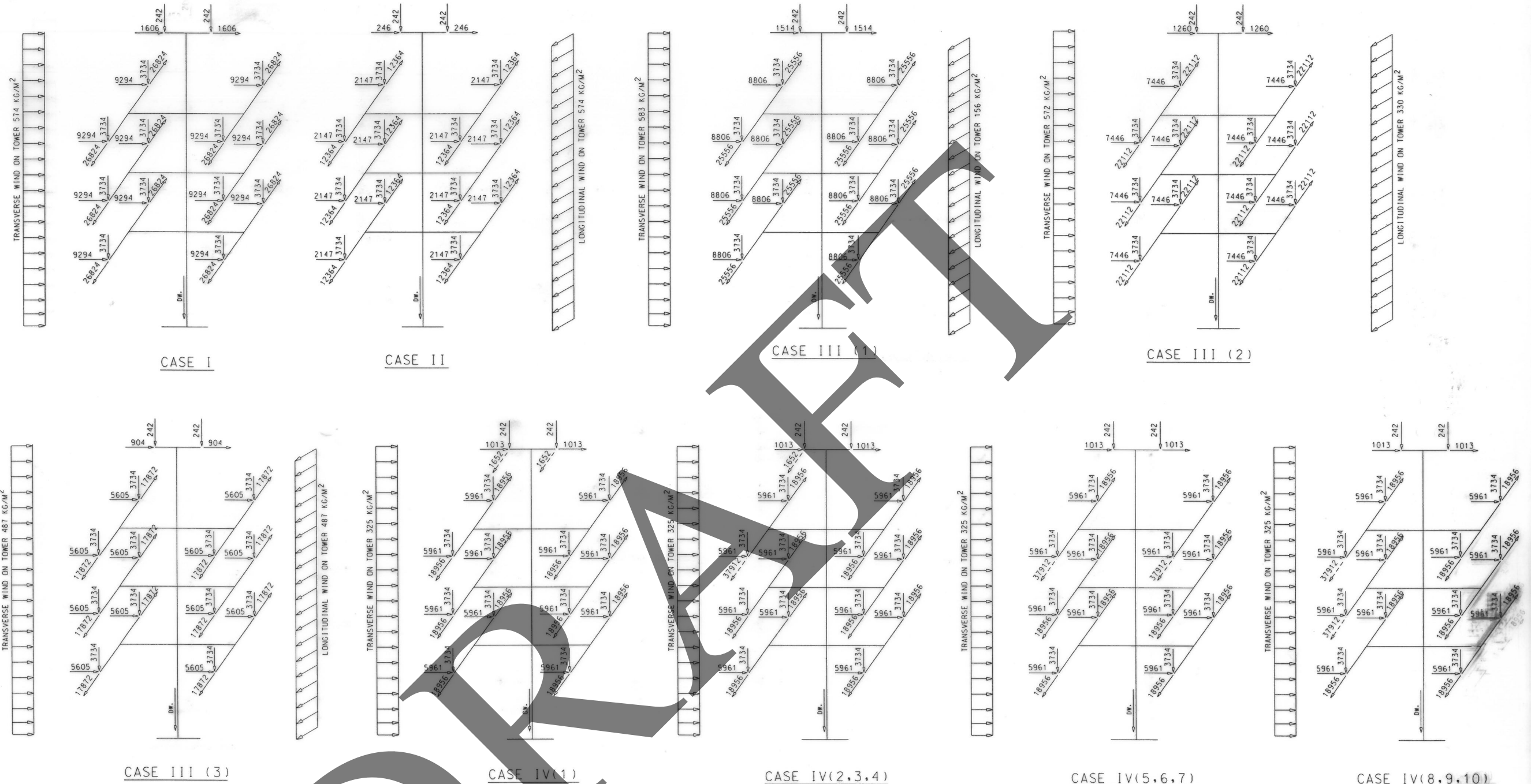
DESIGNED BY SARUT
VERIFIED BY Than
APPROVED

JOB NO. REPLACING DWG. NO. DWG. NO. C02 - 006

ASSISTANT GOVERNOR - TRANSMISSION SYSTEM ENGINEERING

DATE

REV. NO. JOB NO. JOB DESCRIPTION DRAWN DESIGNED VERIFIED VALIDATED RECOMMENDED CONCURRED APPROVED DATE



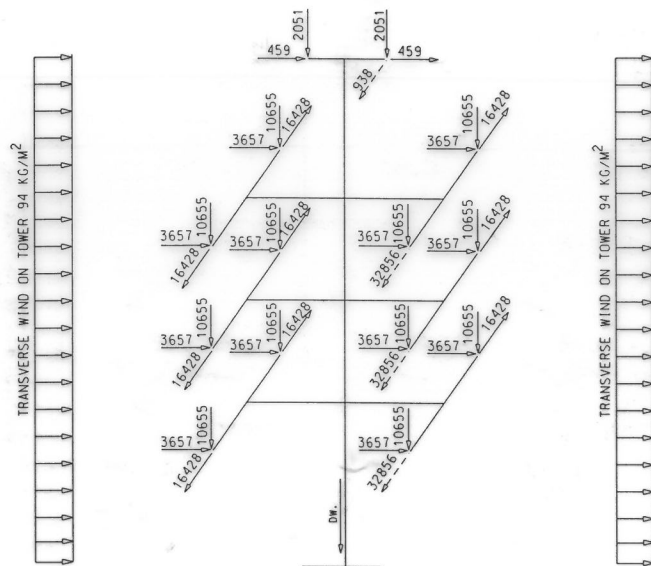
LOADING CASES

- CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
CASE III EXTREME OBLIQUE WIND
(1) $\beta = 75^\circ$
(2) $\beta = 60^\circ$
(3) $\beta = 45^\circ$
CASE IV FAILURE CONTAINMENT
(1) TWO OHG. WIRES.
(2) ONE OHG. WIRE AND ANY ONE OF TOP CONDUCTORS.
(3) ONE OHG. WIRE AND ANY ONE OF MIDDLE CONDUCTORS.
(4) ONE OHG. WIRE AND ANY ONE OF BOTTOM CONDUCTORS.
(5) TOP CONDUCTORS.
(6) MIDDLE CONDUCTORS.
(7) BOTTOM CONDUCTORS.
(8) TOP AND MIDDLE CONDUCTORS ON THE SAME SIDE.
(9) TOP AND BOTTOM CONDUCTORS ON THE SAME SIDE.
(10) MIDDLE AND BOTTOM CONDUCTORS ON THE SAME SIDE.

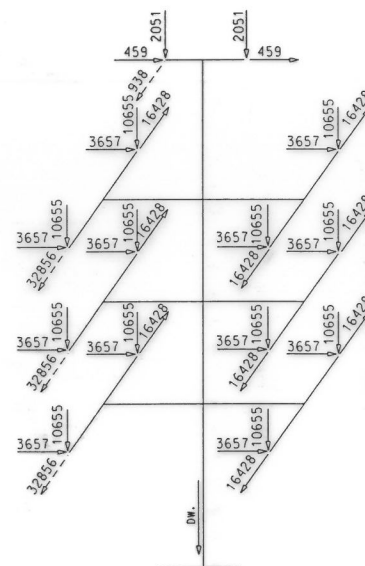
NOTES

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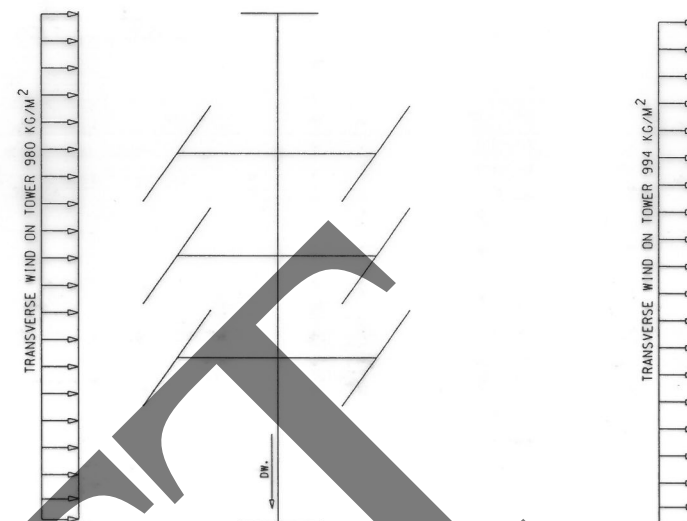
ELECTRICITY GENERATING AUTHORITY OF THAILAND									
500 KV TRANSMISSION LINE									
LOADING DIAGRAM									
TOWER TYPE DOT20									
DRAWN	CHALUE	VAL IDATED	T. Chanya 18 May '03		JOB NO.		REPLACING DWG. NO.		DWG. NO.
DESIGNED	SARUT	RECOMMENDED	ASST. DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE		C02 - 007		REV.
VERIFIED	Vhan	CONCURRED	DIRECTION, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE				
APPROVED			ASSISTANT GENERAL - TRANSMISSION SYSTEM ENGINEERING		DATE				



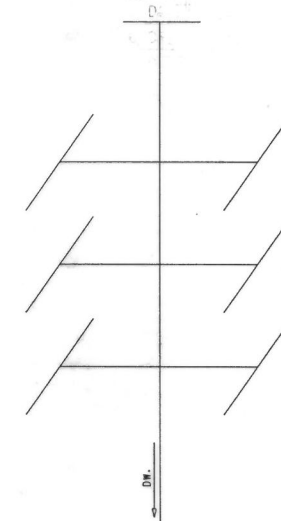
CASE V(1)



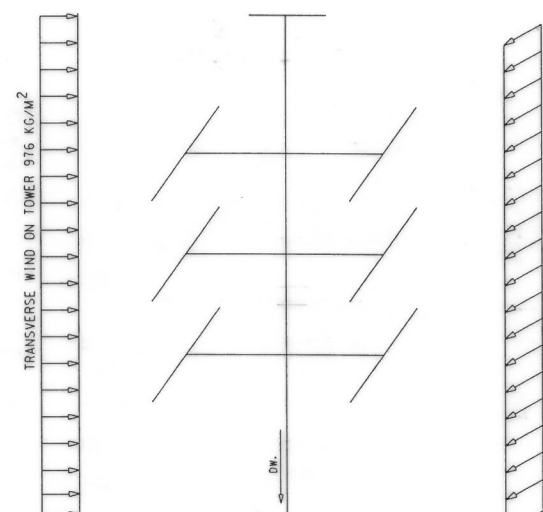
CASE V(2)



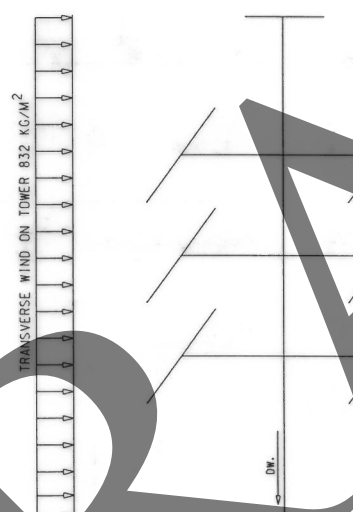
CASE VI(1)



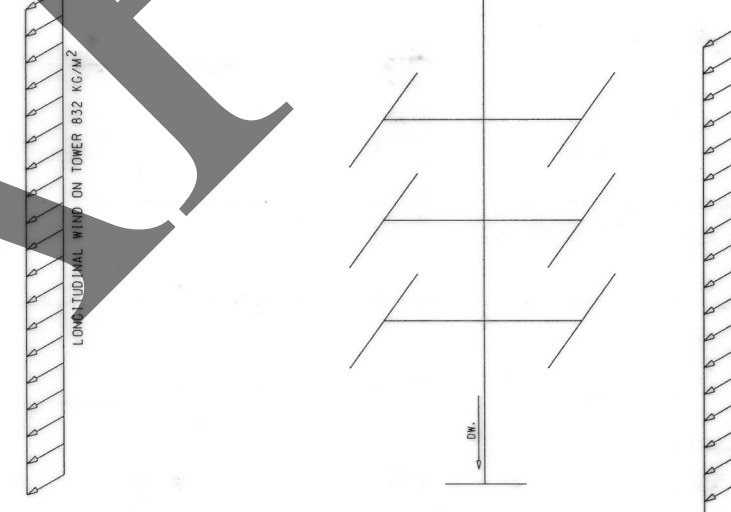
CASE VI(2)



CASE VI(3)



CASE VI(4)



CASE VI(5)

LOADING CASES

CASE V STRINGING AND/OR MAINTENANCE
(1) ONE-CIRCUIT RIGHT SIDE.
(2) ONE-CIRCUIT LEFT SIDE

CASE VI HIGH INTENSITY WIND
(1) $\beta = 90^\circ$
(2) $\beta = 75^\circ$
(3) $\beta = 60^\circ$
(4) $\beta = 45^\circ$
(5) $\beta = 0^\circ$

CASE VII UPLIFT (SEE NOTES 7.)

NOTES

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- ALL ELEMENTS OF TOWER SHALL BE CAPABLE TO WITHSTAND VERTICAL UPLIFT LOADS EQUAL TO DOWNWARD VERTICAL LOADS SPECIFIED IN EACH LOADING CASE.

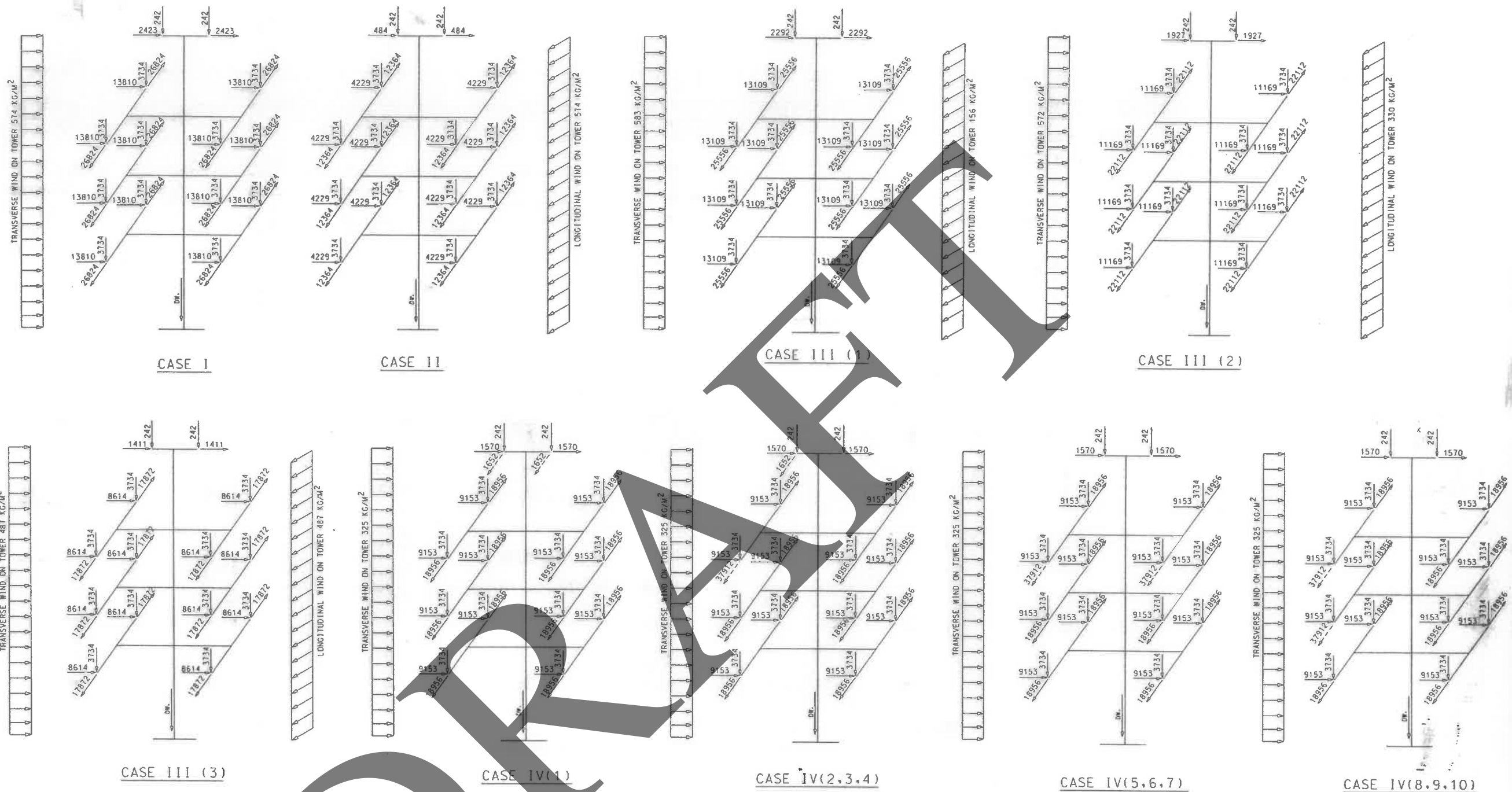
ISO
TSEB 1993

CAD
CENTER
DO NOT AMEND
MANUALLY

FILENAME
4x1272 MCM ACSR/GA, RULING SPAN 440 m.
9 SEPTEMBER 2003

REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN		CHALEE	VALIDATED <i>J. Chaiyaporn</i>		500 kV TRANSMISSION LINE				
DESIGNED		<i>SARUT</i>	RECOMMENDED		CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT				
VERIFIED		<i>Than</i>	CONCURRED		ASST. DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION				
APPROVED					LOADING DIAGRAM				
					TOWER TYPE DOT20				
					JOB NO.		REPLACING DWG.NO.		DWG.NO.



LOADING CASES

- CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
- CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
- CASE III EXTREME OBLIQUE WIND

- (1) $\beta = 75^\circ$
- (2) $\beta = 60^\circ$
- (3) $\beta = 45^\circ$

CASE IV

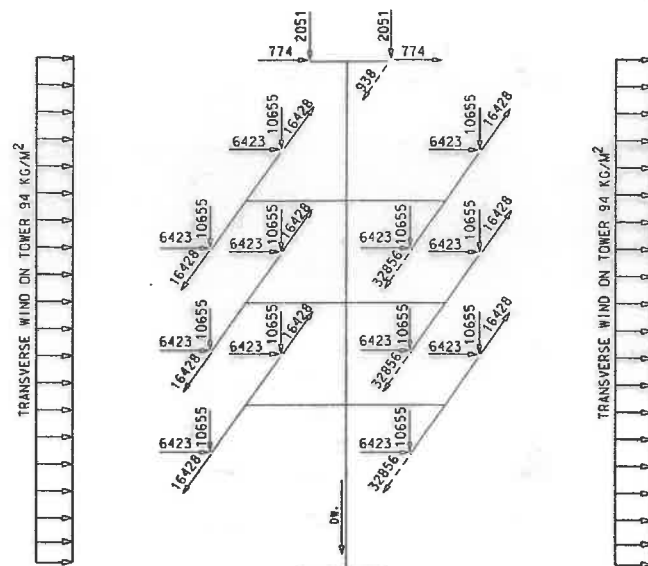
FAILURE CONTAINMENT

- (1) TWO OHG. WIRES.
- (2) ONE OHG. WIRE AND ANY ONE OF TOP CONDUCTORS.
- (3) ONE OHG. WIRE AND ANY ONE OF MIDDLE CONDUCTORS.
- (4) ONE OHG. WIRE AND ANY ONE OF BOTTOM CONDUCTORS.

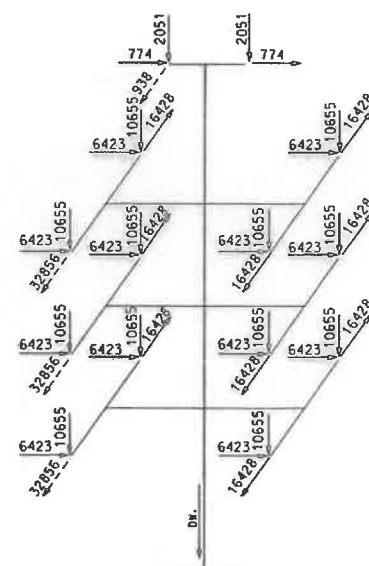
- (5) TOP CONDUCTORS.
- (6) MIDDLE CONDUCTORS.
- (7) BOTTOM CONDUCTORS.
- (8) TOP AND MIDDLE CONDUCTORS ON THE SAME SIDE.
- (9) TOP AND BOTTOM CONDUCTORS ON THE SAME SIDE.
- (10) MIDDLE AND BOTTOM CONDUCTORS ON THE SAME SIDE.

NOTES

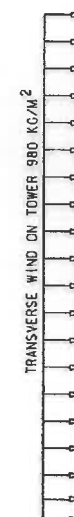
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CASE V(1)



CASE V(2)



CASE VI(1)



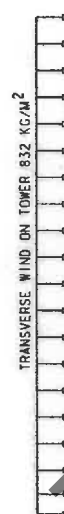
CASE VI(2)



CASE VI(3)



CASE VI(4)



CASE VI(5)



LOADING CASES

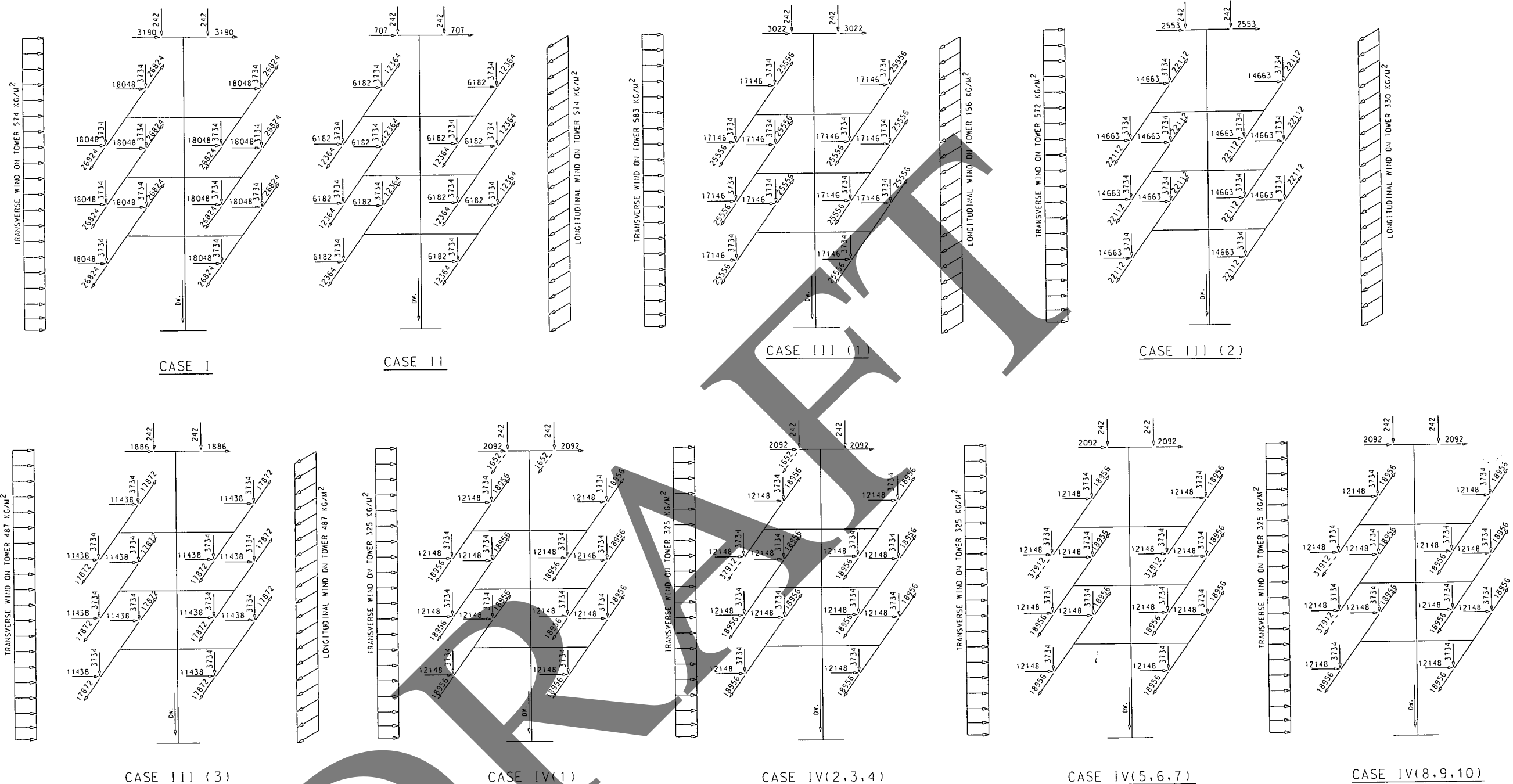
CASE V STRINGING AND/OR MAINTENANCE
(1) ONE-CIRCUIT RIGHT SIDE.
(2) ONE-CIRCUIT LEFT SIDE

CASE VI HIGH INTENSITY WIND
(1) $\beta = 90^\circ$
(2) $\beta = 75^\circ$
(3) $\beta = 60^\circ$
(4) $\beta = 45^\circ$
(5) $\beta = 0^\circ$

CASE VII UPLIFT (SEE NOTES 7.)

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4. β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
5. DW. DENOTES DEAD WEIGHT OF THE TOWER.
6. THE TOWER SHALL BE DESIGNED FOR USE WITH ANY COMBINATION OF DIFFERENT LEG EXTENSIONS, RESULTING IN A MAXIMUM DIFFERENTIAL OF SIX METERS IN HEIGHT, BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.
7. ALL ELEMENTS OF TOWER SHALL BE CAPABLE TO WITHSTAND VERTICAL UPLIFT LOADS EQUAL TO DOWNWARD VERTICAL LOADS SPECIFIED IN EACH LOADING CASE.



LOADING CASES

- CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
CASE III EXTREME OBLIQUE WIND
(1) $\beta = 75^\circ$
(2) $\beta = 60^\circ$
(3) $\beta = 45^\circ$
CASE IV FAILURE CONTAINMENT
(1) TWO OHG. WIRES.
(2) ONE OHG. WIRE AND ANY ONE OF TOP CONDUCTORS.
(3) ONE OHG. WIRE AND ANY ONE OF MIDDLE CONDUCTORS.
(4) ONE OHG. WIRE AND ANY ONE OF BOTTOM CONDUCTORS.
(5) TOP CONDUCTORS.
(6) MIDDLE CONDUCTORS.
(7) BOTTOM CONDUCTORS.
(8) TOP AND MIDDLE CONDUCTORS ON THE SAME SIDE.
(9) TOP AND BOTTOM CONDUCTORS ON THE SAME SIDE.
(10) MIDDLE AND BOTTOM CONDUCTORS ON THE SAME SIDE.

NOTES

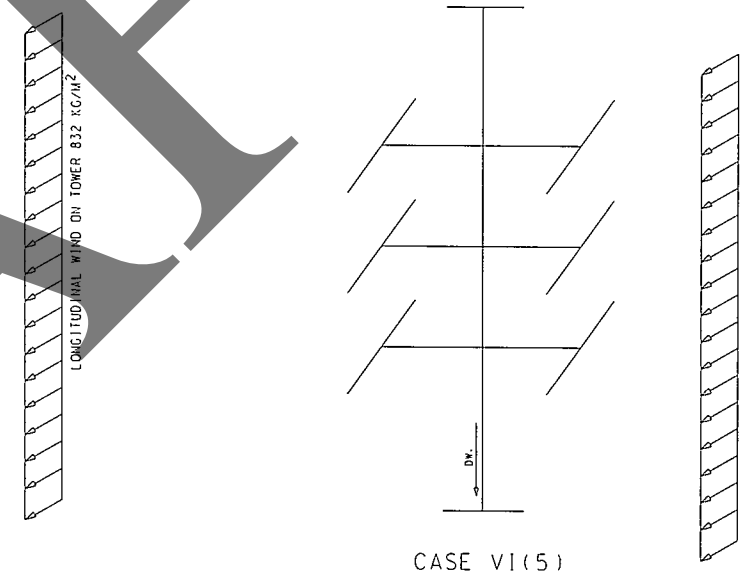
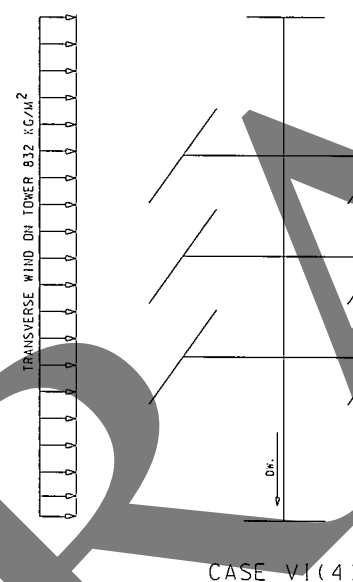
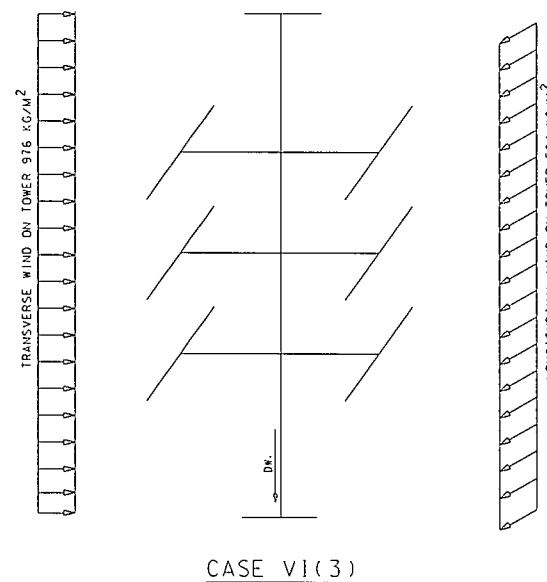
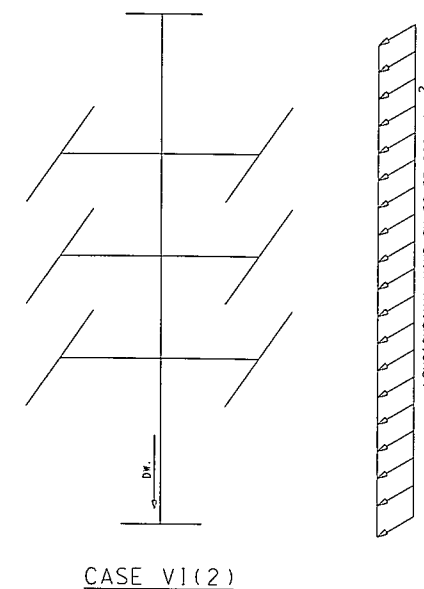
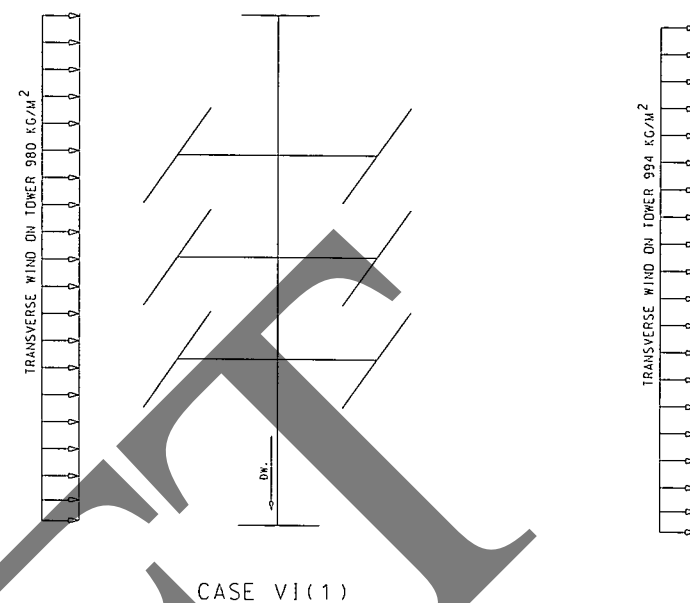
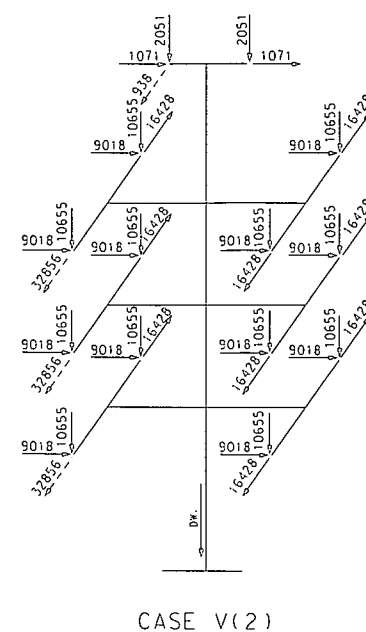
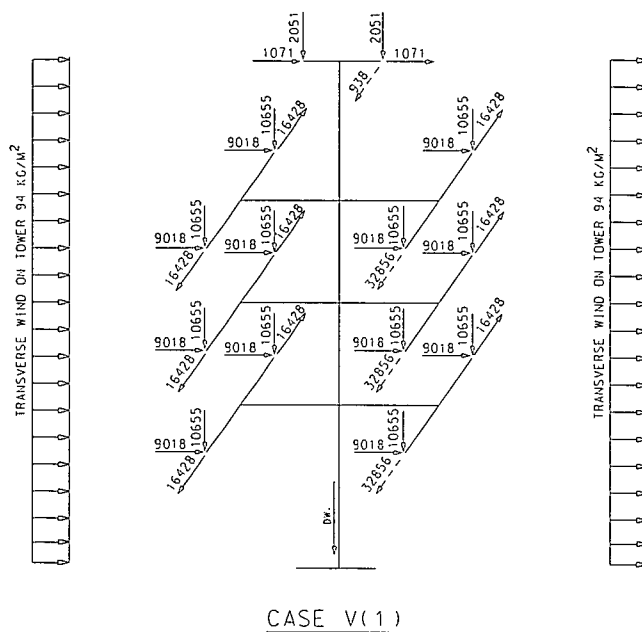
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ELECTRICITY GENERATING AUTHORITY OF THAILAND

500 kV TRANSMISSION LINE
LOADING DIAGRAM
TOWER TYPE DOT60

DRAWN CHALEE
DESIGNED SPATIT
VERIFIED Jkan
APPROVED
VALIDATED 18 Mar 01
RECOMMENDED
CONCURRED
DATE

JOB NO. REPLACING Dwg. NO. Dwg. NO. C02 - 011 REV.



LOADING CASES

CASE V STRINGING AND/OR MAINTENANCE
(1) ONE-CIRCUIT RIGHT SIDE.
(2) ONE-CIRCUIT LEFT SIDE

CASE VI HIGH INTENSITY WIND
(1) $\beta = 90^\circ$
(2) $\beta = 75^\circ$
(3) $\beta = 60^\circ$
(4) $\beta = 45^\circ$
(5) $\beta = 0^\circ$

CASE VII UPLIFT (SEE NOTES 7.)

NOTES

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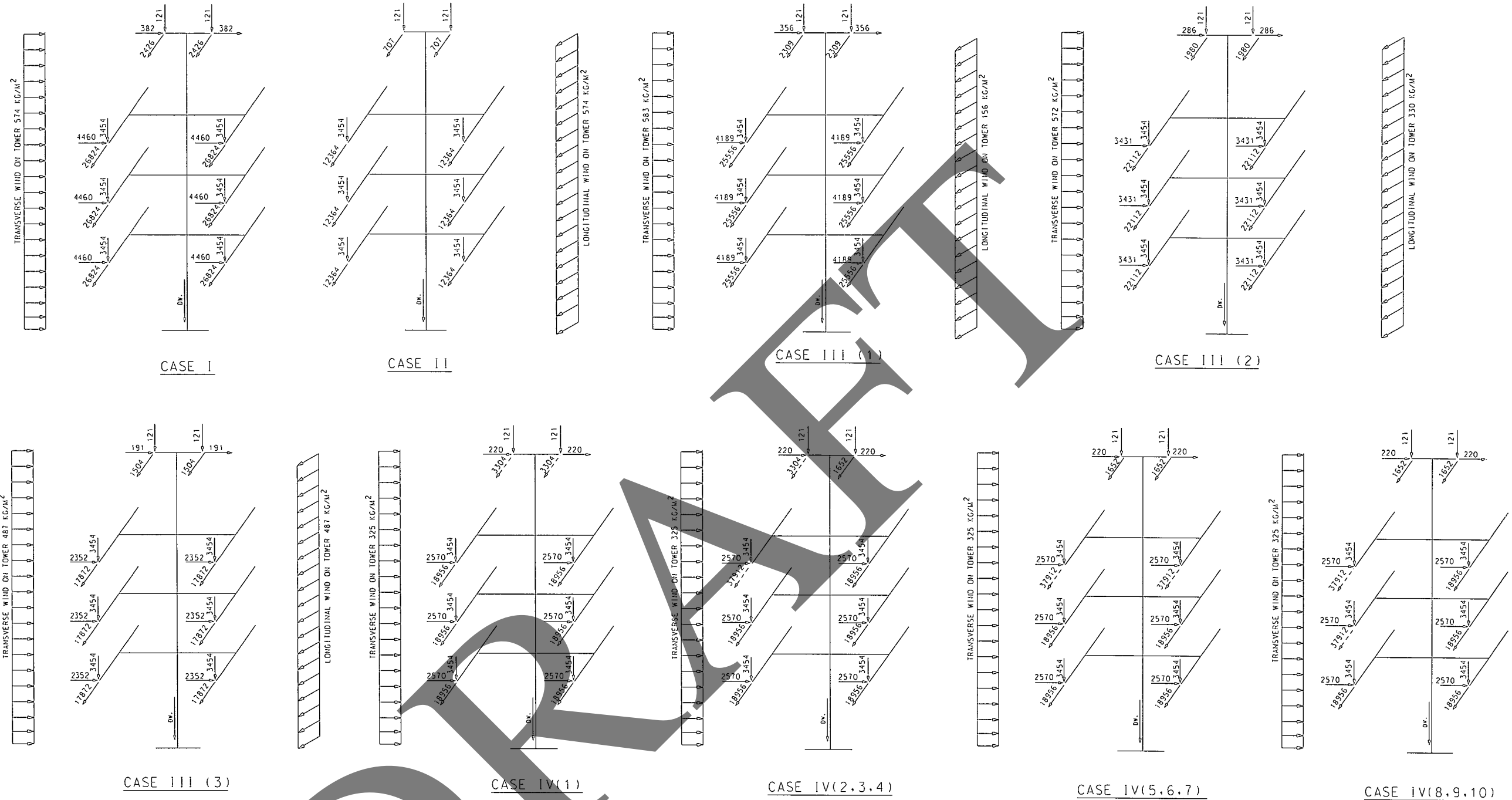
ELECTRICITY GENERATING AUTHORITY OF THAILAND

DESIGNED	CHALCE	VALIDATED	500 kV TRANSMISSION LINE
DESIGNED	SARUT	RECOMMENDED	LOADING DIAGRAM
VERIFIED	THAN	CONCURRED	TOWER TYPE DOT60
APPROVED			

REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE	JOB NO.	REPLACING DWG. NO.	DWG. NO.	REV.
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4x1272 NEW ACSR/GA - RULING SPAN 440 m.

C02 - 012



LOADING CASES

- CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
CASE III EXTREME OBLIQUE WIND
(1) $\beta = 75^\circ$
(2) $\beta = 60^\circ$
(3) $\beta = 45^\circ$
CASE IV FAILURE CONTAINMENT
(1) TWO OHG. WIRES.
(2) ONE OHG. WIRE AND ANY ONE OF TOP CONDUCTORS.
(3) ONE OHG. WIRE AND ANY ONE OF MIDDLE CONDUCTORS.
(4) ONE OHG. WIRE AND ANY ONE OF BOTTOM CONDUCTORS.

- (5) TOP CONDUCTORS.
(6) MIDDLE CONDUCTORS.
(7) BOTTOM CONDUCTORS.
(8) TOP AND MIDDLE CONDUCTORS ON THE SAME SIDE.
(9) TOP AND BOTTOM CONDUCTORS ON THE SAME SIDE.
(10) MIDDLE AND BOTTOM CONDUCTORS ON THE SAME SIDE.

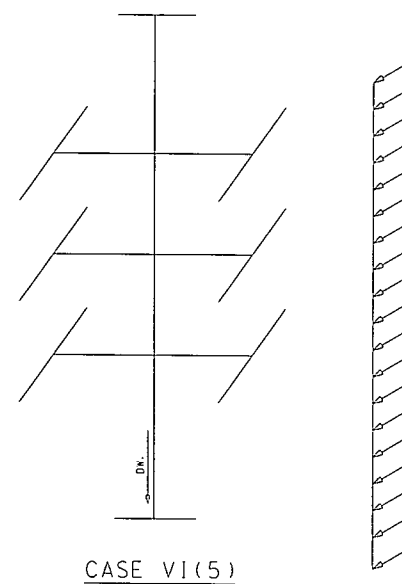
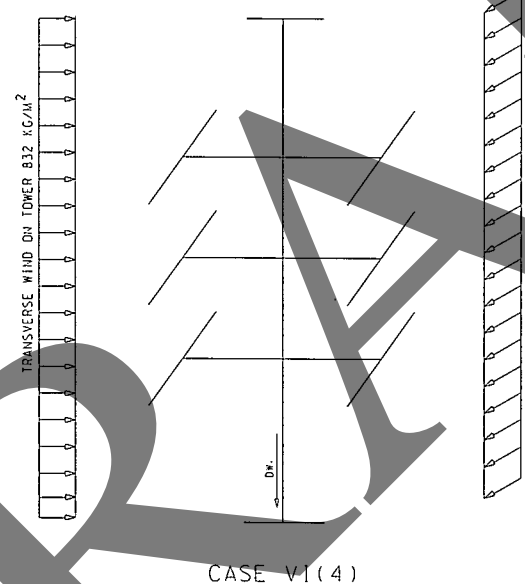
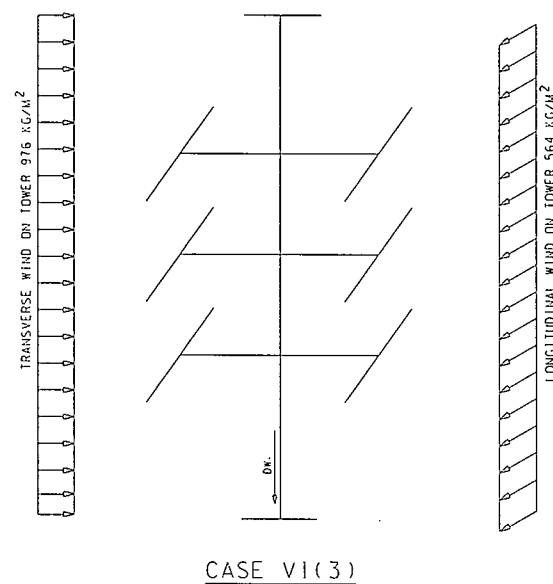
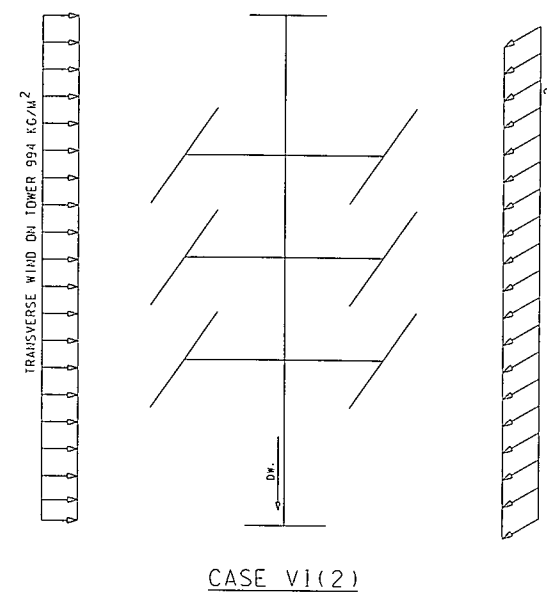
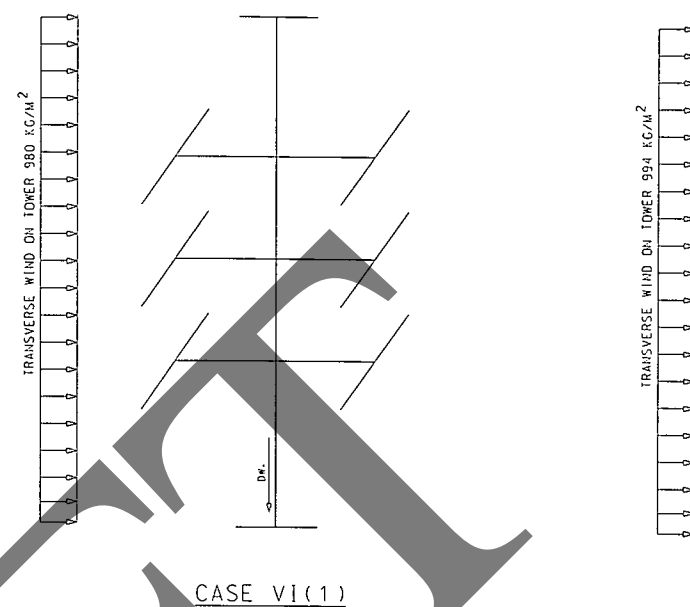
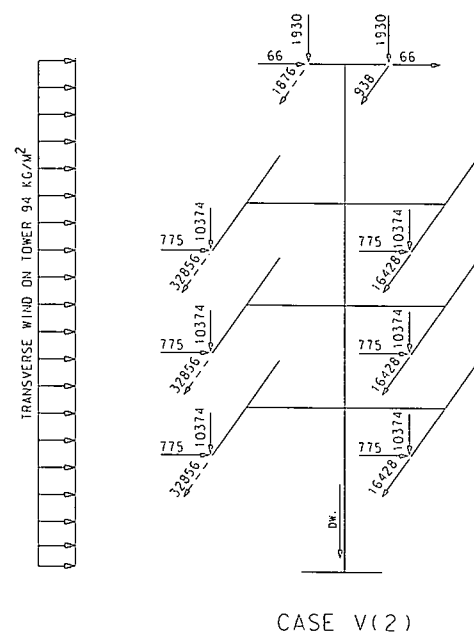
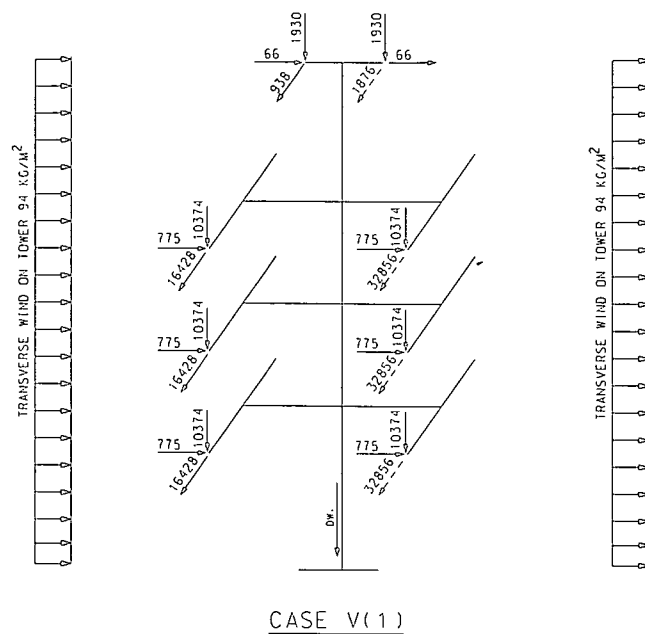
NOTES

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FOR 0° + COMPLETE DEADEND CASE

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DESIGNED SARUT	VALIDATED T. Chan	500 kV TRANSMISSION LINE
VERIFIED Chan	RECOMMENDED ASST. DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	LOADING DIAGRAM
APPROVED ASSISTANT GOVERNOR - TRANSMISSION SYSTEM ENGINEERING	CONCURRED DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	TOWER TYPE DOT60
REV. NO.	JOB NO.	REV.



LOADING CASES

CASE V STRINGING AND/OR MAINTENANCE
(1) ONE-CIRCUIT RIGHT SIDE.
(2) ONE-CIRCUIT LEFT SIDE

CASE VI HIGH INTENSITY WIND

- (1) $\beta = 90^\circ$
- (2) $\beta = 75^\circ$
- (3) $\beta = 60^\circ$
- (4) $\beta = 45^\circ$
- (5) $\beta = 0^\circ$

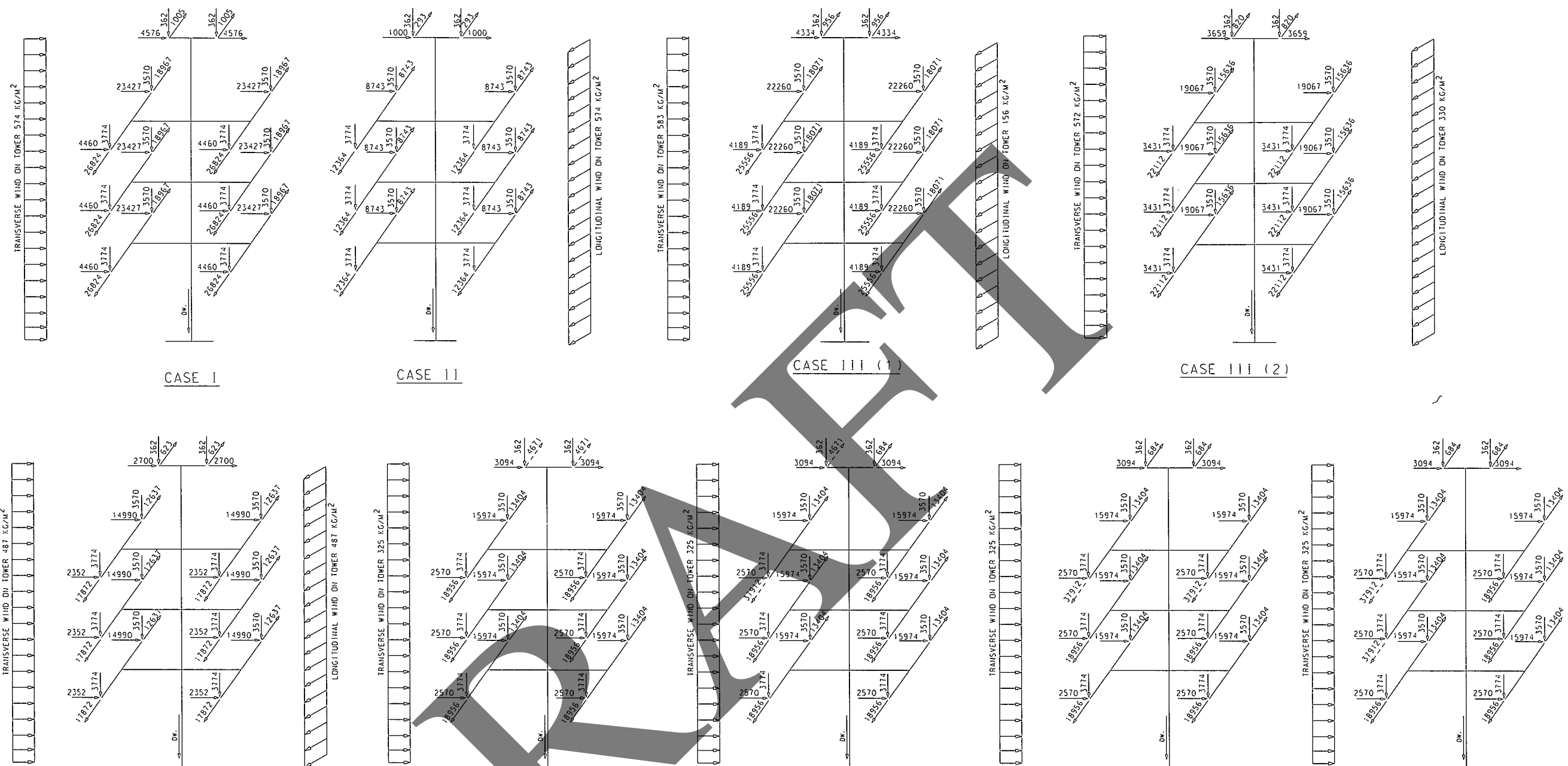
CASE VII UPLIFT (SEE NOTES 7.)

FOR 0° + COMPLETE DEADEND CASE

NOTES

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ELECTRICITY GENERATING AUTHORITY OF THAILAND			
DRAWN	CHALEE	VALIDATED	500 KV TRANSMISSION LINE
DESIGNED	SARUT	CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT	LOADING DIAGRAM
VERIFIED	Shan	CONCURRED	TOWER TYPE DOT60
APPROVED		ASSIST. DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	
ASSISTANT GENERAL - TRANSMISSION SYSTEM ENGINEERING		DATE	REPLACING DWG. NO.
			DWG. NO.
			C02 - 014



CASE I

CASE II

CASE III (1)

CASE III (2)

CASE III (3)

CASE IV (1)

CASE IV (2,3,4)

CASE IV (5,6,7)

CASE IV (8,9,10)

LOADING CASES

- CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
CASE III EXTREME OBLIQUE WIND
(1) $\beta = 75^\circ$
(2) $\beta = 60^\circ$
(3) $\beta = 45^\circ$
CASE IV FAILURE CONTAINMENT
(1) TWO OHG. WIRES.
(2) ONE OHG. WIRE AND ANY ONE OF TOP CONDUCTORS.
(3) ONE OHG. WIRE AND ANY ONE OF MIDDLE CONDUCTORS.
(4) ONE OHG. WIRE AND ANY ONE OF BOTTOM CONDUCTORS.

- (5) TOP CONDUCTORS.
(6) MIDDLE CONDUCTORS.
(7) BOTTOM CONDUCTORS.
(8) TOP AND MIDDLE CONDUCTORS ON THE SAME SIDE.
(9) TOP AND BOTTOM CONDUCTORS ON THE SAME SIDE.
(10) MIDDLE AND BOTTOM CONDUCTORS ON THE SAME SIDE.

NOTES

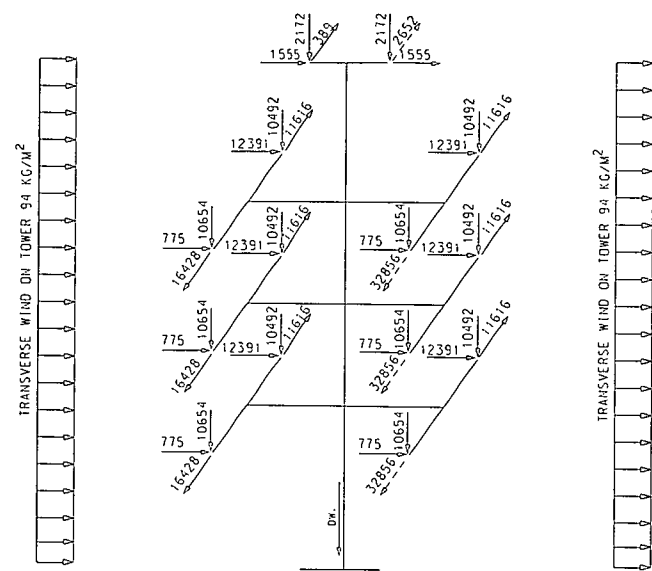
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FOR $0^\circ + 45^\circ$ SLACK SPAN CASE

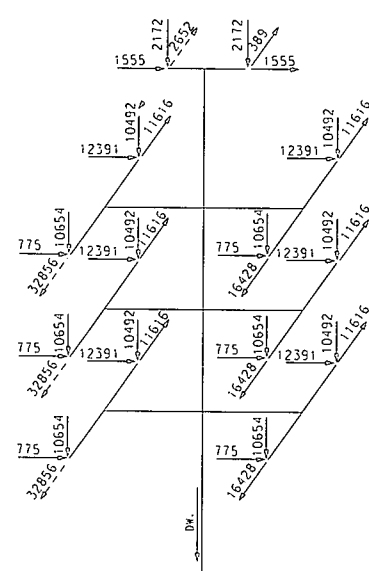
9001
1899
SEPTEMBER 2003

REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

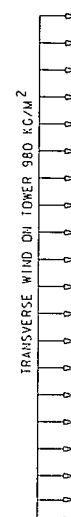
ELECTRICITY GENERATING AUTHORITY OF THAILAND		500 kV TRANSMISSION LINE	
LOADING DIAGRAM		TOWER TYPE DOT60	
DRAWN CHALCE	DESIGNED SARUT	VERIFIED Than	APPROVED
DATE		DATE	
JOB NO.		REV.	



CASE V(1)



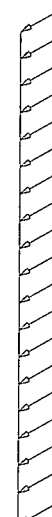
CASE V(2)



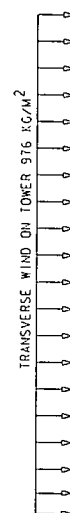
CASE VI(1)



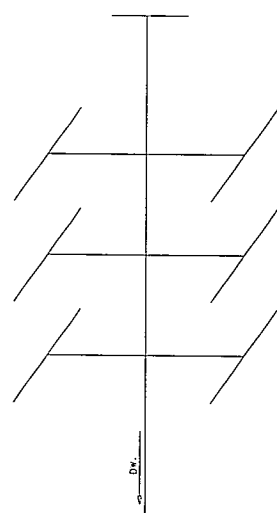
CASE VI(2)



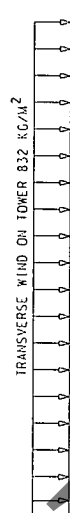
LONGITUDINAL WIND ON TOWER 266 KG/M²



CASE VI(3)

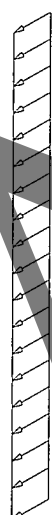


LONGITUDINAL WIND ON TOWER 564 KG/M²

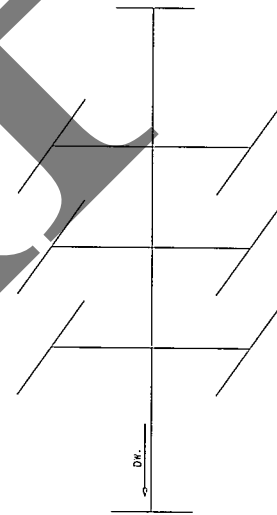


TRANSVERSE WIND ON TOWER 832 KG/M²

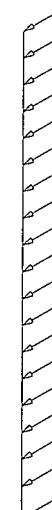
CASE VI(4)



LONGITUDINAL WIND ON TOWER 832 KG/M²



CASE VI(5)



LONGITUDINAL WIND ON TOWER 980 KG/M²

LOADING CASES

CASE V STRINGING AND/OR MAINTENANCE
(1) ONE-CIRCUIT RIGHT SIDE.
(2) ONE-CIRCUIT LEFT SIDE

CASE VI HIGH INTENSITY WIND
(1) $\beta = 90^\circ$
(2) $\beta = 75^\circ$
(3) $\beta = 60^\circ$
(4) $\beta = 45^\circ$
(5) $\beta = 0^\circ$

CASE VII UPLIFT (SEE NOTES 7.)

FOR $0^\circ + 45^\circ$ SLACK SPAN CASE

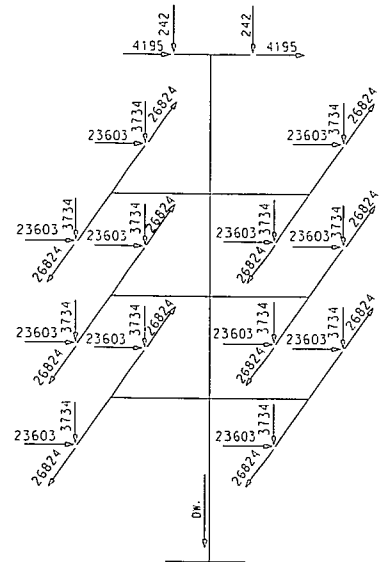
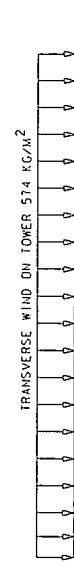
NOTES

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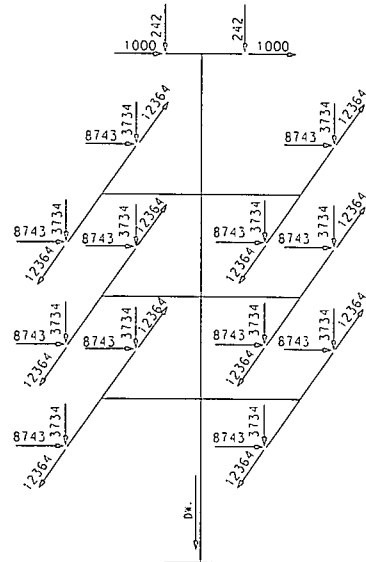
ELECTRICITY GENERATING AUTHORITY OF THAILAND

DESIGNED	CHALEC	VALIDATED	CHALEC	500 kV TRANSMISSION LINE
VERIFIED	SARUT	RECOMMENDED	CHALEC	LOADING DIAGRAM
APPROVED	THAN	CONCURRED	CHALEC	TOWER TYPE DOT60
DATE				REV.

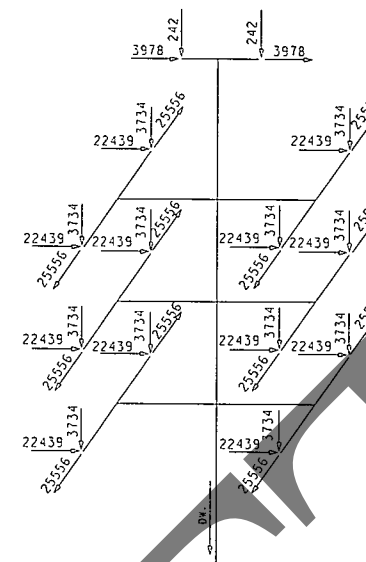
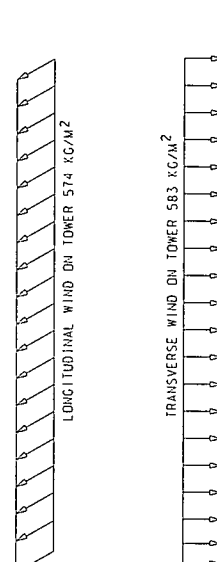
C02 - 016



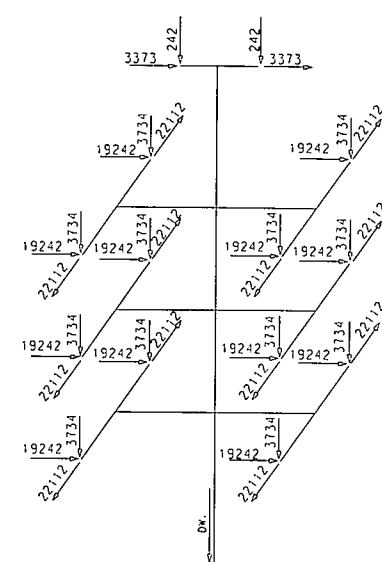
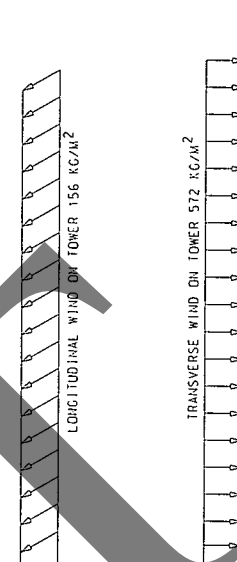
CASE I



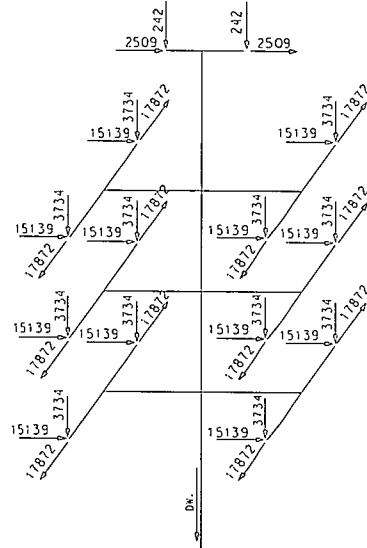
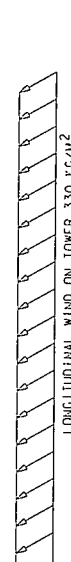
CASE II



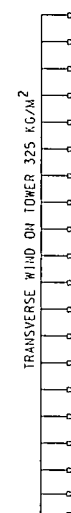
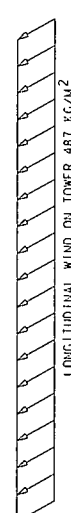
CASE III (1)



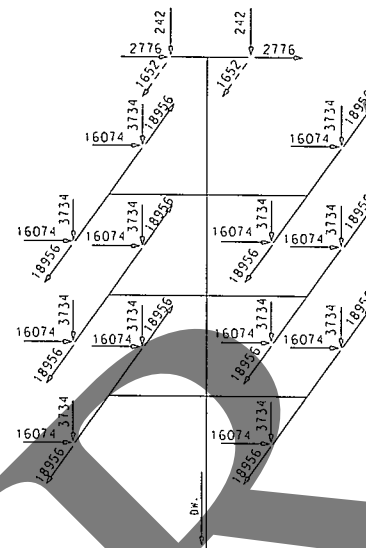
CASE III (2)



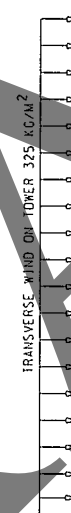
CASE III (3)



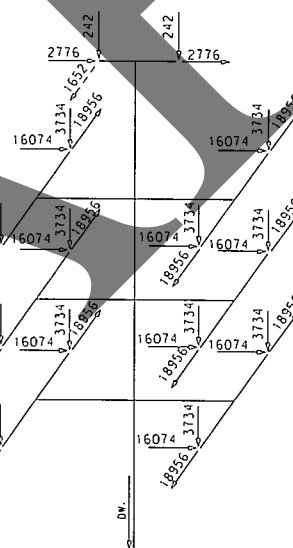
TRANSVERSE WIND ON TOWER 325 KG/M²



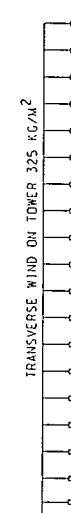
CASE IV (1)



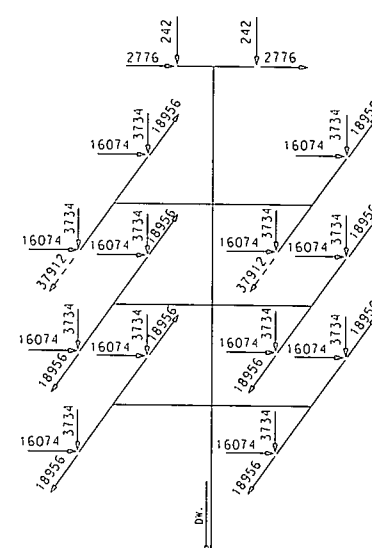
TRANSVERSE WIND ON TOWER 325 KG/M²



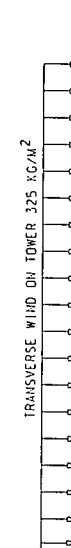
CASE IV (2,3,4)



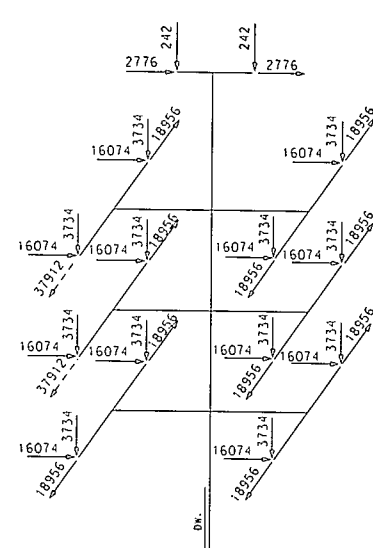
TRANSVERSE WIND ON TOWER 325 KG/M²



CASE IV (5,6,7)



TRANSVERSE WIND ON TOWER 325 KG/M²



CASE IV (8,9,10)

LOADING CASES

- CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
CASE III EXTREME OBLIQUE WIND
(1) $\beta = 75^\circ$
(2) $\beta = 60^\circ$
(3) $\beta = 45^\circ$
CASE IV FAILURE CONTAINMENT
(1) TWO OHG. WIRES.
(2) ONE OHG. WIRE AND ANY ONE OF TOP CONDUCTORS.
(3) ONE OHG. WIRE AND ANY ONE OF MIDDLE CONDUCTORS.
(4) ONE OHG. WIRE AND ANY ONE OF BOTTOM CONDUCTORS.

- (5) TOP CONDUCTORS.
(6) MIDDLE CONDUCTORS.
(7) BOTTOM CONDUCTORS.
(8) TOP AND MIDDLE CONDUCTORS ON THE SAME SIDE.
(9) TOP AND BOTTOM CONDUCTORS ON THE SAME SIDE.
(10) MIDDLE AND BOTTOM CONDUCTORS ON THE SAME SIDE.

NOTES

- ALL SPECIFIED LOADS ARE DESIGN LOADS (INCLUDING LOAD FACTORS) IN KILOGRAMS EXCEPT AS OTHERWISE INDICATED.
- THE SPECIFIED TRANSVERSE AND/OR LONGITUDINAL WIND ON TOWER SHALL ACT ON THE PROJECTED AREA OF ONE LONGITUDINAL FACE AND/OR ONE TRANSVERSE FACE OF THE TOWER, RESPECTIVELY.
- ALL ELEMENTS OF TOWER, BOTH MEMBERS AND CONNECTIONS, SHALL BE DESIGNED TO 0.79 OF THEIR CAPACITIES.
- β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
- DW. DENOTES DEAD WEIGHT OF THE TOWER.
- THE TOWER SHALL BE DESIGNED FOR USE WITH ANY COMBINATION OF DIFFERENT LEG EXTENSIONS, RESULTING IN A MAXIMUM DIFFERENTIAL OF SIX METERS IN HEIGHT, BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

500 KV TRANSMISSION LINE

LOADING DIAGRAM

TOWER TYPE DOT90

DRAWN CHALEE
DESIGNED SARUT
VERIFIED THAN
APPROVED

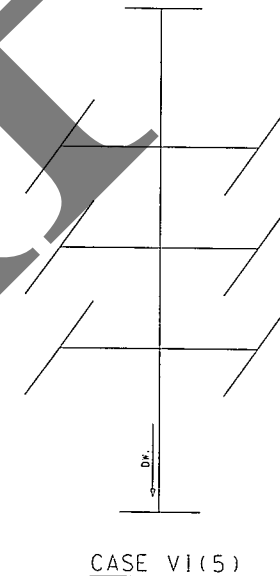
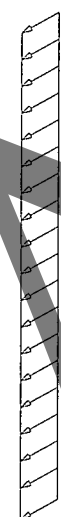
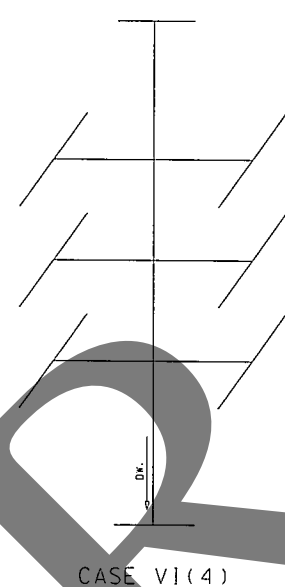
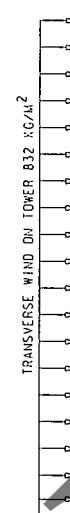
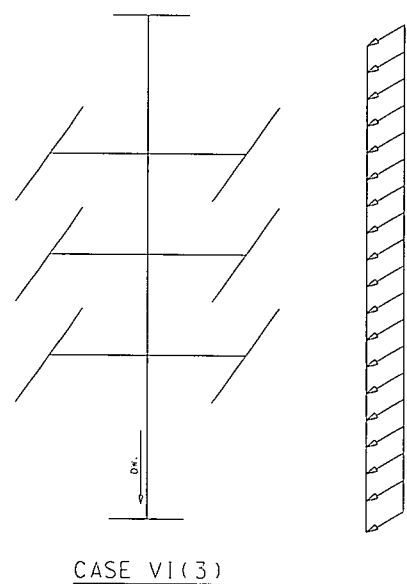
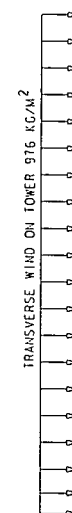
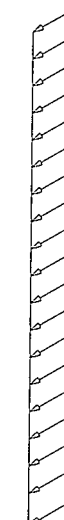
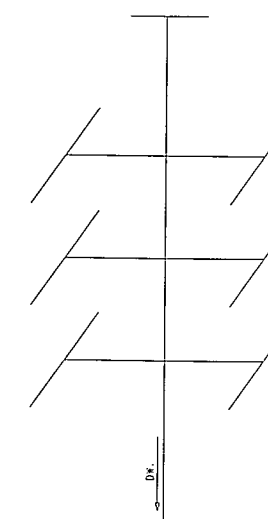
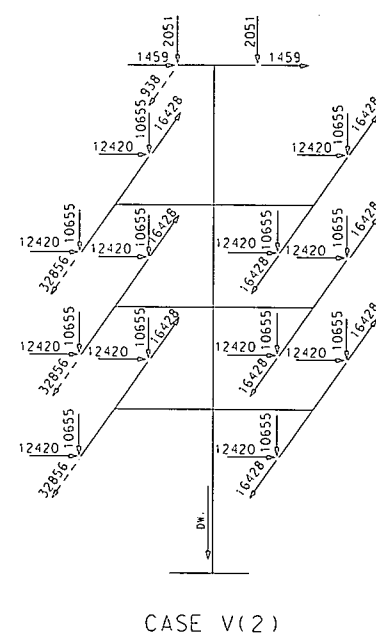
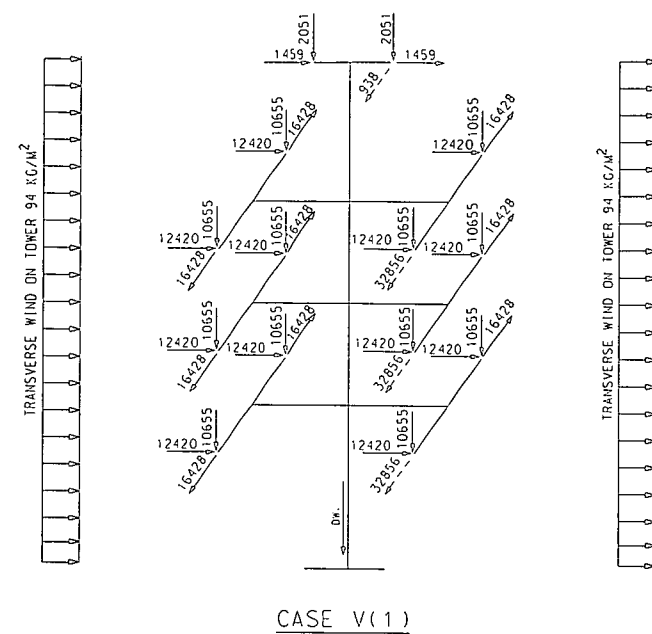
VALIDATED
RECOMMENDED
CONCURRED
DATE

JOB NO. REPLACING DWG. NO. DWG. NO.

ASSISTANT CHIEF - TRANSMISSION SYSTEM ENGINEERING

DATE

C02 - 017



LOADING CASES

CASE V STRINGING AND/OR MAINTENANCE
(1) ONE-CIRCUIT RIGHT SIDE.
(2) ONE-CIRCUIT LEFT SIDE

CASE VI HIGH INTENSITY WIND

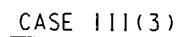
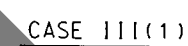
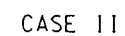
- (1) $\beta = 90^\circ$
- (2) $\beta = 75^\circ$
- (3) $\beta = 60^\circ$
- (4) $\beta = 45^\circ$
- (5) $\beta = 0^\circ$

CASE VII UPLIFT (SEE NOTES 7.)

NOTES

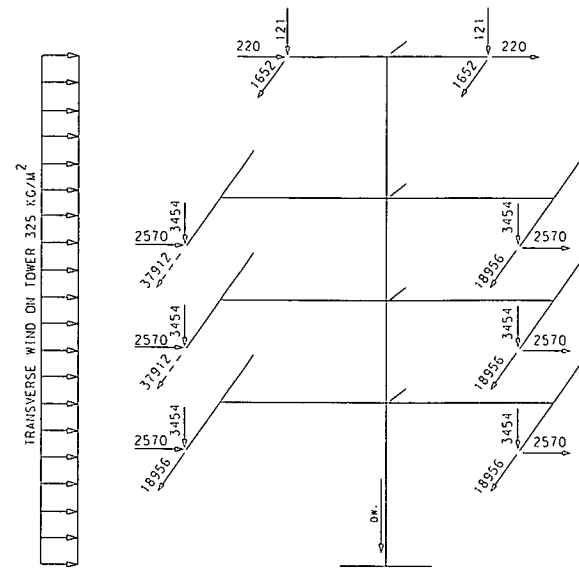
1. ALL SPECIFIED LOADS ARE DESIGN LOADS (INCLUDING LOAD FACTORS) IN KILOGRAMS EXCEPT AS OTHERWISE INDICATED.
2. THE SPECIFIED TRANSVERSE AND/OR LONGITUDINAL WIND ON TOWER SHALL ACT ON THE PROJECTED AREA OF ONE LONGITUDINAL FACE AND/OR ONE TRANSVERSE FACE OF THE TOWER, RESPECTIVELY.
3. ALL ELEMENTS OF TOWER, BOTH MEMBERS AND CONNECTIONS, SHALL BE DESIGNED TO 0.79 OF THEIR CAPACITIES.
4. β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
5. DW. DENOTES DEAD WEIGHT OF THE TOWER.
6. THE TOWER SHALL BE DESIGNED FOR USE WITH ANY COMBINATION OF DIFFERENT LEG EXTENSIONS, RESULTING IN A MAXIMUM DIFFERENTIAL OF SIX METERS IN HEIGHT, BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.
7. ALL ELEMENTS OF TOWER SHALL BE CAPABLE TO WITHSTAND VERTICAL UPLIFT LOADS EQUAL TO DOWNWARD VERTICAL LOADS SPECIFIED IN EACH LOADING CASE.

								ELECTRICITY GENERATING AUTHORITY OF THAILAND							
								500 kV TRANSMISSION LINE							
								LOADING DIAGRAM							
								TOWER TYPE DOT90							
REV. NO.	JOB NO.	JOB DESCRIPTION		DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE	JOB NO.	REPLACING DWG. NO.	DWG. NO.	
												COT - 018			

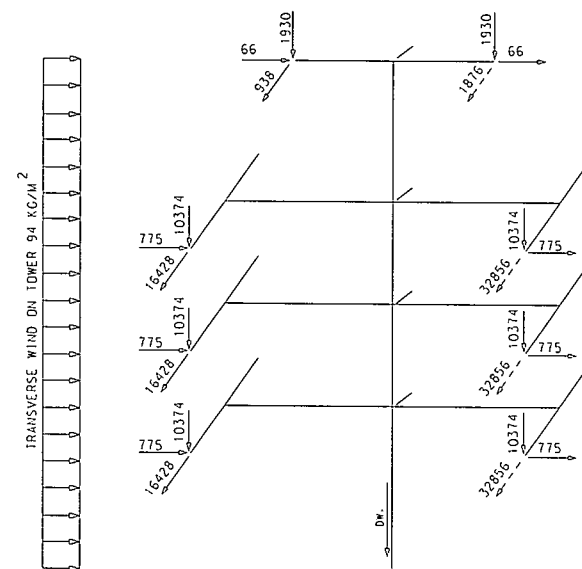


(5) TOP CONDUCTORS.
(6) MIDDLE CONDUCTORS.
(7) BOTTOM CONDUCTORS.

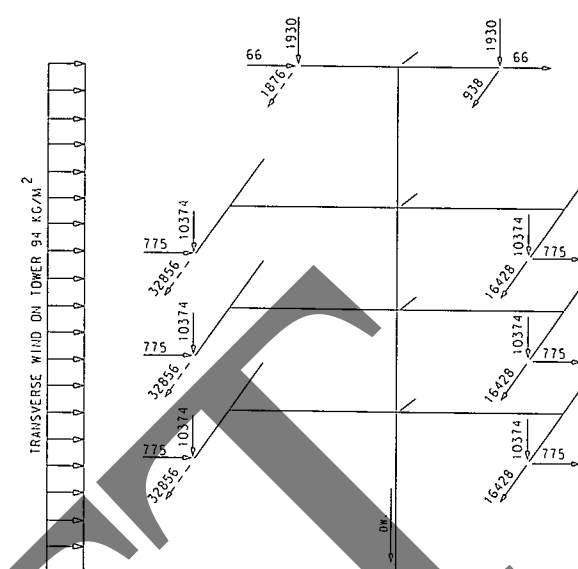
1 TL903



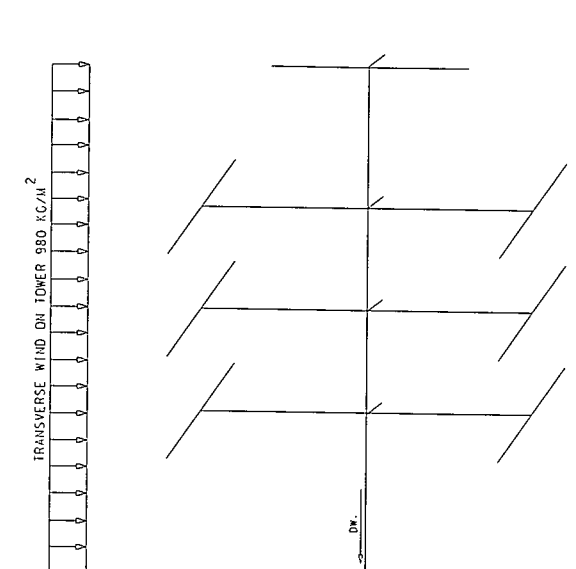
CASE IV(8,9,10)



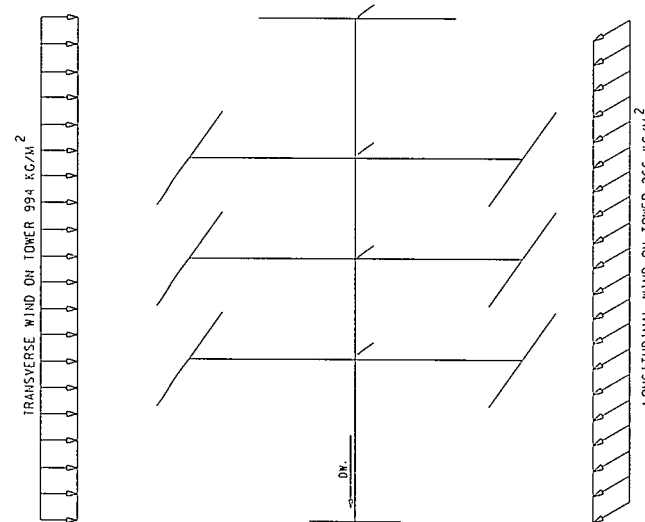
CASE V(1)



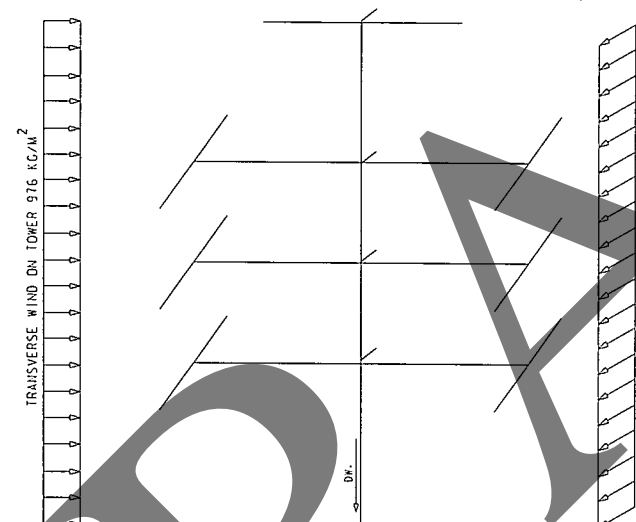
CASE V(2)



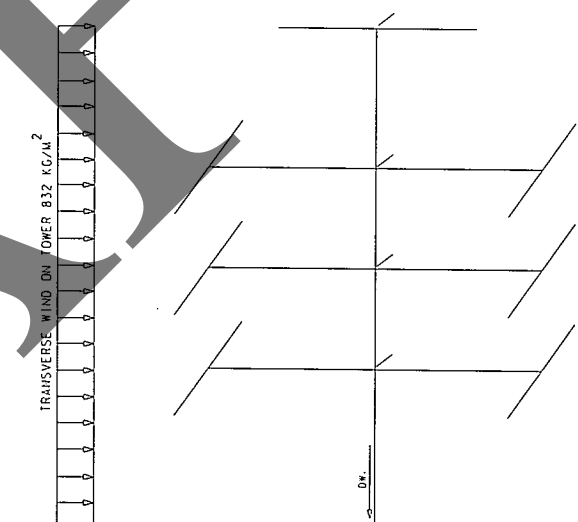
CASE VI(1)



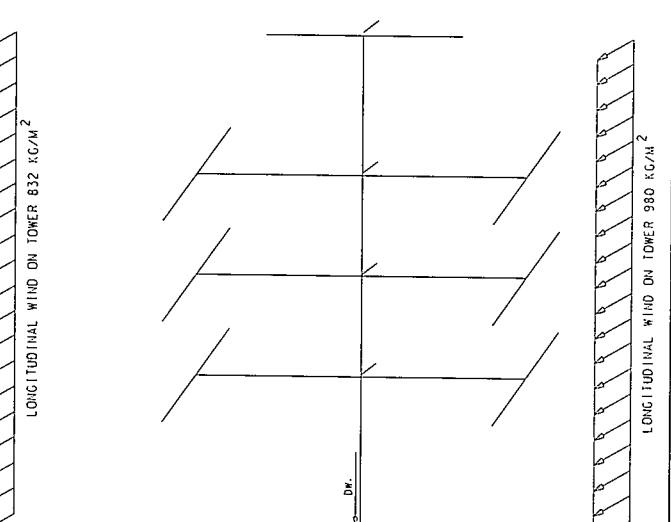
CASE VI(2)



CASE VI(3)



CASE VI(4)



CASE VI(5)

LOADING CASES

- CASE V STRINGING AND/OR MAINTENANCE
- (1) ONE CIRCUIT RIGHT SIDE.
 - (2) ONE CIRCUIT LEFT SIDE.

CASE VI HIGH INTENSITY WIND

- (1) $\beta = 90^\circ$
- (2) $\beta = 75^\circ$
- (3) $\beta = 60^\circ$
- (4) $\beta = 45^\circ$
- (5) $\beta = 0^\circ$

CASE VI(1) UPLIFT (SEE NOTES 7.)

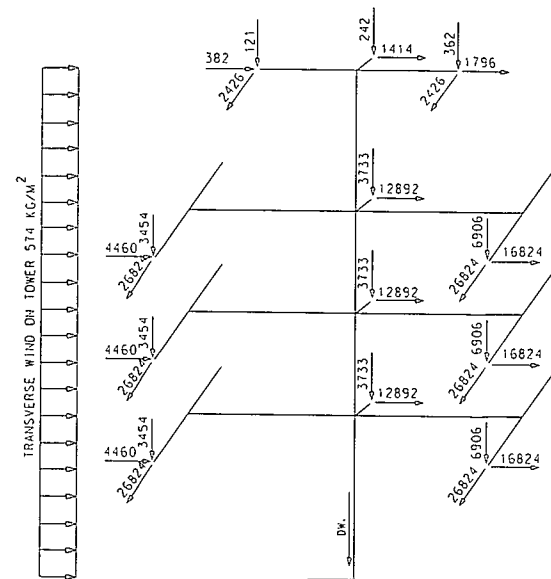
FOR 0° + COMPLETE DEADEND CASE

NOTES

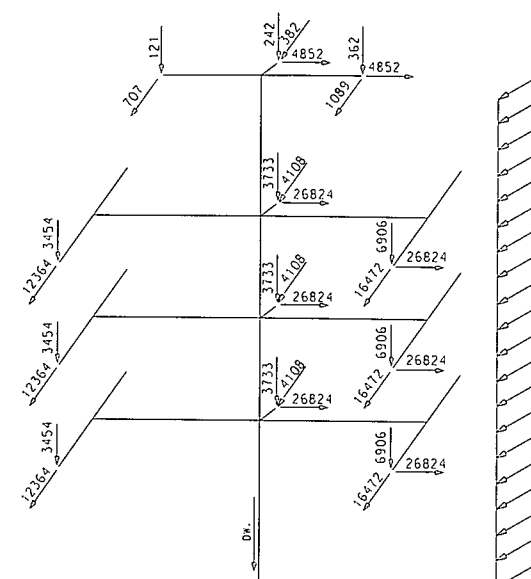
- ALL SPECIFIED LOADS ARE DESIGN LOADS (INCLUDING LOAD FACTORS) IN KILOGRAMS EXCEPT AS OTHERWISE INDICATED.
- THE SPECIFIED TRANSVERSE AND/OR LONGITUDINAL WIND ON TOWER SHALL ACT ON THE PROJECTED AREA OF ONE LONGITUDINAL FACE AND/OR ONE TRANSVERSE FACE OF THE TOWER, RESPECTIVELY.
- ALL ELEMENTS OF TOWER, BOTH MEMBERS AND CONNECTIONS, SHALL BE DESIGNED TO 0.79 OF THEIR CAPACITIES.
- β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
- DW. DENOTES DEAD WEIGHT OF THE TOWER.
- THE TOWER SHALL BE DESIGNED FOR USE WITH ANY COMBINATION OF DIFFERENT LEG EXTENSIONS, RESULTING IN A MAXIMUM DIFFERENTIAL OF SIX METERS IN HEIGHT, BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.
- ALL ELEMENTS OF TOWER SHALL BE CAPABLE TO WITHSTAND VERTICAL UPLIFT LOADS EQUAL TO DOWNWARD VERTICAL LOADS SPECIFIED IN EACH LOADING CASE.

REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

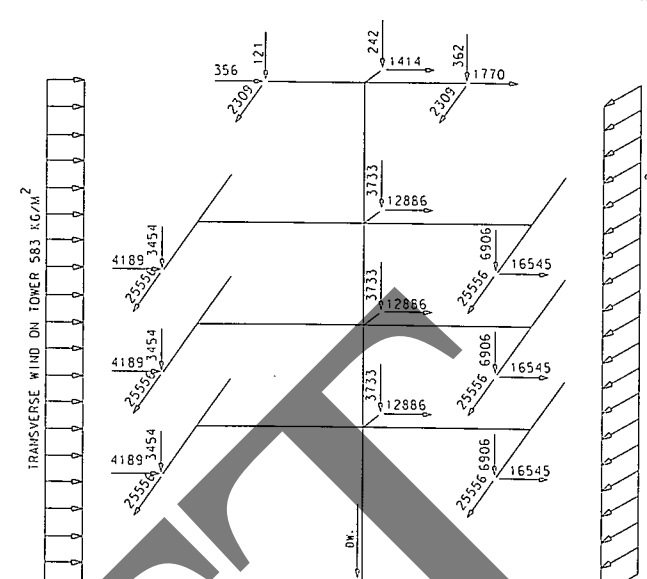
ELECTRICITY GENERATING AUTHORITY OF THAILAND									
500 kV TRANSMISSION LINE									
LOADING DIAGRAM									
TOWER TYPE DOT90									
DRAWN CHALEE	DESIGNED SARUF	VERIFIED Than	VALIDATED Y. Chaiyaporn	RECOMMENDED ASST. DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	CONCURRED DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	JOB NO. REPLACING DWG. NO. DWG. NO.			
APPROVED ASSISTANT CHIEF - TRANSMISSION SYSTEM ENGINEERING						DATE			



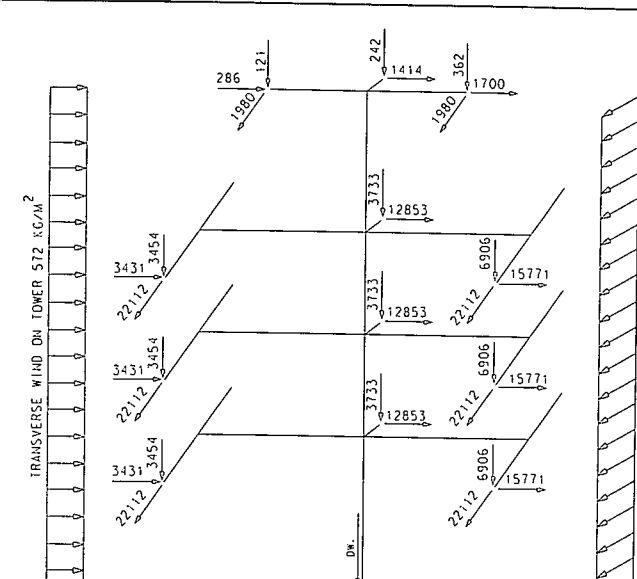
CASE I



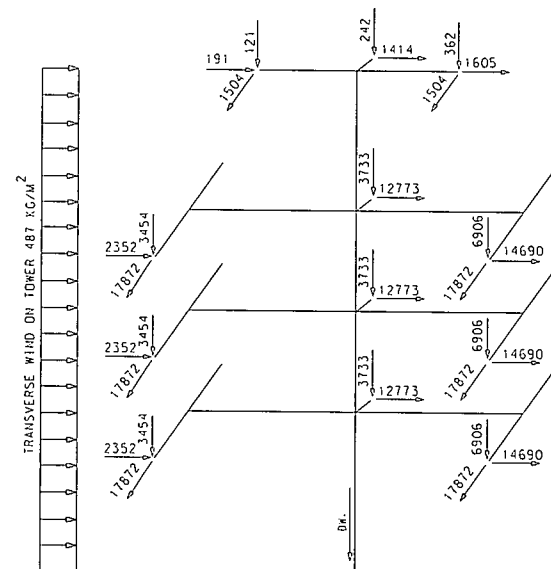
CASE II



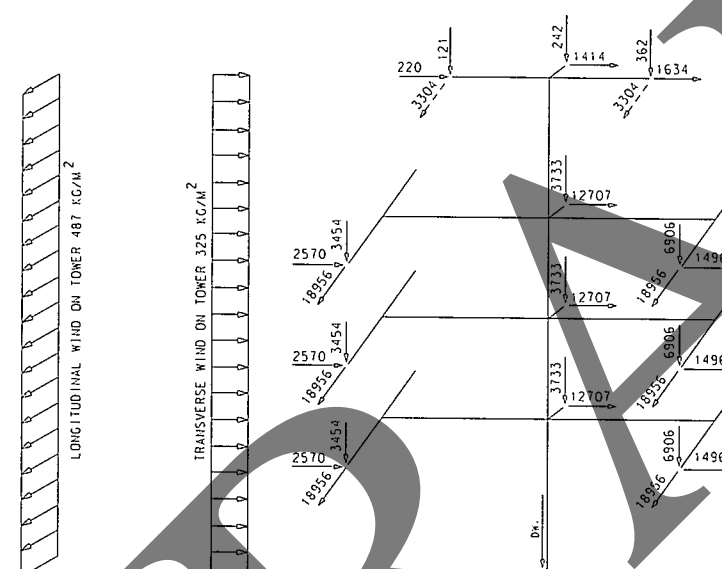
CASE III(1)



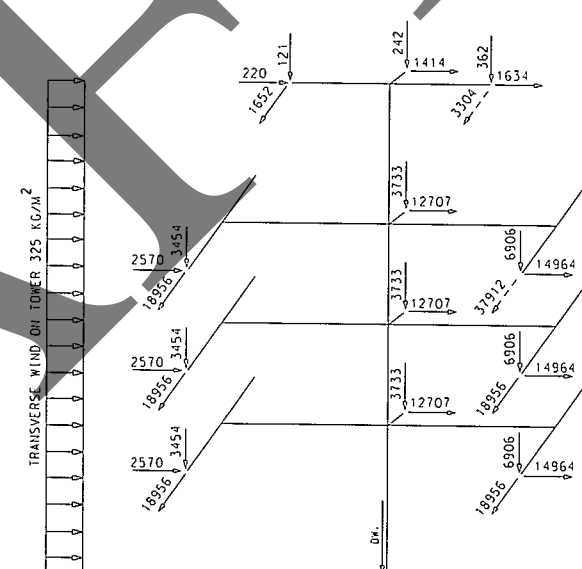
CASE III(2)



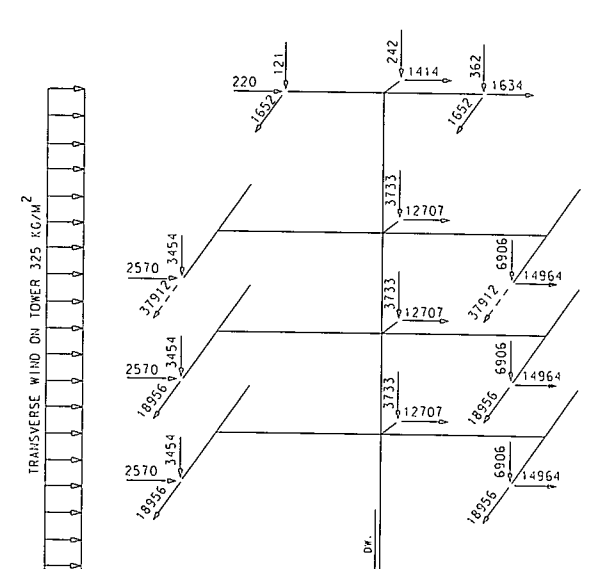
CASE III(3)



CASE IV(1)



CASE IV(2,3,4)



CASE IV(5,6,7)

LOADING CASES

CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
CASE III EXTREME OBLIQUE WIND

- (1) $\beta = 75^\circ$
- (2) $\beta = 60^\circ$
- (3) $\beta = 45^\circ$

CASE IV FAILURE CONTAINMENT

- (1) TWO OHG. WIRES.
- (2) ONE OHG. WIRE AND ANY ONE OF TOP CONDUCTORS.
- (3) ONE OHG. WIRE AND ANY ONE OF MIDDLE CONDUCTORS.
- (4) ONE OHG. WIRE AND ANY ONE OF BOTTOM CONDUCTORS.

- (5) TOP CONDUCTORS.
- (6) MIDDLE CONDUCTORS.
- (7) BOTTOM CONDUCTORS.

NOTES

1. ALL SPECIFIED LOADS ARE DESIGN LOADS (INCLUDING LOAD FACTORS) IN KILOGRAMS EXCEPT AS OTHERWISE INDICATED.
2. THE SPECIFIED TRANSVERSE AND/OR LONGITUDINAL WIND ON TOWER SHALL ACT ON THE PROJECTED AREA OF ONE LONGITUDINAL FACE AND/OR ONE TRANSVERSE FACE OF THE TOWER, RESPECTIVELY.
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4. β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
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FOR $0^\circ + 90^\circ$ SLACK SPAN CASE

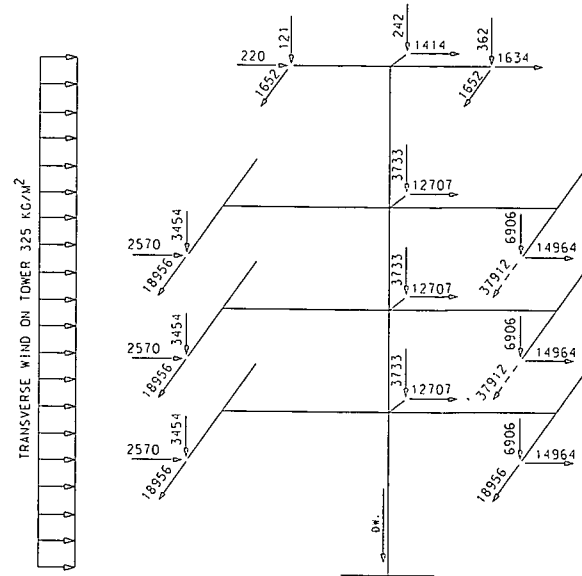
9001

REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

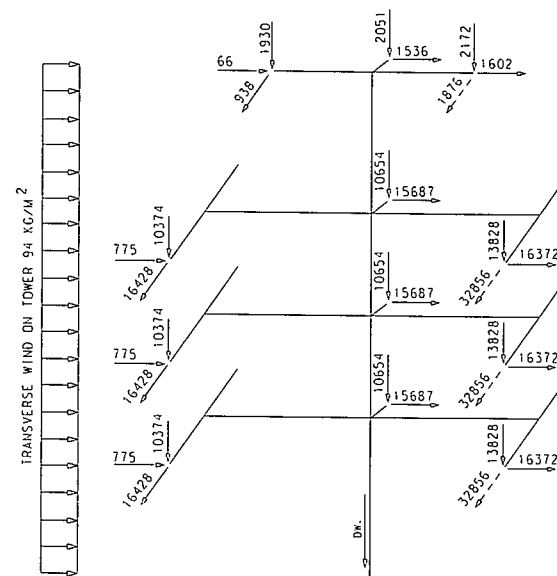
ELECTRICITY GENERATING AUTHORITY OF THAILAND									
500 kV TRANSMISSION LINE									
LOADING DIAGRAM									
TOWER TYPE DOT90									
DRAWN	CHALEE	VALIDATED	Y. Chaiy 18/11/65	RECOMMENDED	CHIEF, TRANSMISSION LINE ENGINEERING DIVISION	JOB NO.	REPLACING DWG. NO.	DWG. NO.	REV.
DESIGNED	SARUT	CONCURRED	CHIEF, TRANSMISSION SYSTEM ENGINEERING DIVISION	DATE					
VERIFIED	Than								
APPROVED									

4x1272 MCM ACSR/GA - RULING SPAN 440 M.

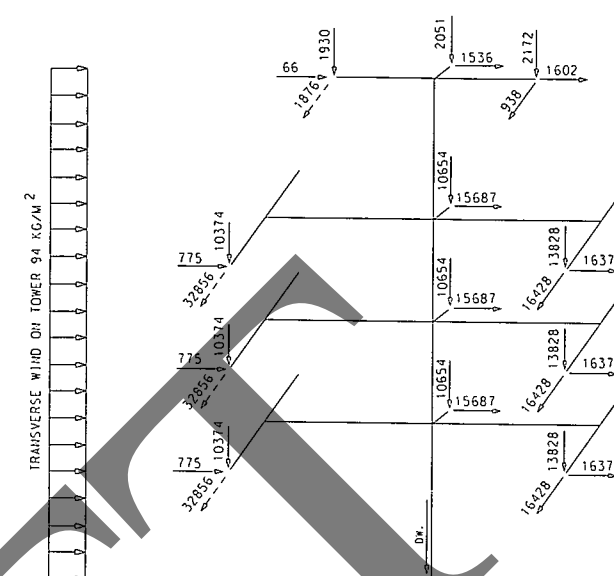
C02 - 021



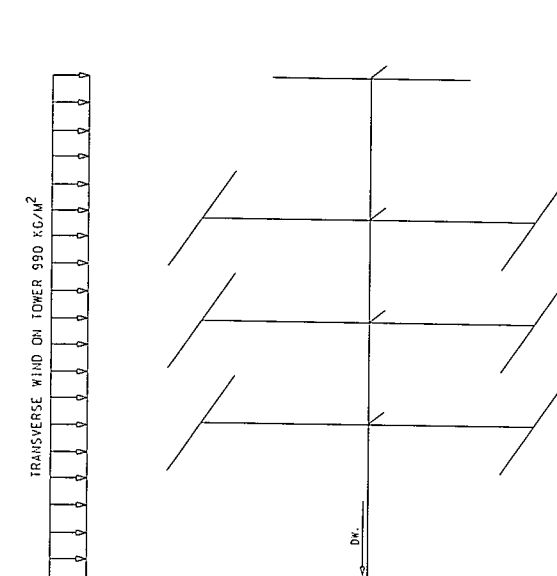
CASE IV(8,9,10)



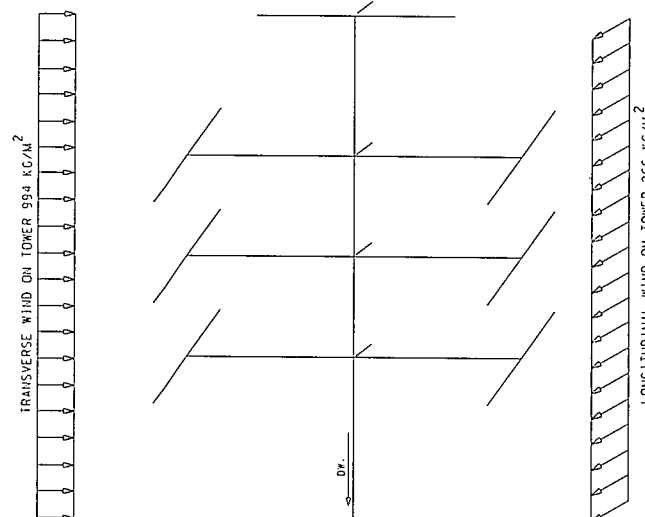
CASE V(1)



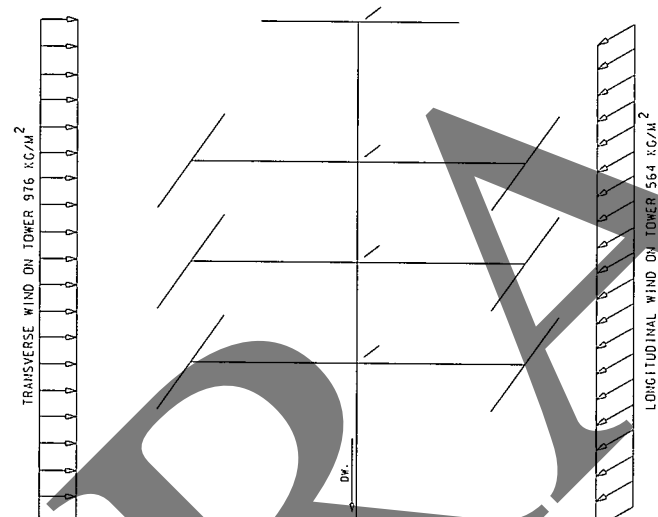
CASE V(2)



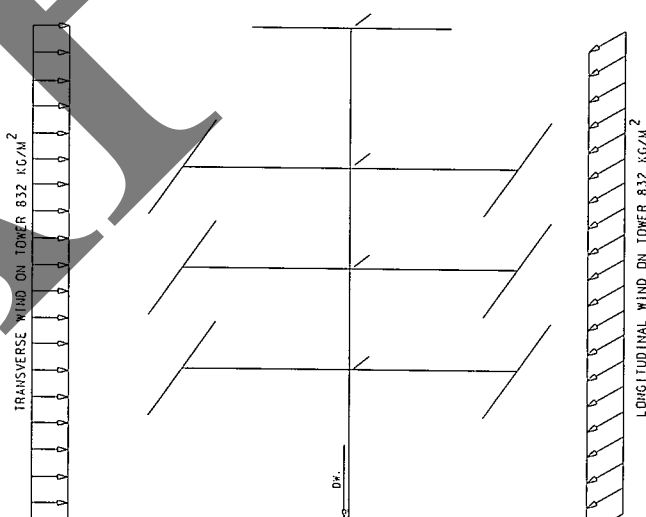
CASE VI(1)



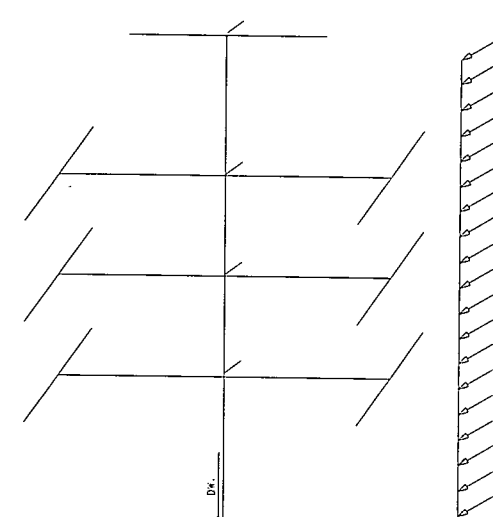
CASE VI(2)



CASE VI(3)



CASE VI(4)



CASE VI(5)

LOADING CASES

- (8) TOP AND MIDDLE CONDUCTORS ON THE SAME SIDE.
- (9) TOP AND BOTTOM CONDUCTORS ON THE SAME SIDE.
- (10) MIDDLE AND BOTTOM CONDUCTORS ON THE SAME SIDE.

- CASE V STRINGING AND/OR MAINTENANCE
- (1) ONE-CIRCUIT RIGHT SIDE.
 - (2) ONE-CIRCUIT LEFT SIDE.

CASE VI HIGH INTENSITY WIND

- (1) $\beta = 90^\circ$
- (2) $\beta = 75^\circ$
- (3) $\beta = 60^\circ$
- (4) $\beta = 45^\circ$
- (5) $\beta = 0^\circ$

CASE VII UPLIFT (SEE NOTES 7.)

FOR $0^\circ + 90^\circ$ SLACK SPAN CASE

NOTES

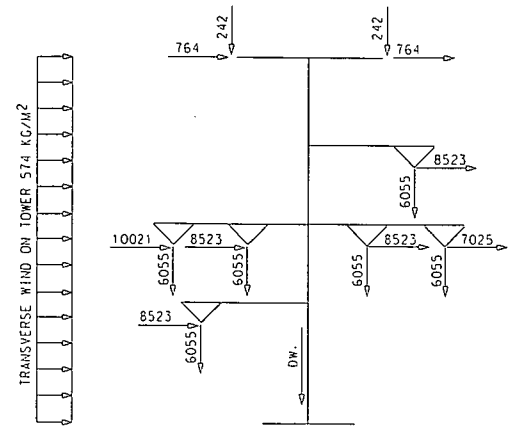
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- β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
- DW. DENOTES DEAD WEIGHT OF THE TOWER.
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- ALL ELEMENTS OF TOWER SHALL BE CAPABLE TO WITHSTAND VERTICAL UPLIFT LOADS EQUAL TO DOWNWARD VERTICAL LOADS SPECIFIED IN EACH LOADING CASE.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

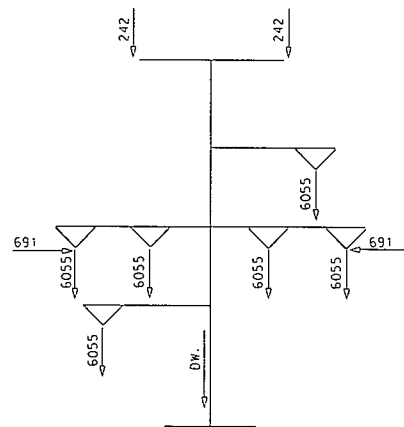
500 KV TRANSMISSION LINE
LOADING DIAGRAM
TOWER TYPE DOT90

REPLACING DWG. NO. DATE

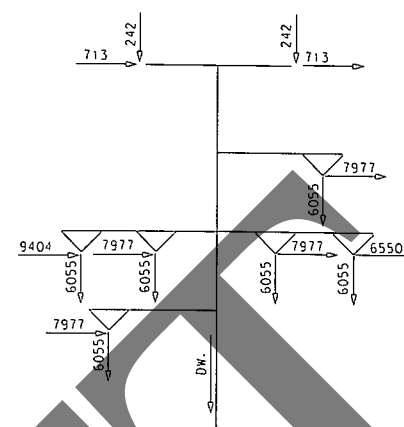
C02 - 022



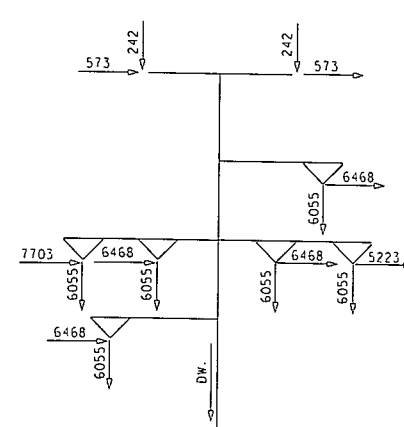
CASE I



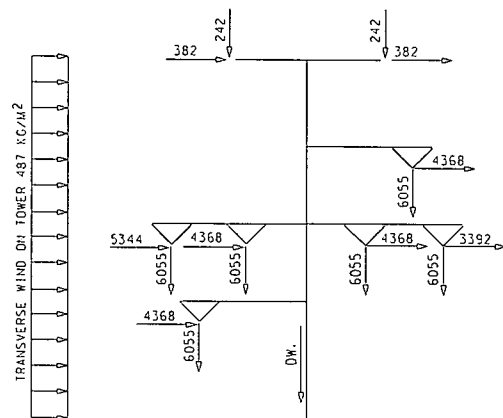
CASE II



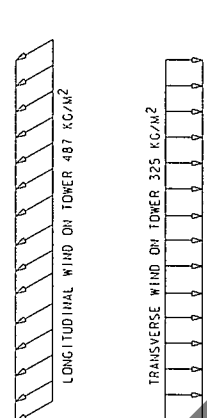
CASE III(1)



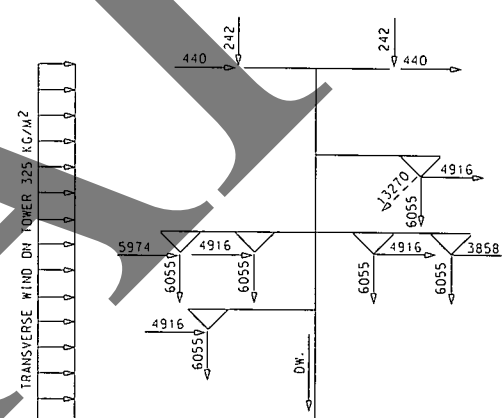
CASE III(2)



CASE III(3)



CASE IV(1)



CASE IV(2)

LOADING CASES

- CASE I EXTREME TRANSVERSE WIND ($\beta = 90^\circ$)
CASE II EXTREME LONGITUDINAL WIND ($\beta = 0^\circ$)
CASE III EXTREME OBLIQUE WIND
(1) $\beta = 75^\circ$
(2) $\beta = 60^\circ$
(3) $\beta = 45^\circ$
CASE IV FAILURE CONTAINMENT
(1) ANY ONE OF OHG. WIRE.
(2) ANY ONE OF CONDUCTOR.

NOTES

- ALL SPECIFIED LOADS ARE DESIGN LOADS (INCLUDING LOAD FACTORS) IN KILOGRAMS EXCEPT AS OTHERWISE INDICATED.
- THE SPECIFIED TRANSVERSE AND/OR LONGITUDINAL WIND ON TOWER SHALL ACT ON THE PROJECTED AREA OF ONE LONGITUDINAL FACE AND/OR ONE TRANSVERSE FACE OF THE TOWER, RESPECTIVELY.
- ALL ELEMENTS OF TOWER, BOTH MEMBERS AND CONNECTIONS, SHALL BE DESIGNED TO 0.92 OF THEIR CAPACITIES.
- β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
- DW. DENOTES DEAD WEIGHT OF THE TOWER.
- THE TOWER SHALL BE DESIGNED FOR USE WITH ANY COMBINATION OF DIFFERENT LEG EXTENSIONS, RESULTING IN A MAXIMUM DIFFERENTIAL OF SIX METERS IN HEIGHT, BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DRAWN CHALEE

VALIDATED *V. Chalee 18 Mar 01*

DESIGNED SARUT

RECOMMENDED *SARUT*

VERIFIED *Thai*

CONCURRED

APPROVED

DATE

500 kV TRANSMISSION LINE

LOADING DIAGRAM
TOWER TYPE DOTR

JOB NO.

REPLACING DWG. NO.

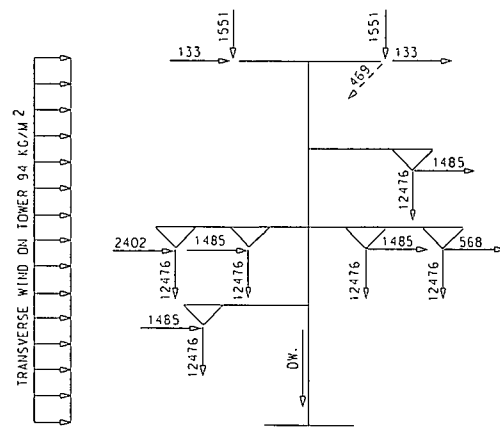
DWG. NO.

C02 - 023

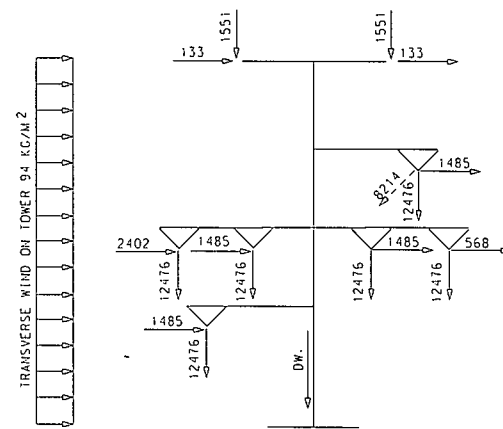
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65

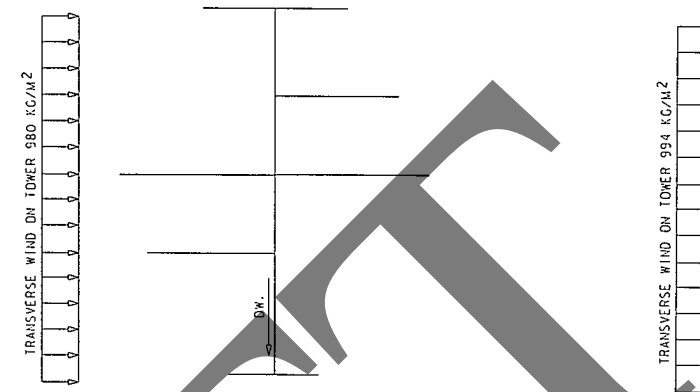
11/97



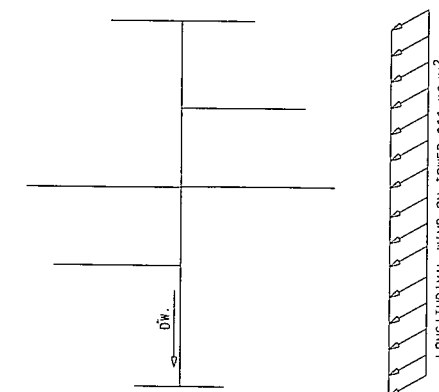
CASE V(1)



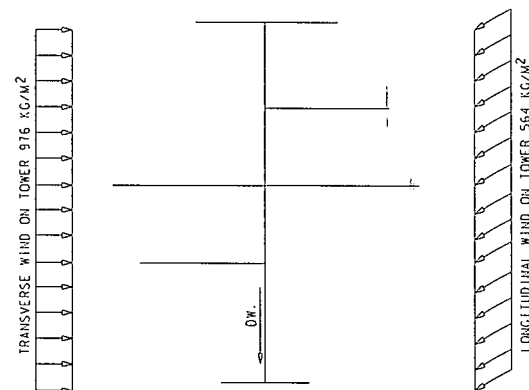
CASE V(2)



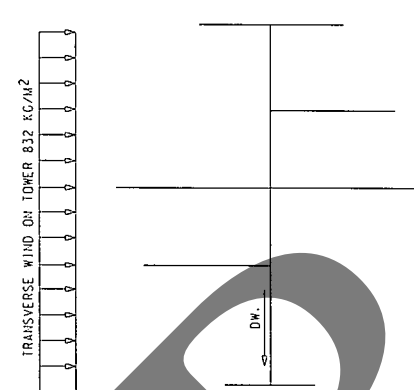
CASE VI(1)



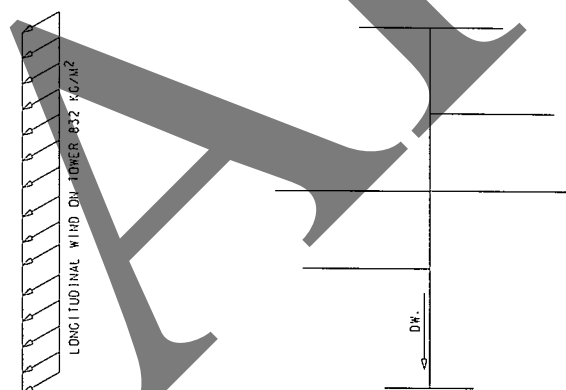
CASE VI(2)



CASE VI(3)



CASE VI(4)



CASE VI(5)

LOADING CASES

CASE V STRINGING AND/OR MAINTENANCE

- (1) ANY ONE OF OHG. WIRE.
- (2) ANY ONE OF CONDUCTOR.

CASE VI HIGH INTENSITY WIND

- (1) $\beta = 90^\circ$
- (2) $\beta = 75^\circ$
- (3) $\beta = 60^\circ$
- (4) $\beta = 45^\circ$
- (5) $\beta = 0^\circ$

NOTES

1. ALL SPECIFIED LOADS ARE DESIGN LOADS (INCLUDING LOAD FACTORS) IN KILOGRAMS EXCEPT AS OTHERWISE INDICATED.
2. THE SPECIFIED TRANSVERSE AND/OR LONGITUDINAL WIND ON TOWER SHALL ACT ON THE PROJECTED AREA OF ONE LONGITUDINAL FACE AND/OR ONE TRANSVERSE FACE OF THE TOWER, RESPECTIVELY.
3. ALL ELEMENTS OF TOWER, BOTH MEMBERS AND CONNECTIONS, SHALL BE DESIGNED TO 0.92 OF THEIR CAPACITIES.
4. β IS THE ANGLE BETWEEN THE WIND DIRECTION AND THE LONGITUDINAL AXIS OF THE TOWER.
5. DW. DENOTES DEAD WEIGHT OF THE TOWER.
6. THE TOWER SHALL BE DESIGNED FOR USE WITH ANY COMBINATION OF DIFFERENT LEG EXTENSIONS, RESULTING IN A MAXIMUM DIFFERENTIAL OF SIX METERS IN HEIGHT, BETWEEN ADJACENT OR DIAGONALLY OPPOSITE LEGS.

FOUNDATIONS SHALL BE PROPORTIONED SUCH THAT THEY MEET THE FOLLOWING REQUIREMENTS:

FOUNDATION TYPE	RESISTANCE TO UPLIFT	RESISTANCE TO OVERTURNING & UPLIFT	LIMITING SOIL BEARING PRESSURE	RESISTANCE TO OVERTURNING & COMPRESSION
PAD	$W_c + \phi_u W_s \geq T_u$	$\phi_u M_{rs} + M_{rc} + \phi_u M_{rp} \geq M_{ou}$	<p>WHEN $e \leq B/6$, $(\frac{Q_z + W_c}{B^2})(1 + \frac{6e}{B}) \leq \phi_c \sigma$</p> <p>WHEN $e > B/6$, $\frac{2(Q_z + W_c)}{3B(B/2 - e)} \leq \phi_c \sigma$</p> <p>NOTE: $e = M_{oc}/(Q_z + W_c)$</p>	<p>$E \leq B/6$</p> <p>WHERE $E = M_{oc}/(Q_z + \phi_c W_{sv} + W_c)$</p>
ROCK	$W_c + F_r \geq T_u$	$M_{rc} + \phi_u M_{rp} + M_{rf} \geq M_{ou}$		
RAFT		$\phi_u M_{rs} + M_{rc} \geq M_o$	<p>WHEN $e \leq B/6$, $(\frac{Q_z + W_c}{B^2})(1 + \frac{6e}{B}) \leq \phi_c \sigma$</p> <p>WHEN $e > B/6$, $\frac{2(Q_z + W_c)}{3B(B/2 - e)} \leq \phi_c \sigma$</p>	<p>$E \leq B/6$</p> <p>WHERE $E = M_o/(\geq T_u + \geq Q_z + \phi_c W_{sv} + W_c)$</p>
PILE		$P_u = \frac{T_u - W_c - W_{sv}}{n} + \frac{M_{up} \times d_o}{\sum d^2} \leq 1.5 P_{ud}$		$P_c = \frac{Q_z + W_c}{n} + \frac{M_{cp} \times d_o}{\sum d^2} \leq 1.5 P_{cd}$

NOMENCLATURE:

- W_c = EFFECTIVE WEIGHT OF CONCRETE FOUNDATION.
 W_s = EFFECTIVE WEIGHT OF SOIL IN INVERTED TRUNCATED PYRAMID (EXCLUDING VOLUME OF CONCRETE EMBEDDED THEREIN) EXTENDING UPWARD FROM TOP EDGE OF FOUNDATION PAD TOWARD THE GROUND SURFACE. PYRAMID VOLUME IS DEFINED BY APPLICABLE "ANGLE OF REPOSE" THE CRITICAL SURFACE AT GROUND LEVEL OF THE PYRAMID VOLUME IS DEFINED AS SQUARE WITH A QUARTER OF CIRCLE AT CORNER.
 W_{sv} = EFFECTIVE WEIGHT OF RECTANGULAR BLOCK OF SOIL (EXCLUDING VOLUME OF CONCRETE EMBEDDED THEREIN) LYING DIRECTLY ABOVE FOUNDATION PAD.
 F_r = ULTIMATE FRICTIONAL RESISTANCE WHICH CAN BE MOBILIZED AROUND THE PERIPHERY OF A ROCK FOUNDATION.
 T_u = ULTIMATE AXIAL FOUNDATION DESIGN LOAD IN UPLIFT.
 Q_z = ULTIMATE AXIAL FOUNDATION DESIGN LOAD IN COMPRESSION.
 P_{ud} = ALLOWABLE CAPACITY OF DRIVEN PILE IN TENSION.
 P_{cd} = ALLOWABLE CAPACITY OF DRIVEN PILE IN COMPRESSION.
 M_{rs} = RESISTING MOMENT (ABOUT TOE OF PAD) CAUSED BY EFFECTIVE WEIGHT OF SOIL ABOVE FOUNDATION PAD.
 M_{rc} = RESISTING MOMENT (ABOUT TOE OF PAD) CAUSED BY EFFECTIVE WEIGHT OF FOUNDATION CONCRETE.
 M_{rp} = RESISTING MOMENT (ABOUT TOE OF PAD) CAUSED BY PASSIVE EARTH PRESSURE ACTING ON VERTICAL SURFACES OF FOUNDATION CONCRETE FROM 0.5 METER BELOW GROUNDLINE TO BASE OF FOUNDATION.
 M_{rf} = RESISTING MOMENT (ABOUT TOE OF PAD) CAUSED BY VERTICAL FRICTIONAL FORCES WHICH CAN BE MOBILIZED AROUND THE PERIPHERY OF A FOOTING PAD OR ROCK FOUNDATION.
 M_{ou} = ULTIMATE OVERTURNING MOMENT (ABOUT TOE OF PAD) CAUSED BY FOUNDATION DESIGN LOADS (AXIAL UPLIFT AND HORIZONTAL WEB SHEARS) APPLIED AT THE TOP OF THE FOUNDATION.
 M_{oc} = ULTIMATE OVERTURNING MOMENT (ABOUT CENTER LINE OF BOTTOM FACE OF THE PAD) CAUSED BY FOUNDATION DESIGN LOADS (VERTICAL COMPRESSION AND HORIZONTAL WEB SHEARS) APPLIED AT THE TOP OF THE FOUNDATION.
 M_{up} = ULTIMATE OVERTURNING MOMENT (ABOUT C.G. OF PILE GROUP) WHICH IS CAUSED BY FOUNDATION DESIGN LOADS (VERTICAL UPLIFT AND HORIZONTAL SHEARS) APPLIED AT THE TOP OF THE FOUNDATION.
 M_{cp} = ULTIMATE OVERTURNING MOMENT (ABOUT C.G. OF PILE GROUP) WHICH IS CAUSED BY FOUNDATION DESIGN LOADS (AXIAL COMPRESSION AND HORIZONTAL WEB SHEARS) APPLIED AT THE TOP OF THE FOUNDATION.
 M_o = ULTIMATE OVERTURNING MOMENT (ABOUT CENTER LINE OF THE BASE OF THE RAFT FOUNDATION) CAUSED BY ALL FOUNDATION DESIGN LOADS ACTING ON THE FOUNDATION.
 n = NUMBER OF DRIVEN PILES IN A GIVEN PILE GROUP.
 d_o = DISTANCE FROM C.G. OF PILE GROUP TO OUTERMOST PILE.
 d = DISTANCE FROM C.G. OF PILE GROUP TO ANY GIVEN PILE IN THE GROUP.
 B = WIDTH OF FOOTING PAD.
 σ = APPLICABLE NET ULTIMATE BEARING CAPACITY OF THE SOIL.
 E = ECCENTRICITY OF THE GROSS BEARING PRESSURE DISTRIBUTION ON THE BASE OF A PAD WITH RESPECT TO THE C.G. OF THE PAD.
 e = ECCENTRICITY OF THE NET BEARING PRESSURE DISTRIBUTION ON THE BASE OF A PAD WITH RESPECT TO THE C.G. OF THE PAD.
 P_u = ULTIMATE LOAD ON INDIVIDUAL PILE IN TENSION.
 P_c = ULTIMATE LOAD ON INDIVIDUAL PILE IN COMPRESSION.

NOTES:

- FOUNDATION DESIGN LOADS SHALL BE COMPUTED ON THE BASIS OF THE MAXIMUM AXIAL AND HORIZONTAL TOWER BASE REACTIONS (INCLUDING ALL SPECIFIED TOWER DESIGN LOAD FACTORS) AND FURTHER MULTIPLIED BY THE FACTORS SPECIFIED BELOW. MAXIMUM FOUNDATION SHEAR FORCE FROM ANY LOAD COMBINATION FOR THE DOWNLOAD LEG WILL BE ASSUMED TO ACT SIMULTANEOUSLY WITH THE MAXIMUM FOUNDATION COMPRESSION FORCE. MAXIMUM FOUNDATION SHEAR FORCE FROM ANY LOAD COMBINATION FOR THE UPLIFT LEG WILL BE ASSUMED TO ACT SIMULTANEOUSLY WITH THE MAXIMUM FOUNDATION UPLIFT FORCE.

TOWER TYPE

FOUNDATION DESIGN LOAD FACTOR

SUSPENSION	1.00
TENSION/DEADEND	1.00

ALL COMBINATIONS OF TOWER AND LEG EXTENSION HEIGHTS, AS STATED IN THE TOWER DESIGN SPECIFICATION, SHALL BE CONSIDERED IN DETERMINING THE MAXIMUM TOWER BASE REACTIONS.

- THE STRENGTH REDUCTION FACTORS FOR SOIL STRENGTH SHALL BE SPECIFIED AS FOLLOWS:

TOWER TYPE

COMPRESSION CASE (ϕ_c)

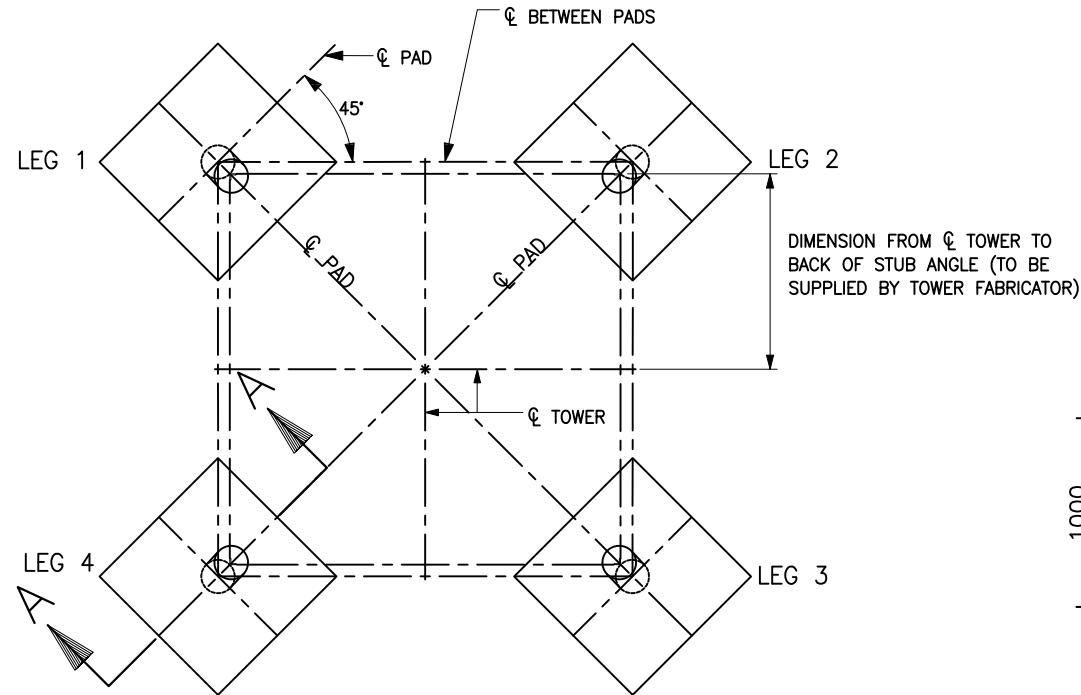
UPLIFT CASE (ϕ_u)

SUSPENSION	0.54	0.71
TENSION/DEADEND	0.47	0.61

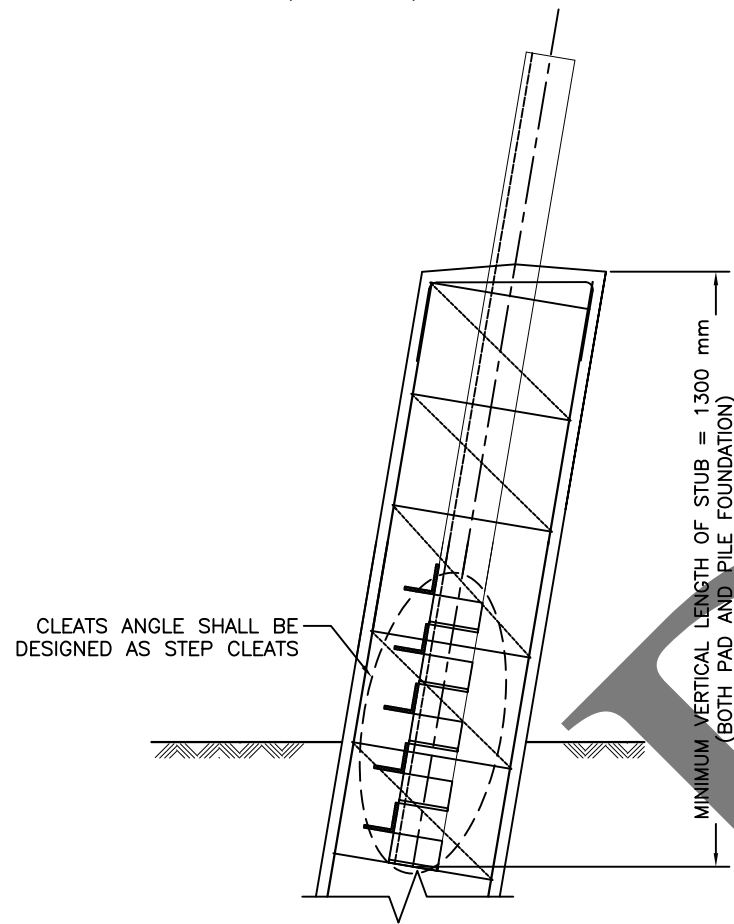
- FOUNDATIONS SHALL BE PROPORTIONED TO RESIST THESE FOUNDATION DESIGN LOADS IN ACCORDANCE WITH THE FORMULAS SHOWN ABOVE. REINFORCED CONCRETE FOUNDATION COMPONENTS SHALL BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI STANDARD 318, LATEST REVISION. NO ADDITIONAL LOAD FACTORS NEED BE APPLIED (IN EXCESS OF THOSE MENTIONED ABOVE); HOWEVER, APPROPRIATE ACI "CAPACITY REDUCTION FACTORS" SHALL BE CONSIDERED IN THE DESIGN.
- FOR PEDESTAL DESIGN, THE CONCRETE AND STEEL REINFORCEMENT SHALL BE CAPABLE OF RESISTING THE BENDING MOMENT ABOUT TWO AXES CAUSED BY THE MAXIMUM HORIZONTAL WEB SHEARS BOTH IN TRANSVERSE AND LONGITUDINAL DIRECTIONS. HOWEVER THE BENDING MOMENT CAN BE REDUCED BY THE EFFECTIVE LATERAL EARTH PRESSURE. IN SUCH CASE, THE PASSIVE EARTH PRESSURE SHALL BE EQUAL TO $\gamma_s \tan^2(45^\circ + \alpha/2)$ FROM 0.5 METER BELOW GROUND LINE. WHERE γ_s IS UNIT WEIGHT OF SOIL AND α IS ANGLE OF REPOSE OF SOIL. IF CIRCULAR SHAPE PEDESTAL IS EMPLOYED, THE STEEL REINFORCEMENT MAY BE CALCULATED ON THE ASSUMPTION THAT THEY ARE DISTRIBUTED AS CIRCULAR TUBE EMBEDDED IN CONCRETE.
- THE DETERMINATION OF PILE LENGTH FOR PILE TYPE FOUNDATION, P_u AND P_c SHALL NOT BE GREATER THAN 49 PER CENT FOR SUSPENSION TOWER TYPE AND 41 PERCENT FOR TENSION/DEADEND TOWER TYPE OF THE CORRESPONDING ULTIMATE STRENGTH OF SOIL OBTAINED FROM SUB-SOIL TEST.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

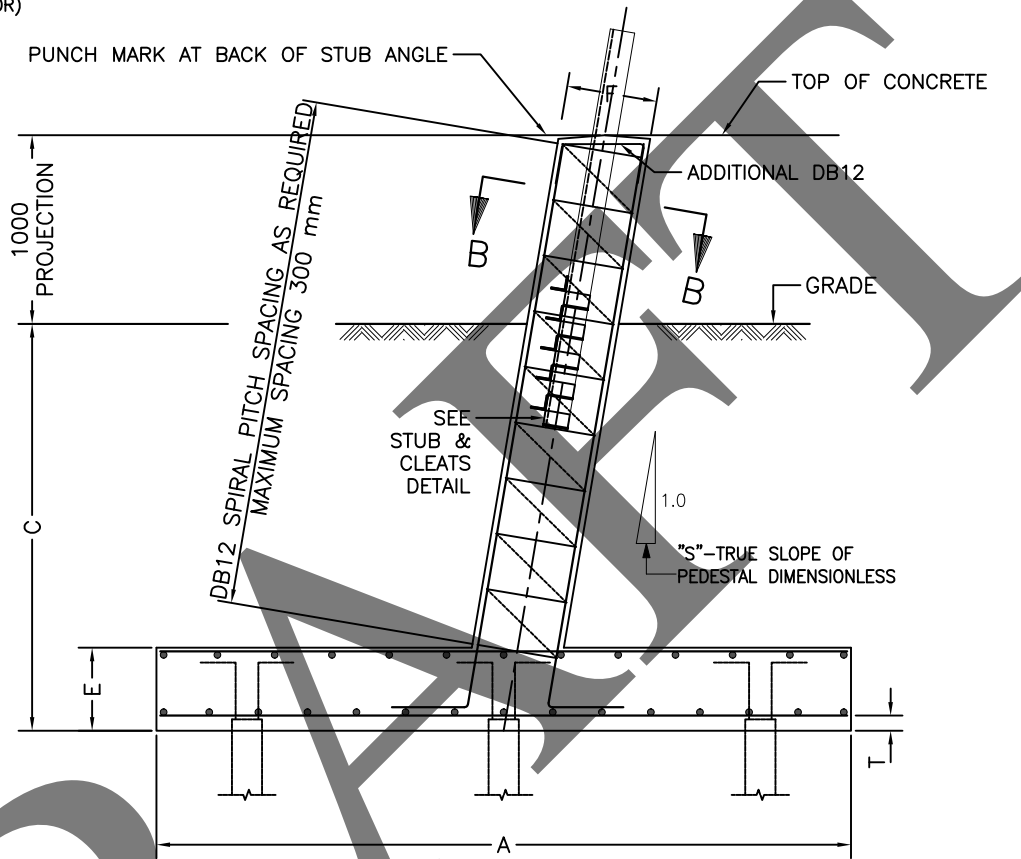
DRAWN: CHALEE DESIGNED: Kunwadee VERIFIED: Supakorn APPROVED: Thanat	VALIDATED: 12/11/07 RECOMMENDED: 12/11/07 CONCURRED: 12/11/07 DATE: 12 Nov 07	500 kV TRANSMISSION LINE FOUNDATION DESIGN CRITERIA JOB NO.: REPLACING DWG. NO.: DWG. NO.: C21-011
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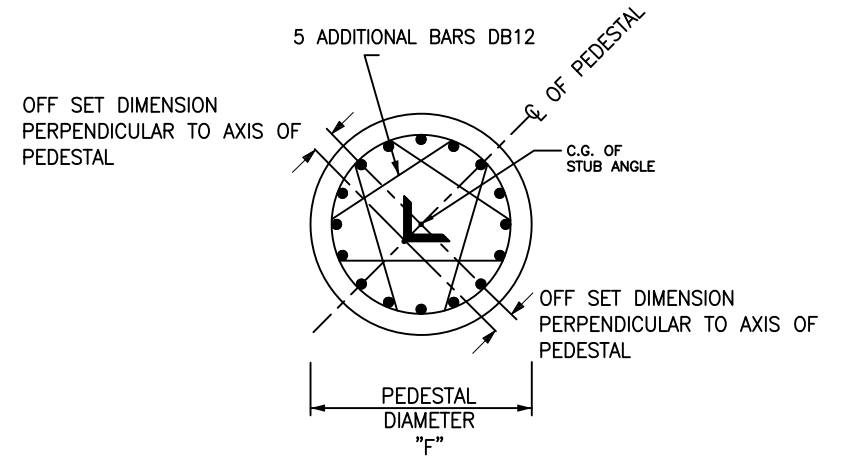
ORIENTATION OF FOUNDATION
(NOT TO SCALE)



STUB & CLEATS DETAIL
(NOT TO SCALE)



SECTION A-A
(NOT TO SCALE)



SECTION B-B
(NOT TO SCALE)

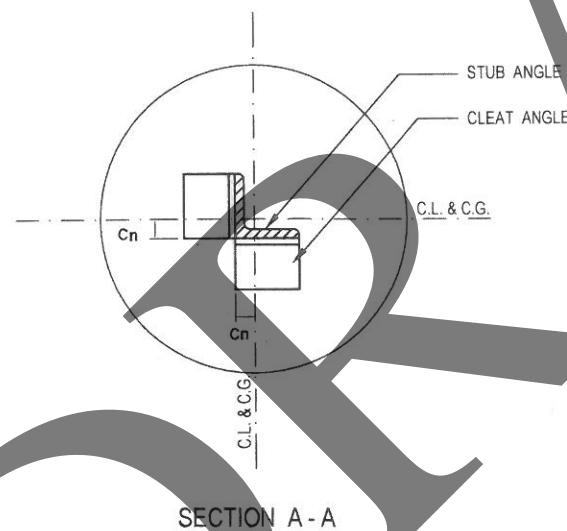
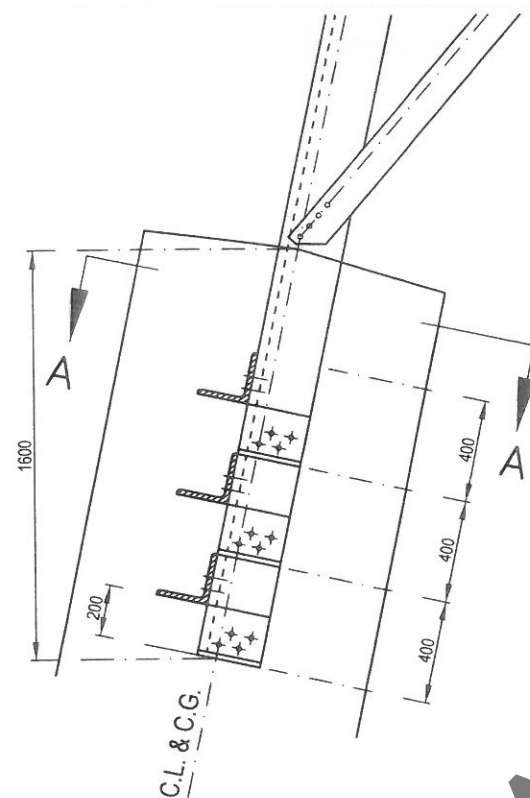
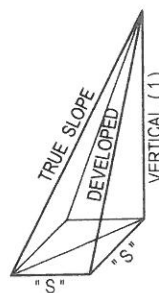
MINIMUM DIMENSIONS		
ITEM	PAD TYPE	PILE TYPE
A	3000	2400
F	800	800
C	3000	1250
E	600	800
T	75	200

NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT AS NOTED.
- ALL REINFORCING BARS SHALL BE DEFORMED BARS CONFORMING TO THAI STANDARD FOR STEEL BARS FOR REINFORCED CONCRETE TIS-24-2559 GRADE SD-40.
- CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 210 kg/cm² AT 28 DAYS (CYLINDER TEST).
- REINFORCING TIE WIRES SHALL BE 16 GAGE (1.58 mm) MINIMUM.
- FOUNDATIONS SHALL BE PLACED ON UNDISTURBED SOIL. BOTTOMS OF ALL FOUNDATION SHALL BE LEVEL.
- STUB ANGLES SHALL BE SET TO TRUE POSITION USING STUB ANGLE SETTING TEMPLATE.
- CONCRETE COVER OVER REINFORCING SHALL BE 50 mm EXCEPT AS SPECIFIED.
- REINFORCEMENT SHALL BE SET AND MAINTAINED WITHIN 26 mm OF THE CENTER-TO-CENTER SPACING INDICATED.
- PILES SHALL BE PROVIDED IF REQUIRED. NUMBER AND LENGTH OF PILE SHALL BE DESIGNED BY THE CONTRACTOR.
- MATERIAL AND CONSTRUCTION SHALL BE AS SPECIFIED IN LATEST EDITION OF SPECIFICATION NO. L-500 kV.
- STUB OF TOWER SHALL BE THE SAME LENGTH FOR PILE FOUNDATION AND CAN BE SAME OR DIFFERENT LENGTH FOR PAD FOUNDATION . THE MINIMUM LENGTH = 1300 mm.

REV.NO.	JOB NO.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
01	-	REVISED OF STUB LENGTH DETAIL IN NOTES 11 AND MINIMUM THICKNESS OF PAD, MINIMUM PILE WIDTH	-	-	-	-	-	-	-	03/10/2025

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN		RECOMMENDED AND VALIDATED		DRAWING NAME		500 kV TRANSMISSION LINE			
DESIGNED		CONCURRED		DESCRIPTION		TYPICAL FOUNDATION OUTLINE			
VERIFIED		APPROVED		JOB NO.		REPLACING DWG. NO.		DWG. NO.	
03/10/2025		03/10/2025		-		-		C21-025	
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE		-		-		-	



DQV15	
STUB ANGLE	HL 250 x 250 x 25
CLEAT ANGLE	6 - HL 200 x 200 x 20 LENGTH 250 mm. 4 - M20 / CLEAT
COMPRESSIVE LOAD (kg.)	320459
TENSILE LOAD (kg.)	233061
SHEAR LOAD (kg.)	14319
OFFSET DIMENSION "Cn" (mm.)	71.00
HORIZONTAL RATIO "S"	0.15151

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT AS NOTED. LOAD ON FOUNDATION ARE INCLUDED TOWER LOAD FACTORS.
2. MEMBER AND PLATES WITH PREFIX "H" SHALL BE CONFORMING TO JIS G3101 SS 540. MEMBERS AND PLATES WITHOUT PREFIX "H" SHALL CONFORM TO JIS G3101 SS 400.
3. STUB ANGLE SHALL BE SET TO TRUE POSITION USING STUB ANGLE SETTING TEMPLATE.
4. THE CONCRETE PIER HAVING AN AREA AT LEAST FOUR TIMES AS LARGE AS THE BEARING AREA OF A SET OF SHEAR CONNECTOR ANGLES.
5. C. L. DENOTES CENTRE LINE OF PEDESTAL. C.G. DENOTES CENTRE OF GRAVITY OF STUB ANGLE.
6. CONSTRUCTION AND OTHERWISE SHOW SHALL BE AS SPECIFIED IN LATEST EDITION OF SPECIFICATION NO. L - 500 kV.

ISO
9001
TSEB1999

CAD
CENTER
DO NOT AMEND
MANUALLY

REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
2		REVISED NAME OF DRAWING.	ARKHET							
1		REMOVE (NON GALVANIZED) FROM CLEAT ANGLE.	ARKHET							

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DRAWN	ARKET	VALIDATED	500 kV TRANSMISSION LINE
DESIGNED	titipong	RECOMMENDED	DETAILS DRAWING
VERIFIED	Sunthorn	CONCURRED	STUB & CLEAT ANGLE (PILE FOUNDATION) FOR TOWER TYPE DQV15
APPROVED	4.9	DATE 14/4/18	JOB NO.
ASSISTANT ENGINEER - TRANSMISSION SYSTEM ENGINEERING		REPLACING DWG. NO.	DWG. NO. C25-013
		REV.	2

TOWER NUMBER

PROVISIONAL

FINAL

ACTUAL SPAN (M)

STATION

DEVIATION ANGLE

TOWER TYPE

GROUND SURFACE CONDITION

WATER TABLE (m)

MAX. WATER LEVEL (m)

WEIGHT OF SOIL (kN/m³)

METHOD OF TEST

SOIL RESISTANCE AND DESCRIPTION
(a) BLOWS PER 20 cm FOR LIGHT RAM SOUND TEST
(b) BLOWS PER FOOT FOR STANDARD PENETRATION TEST
(c) CONE RESISTANCE (kg/cm²) FOR DUTCH CONE TEST

CUMULATIVE SUM OF ULTIMATE SKIN FRICTION (kN/m)
ULTIMATE BEARING CAPACITY (kN/m²)
AT DEPTH (m)

0.5 1.5 2.5 3.5 4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 12.5 13.5 14.5 15.5 16.5 17.5 18.5 XX

0.5 1.5 2.5 3.5 4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 12.5 13.5 14.5 15.5 16.5 17.5 18.5 XX

FOOTING DEPTH (m)

SOIL CLASS

ULTIMATE END BEARING CAPACITY (kN/m²)

ADJ. ULTIMATE BEARING CAPACITY (kN/m²)

FOUNDATION TYPE

FURNISHING OF PILES (PER LEG)
NUMBER x LENGTH (m)

INSTALLING OF PILES (PER LEG)
NUMBER x LENGTH (m)

REMARKS

XX 1 2 3 4 XX
TOWER ORIENTATION

NOTES
RF = RICE FIELD
SW = SWAMP
SC = SCRUB
FR = FOREST
HL = HIGH LAND
HS = HILL SIDE
LL = LOW LAND
S = CLAYEY SAND, SILTY SAND, SAND
C = SANDY CLAY, SILTY CLAY, CLAY
M = CLAYEY SILT, SANDY SILT, SILT

TOWER TYPE

SUMMARY OF FOUNDATION TYPE

PILE

REVISIONS
REV. DATE DESCRIPTION

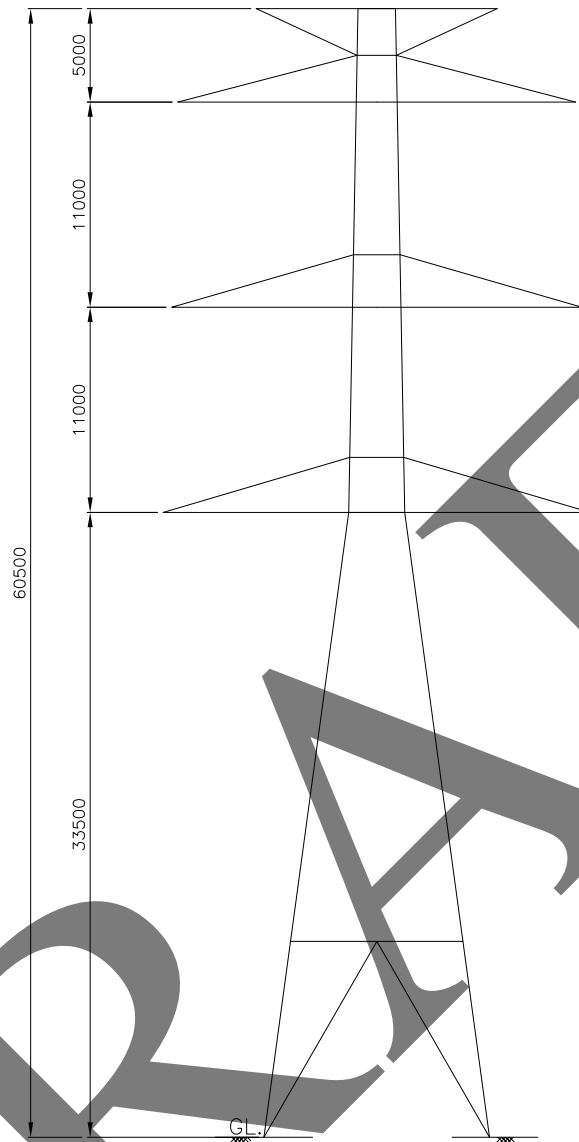
CONCURRED AP. PROVED

LISTED :
CHECKED :
SUBMITTED :
APPROVED :

FOR CONTRACTOR USE

ELECTRICITY GENERATING AUTHORITY OF THAILAND
..... kV TRANSMISSION LINE
FOUNDATION LIST
LISTED :
CHECKED :
SUBMITTED :
APPROVED :
SHEET: DATE: REPLACING DWG. NO. DWG NO. JOB NO.-F-01 REV.

-	-	DWG.NO.	C06-164
-	-	REV.	

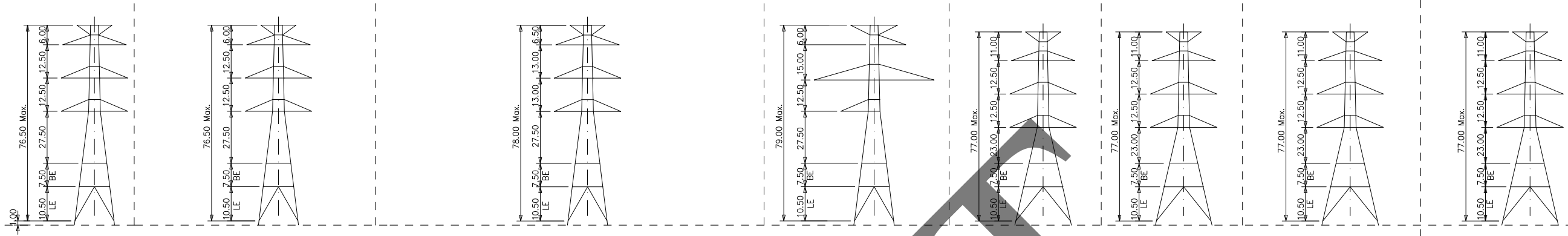


TOWER TYPE DQV3

TOWER TYPE	APPROXIMATE WEIGHT IN KILOGRAMS								
	BASIC BODY	BODY EXTENSION	SINGLE LEG EXTENSION						
			+1.5m	+3.0m	+4.5m	+6.0m	+7.5m	+9.0m	+10.5m
DH(15)	36,830	-	-	-	-	-	-	-	1,789

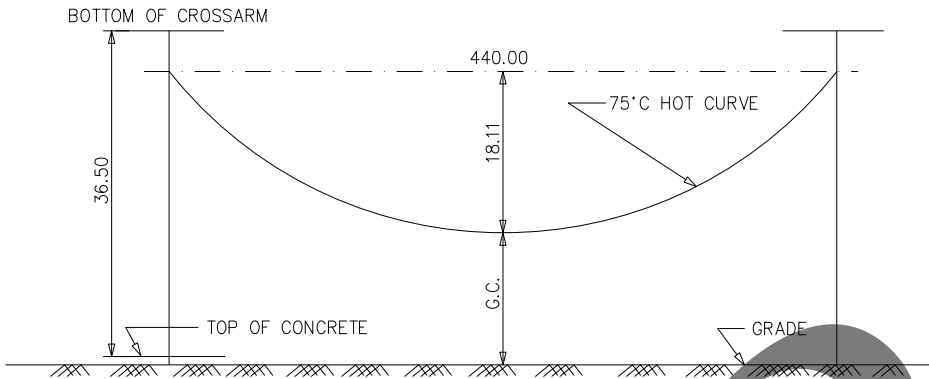
NOTES
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

												ELECTRICITY GENERATING AUTHORITY OF THAILAND										
												DRAWN	Puchit.S	RECOMMENDED AND VALIDATED		DISMANTLING OF 500 kV TRANSMISSION LINE MAE MOH 3 – THA TAKO (CIRCUIT 2,3)						
												DESIGNED	Puchit.S	CONCURRED								
												VERIFIED		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION								
-	-	-		-	-	-	-	-	-	-	-	APPROVED		DATE 16/07/2025		JOB NO.	REPLACING DWG.NO.	DWG.NO.		-	REV.	
REV.NO.	JOB NO.		JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE	DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION				NPUP-01-L03		C06-164		-	-	



TOWER TYPE	DQV3 SUSPENSION	DQV9(3) SUSPENSION	DQV9(9) SUSPENSION	DQV15(3) SUSPENSION	DQV15(9) SUSPENSION	DQV15(15) SUSPENSION	DQTR SUSPENSION	DQT20 TENSION	DQT40 TENSION	DQT60 TENSION	DQT90 TENSION
LINE ANGLE	0°-3°	0°-3°	3°-9°	0°-3°	3°-9°	9°-15°	0°-3°	0°-20°	0°-40°	0°-60° ,0°+COMPLETE,45°+SLACK	0°-90° ,0°+COMPLETE,90°+SLACK
BRACKETS	-	3°-9°	NONE AND 9°	3°-3°	NONE AND 9°	NONE AND 15°	-	-	-	-	-
ARMS	SYMMETRICAL	3°	9°	3°	9°	15°	SYMMETRICAL	SYMMETRICAL	SYMMETRICAL	SYMMETRICAL	SYMMETRICAL
LEG EXTENSION	1.50 m TO 10.50 m	1.50 m TO 10.50 m			1.50 m TO 10.50 m		1.50 m TO 10.50 m	1.50 m TO 10.50 m	1.50 m TO 10.50 m	1.50 m TO 10.50 m	1.50 m TO 10.50 m
BODY EXTENSION	7.50 m	7.50 m			7.50 m, 15.0 m		7.50 m	7.50 m	7.50 m	7.50 m	7.50 m
WIND SPAN	460 m AT 0°	650 m AT 0°			850 m AT 0°,610 m AT 9°,460 m AT 15°		460 m AT 0°	460 m AT 20°	460 m AT 40°	460 m AT 60°	460 m AT 90°
WEIGHT SPAN	690 m	1300 m			1700 m		690 m	690 m	690 m	690 m	690 m

TOWER SPOTTING TEMPLATE DATA



1. VERTICAL CONDUCTOR CLEARANCES
(BASED ON FINAL CONDUCTOR SAG AT 75°C)
- GROUND CLEARANCES
- RAIL ROADS, NEAR SUBSTATION ENTRANCES16.00
- STATE/MAJOR HIGHWAYS14.50
- CULTIVATED AREAS, GROUND ACCESSIBLE BY VEHICLES13.00
- GROUND ACCESSIBLE TO PEDESTRIANS, UNCULTIVATED LAND11.00
- WATER FOR SAIL BOATS LESS THAN 0.8 SQUARE KM16.00
- CROSSING CLEARANCES
- 500 kV LINES7.00
- 230 kV LINES6.00
- 115 kV AND COMMUNICATION LINES5.25
- DISTRIBUTION LINES 69 kV AND LESS4.65
- SHIELD WIRES OF OTHER LINES4.00
- GAS PIPE LINES13.00
- BUILDINGSNOT PERMITTED
2. HORIZONTAL CLEARANCES TO OTHER FEATURES
(BASED ON MIN.DISTANCE TO TOWER CENTER LINE)
- STATE/MAJOR HIGHWAYS75.00
- RAIL ROADS65.00
- COUNTRY ROADS55.00
- FARM LANES, DIRT ROADS, CART TRACKS25.00
- CANALS20.00
- BUILDINGS35.00
- TRANSMISSION LINES 230 kV50.00
- TRANSMISSION & DISTRIBUTION LINES 115 kV AND LESS40.00
- GAS PIPE LINES43.00

CONDUCTOR AND SHIELD WIRE SAG-TENSION DATA

CONDUCTOR : 1272 MCM ACSR/GA, 42/7 STRAND AND 1272 MCM ACSR/AW, 42/7 STRAND
SHIELD WIRE : 3/8 INCH, 7 STRAND, EHS GALV. ,7 NO.8 ALUMINUM CLAD STEEL AND OPGW
75°C HOT CURVE TEMPLATE : 18.11 M FINAL SAG AT 440 M RULING SPAN
5°C COLD CURVE TEMPLATE : 12.81 M INITIAL SAG AT 440 M RULING SPAN

TOWER HEIGHT

SUSPENSION TOWERS					
TOWER BODY HEIGHT TOP OF CONCRETE TO BOTTOM CROSSARM		SPOTTING HEIGHT (GROUND TO SUSPENSION CLAMP)			
		DQV(3)	DQV(9)	DQV(15)	DQTR
HEIGHT	LEG EXT.	0°-3°	0°-3° & 3°-9°	0°-3° 3°-9°&9°-15°	0°-3°
29.0	1.5	24.5	24.5	24.5	24.5
30.5	3.0	26.0	26.0	26.0	26.0
32.0	4.5	27.5	27.5	27.5	27.5
33.5	6.0	29.0	29.0	29.0	29.0
35.0	7.5	30.5	30.5	30.5	30.5
36.5	9.0	32.0	32.0	32.0	32.0
38.0	10.5or 3.0+BE	33.5	33.5 (41.0)*	33.5	33.5
39.5	4.5+BE	35.0	35.0 (42.5)*	35.0	35.0
41.0	6.0+BE	36.5	36.5 (44.0)*	36.5	36.5
42.5	7.5+BE	38.0	38.0 (45.5)*	38.0	38.0
44.0	9.0+BE	39.5	39.5 (47.0)*	39.5	39.5
45.5	10.5+BE	41.0	41.0 (48.5)*	41.0	41.0

* IF THE BODY EXTENSION OF 15.0 M IS USED

TENSION TOWERS					
TOWER BODY HEIGHT TOP OF CONCRETE TO BOTTOM CROSSARM		SPOTTING HEIGHT (GROUND TO CROSSARM)			
		DQT-20	DQT-40	DQT-60	DQT-90
HEIGHT	LEG EXT.	0°-20°	0°-40°	0°-60° 0°-45° TERMINAL	0°-90° 0°-90° TERMINAL
24.5	1.5	25.5	-	-	-
26.0	3.0	27.0	27.0	27.0	27.0
27.5	4.5	28.5	28.5	28.5	28.5
29.0	6.0	30.0	30.0	30.0	30.0
30.5	7.5	31.5	31.5	31.5	31.5
32.0	9.0	33.0	33.0	33.0	33.0
33.5	10.5or 3.0+BE	34.5	34.5	34.5	34.5
35.0	4.5+BE	36.0	36.0	36.0	36.0
36.5	6.0+BE	37.5	37.5	37.5	37.5
38.0	7.5+BE	39.0	39.0	39.0	39.0
39.5	9.0+BE	40.5	40.5	40.5	40.5
41.0	10.5+BE	42.0	42.0	42.0	42.0

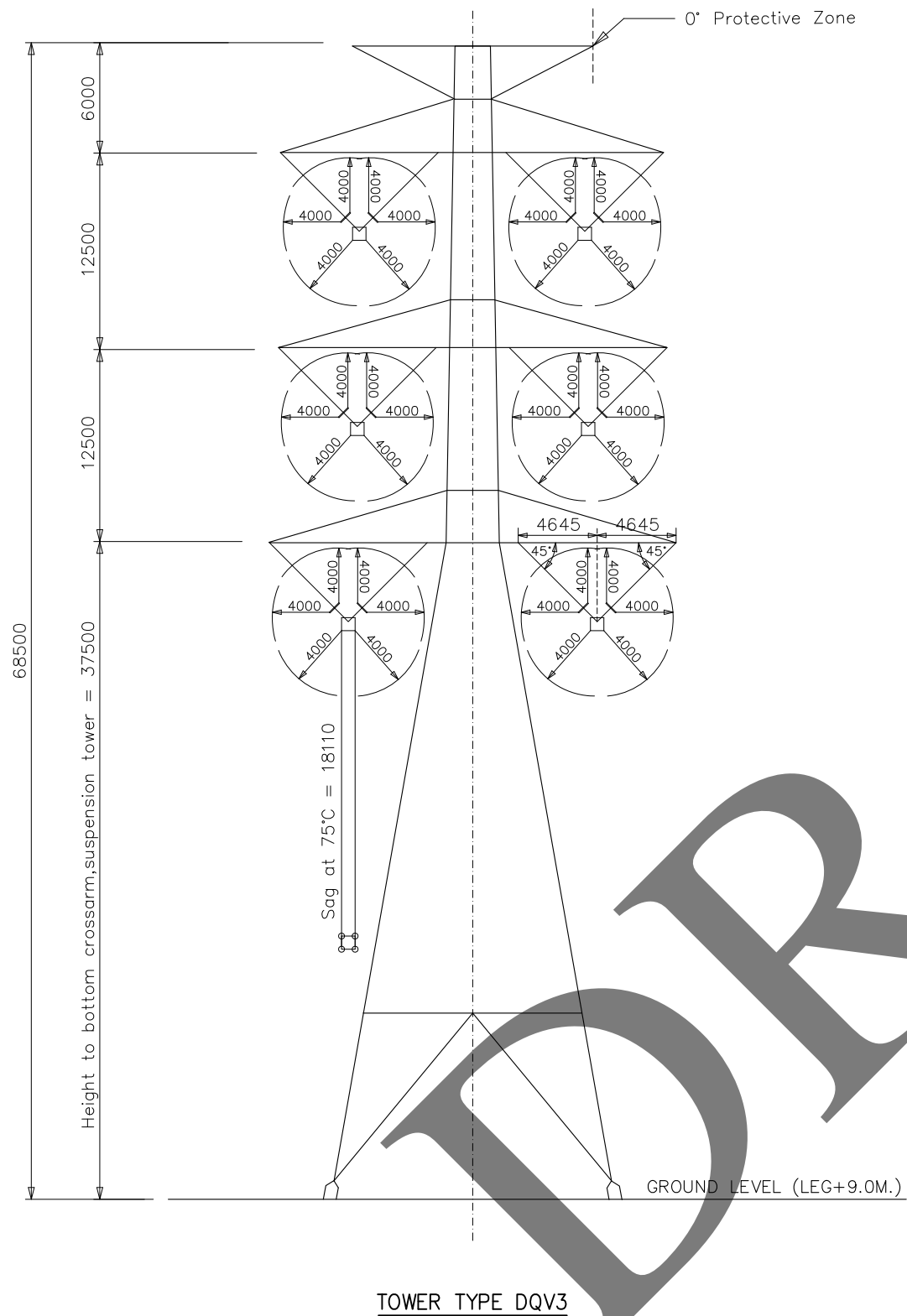
NOTE

ALL DIMENSIONS ARE IN METERS.

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND										
DRAWN KITIPAT P.		RECOMMENDED AND VALIDATED <i>titipong</i>			DRAWING NAME 500 kV TRANSMISSION LINE					
DESIGNED PISAGORN T.		CONCURRED CHIEF, CONTROL AND PROTECTION SYSTEM ENGINEERING DEPARTMENT			DESCRIPTION OF DETAIL DRAWING					
VERIFIED <i>Akanay D.</i>		CONCURRED ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION			RULING SPAN SUMMARY AND TOWER HEIGHT DESCRIPTION					
APPROVED <i>Sutarakulchai</i>		DATE 24 Apr 2025			JOB NO. —		REPLACING DWG.NO. —		DWG.NO. E03-049.1	
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION										
					—		—		—	

-	-	E05-135	DWG.NO.
REV.	-		



TOP PLANE

SHIELD WIRE CROSSARM

CONDUCTOR CROSSARM

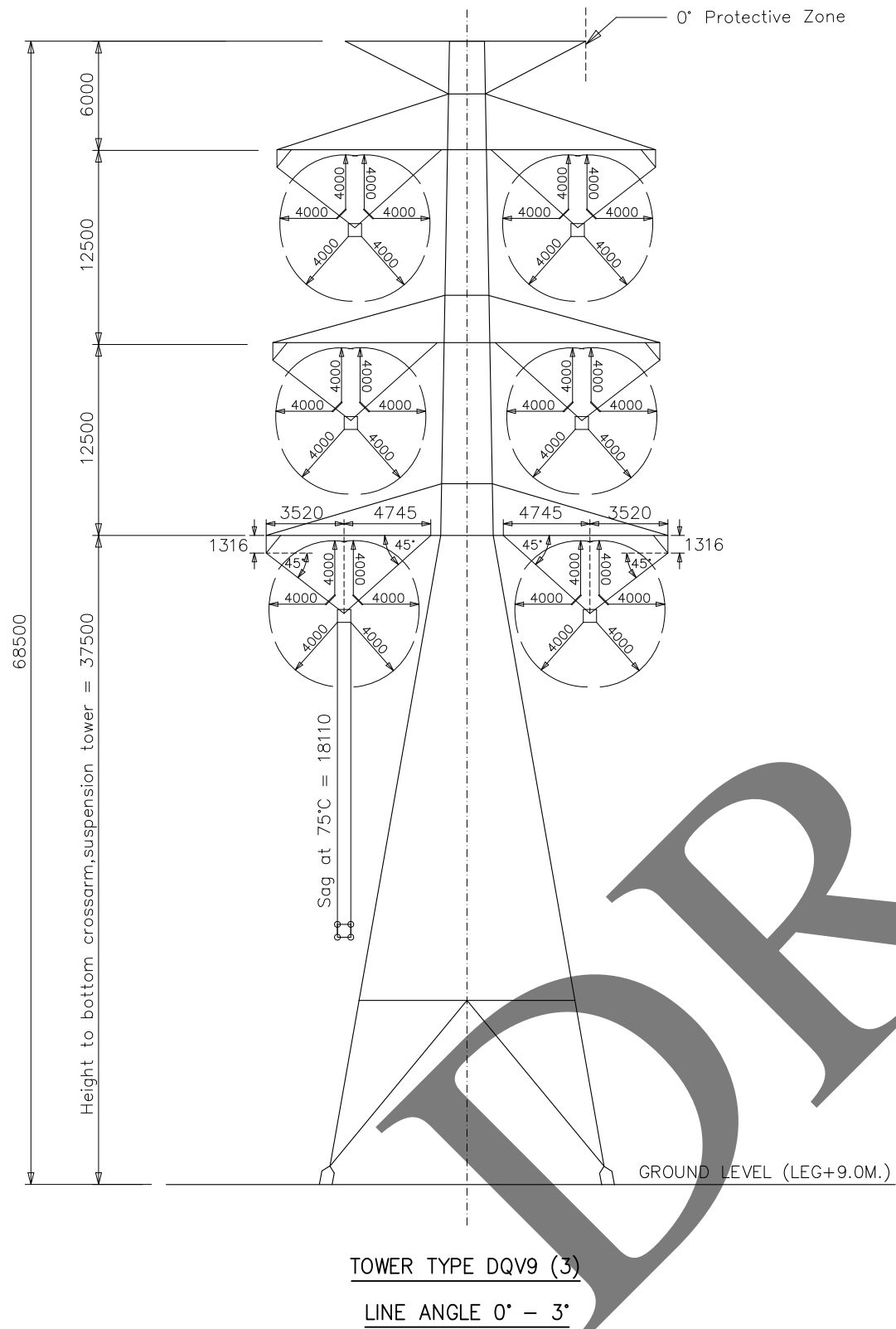
ELECTRICAL CLEARANCE DATA

- NORMAL SPAN 440 m
WIND SPAN 460 m at 0°
WEIGHT SPAN 690 m
- TOWER DESIGN SHALL PROVIDE AT LEAST THE FOLLOWING ELECTRICAL CLEARANCES:
MINIMUM CLEARANCE 4000 mm
- OVERHEAD GROUND WIRE SHALL PROVIDE 0° PROTECTIVE ZONE (ON TOP CONDUCTOR OF V-SUSPENSION INSULATOR ASSEMBLY).

NOTES

- ALL DIMENSIONS ARE IN MILLIMETER EXCEPT AS NOTED.
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGE OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR HARDWARE.
- ALL CABLE ATTACHMENT DEVICES SHALL BE SUPPLIED WITH TOWER, MINIMUM PROOF LOADS SHALL BE EQUAL TO THOSE OF HARDWARES.
- SEE DRAWING NO. E11-197 (ASSEMBLY 3D) AND E11-024 (SHIELD WIRE) FOR DETAILS OF INSULATOR AND HARDWARE ASSEMBLIES.

ELECTRICITY GENERATING AUTHORITY OF THAILAND											
DRAWN SARUTA S.			RECOMMENDED AND VALIDATED <i>Titipong</i>			DRAWING NAME 500 kV TRANSMISSION LINE					
DESIGNED PISAGORN T.			CONCURRED			DESCRIPTION OF DETAIL DRAWING ELECTRICAL AND GROUND CLEARANCE FOR TOWER TYPE DQV3					
VERIFIED <i>Akanya D.</i>			ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION			JOB NO.		REPLACING DWG.NO.		DWG.NO. E05-135	
APPROVED <i>Saruta S.</i>			DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION			DATE 24 Apr 2025				REV. -	
REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE	



TOP PLANE

SHIELD WIRE CROSSARM

CONDUCTOR CROSSARM

ELECTRICAL CLEARANCE DATA

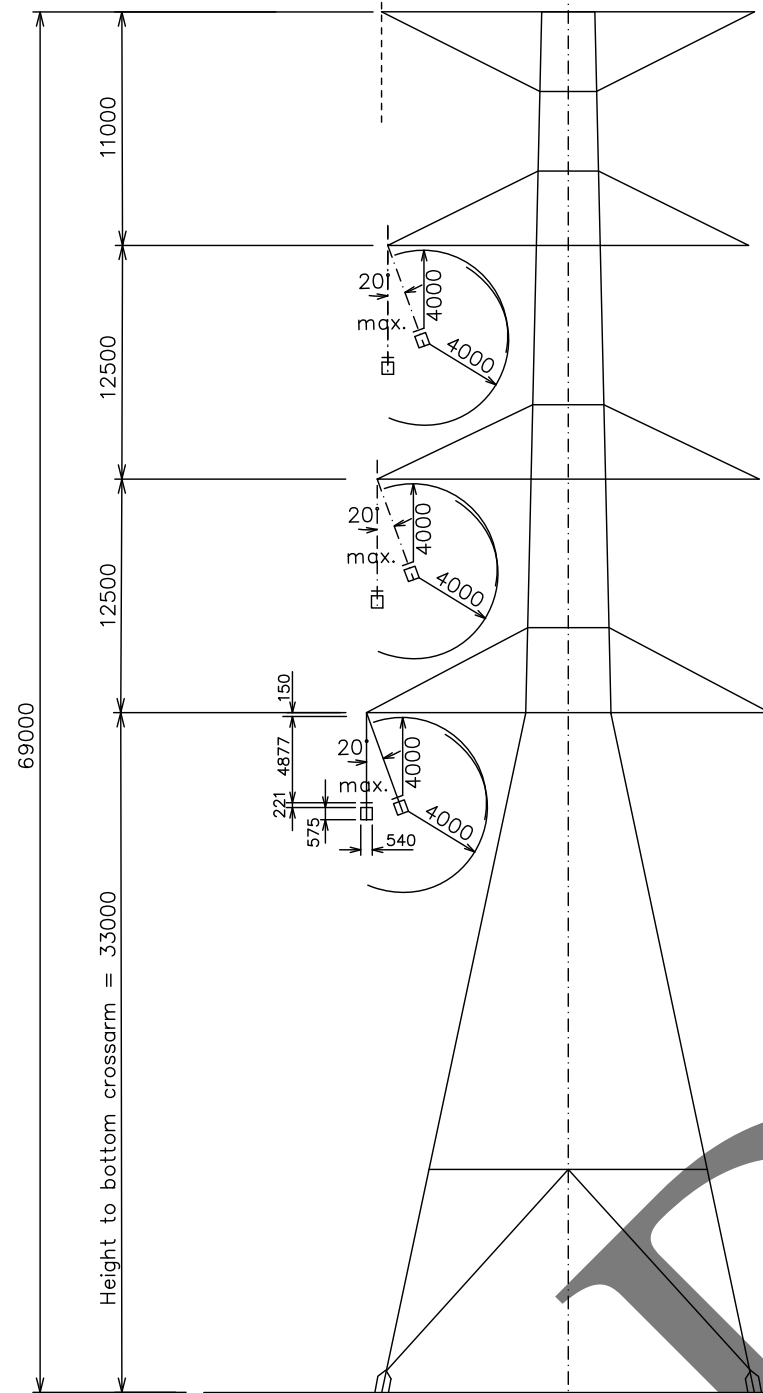
- NORMAL SPAN 440 m
WIND SPAN 650 m at 0°
WEIGHT SPAN 1300 m
- TOWER DESIGN SHALL PROVIDE AT LEAST THE FOLLOWING ELECTRICAL CLEARANCES:
MINIMUM CLEARANCE 4000 mm
- OVERHEAD GROUND WIRE SHALL PROVIDE 0° PROTECTIVE ZONE (ON TOP CONDUCTOR OF V-SUSPENSION INSULATOR ASSEMBLY).

NOTES

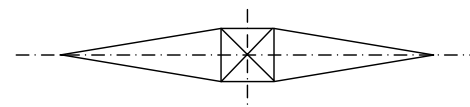
- ALL DIMENSIONS ARE IN MILLIMETER EXCEPT AS NOTED.
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGE OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR HARDWARE.
- ALL CABLE ATTACHMENT DEVICES SHALL BE SUPPLIED WITH TOWER, MINIMUM PROOF LOADS SHALL BE EQUAL TO THOSE OF HARDWARES.
- SEE DRAWING NO. E11-198 (ASSEMBLY 8D) AND E11-024 (SHIELD WIRE) FOR DETAILS OF INSULATOR AND HARDWARE ASSEMBLIES.

ELECTRICITY GENERATING AUTHORITY OF THAILAND											
DRAWN SARUTA S.			RECOMMENDED AND VALIDATED Etipong			DRAWING NAME 500 kV TRANSMISSION LINE					
DESIGNED PISAGORN T.			CONCURRED CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT			DESCRIPTION OF DETAIL DRAWING ELECTRICAL AND GROUND CLEARANCE FOR TOWER TYPE DQV9 (3)					
VERIFIED Aknady D.			ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION			JOB NO. -			REPLACING DWG.NO. -		
APPROVED Saranya P.			DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION			DATE 24 Apr 2025			DWG.NO. E05-136		
REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE	REV.
-	-	-	-	-	-	-	-	-	-	-	-

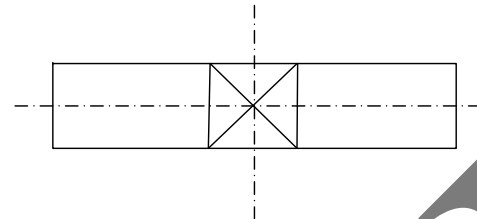
0° Max. protective Zone



TOP PLANE



SHIELD WIRE CROSSARM



CONDUCTOR CROSSARM

FULL TENSION

FULL TENSION

0° TANGENT APPLICATION

LINE ANGLE

20° MAX.

FULL TENSION

FULL TENSION

APPLICATION FOR
0° < LINE ANGLE ≤ 20°

INSTALL ONE JUMPER ASSEMBLY AT
CENTER SUPPORTS OF PHASE ARMS ON
BOTH SIDES OF TOWER

INSTALL ONE JUMPER
ASSEMBLY AT CENTER
SUPPORTS OF PHASE ARMS
ONE SIDE OF TOWER
ON INSIDE OF ANGLE

FOR LINE ANGLES
GREATER THAN 0°
INSTALL TWO JUMPER
ASSEMBLIES AT OUTSIDE
SUPPORTS OF PHASE ARMS
ON SIDE OF TOWER
ON OUTSIDE OF ANGLE

ELECTRICAL CLEARANCE DATA

- NORMAL SPAN 440 m
WIND SPAN 460 m AT 20°
WEIGHT SPAN 690 m
- TOWER DESIGN SHALL PROVIDE AT LEAST THE FOLLOWING ELECTRICAL CLEARANCES.
MINIMUM CLEARANCE 4000 mm
- OVERHEAD GROUND WIRE SHALL PROVIDE 0° PROTECTIVE ZONE.

NOTES

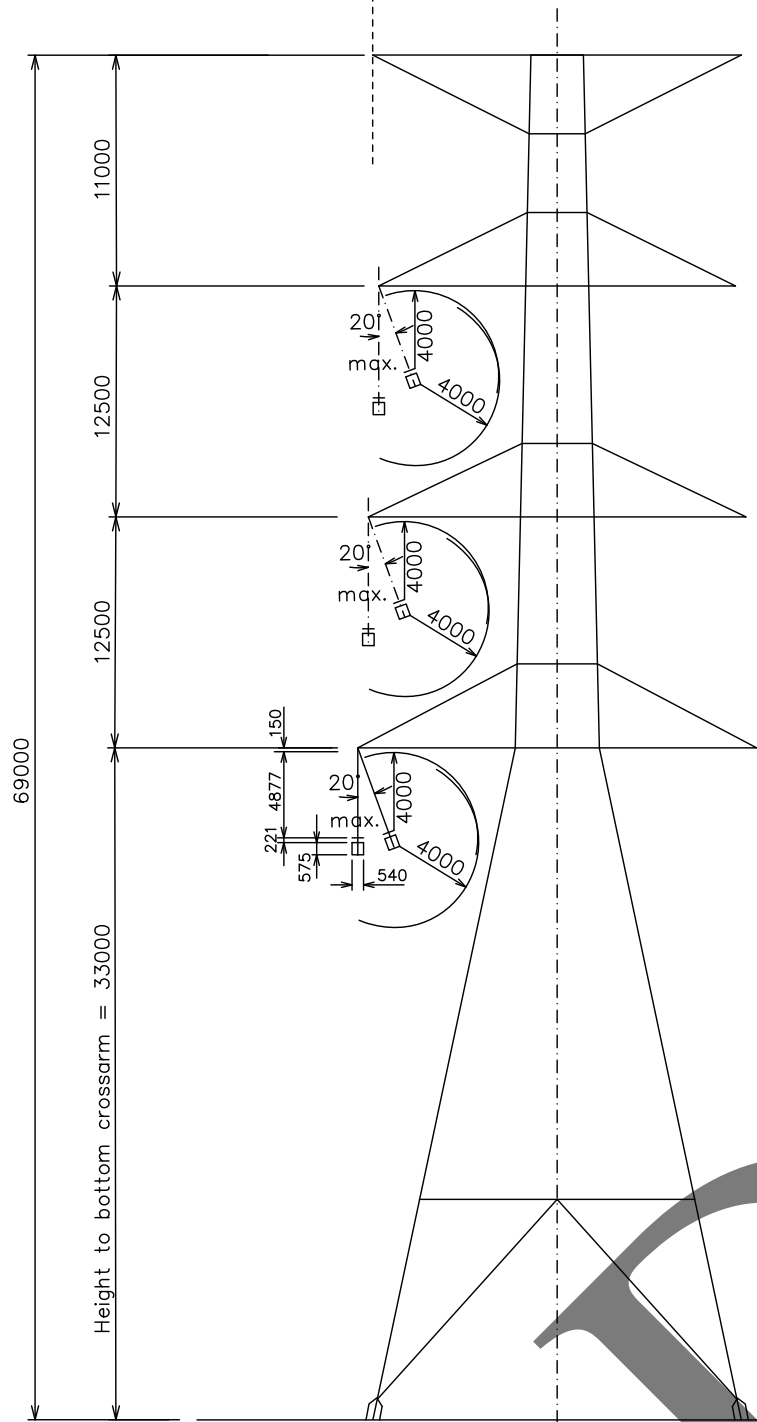
- ALL DIMENSIONS ARE IN MILLIMETER EXCEPT AS NOTED.
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGE OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR HARDWARE.
- ALL CABLE ATTACHMENT DEVICES SHALL BE SUPPLIED WITH TOWER, MINIMUM PROOF LOADS SHALL BE EQUAL TO THOSE OF HARDWARES.
- SEE DRAWING NO. E11-203, E11-205, E11-024 FOR DETAIL OF INSULATOR AND HARDWARE ASSEMBLIES.

TOWER TYPE DQT20

0° < LINE ANGLE ≤ 20°

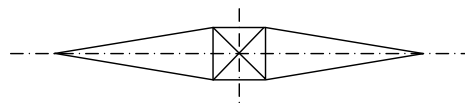
REV.	-	DWG.NO.	E05-142
-	-	-	-

0° Max. protective Zone

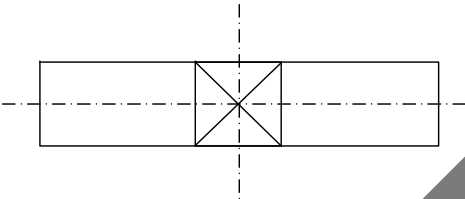


TOWER TYPE DQT40
0° < LINE ANGLE <= 40°

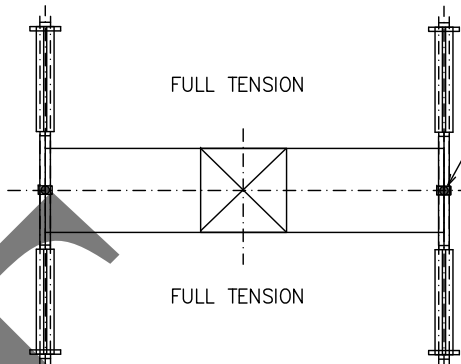
TOP PLANE



SHIELD WIRE CROSSARM



CONDUCTOR CROSSARM



INSTALL ONE JUMPER ASSEMBLY AT
CENTER SUPPORTS OF PHASE ARMS ON
BOTH SIDES OF TOWER

0° TANGENT APPLICATION

LINE ANGLE

40°
MAX.

FULL TENSION

FULL TENSION

APPLICATION FOR
0° < LINE ANGLE <= 40°

FOR LINE ANGLES
GREATER THAN 0°
INSTALL TWO JUMPER
ASSEMBLIES AT OUTSIDE
SUPPORTS OF PHASE ARMS
ON SIDE OF TOWER
ON OUTSIDE OF ANGLE

FOR LINE ANGLES
LESS THAN 25°
INSTALL ONE JUMPER
ASSEMBLY AT CENTER
SUPPORT OF PHASE ARMS
ON SIDE OF TOWER
ON INSIDE OF ANGLE

ELECTRICAL CLEARANCE DATA

- NORMAL SPAN 440 m
WIND SPAN 460 m AT 40°
WEIGHT SPAN 690 m
- TOWER DESIGN SHALL PROVIDE AT LEAST THE FOLLOWING ELECTRICAL CLEARANCES.
MINIMUM CLEARANCE 4000 mm
- OVERHEAD GROUND WIRE SHALL PROVIDE 0° PROTECTIVE ZONE.

NOTES

- ALL DIMENSIONS ARE IN MILLIMETER EXCEPT AS NOTED.
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGE OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR HARDWARE.
- ALL CABLE ATTACHMENT DEVICES SHALL BE SUPPLIED WITH TOWER, MINIMUM PROOF LOADS SHALL BE EQUAL TO THOSE OF HARDWARES.
- SEE DRAWING NO. E11-203, E11-205, E11-024 FOR DETAIL OF INSULATOR AND HARDWARE ASSEMBLIES.

ISO
9001
TSE : 2015

CAD
CENTER

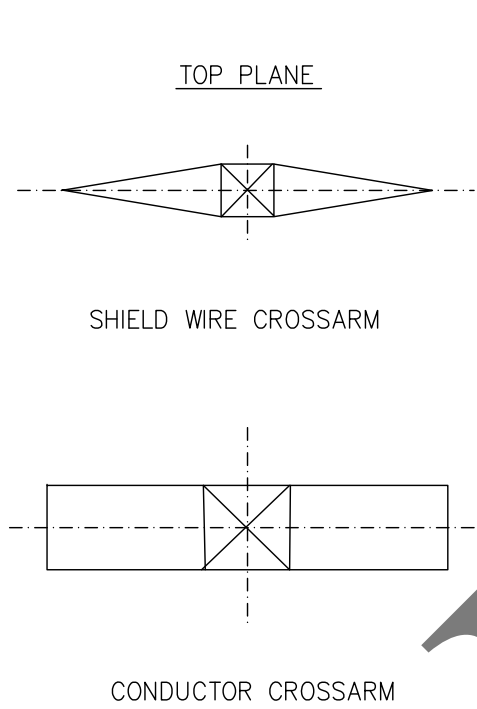
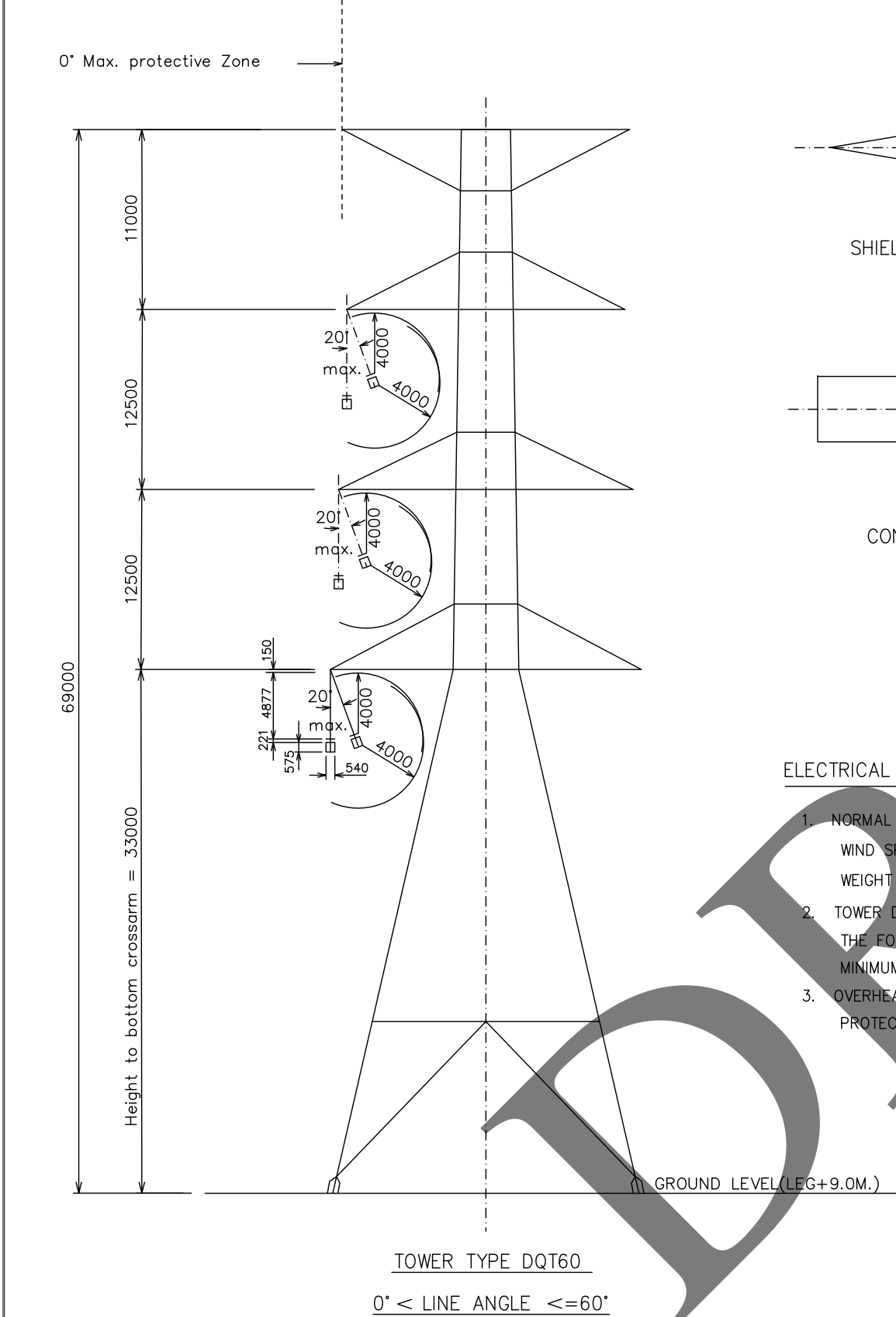
DO NOT AMEND
MANUALLY

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DRAWN	KITIPAT P.	RECOMMENDED AND VALIDATED	Kitipong	DRAWING NAME	500 kV TRANSMISSION LINE
DESIGNED	PISAGORN T.	CONCURRED	Chief, CONTROL AND PROTECTION SYSTEM ENGINEERING DEPARTMENT	DESCRIPTION OF DETAIL DRAWING	ELECTRICAL AND GROUND CLEARANCE FOR TOWER TYPE DQT40
VERIFIED	Akanya D.	ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		JOB NO.	REPLACING DWG.NO.
APPROVED	Sorachai P.	DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	DATE 24 Apr 2025	DWG.NO.	E05-142
-	-	-	-	-	-

REV.	-	-	E05-143	DWG.NO.
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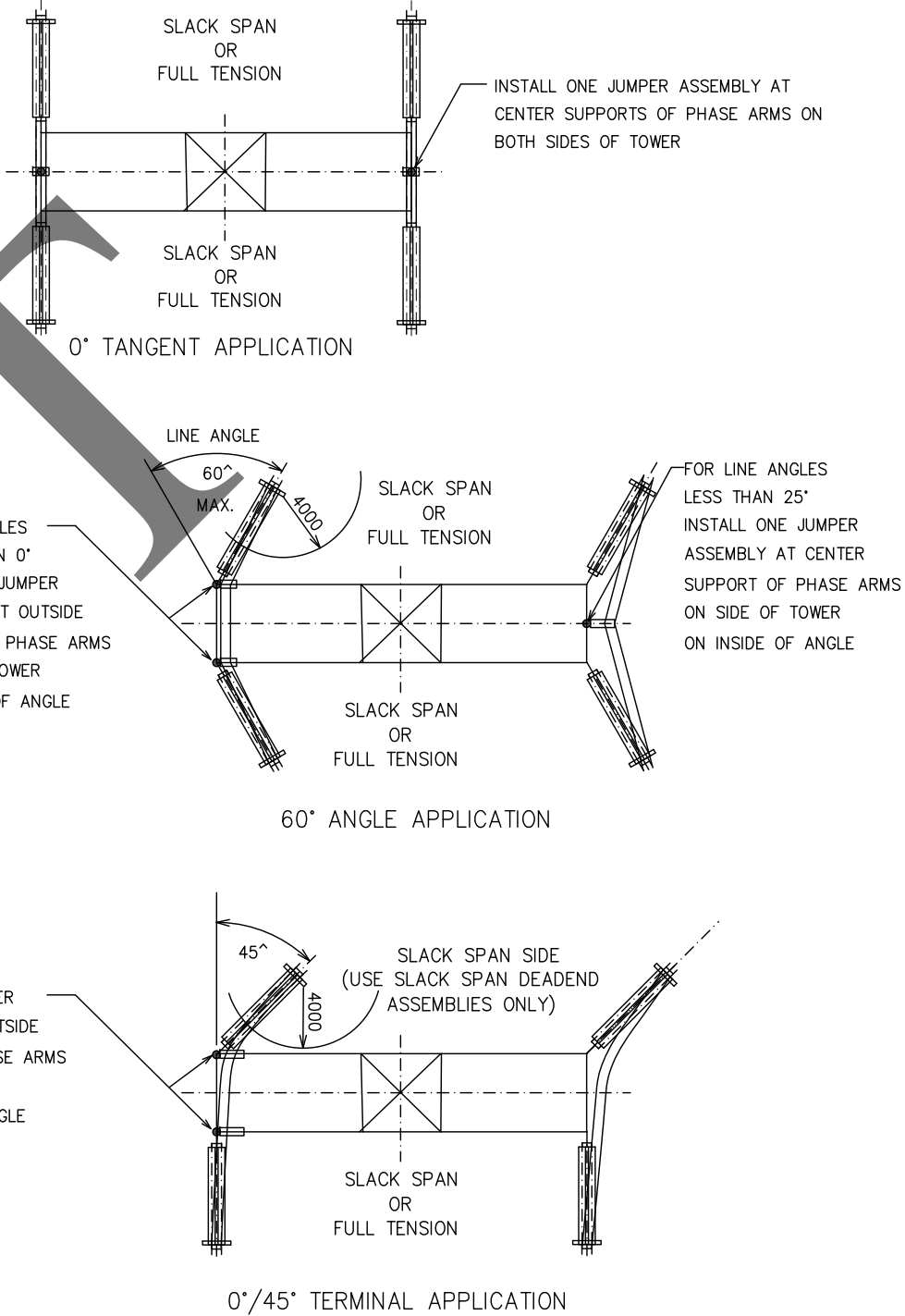


ELECTRICAL CLEARANCE DATA

1. NORMAL SPAN 440 m
WIND SPAN 460 m AT 60°
WEIGHT SPAN 690 m
2. TOWER DESIGN SHALL PROVIDE AT LEAST THE FOLLOWING ELECTRICAL CLEARANCES.
MINIMUM CLEARANCE 4000 mm
3. OVERHEAD GROUND WIRE SHALL PROVIDE 0° PROTECTIVE ZONE.

NOTES

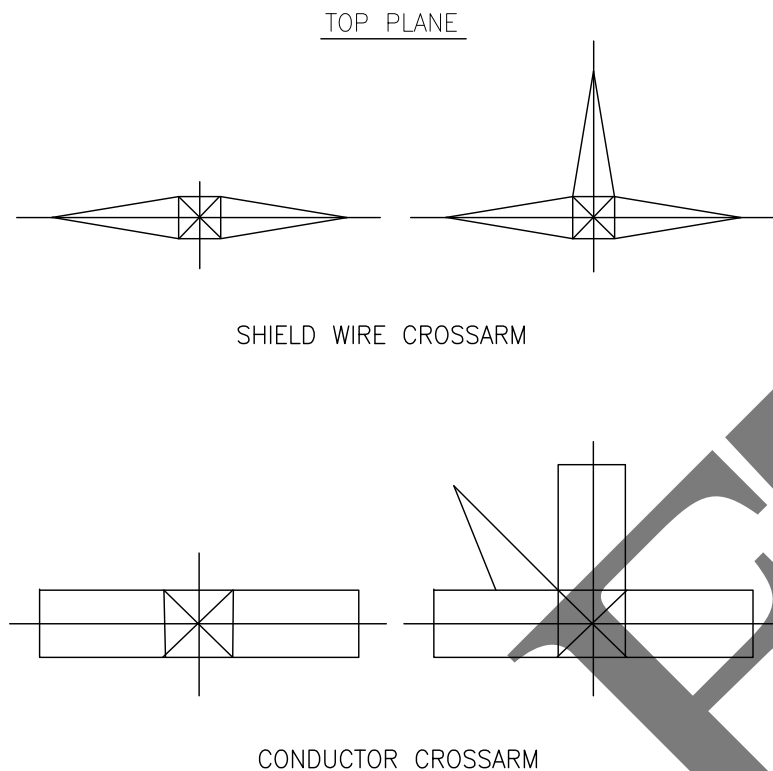
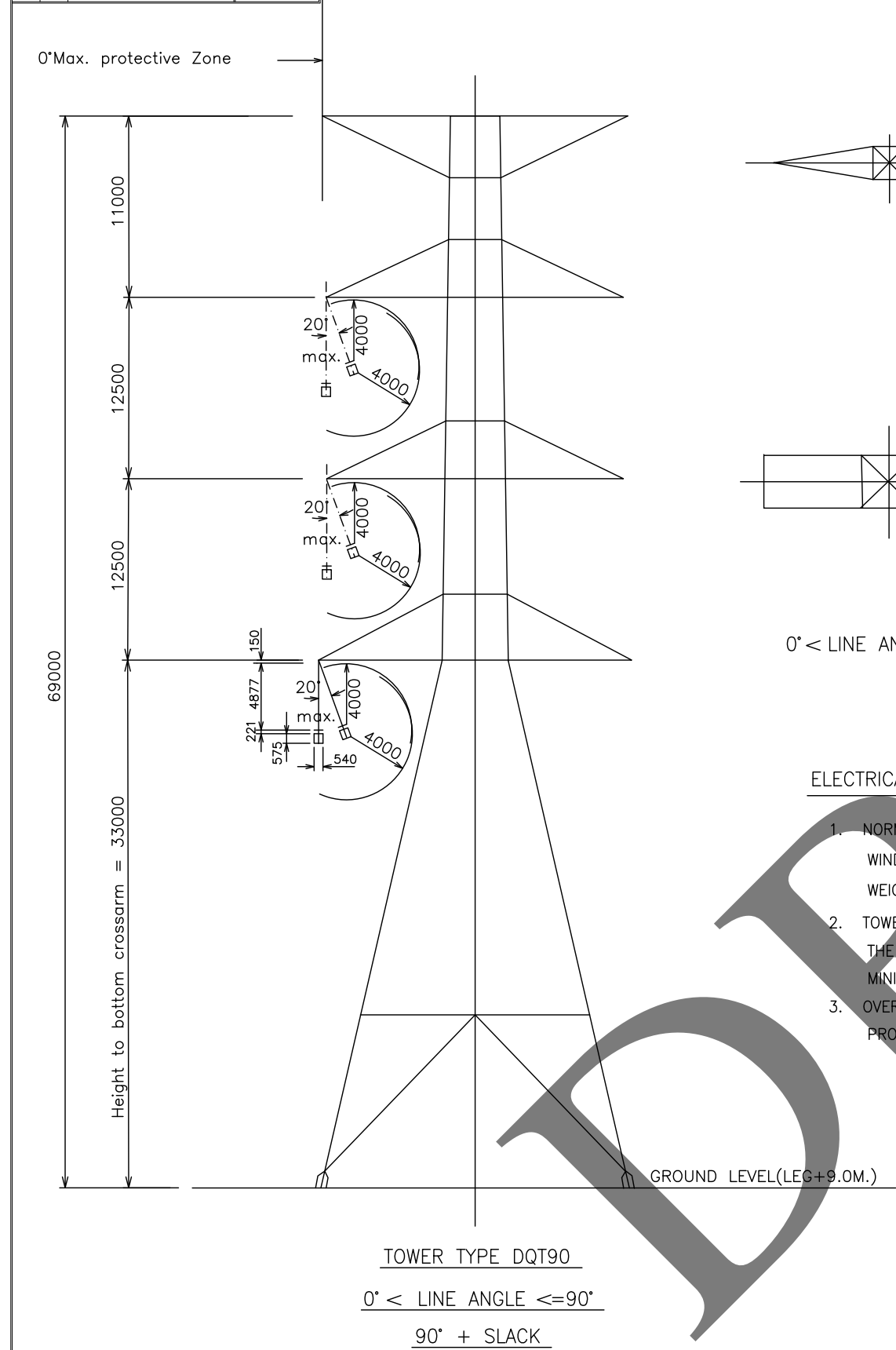
1. ALL DIMENSIONS ARE IN MILLIMETER EXCEPT AS NOTED.
2. CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGE OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR HARDWARE.
3. ALL CABLE ATTACHMENT DEVICES SHALL BE SUPPLIED WITH TOWER, MINIMUM PROOF LOADS SHALL BE EQUAL TO THOSE OF HARDWARES.
4. SEE DRAWING NO. E11-203, E11-204, E11-205, E11-024 FOR DETAIL OF INSULATOR AND HARDWARE ASSEMBLIES.



REV.NO.	JOB NO.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND										DRAWING NAME			
DRAWN		KITIPAT P.		RECOMMENDED AND VALIDATED		E. HIRONG		DESIGNED		PISAGORN T.		DESCRIPTION OF DETAIL DRAWING	
DESIGNED		PISAGORN T.		CONCURRED		CONCURRED		VERIFIED		AKRACHY D.		ELECTRICAL AND GROUND CLEARANCE FOR TOWER TYPE DQT60	
VERIFIED		AKRACHY D.		APPROVED		S. S. S. S.		JOB NO.		REPLACING DWG.NO.		DWG.NO.	
APPROVED		S. S. S. S.		DATE		24 Apr. 2025		JOB NO.		REPLACING DWG.NO.		DWG.NO.	
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION												E05-143	

REV.		DWG. NO.	E05-144
-	-	-	-



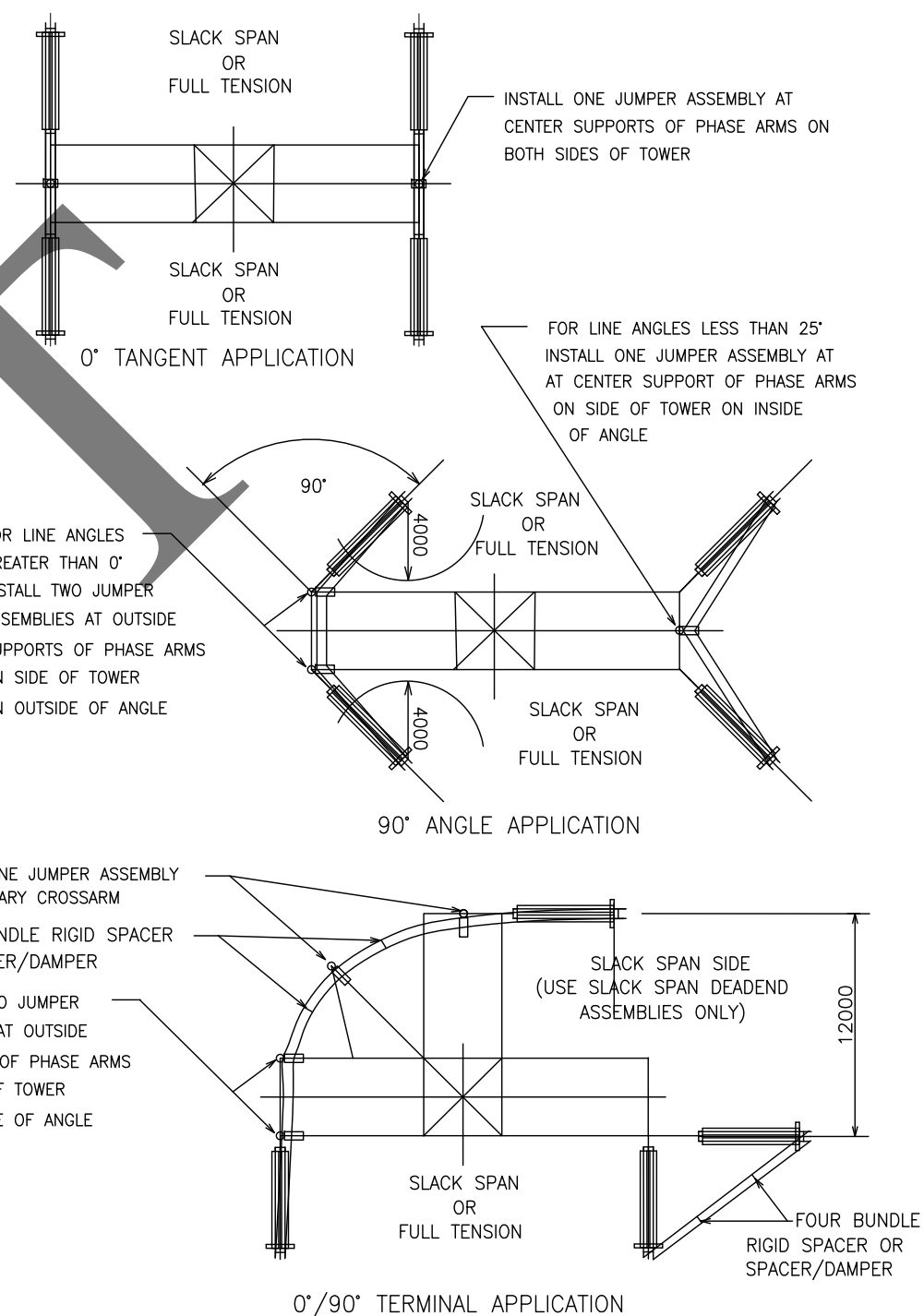
0° < LINE ANGLE <= 90° 90° + SLACK

ELECTRICAL CLEARANCE DATA

- NORMAL SPAN 440 m
WIND SPAN 460 m AT 90°
WEIGHT SPAN 690 m
- TOWER DESIGN SHALL PROVIDE AT LEAST THE FOLLOWING ELECTRICAL CLEARANCES.
MINIMUM CLEARANCE 4000 mm
- OVERHEAD GROUND WIRE SHALL PROVIDE 0° PROTECTIVE ZONE.

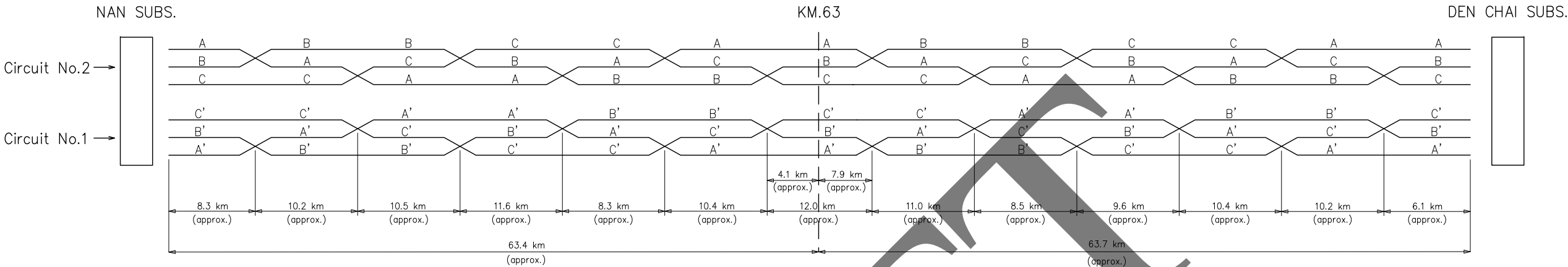
NOTES

- ALL DIMENSIONS ARE IN MILLIMETER EXCEPT AS NOTED.
- CLEARANCE DIMENSIONS ARE MINIMUM FROM SURFACE OF STEEL (NOT FROM MEMBER GAGE OR WORKING LINES) TO THE NEAREST POINT ON THE CONDUCTOR OR HARDWARE.
- ALL CABLE ATTACHMENT DEVICES SHALL BE SUPPLIED WITH TOWER, MINIMUM PROOF LOADS SHALL BE EQUAL TO THOSE OF HARDWARES.
- SEE DRAWING NO. E11-203, E11-204, E11-205, E11-024 FOR DETAIL OF INSULATOR AND HARDWARE ASSEMBLIES.

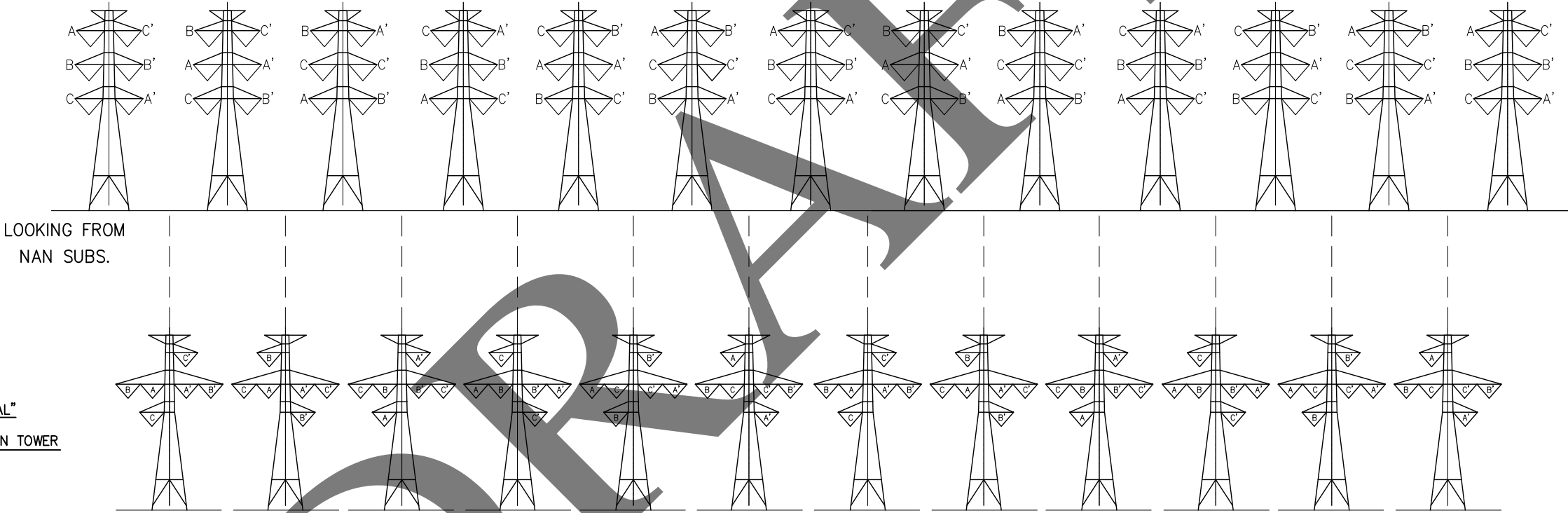


REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN	KITIPAT P.	RECOMMENDED AND VALIDATED	Kitipong	DRAWING NAME	500 kV TRANSMISSION LINE				
DESIGNED	PISAGORN T.	CONCURRED	Kitipong	DESCRIPTION OF DETAIL DRAWING	ELECTRICAL AND GROUND CLEARANCE FOR TOWER TYPE DQT90				
VERIFIED	Akanyu D.	ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	Kitipong	JOB NO.	REPLACING DWG. NO.	DWG. NO.	E05-144	-	REV.
APPROVED	Kitipong	DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	Kitipong	DATE	24 Apr 2025				



TRANSPOSITION SYSTEM

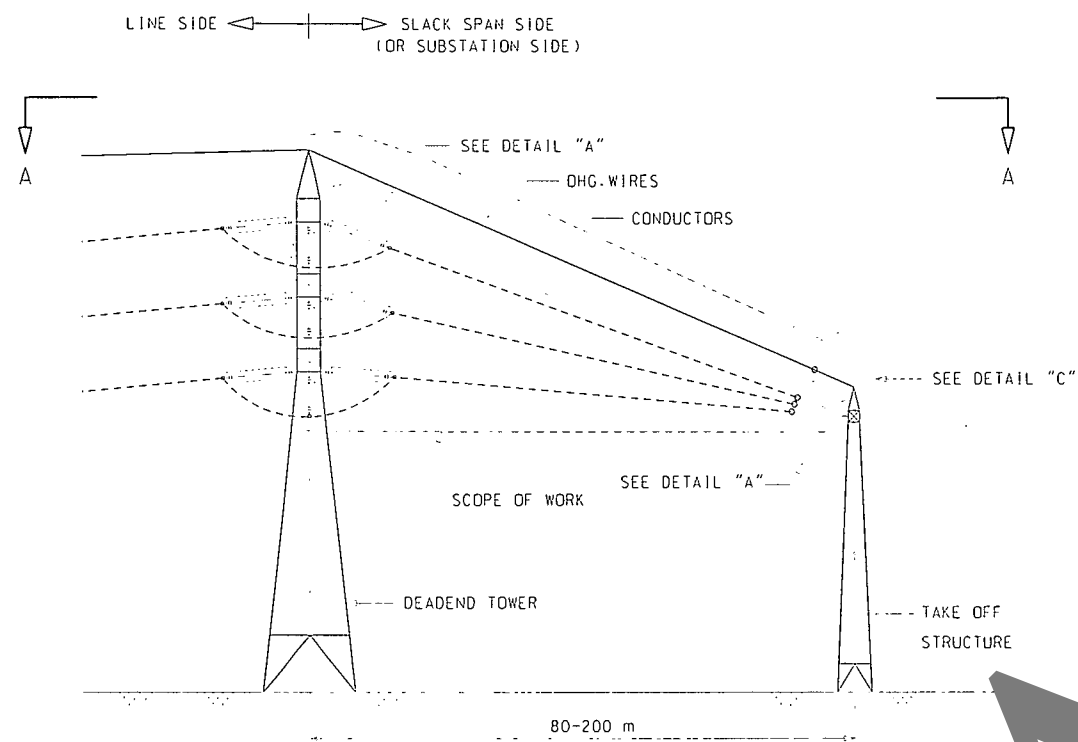


TRANSPOSITION ARRANGEMENT

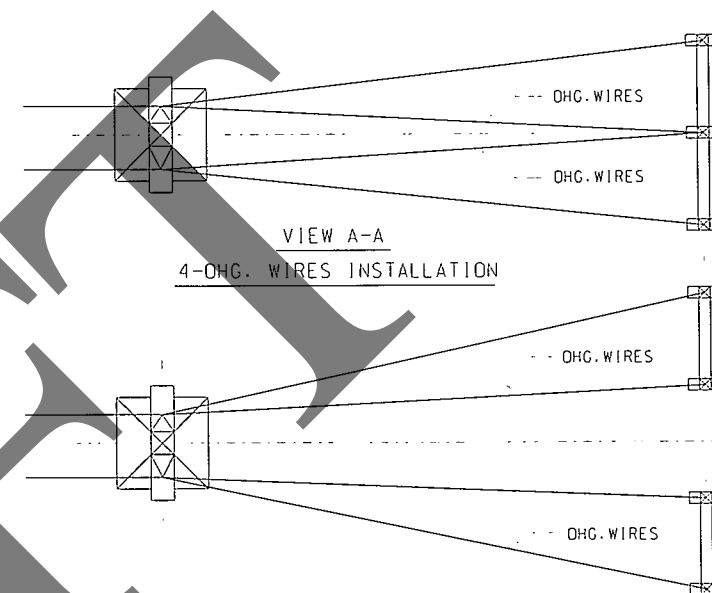
- NOTES:
- 1. ALL DIMENSIONS ARE IN KILOMETER.
 - 2. TWO COMPLETE TRANSPOSITIONS ARE REQUIRED.
 - 3. SPECIFIED DISTANCES BETWEEN TRANSPOSITION TOWERS ARE APPROXIMATE.
 - 4. PHASING SIGNS ARE TO BE INSTALLED ON BOTH TOWERS ADJACENT TO A TRANSPOSITION TOWER.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

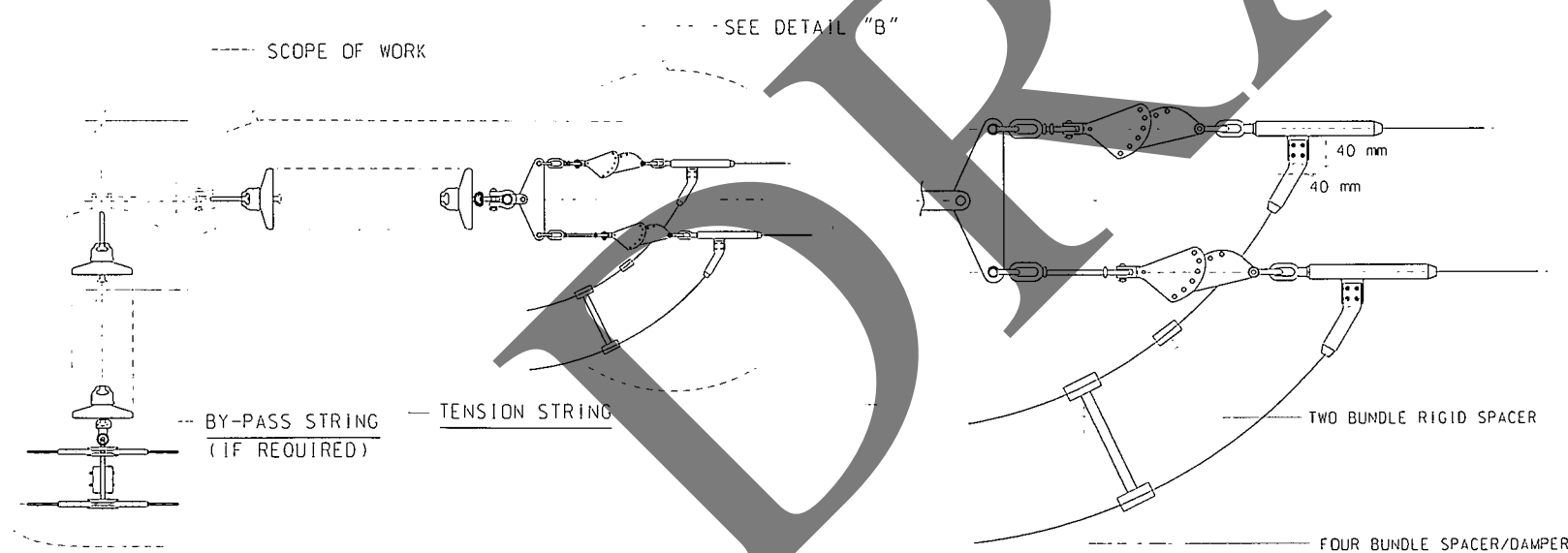
DRAWN ARINON W.	RECOMMENDED AND VALIDATED L. PONG	DRAWING NAME 500 kV TRANSMISSION LINE
DESIGNED Santana S.	CONCURRED	DESCRIPTION OF DETAIL DRAWING TRANSPOSITION
VERIFIED Akanach D.	ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	JOB NO. NPUP-01-L02
APPROVED	DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	REPLACING DWG. NO. -
	DATE 25 Jul 2025	DWG. NO. E07-096



INSTALLATION OF DOUBLE CIRCUIT CONDUCTORS
AND OHG. WIRES ON SLACK SPAN



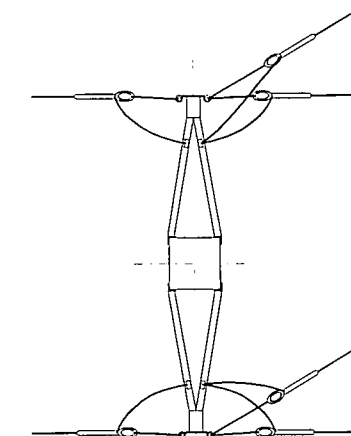
VIEW A-A
4-OHG. WIRES INSTALLATION



DETAIL "A"

DETAIL "B"

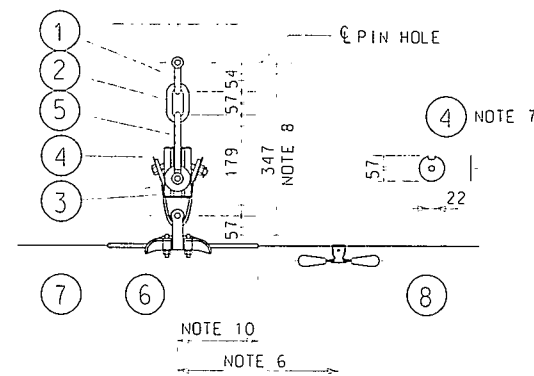
DETAIL "C"



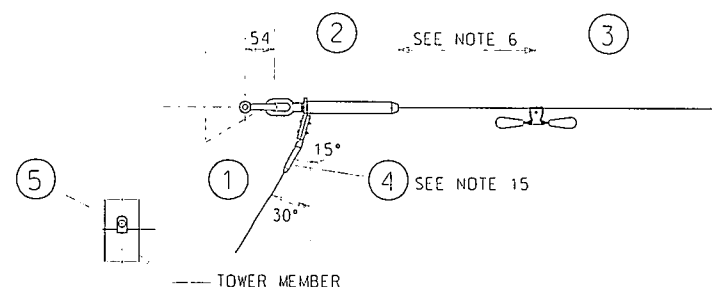
OHG. WIRE ATTACHMENTS
DEADEND TOWER

ELECTRICITY GENERATING AUTHORITY OF THAILAND

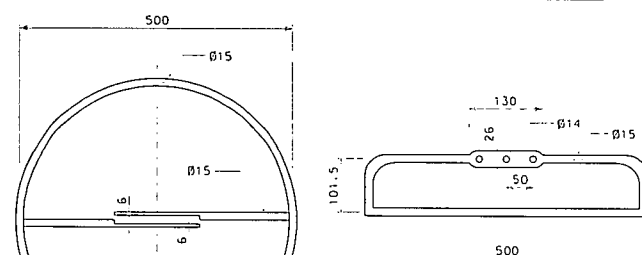
DESIGNED V. PHUCHONG	VALIDATED 18 Mar 07	500 kV TRANSMISSION LINE
RECOMMENDED	RECOMMENDED	INSTALLATION OF CONDUCTOR & OHG. WIRE
VERIFIED	CONCURRED	ON SLACK TENSION APPROACH SPANS
APPROVED	APPROVED	JOB NO. REPLACING DWG. NO. DWG. NO. E08-002



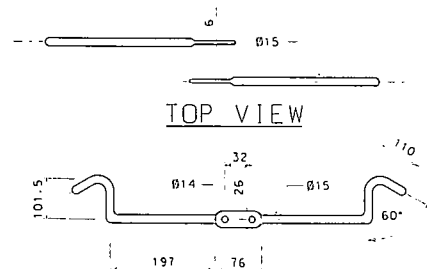
SHIELD WIRE SUSPENSION
(INSULATED)
ASSEMBLY 1 AND 1A



SHIELD WIRE DEADEND (GROUNDED)
USE FOR ALL TOWER TYPES
ASSEMBLY 12 AND 12A

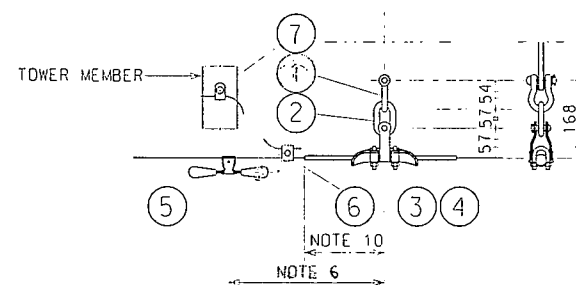


DETAIL OF ARCING HORN
TOP VIEW WITH RING ASSEMBLY

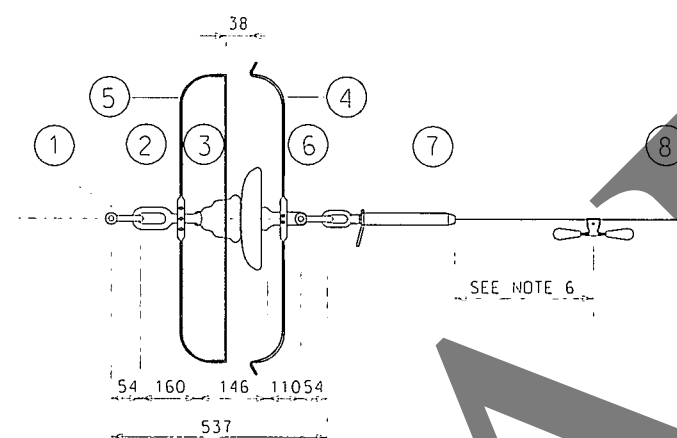


SIDE VIEW

DETAIL OF ARCING HORN ASSEMBLY



SHIELD WIRE SUSPENSION
(GROUNDED)
ASSEMBLY 2 AND 2A



SHIELD WIRE DEADEND (INSULATED)
USE FOR ALL TOWER TYPES
ASSEMBLY 11 AND 11A

NOTES:

1. ALL FERROUS PLATES HOT DIP GALVANIZED PER ASTM STD A-123.
2. ALL FERROUS FASTENERS HOT DIP GALVANIZED PER ASTM STD A-153.
3. BALL AND SOCKET FITTINGS TO FIT NEMA CLASS 52-B.
4. ALL COTTER KEYS WILL BE HUMP BACK, STAINLESS STEEL, TYPE 304. ALL COTTER KEYS SHALL BE SPREAD TO PREVENT REMOVAL DURING SERVICE.
5. ALL HARDWARE SHALL HAVE HOT-LINE MAINTENANCE CAPABILITY.
6. VIBRATION DAMPER QUANTITY AND LOCATION TO BE DETERMINED BY THE MANUFACTURER.
7. EXACT DIMENSIONS OF CLIPPED WASHERS FOR SHIELD WIRE SUSPENSION ASSEMBLIES ARE TO BE DETERMINED SUCH THAT THE MINIMUM AIR GAP BETWEEN WASHERS IS APPROXIMATE 38 MILLIMETERS.
8. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS. DIMENSIONS OF INDIVIDUAL HARDWARE ITEMS MAY BE VARIED PROVIDED THAT OVERALL ASSEMBLY DIMENSIONS ARE NOT CHANGED.
9. CATALOG NUMBERS ARE LISTED FOR PURPOSES OF GENERAL DESCRIPTION ONLY.
10. ARMOR RODS FOR SHIELD WIRE SHALL BE SELECTED SO THAT VIBRATION DAMPERS ARE ATTACHED TO THE BARE STRAND AND NOT OVER THE ARMOR ROD.
11. SEE TOWER DRAWINGS FOR ATTACHMENT PLATE DETAILS.
12. STRENGTH OF ALL HARDWARE SHALL BE SUCH THAT THE MINIMUM STRENGTH OF THE ENTIRE ASSEMBLY IS NOT LESS THAN THAT OF THE INSULATORS OR COMBINATION OF INSULATORS USED IN THAT ASSEMBLY.
13. ALL WELDING SHALL BE PER AWS-D1.1.
14. SHIELD WIRE IS 3/8" EXTRA HIGH STRENGTH GALVANIZED STEEL WIRE OR 7 NO.8 AWG. ALUMINUM-CLAD STEEL WIRE.
15. COMPRESSION DEADEND FITTINGS FOR THE CONDUCTOR SHALL BE PROVIDED WITH 4 HOLES, AND FOR THE SHIELD WIRE WITH 2 HOLES, NEMA PAD TERMINALS.

MATERIAL LIST

ITEM NO.	QUANTITY	CATALOG NO.	MINIMUM RATE STRENGTH (METRIC TON)	DESCRIPTION
SHIELD WIRE SUSPENSION (INSULATED) - ASSEMBLY 1 FOR 3/8 INCH EHS GALV. STEEL WIRE - ASSEMBLY 1A FOR 7 NO.8 AWG. ALUMINUM-CLAD S.W.				
1	1		5.4	ANCHOR SHACKLE W/BNC. BOLT Ø 16 MM
2	1		5.4	CHAIN LINK
3	1		5.4	STRAIN INSULATOR ANSI CLASS 54-2
4	4			CLIPPED WASHER ASTM A-36 STEEL GALV. PER ASTM A-153
5	2		5.4	STRAIN INSULATOR CLEVIS
6	1		5.4	SUSPENSION CLAMP: MIN 15 DEGREE TAKE-OFF ANGLE
7	1 SET			ARMOR ROD: USE WITH 3/8 INCH EHS STEEL SW. (ASSEMBLY 1) OR WITH 7 NO. 8 AWG. ALUMINUM-CLAD SW. (ASSEMBLY 1A)
8	NOTE 6			VIBRATION DAMPER: USE WITH 3/8 INCH EHS GALV. SW. (ASSEMBLY 1) OR WITH 7 NO.8 AWG ALUMINUM-CLAD SW. (ASSEMBLY 1A)
SHIELD WIRE SUSPENSION (GROUNDED) - ASSEMBLY 2 FOR 3/8 INCH EHS GALV. STEEL WIRE - ASSEMBLY 2A FOR 7 NO.8 AWG. ALUMINUM-CLAD S.W.				
1	1		5.4	ANCHOR SHACKLE W/BNC. BOLT Ø 16 MM
2	1		5.4	CHAIN LINK
3	1		5.4	SUSPENSION CLAMP: MIN 15 DEGREE TAKE-OFF ANGLE
4	1 SET			ARMOR ROD: USE WITH 3/8 INCH EHS STEEL SW. (ASSEMBLY 2) OR WITH 7 NO. 8 AWG. ALUMINUM-CLAD SW. (ASSEMBLY 2A)
5	NOTE 6			VIBRATION DAMPER: USE WITH 3/8 INCH EHS GALV. SW. (ASSEMBLY 2) OR WITH 7 NO.8 AWG ALUMINUM-CLAD SW. (ASSEMBLY 2A)
6	1			PARALLEL GROOVE CLAMP
7	1			GROUNTING CLAMP
SHIELD WIRE DEADEND (INSULATED) - ASSEMBLY 11 FOR 3/8 INCH EHS GALV. STEEL WIRE - ASSEMBLY 11A FOR 7 NO.8 AWG. ALUMINUM-CLAD S.W.				
1	2		6.8	ANCHOR SHACKLE W/BNC. BOLT Ø 16 MM
2	1		6.8	BALL EYE LINK WITH ARCING HORN
3	1		6.8	INSULATOR: ANSI CLASS 52-B
4	1		-	ARCING HORN ASSEMBLY WITH 2 SETS OF Ø12 MM x 35 MM GALV. BOLT AND NUT WITH SPRING WASHER
5	1		-	ARCING HORN WITH RING ASSEMBLY WITH 3 SETS OF Ø12 MM x 35 MM GALV. BOLT AND NUT WITH SPRING WASHER
6	1		6.8	SOCKET EYE FOR ARCING HORN
7	1		-	COMPRESSION DEADEND FOR 3/8 INCH EHS GALV. SW. (ASSEMBLY 11) OR FOR 7 NO.8 AWG ALUMINUM-CLAD SW. (ASSEMBLY 11A)
8	NOTE 6		-	VIBRATION DAMPER USE WITH 3/8 INCH EHS GALV. SW. (ASSEMBLY 11) OR WITH 7 NO.8 AWG ALUMINUM-CLAD SW. (ASSEMBLY 11A)
SHIELD WIRE DEADEND (GROUNDED) - ASSEMBLY 12 FOR 3/8 INCH EHS GALV. STEEL WIRE - ASSEMBLY 12A FOR 7 NO.8 AWG. ALUMINUM-CLAD S.W.				
1	1		6.8	ANCHOR SHACKLE W/BNC. BOLT Ø 16 MM
2	1		-	COMPRESSION DEADEND FOR 3/8 INCH EHS GALV. SW. (ASSEMBLY 12) OR FOR 7 NO.8 AWG ALUMINUM-CLAD SW. (ASSEMBLY 12A)
3	NOTE 6		-	VIBRATION DAMPER USE WITH 3/8 INCH EHS GALV. SW. (ASSEMBLY 12) OR WITH 7 NO.8 AWG ALUMINUM-CLAD SW. (ASSEMBLY 12A)
4	1		-	JUMPER TERMINAL FOR 3/8 INCH EHS GALV. SW. (ASSEMBLY 12) OR FOR 7 NO.8 AWG ALUMINUM-CLAD SW. (ASSEMBLY 12A)
5	1		-	GROUNTING CLAMP

ELECTRICITY GENERATING AUTHORITY OF THAILAND

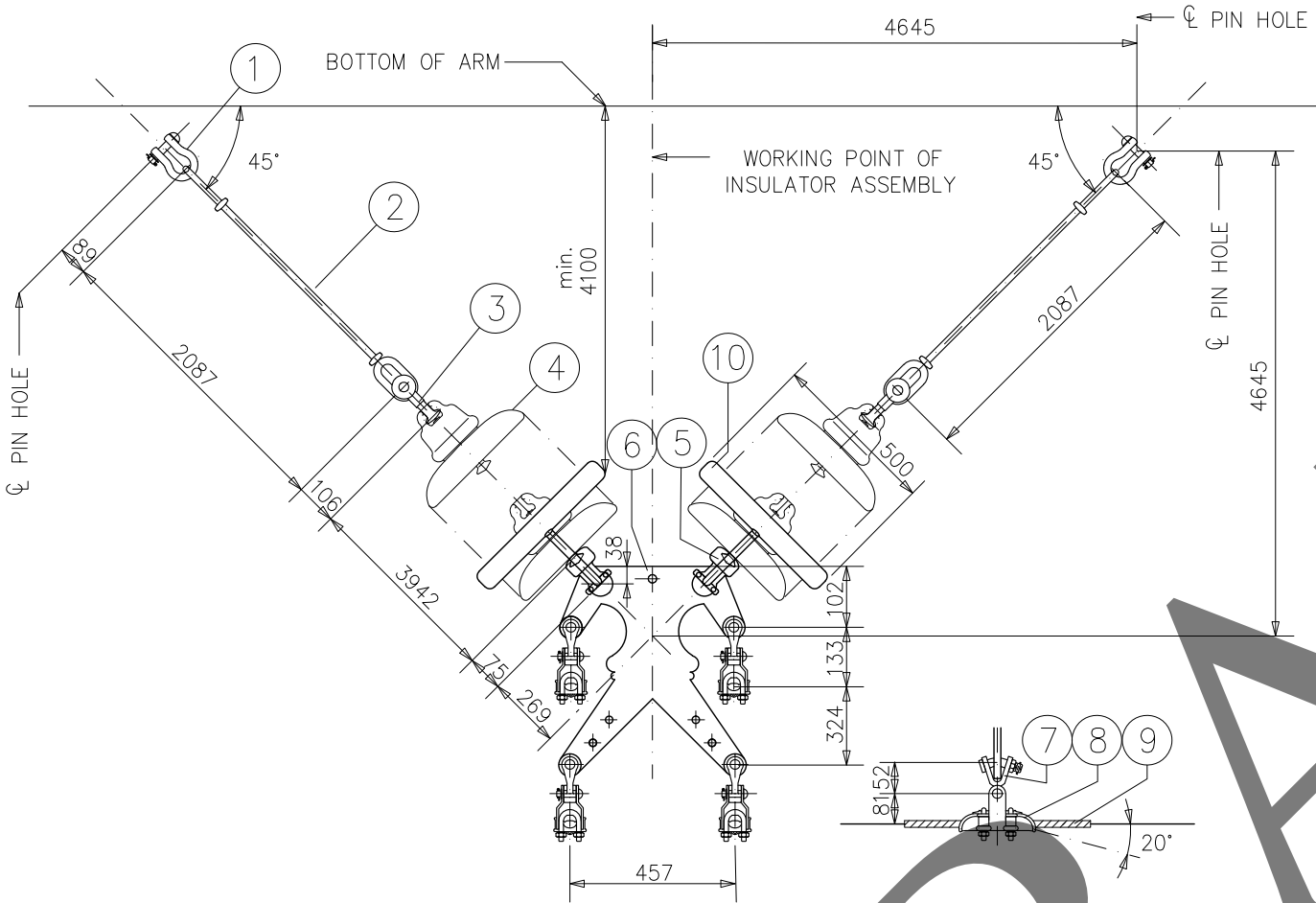
DESIGNED V. PHUCHONG	VALIDATED S. Phay 16/10/08	500 KV TRANSMISSION LINE
RECOMMENDED S. Phay 16/10/08	CONCURRED S. Phay 16/10/08	INSULATOR AND HARDWARE DETAILS FOR SHIELD WIRE ASSEMBLIES
APPROVED S. Phay 16/10/08	DATE	JOB NO. REPLACING Dwg. NO. Dwg. NO. REV.
E11-024		

MATERIAL LIST

45°/45° V-STRING SUSPENSION : ASSEMBLY 3D FOR DQV3				
ITEM NO.	QUANTITY	CATALOG NO.	MINIMUM RATE STRENGTH (METRIC TON)	DESCRIPTION
1	2		16.3	ANCHOR SHACKLE W/BNC, BOLT ϕ 22 mm
2	2		16.3	CH.EYE/90°CH.EYE EXTENSION LINK, 2087 mm LONG
3	2		16.3	BALL CLEVIS
* 4	2 X 27		16.3	SUSPENSION INSULATOR; ANSI CLASS 52-8
5	2		16.3	SOCKET Y-CLEVIS
6	1		16.3	STEEL YOKE PLATE (4-CONDUCTOR)
7	4		8.0	Y-CLEVIS EYE
8	4		8.0	SUSPENSION CLAMP; MIN.20°TAKE-OFF ANGLE
9	4 SETS			ARMOR RODS
10	2			GRADING RING

GENERAL NOTES:

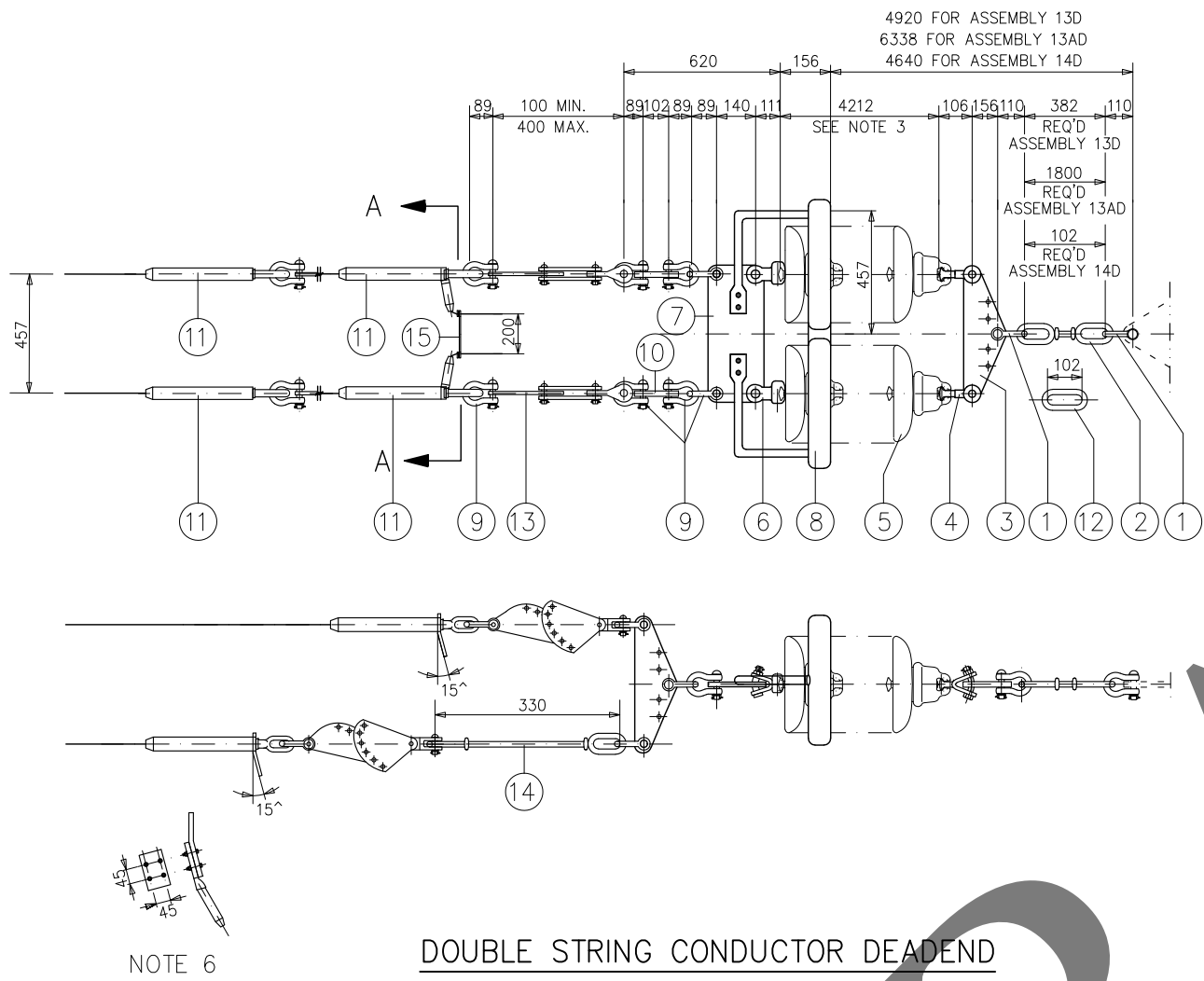
1. ALL FERROUS PLATES HOT DIP GALVANIZED PER ASTM STD A-123.
2. ALL FERROUS FASTENERS HOT DIP GALVANIZED PER ASTM STD A-153.
3. BALL AND SOCKET FITTINGS TO FIT NEMA CLASS 52-8.
4. ALL COTTER KEYS WILL BE HUMP BACK, STAINLESS STEEL, TYPE 304
ALL COTTER KEYS SHALL BE SPREAD TO PREVENT REMOVAL DURING SERVICE.
5. ALL HARDWARE SHALL HAVE HOT-LINE MAINTENANCE CAPABILITY.
6. ALL CONDUCTOR HARDWARE SHALL BE DESIGNED FOR CORONA-FREE EHV OPERATION.
7. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS. DIMENSIONS OF INDIVIDUAL
HARDWARE ITEMS MAY BE VARIED PROVIDED THAT OVERALL ASSEMBLY
DIMENSIONS ARE NOT CHANGED.
8. CATALOG NUMBERS ARE LISTED FOR PURPOSES OF GENERAL DESCRIPTION ONLY.
9. IN AREAS OF ANTI POLLUTION ZONE, INCREASED LEAKAGE DISTANCE WILL BE USED.
STANDARD 52-8 INSULATORS MARKED WITH * WILL BE REPLACED WITH THE SAME
QUANTITY OF FOG TYPE 36,000 lbs. WITH 432 MM OR GREATER LEAKAGE DISTANCE.
10. SEE TOWER DRAWINGS FOR ATTACHMENT PLATE DETAILS.
11. STRENGTH OF ALL HARDWARE SHALL BE SUCH THAT THE MINIMUM STRENGTH OF THE
ENTIRE ASSEMBLY IS NOT LESS THAN THAT OF THE INSULATORS OR COMBINATION OF
INSULATORS USED IN THAT ASSEMBLY.
12. ALL WELDING SHALL BE PER AWS.D1.1
13. CONDUCTOR IS 1272 MCM ACSR/GA OR 1272 MCM ACSR/AW.



45°/45° V-STRING SUSPENSION
TOWER TYPES DQV3 AND DQTR
ASSEMBLY 3D

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN ARNON W.		RECOMMENDED AND VALIDATED Titipong		DRAWING NAME 500 kV TRANSMISSION LINE					
DESIGNED Kitipong P.		CONCURRED Assistant Director, Transmission System Engineering Division		DESCRIPTION OF DETAIL DRAWING INSULATOR AND HARDWARE DETAILS FOR SUSPENSION ASSEMBLY - ASSEMBLY 3D					
VERIFIED Akanya D.		APPROVED Director, Transmission System Engineering Division		DATE 24 Apr 2025		JOB NO. -		REPLACING DWG.NO. -	
						DWG.NO. E11-197			



DOUBLE STRING CONDUCTOR DEADEND

ASSEMBLIES 13D, 13AD AND 14D

CONDUCTOR DEADEND

				- ASSEMBLY 13D FOR DQT60 AND DQT90 STRUCTURE - ASSEMBLY 13AD FOR DQT90 STRUCTURE (90°ANGLE APPLICATION), FOR DQT60 (0°/45° TERMINAL APPLICATION)* - ASSEMBLY 14D FOR DQT20 AND DQT40 STRUCTURE
ITEM NO.	QUANTITY	CATALOG NO.	MINIMUM RATE STRENGTH (METRIC TON)	DESCRIPTION
1	2		45.4	ANCHOR SHACKLE W/BNC, BOLT Ø 32 mm
2	1		45.4	CHAIN EYE-CHAIN EYE EXTENSION LINK(382 mm FOR ASSEMBLY 13D AND 1800 mm FOR ASSEMBLY 13AD AND 102 mm FOR ASSEMBLY 14D)
3	1		45.4	YOKE PLATE,TRIANGULAR
4	2		22.7	BALL Y-CLEVIS
* * 5	2 X 27		22.7	SUSPENSION INSULATOR; ANSI CLASS 52-11
6	2		22.7	SOCKET Y-CLEVIS
7	1		45.4	YOKE PLATE,RECTANGULAR
8	1		-	GRADING RING
9	12		22.7	ANCHOR SHACKLE W/BNC
10	2		22.7	YOKE PLATE, TRIANGULAR
11	4		-	COMPRESSION DEADEND ASSEMBLY WITH STEEL EYE & JUMPER TERMINAL.
12	1		45.4	CHAIN LINK(102 mm) FOR ASSEMBLY 14D ONLY
13	4 SETS		12.0	TENSION ADJUSTING PLATES
14	2		12.0	90° CHAIN EYE-CHAIN EYE EXTENSION LINK (330 mm)
15	-		-	TWO BUNDLE RIGID SPACER

* HARDWARE ASSEMBLY 13AD SHALL BE USED FOR TOWER TYPE DQT60 (0°/45° TERMINAL APPLICATION) OF WHICH THE ORIENTATION ANGLE IS MORE THAN 30°.

NOTES:

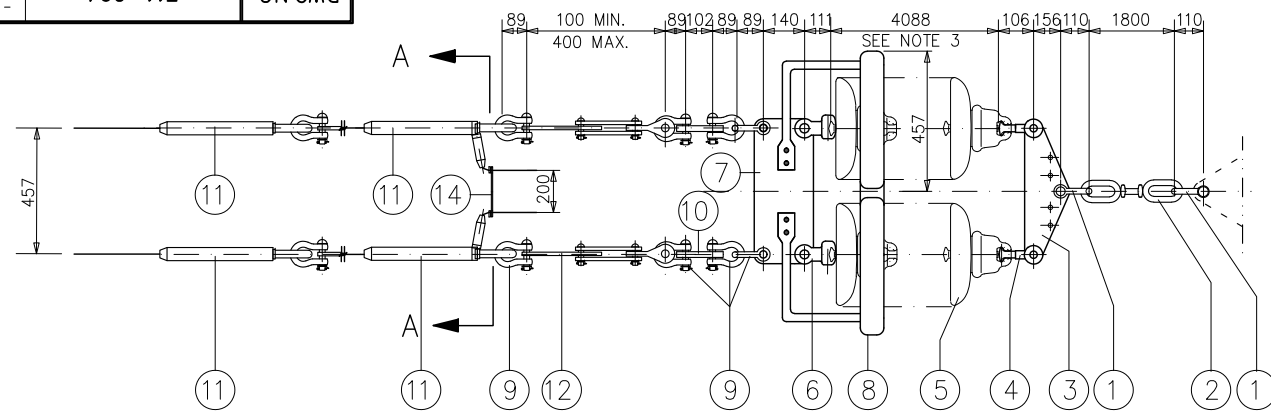
- SEE DRAWING NO. E11-197 FOR GENERAL NOTES.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED.
- IN AREAS OF ANTI POLLUTION ZONE, INCREASED LEAKAGE DISTANCE WILL BE USED.
52-11 INSULATORS MARKED WITH ** WILL BE REPLACED WITH SAME QUANTITY OF FOG TYPE 50,000 lbs. WITH 545 MM OR GREATER LEAKAGE DISTANCE.
- INSTALL FOUR (4) BUNDLE RIGID SPACERS OR SPACER DAMPERS EQUIDISTANT ALONG JUMPER LOOP LENGTH FOR DETERMINATION OF SEPARATION DISTANCE, ASSUME THE INSULATOR ASSEMBLY, YOKE (IF PRESENT) ACTS AS A FOUR BUNDLE SPACER.
- DIMENSIONS OF INDIVIDUAL HARDWARE ITEMS MAY BE VARIED PROVIDED THAT OVERALL ASSEMBLY DIMENSIONS ARE NOT CHANGED.
- COMPRESSION DEADEND FITTINGS FOR THE CONDUCTOR SHALL BE PROVIDED WITH 4 HOLE, AND FOR THE SHIELD WIRE WITH 2 HOLE, NEMA PAD TERMINALS.
- OMIT 2 SPACERS FROM ANY LOOP CONTAINING 2 SETS OF I-STRING JUMPER SUPPORT ASSEMBLIES.
- SEE DRAWING NO. E05-141, E05-142, E05-143 AND E05-144 FOR QUANTITY OF JUMPER SUPPORT INSULATOR ASSEMBLIES REQUIRED FOR EACH LINE ANGLE APPLICATION. MINIMUM CLEARANCE TO ANY STRUCTURE MEMBER, WHEN JUMPER SUPPORT INSULATOR ASSEMBLY IS NOT REQUIRED, SHALL BE 4.0 METERS.

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

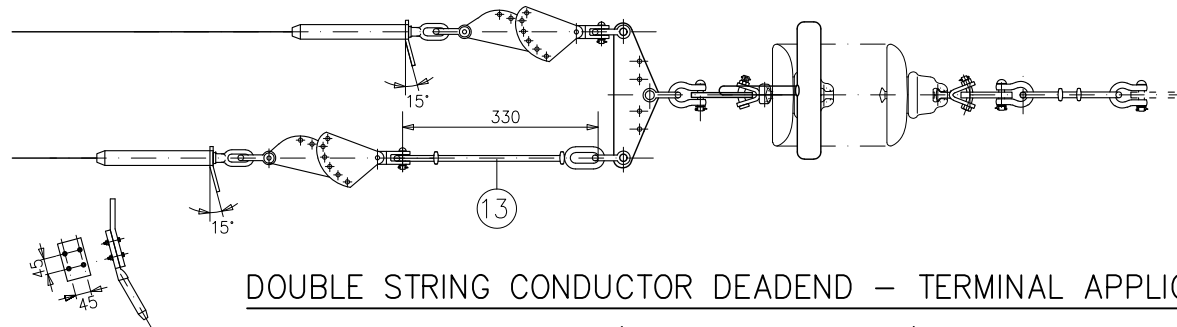
ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN ARNON W.		RECOMMENDED AND VALIDATED EITIPONG		DRAWING NAME 500 kV TRANSMISSION LINE					
DESIGNED Kitipat P		CONCURRED		DESCRIPTION OF DETAIL DRAWING					
VERIFIED Akarady D.		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		INSULATOR AND HARDWARE DETAILS FOR DEADEND ASSEMBLIES - ASSEMBLIES 13D, 13AD AND 14D					
APPROVED		DATE 24 Apr 2025		JOB NO. -		REPLACING DWG.NO. -		DWG.NO. E11-203	
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION									

MATERIAL LIST

CONDUCTOR DEADEND (SLACK SPAN SIDE)-ASSEMBLY 15D				
ITEM NO.	QUANTITY	CATALOG NO.	MINIMUM RATE STRENGTH (METRIC TON)	DESCRIPTION
1	2		16.3	ANCHOR SHACKLE W/BNC, BOLT ϕ 32 mm
2	1		16.3	CHAIN EYE-CHAIN EYE EXTENSION LINK(1800 mm)
3	1		16.3	YOKE PLATE, TRIANGULAR
4	2		16.3	BALL Y-CLEVIS
* 5	2 X 28		16.3	SUSPENSION INSULATOR; ANSI CLASS 52-8
6	2		16.3	SOCKET Y-CLEVIS
7	1		16.3	YOKE PLATE, RECTANGULAR
8	1			GRADING RING
9	12		16.3	ANCHOR SHACKLE W/BNC
10	2		16.3	YOKE PLATE, TRIANGULAR
11	4		-	COMPRESSION DEADEND ASSEMBLY WITH STEEL EYE & JUMPER TERMINAL.
12	4 SETS		12.0	TENSION ADJUSTING PLATES
13	2		12.0	90° CHAIN EYE-CHAIN EYE EXTENSION LINK (330 mm)
14	-		-	TWO BUNDLE RIGID SPACER

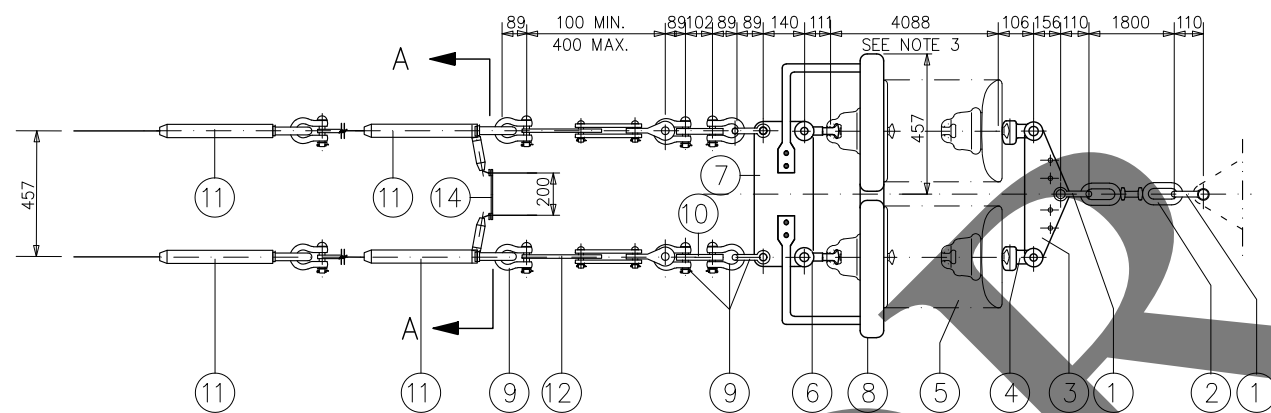


VIEW A-A

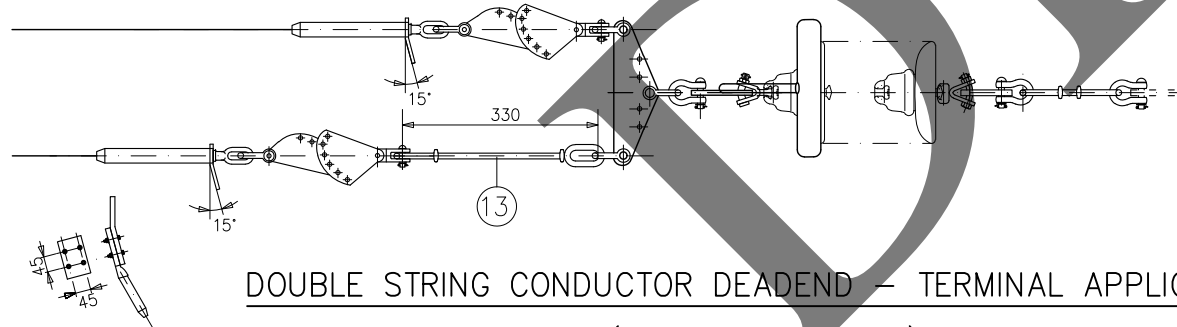


DOUBLE STRING CONDUCTOR DEADEND – TERMINAL APPLICATION
(SLACK SPAN SIDE)
ASSEMBLY 15D

NOTE 6



VIEW A-A



DOUBLE STRING CONDUCTOR DEADEND – TERMINAL APPLICATION
(SLACK SPAN SIDE)
ASSEMBLY 15D (INVERTED INSULATOR)

NOTE 6

NOTES:

- SEE DRAWING NO. E11-197 FOR GENERAL NOTES.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED.
- IN AREAS OF ANTI POLLUTION ZONE, INCREASED LEAKAGE DISTANCE WILL BE USED.
STANDARD 52-8 INSULATORS MARKED WITH * WILL BE REPLACED WITH SAME QUANTITY OF FOG TYPE 36,000 lbs. WITH 432 MM OR GREATER LEAKAGED DISTANCE,
- INSTALL FOUR (4) BUNDLE RIGID SPACERS OR SPACER DAMPERS EQUIDISTANT ALONG JUMPER LOOP LENGTH FOR DETERMINATION OF SEPARATION DISTANCE, ASSUME THE INSULATOR ASSEMBLY, YOKE (IF PRESENT) ACTS AS A FOUR BUNDLE SPACER.
- DIMENSIONS OF INDIVIDUAL HARDWARE ITEMS MAY BE VARIED PROVIDED THAT OVERALL ASSEMBLY DIMENSIONS ARE NOT CHANGED.
- COMPRESSION DEADEND FITTINGS FOR THE CONDUCTOR SHALL BE PROVIDED WITH 4 HOLE, AND FOR THE SHIELD WIRE WITH 2 HOLE,NEMA PAD TERMINALS.
- OMIT 2 SPACERS FROM ANY LOOP CONTAINING 2 SETS OF I-STRING JUMPER SUPPORT ASSEMBLIES.
- SEE DRAWING NO. E05-141, E05-142, E05-143 AND E05-144 FOR QUANTITY OF JUMPER SUPPORT INSULATOR ASSEMBLIES REQUIRED FOR EACH LINE ANGLE APPLICATION. MINIMUM CLEARANCE TO ANY STRUCTURE MEMBER, WHEN JUMPER SUPPORT INSULATOR ASSEMBLY IS NOT REQUIRED, SHALL BE 4.0 METERS.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DRAWN	ARNON W.	RECOMMENDED AND VALIDATED	Etirong	DRAWING NAME	500 kV TRANSMISSION LINE
DESIGNED	Ritipat P.	CONCURRED		DESCRIPTION OF DETAIL DRAWING	INSULATOR AND HARDWARE DETAILS FOR DEADEND ASSEMBLY – ASSEMBLY 15D
VERIFIED	Akanan D.	ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		JOB NO.	—
APPROVED	Sorarakorn	DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	DATE 24 Apr 2025	REPLACING DWG.NO.	—
				DWG.NO.	E11-204
					REV.

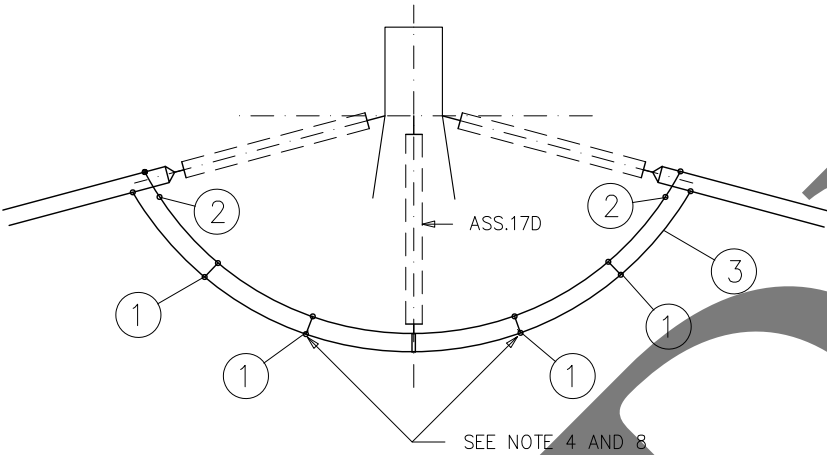
MATERIAL LIST

JUMPER SUPPORT – ASSEMBLY 17D				
ITEM NO.	QUANTITY	CATALOG NO.	MINIMUM RATE STRENGTH (METRIC TON)	DESCRIPTION
1	1		16.3	ANCHOR SHACKLE W/BNC, BOLT ϕ 19 mm
2	1		16.3	BALL EYE LINK
* 3	27		16.3	SUSPENSION INSULATOR; ANSI CLASS 52-8
4	1		16.3	SOCKET Y-CLEVIS
5	1		4.5	WEIGHT YOKE PLATE
6	4		-	ADD ON WEIGHT, 45.0 KILOGRAMS, WITH BOLTS
7	4 sets		-	ARMOR RODS
8	1		-	GRADING RING

JUMPER SUPPORT
ASSEMBLIES 17D

NOTES:

1. SEE DRAWING NO. E11-197 FOR GENERAL NOTES.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED.
3. IN AREAS OF ANTI POLLUTION ZONE, INCREASED LEAKAGE DISTANCE WILL BE USED.
STANDARD 52-8 INSULATORS MARKED WITH * WILL BE REPLACED WITH SAME QUANTITY OF FOG TYPE 36,000 lbs. WITH 432 MM OR GREATER LEAKAGED DISTANCE.
4. INSTALL FOUR (4) BUNDLE RIGID SPACERS OR SPACER DAMPERS EQUIDISTANT ALONG JUMPER LOOP LENGTH FOR DETERMINATION OF SEPARATION DISTANCE, ASSUME THE INSULATOR ASSEMBLY, YOKE (IF PRESENT) ACTS AS A FOUR BUNDLE SPACER.
5. DIMENSIONS OF INDIVIDUAL HARDWARE ITEMS MAY BE VARIED
PROVIDED THAT OVERALL ASSEMBLY DIMENSIONS ARE NOT CHANGED.
6. COMPRESSION DEADEND FITTINGS FOR THE CONDUCTOR SHALL BE PROVIDED WITH 4 HOLE,
AND FOR THE SHIELD WIRE WITH 2 HOLE,NEMA PAD TERMINALS.
7. OMIT 2 SPACERS FROM ANY LOOP CONTAINING 2- 1-STRING JUMPER SUPPORT ASSEMBLIES.
8. SEE DRAWING NO. E05-141, E05-142, E05-143 AND E05-144 FOR QUANTITY OF JUMPER SUPPORT INSULATOR ASSEMBLIES REQUIRED FOR EACH LINE ANGLE APPLICATION. MINIMUM CLEARANCE TO ANY STRUCTURE MEMBER, WHEN JUMPER SUPPORT INSULATOR ASSEMBLY IS NOT REQUIRED, SHALL BE 4.0 METERS.

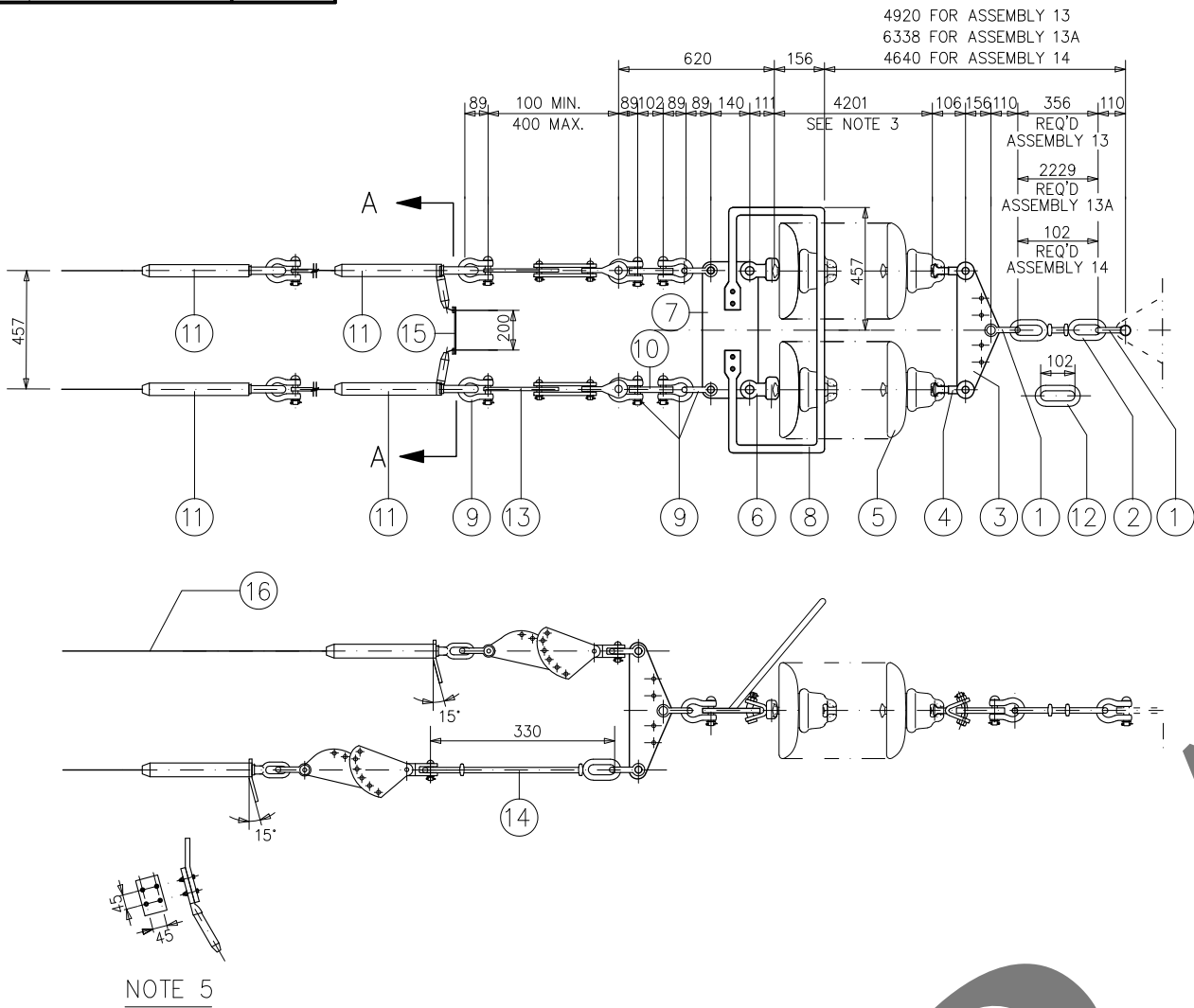


JUMPER LOOP DETAIL

- ① : FOUR BUNDLE RIGID SPACER OR SPACER/DAMPER
- ② : TWO BUNDLE RIGID SPACER
- ③ : CONDUCTOR 1272 MCM 42/7 ACSR LENGTH AS REQUIRED

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN ARNON W.		RECOMMENDED AND VALIDATED LITIPONG		DRAWING NAME 500 kV TRANSMISSION LINE					
DESIGNED Kitipong P.		CONCURRED		DESCRIPTION OF DETAIL DRAWING					
VERIFIED Akasamy D.		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		INSULATOR AND HARDWARE DETAILS FOR ASSEMBLY 17D					
APPROVED		DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		DATE 24 Apr 2025	JOB NO. -	REPLACING DWG.NO. -	DWG.NO. E11-205	-	REV. -



DOUBLE STRING CONDUCTOR DEADEND
ASSEMBLY 13, 13A, AND 14

GENERAL NOTES:

1. CONDUCTOR IS 795 MCM ACSR/GA 'CONDOR'.
2. ALL FERROUS PLATES HOT DIP GALVANIZED PER ASTM STD A-123.
3. ALL FERROUS FASTENERS HOT DIP GALVANIZED PER ASTM STD A-153.
4. ALL COTTER KEYS WILL BE HUMP BACK, STAINLESS STEEL, TYPE 304. ALL COTTER KEYS SHALL BE SPREAD TO PREVENT REMOVAL DURING SERVICE.
5. ALL HARDWARE SHALL HAVE HOT-LINE MAINTENANCE CAPABILITY.
6. ALL CONDUCTOR HARDWARE SHALL BE DESIGNED FOR CORONA-FREE EHV OPERATION.
7. ALL WELDING SHALL BE PER AWS.D1.1
8. STRENGTH OF ALL HARDWARE SHALL BE SUCH THAT THE MINIMUM STRENGTH OF THE ENTIRE ASSEMBLY IS NOT LESS THAN THAT OF THE INSULATORS OR COMBINATION OF INSULATORS USED IN THAT ASSEMBLY.

MATERIAL LIST

CONDUCTOR DEADEND				- ASSEMBLY 13 FOR DQT60 AND DQT90 STRUCTURE - ASSEMBLY 13A FOR DQT90 STRUCTURE (90°ANGLE APPLICATION), FOR DQT60 (0°/45° TERMINAL APPLICATION)* - ASSEMBLY 14 FOR DQT20 AND DQT40 STRUCTURE	
ITEM NO.	QUANTITY	CATALOG NO.	MINIMUM RATE STRENGTH (METRIC TON)	DESCRIPTION	
1	2		45.4	ANCHOR SHACKLE W/BNC, BOLT ϕ 32 mm	
2	1		45.4	CHAIN EYE-CHAIN EYE EXTENSION LINK (356 mm FOR ASSEMBLY 13 AND 2229 mm FOR ASSEMBLY 13A)	
3	1		45.4	YOKE PLATE, TRIANGULAR	
4	2		22.7	BALL Y-CLEVIS	
** 5	2 X 27		22.7	SUSPENSION INSULATOR; ANSI CLASS 52-11	
6	2		22.7	SOCKET Y-CLEVIS	
7	1		45.4	YOKE PLATE, RECTANGULAR	
8	1		-	CORONA RING	
9	12		22.7	ANCHOR SHACKLE W/BNC	
10	2		22.7	YOKE PLATE, TRIANGULAR	
11	4		-	COMPRESSION DEADEND ASSEMBLY WITH STEEL EYE & JUMPER TERMINAL.	
12	1		45.4	CHAIN LINK (102 mm) FOR ASSEMBLY 14 ONLY	
13	4 SETS		12.0	TENSION ADJUSTING PLATES	
14	2		12.0	90° CHAIN EYE-CHAIN EYE EXTENSION LINK (330 mm)	
15	-		-	TWO BUNDLE RIGID SPACER	
16	-		-	CONDUCTOR 795 MCM ACSR/GA 'CONDOR'	

* HARDWARE ASSEMBLY 13A SHALL BE USED FOR TOWER TYPE DQT60 (0°/45° TERMINAL APPLICATION) OF WHICH THE ORIENTATION ANGLE IS MORE THAN 30°

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT AS NOTED.
2. DIMENSIONS OF INDIVIDUAL HARDWARE ITEMS MAY BE VARIED PROVIDED THAT OVERALL ASSEMBLY DIMENSIONS ARE NOT CHANGED.
3. IN AREAS OF ANTI POLLUTION ZONE, INCREASED LEAKAGE DISTANCE WILL BE USED. ITEM NO. 5 (52-11 INSULATORS MARKED WITH **) WILL BE REPLACED WITH SAME QUANTITY OF FOG TYPE 50,000 lbs. WITH 545 MM OR GREATER LEAKAGE DISTANCE.
4. INSTALL FOUR (4) BUNDLE RIGID SPACERS OR SPACER DAMPERS EQUIDISTANT ALONG JUMPER LOOP LENGTH FOR DETERMINATION OF SEPARATION DISTANCE, ASSUME THE INSULATOR ASSEMBLY, YOKE (IF PRESENT) ACTS AS A FOUR BUNDLE SPACER.
5. COMPRESSION DEADEND FITTINGS FOR THE CONDUCTOR SHALL BE PROVIDED WITH 4 HOLES, AND FOR THE SHIELD WIRE WITH 2 HOLES, NEMA PAD TERMINALS.
6. OMIT 2 SPACERS FROM ANY LOOP CONTAINING 2 SETS OF I-STRING JUMPER SUPPORT ASSEMBLIES.
7. SEE DRAWING NO. E05-141, E05-142, E05-143 AND E05-144 FOR QUANTITY OF JUMPER SUPPORT INSULATOR ASSEMBLIES REQUIRED FOR EACH LINE ANGLE APPLICATION. MINIMUM CLEARANCE TO ANY STRUCTURE MEMBER, WHEN JUMPER SUPPORT INSULATOR ASSEMBLY IS NOT REQUIRED, SHALL BE 4.0 METERS.
8. SEE TOWER DRAWINGS FOR ATTACHMENT PLATE DETAILS.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DRAWN SARUTA S.		RECOMMENDED AND VALIDATED <i>Chitpong</i>		DRAWING NAME 500 kV TRANSMISSION LINE	
DESIGNED <i>Saruta S.</i>		CONCURRED		DESCRIPTION OF DETAIL DRAWING	
VERIFIED <i>Akanach D.</i>		ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		INSULATOR AND HARDWARE DETAILS FOR DEADEND ASSEMBLIES - ASSEMBLY 13, 13A, AND 14	
APPROVED		DATE 25 Jul 2025		JOB NO. NPUP-01-L03	REPLACING DWG.NO. -
DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION				DWG.NO. E11-206	REV. -

MATERIAL LIST

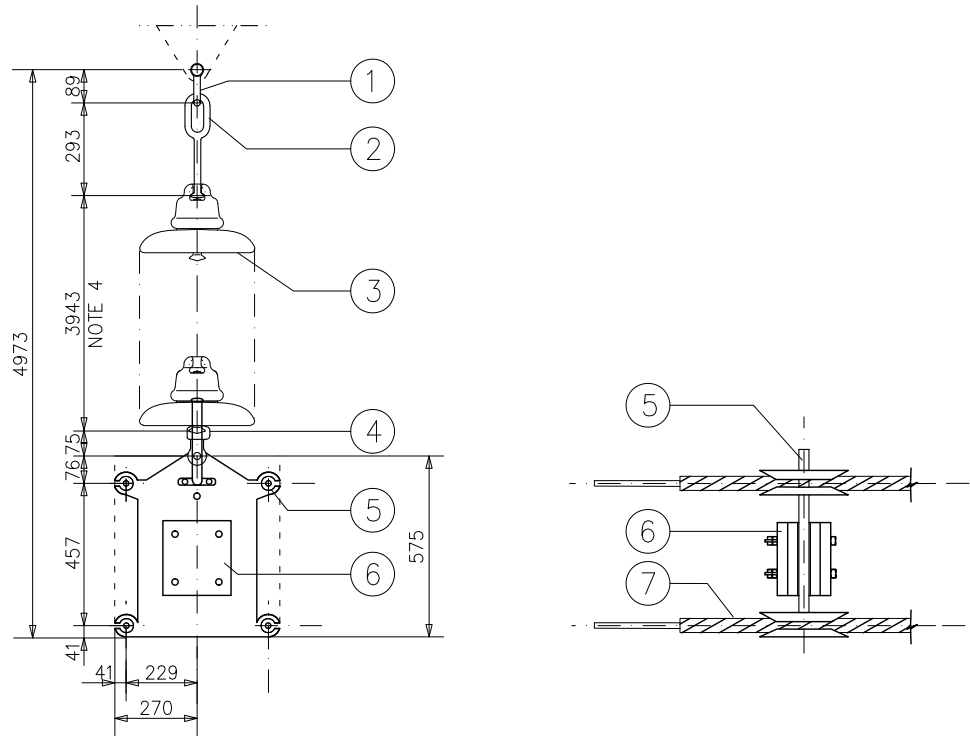
CONDUCTOR DEADEND (SLACK SPAN SIDE) – ASSEMBLY 15A				
ITEM NO.	QUANTITY	CATALOG NO.	MINIMUM RATE STRENGTH (METRIC TON)	DESCRIPTION
1	2		16.3	ANCHOR SHACKLE W/BNC, BOLT Ø 32 mm
2	1		16.3	CHAIN EYE-CHAIN EYE EXTENSION LINK (2229 mm)
3	1		16.3	YOKE PLATE, TRIANGULAR
4	2		16.3	BALL Y-CLEVIS
* 5	2 X 28		16.3	SUSPENSION INSULATOR; ANSI CLASS 52-8
6	2		16.3	SOCKET Y-CLEVIS
7	1		16.3	YOKE PLATE, RECTANGULAR
8	1		–	CORONA RING
9	12		16.3	ANCHOR SHACKLE W/BNC
10	2		16.3	YOKE PLATE, TRIANGULAR
11	4		–	COMPRESSION DEADEND ASSEMBLY WITH STEEL EYE & JUMPER TERMINAL
12	4 SETS		12.0	TENSION ADJUSTING PLATES
13	2		12.0	90° CHAIN EYE-CHAIN EYE EXTENSION LINK (330 mm)
14	–		–	TWO BUNDLE RIGID SPACER
15	–		–	CONDUCTOR 795 MCM ACSR/GA 'CONDOR'

DOUBLE STRING CONDUCTOR DEADEND – TERMINAL APPLICATION
ASSEMBLY 15A

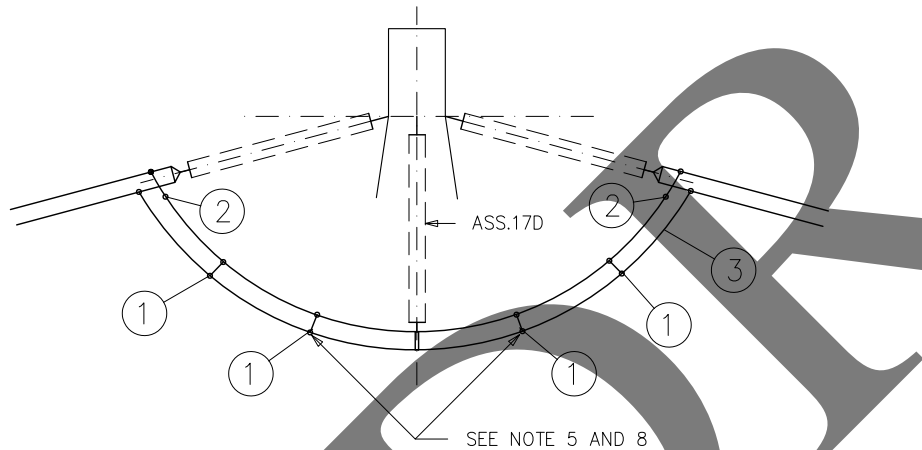
NOTES:

- SEE DRAWING NO. E11-206 FOR GENERAL NOTES.
- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT AS NOTED.
- DIMENSIONS OF INDIVIDUAL HARDWARE ITEMS MAY BE VARIED PROVIDED THAT OVERALL ASSEMBLY DIMENSIONS ARE NOT CHANGED.
- IN AREAS OF ANTI POLLUTION ZONE, INCREASED LEAKAGE DISTANCE WILL BE USED. ITEM NO. 5 (52-8 INSULATORS MARKED WITH *) WILL BE REPLACED WITH SAME QUANTITY OF FOG TYPE 36,000 lbs. WITH 432 MM OR GREATER LEAKAGE DISTANCE.
- INSTALL FOUR (4) BUNDLE RIGID SPACERS OR SPACER DAMPERS EQUIDISTANT ALONG JUMPER LOOP LENGTH FOR DETERMINATION OF SEPARATION DISTANCE, ASSUME THE INSULATOR ASSEMBLY, YOKE (IF PRESENT) ACTS AS A FOUR BUNDLE SPACER.
- COMPRESSION DEADEND FITTINGS FOR THE CONDUCTOR SHALL BE PROVIDED WITH 4 HOLES, AND FOR THE SHIELD WIRE WITH 2 HOLES, NEMA PAD TERMINALS.
- OMIT 2 SPACERS FROM ANY LOOP CONTAINING 2 SETS OF I-STRING JUMPER SUPPORT ASSEMBLIES.
- SEE DRAWING NO. E05-141, E05-142, E05-143 AND E05-144 FOR QUANTITY OF JUMPER SUPPORT INSULATOR ASSEMBLIES REQUIRED FOR EACH LINE ANGLE APPLICATION. MINIMUM CLEARANCE TO ANY STRUCTURE MEMBER, WHEN JUMPER SUPPORT INSULATOR ASSEMBLY IS NOT REQUIRED, SHALL BE 4.0 METERS.
- SEE TOWER DRAWINGS FOR ATTACHMENT PLATE DETAILS.

DOUBLE STRING CONDUCTOR DEADEND – TERMINAL APPLICATION
ASSEMBLY 15A (INVERTED INSULATOR)



JUMPER SUPPORT
ASSEMBLY 17



JUMPER LOOP DETAIL

- ① : FOUR BUNDLE RIGID SPACER OR SPACER/DAMPER
② : TWO BUNDLE RIGID SPACER
③ : CONDUCTOR 795 MCM ACSR/GA 'CONDOR' LENGTH AS REQUIRED

MATERIAL LIST

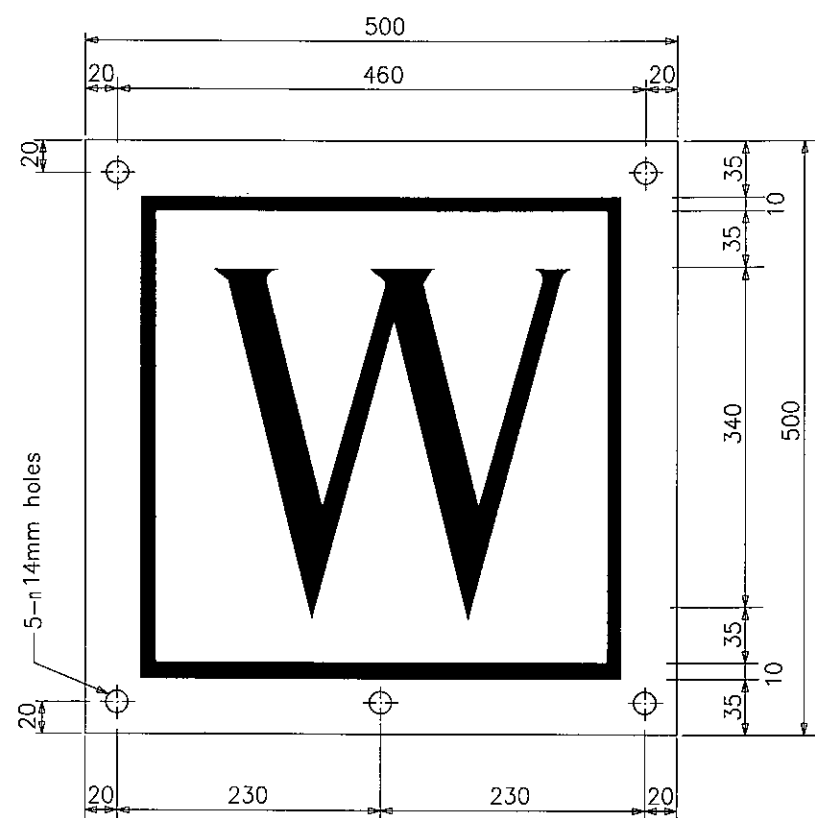
JUMPER SUPPORT – ASSEMBLY 17				
ITEM NO.	QUANTITY	CATALOG NO.	MINIMUM RATE STRENGTH (METRIC TON)	DESCRIPTION
1	1		16.3	ANCHOR SHACKLE W/BNC, BOLT ϕ 19 mm
2	1		16.3	BALL EYE LINK
* 3	27		16.3	SUSPENSION INSULATOR; ANSI CLASS 52–8
4	1		16.3	SOCKET Y–CLEVIS
5	1		4.5	WEIGHT YOKE PLATE
6	4		–	ADD ON WEIGHT, 45.0 KILOGRAMS, WITH BOLTS
7	4 sets		–	ARMOR RODS

NOTES:

- SEE DRAWING NO. E11–206 FOR GENERAL NOTES.
- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT AS NOTED.
- DIMENSIONS OF INDIVIDUAL HARDWARE ITEMS MAY BE VARIED PROVIDED THAT OVERALL ASSEMBLY DIMENSIONS ARE NOT CHANGED.
- IN AREAS OF ANTI POLLUTION ZONE, INCREASED LEAKAGE DISTANCE WILL BE USED. ITEM NO. 5 (52–8 INSULATORS MARKED WITH *) WILL BE REPLACED WITH SAME QUANTITY OF FOG TYPE 36,000 lbs. WITH 432 MM OR GREATER LEAKAGE DISTANCE.
- INSTALL FOUR (4) BUNDLE RIGID SPACERS OR SPACER DAMPERS EQUIDISTANT ALONG JUMPER LOOP LENGTH FOR DETERMINATION OF SEPARATION DISTANCE, ASSUME THE INSULATOR ASSEMBLY, YOKE (IF PRESENT) ACTS AS A FOUR BUNDLE SPACER.
- COMPRESSION DEADEND FITTINGS FOR THE CONDUCTOR SHALL BE PROVIDED WITH 4 HOLES, AND FOR THE SHIELD WIRE WITH 2 HOLES, NEMA PAD TERMINALS.
- OMIT 2 SPACERS FROM ANY LOOP CONTAINING 2 SETS OF I–STRING JUMPER SUPPORT ASSEMBLIES.
- SEE DRAWING NO. E05–141, E05–142, E05–143 AND E05–144 FOR QUANTITY OF JUMPER SUPPORT INSULATOR ASSEMBLIES REQUIRED FOR EACH LINE ANGLE APPLICATION. MINIMUM CLEARANCE TO ANY STRUCTURE MEMBER, WHEN JUMPER SUPPORT INSULATOR ASSEMBLY IS NOT REQUIRED, SHALL BE 4.0 METERS.
- SEE TOWER DRAWINGS FOR ATTACHMENT PLATE DETAILS.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DRAWN	SARUTA S.	RECOMMENDED AND VALIDATED	LEIPONG	DRAWING NAME	500 kV TRANSMISSION LINE
DESIGNED	SARUTA S.	CONCURRED		DESCRIPTION OF DETAIL DRAWING	INSULATOR AND HARDWARE DETAILS FOR ASSEMBLY 17
VERIFIED	AKHARACHIT D.	ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION		JOB NO.	NPUP–01–L03
APPROVED				REPLACING DWG.NO.	–
				DWG.NO.	E11–208

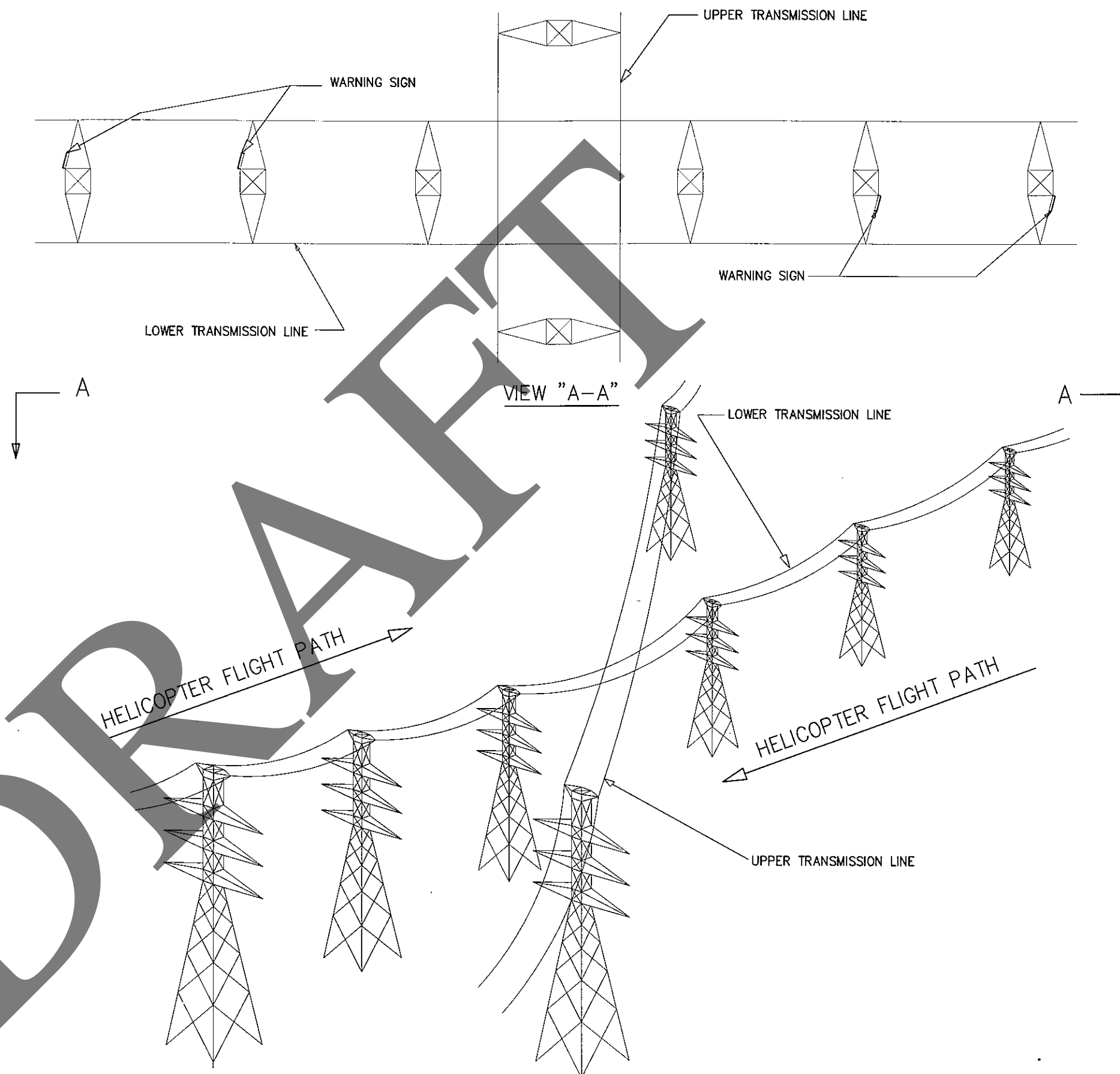


WARNING SIGN

WARNING SIGN COLOR	
FIGURE	BLACK
BACKGROUND	ORANGE

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. THE WARNING SIGNS SHALL BE POSITIONED AS FOLLOWS :
 - 2.1 ON THE FRONT MEMBERS OF THE LEFT OVERHEAD GROUND WIRE ARMS IN THE APPROACHING DIRECTION TO THE CROSSING AS SHOWN.
 - 2.2 ON TWO TOWERS BACK AND AHEAD OF THE LAST TOWER OF THE LOWER TRANSMISSION LINE PRIOR TO THE CROSSING.



ISO
TSEB1999

CAD
CENTER

DO NOT AMEND
MANUALLY

FILENAME E21-037

92

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DRAWN	P. CHAIWAT	VALIDATED	
DESIGNED	P. CHAIWAT	RECOMMENDED	
VERIFIED	J. NAWAT	CONCURRED	
APPROVED			
DATE	24/07/13	JOB NO.	
REPLACING DWG. NO.		DWG. NO.	E21-037
REV.			

ASSISTANT GOVERNOR - TRANSMISSION SYSTEM ENGINEERING

INSTALLATION OF WARNING SIGNS

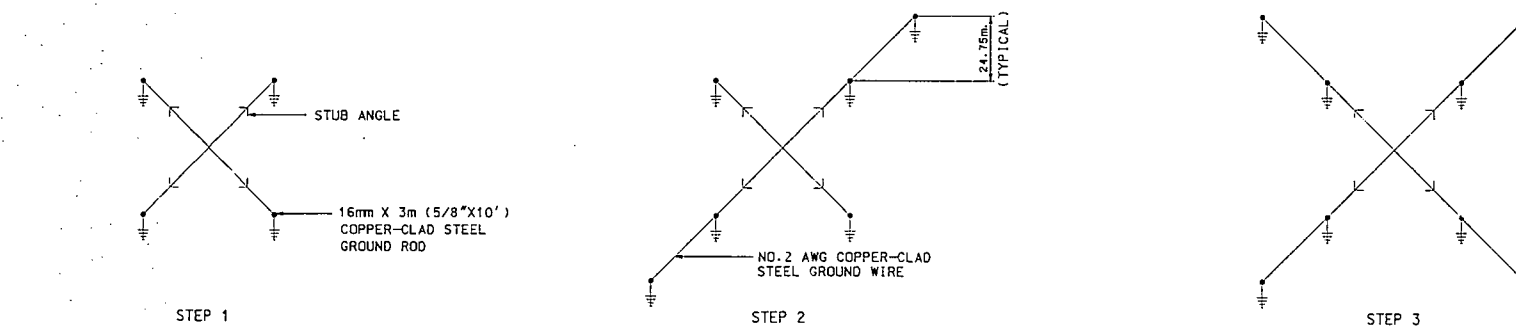
MATERIAL LIST

ITEM NO.	DESCRIPTION	QUANTITY (PER TOWER)				
		STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
1	8 AWG-DEAD SOFT GALVANIZED STEEL WIRE.	12m. * 16m.	-	-	-	-
2	NO.2 AWG. COPPER-CLAD STEEL WIRE.	75m.	70m.*	70m.*	100m.*	100m.*
3	EXOTHERMIC CONNECTOR TYPE CS FOR CABLE TO STEEL SURFACE. (SEE DETAIL "A" & "D")	4	-	-	-	-
4	EXOTHERMIC CONNECTOR TYPE CR1 FOR PARALLEL CABLE TO GROUND ROD. (SEE DETAIL "B")	4	2	2	-	-
5	EXOTHERMIC CONNECTOR TYPE CR2 FOR PERPENDICULAR CABLE TO GROUND ROD. (SEE DETAIL "B")	4	-	-	2	2
6	EXOTHERMIC CONNECTOR TYPE CC FOR CABLE TO CABLE. (SEE DETAIL "C")	-	2	2	-	-
7	16 mm x 3 m. (5/8" x 10') COPPER CLAD STEEL GROUND ROD.	4	2	2	-	-

X FOR STUB ANGLE TYPE 2
 XX QUANTITY IS ADDITIONAL TO PREVIOUS STEP
 XXX EXAMPLE: TOTAL QUANTITY REQUIRED IN STEP 3 IS 200-245 M.
 IF REQUIRED BY EGAT, THE QUANTITY SHALL BE CHANGED FROM 4 TO 8

NOTES

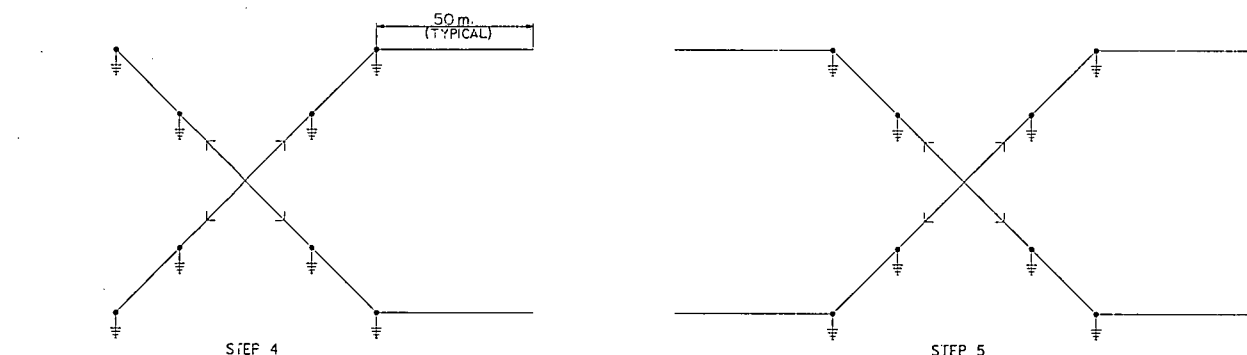
- STEP 1 GROUNDING IS TO BE INSTALLED SUBSEQUENT TO EXCAVATION BUT PRIOR TO PLACEMENT OF FOUNDATION. ADDITIONAL STEPS, IF REQUIRED, ARE TO BE INSTALLED AFTER FOUNDATION WORK HAS BEEN COMPLETED.
- IF TOWER FOOTING RESISTANCE MEASURED AFTER INSTALLATION OF STEP 1 IS GREATER THAN 10 OHMS, PIGTAIL FOR CONNECTION OF COUNTERPOISE SHALL BE LEFT EXTENDING FROM FOUNDATION AS SHOWN.
- IF TOWER FOOTING RESISTANCE MEASURED AFTER INSTALLATION OF STEP 5 IS GREATER THAN 10 OHMS, ADDITIONAL GROUNDING MAY BE INSTALLED AT THE DISCRETION OF EGAT.
- THE USE OF SECTIONAL GROUND RODS IN ANY STEP MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
- THE QUANTITY OF NO.2 AWG. COPPER-CLAD STEEL WIRE SHOWN ON TABLE "MATERIAL LIST" IS APPROXIMATE AND PROVIDED AS PRIMARY INFORMATION ONLY. HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CAREFULLY EXAMINING THE EXACT QUANTITY.



STEP 1
 BOND STUB ANGLES TO FOUNDATION REINFORCING STEEL. CONNECT DIAGONALLY OPPOSITE LEGS AND INSTALL GROUND RODS AS SHOWN. MEASURE TOWER FOOTING RESISTANCE.

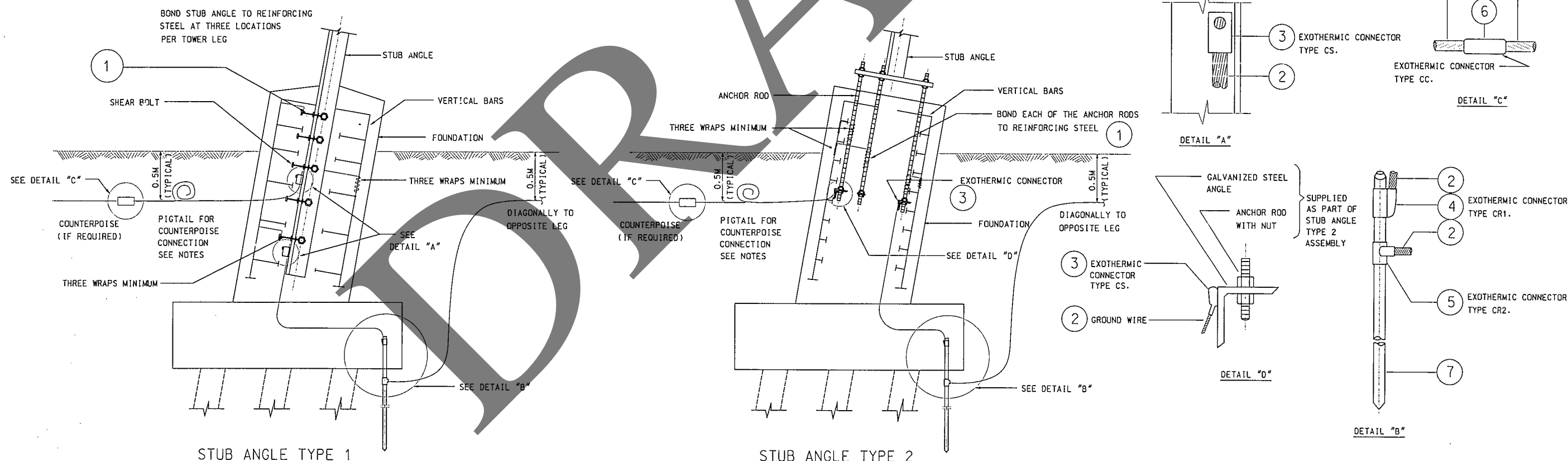
STEP 2
 TO BE USED IF THE FOOTING RESISTANCE MEASURED IN STEP 1 IS GREATER THAN 10 OHMS. CONNECT TWO DIAGONALLY OPPOSITE GROUND RODS TO TWO ADDITIONAL GROUND RODS AS SHOWN. MEASURE TOWER FOOTING RESISTANCE.

STEP 3
 TO BE USED IF THE FOOTING RESISTANCE MEASURED IN STEP 2 IS GREATER THAN 10 OHMS. CONNECT REMAINING TWO GROUND RODS ALONG SECOND TOWER DIAGONAL TO TWO ADDITIONAL GROUND RODS AS SHOWN. MEASURE TOWER FOOTING RESISTANCE.



STEP 4
 TO BE USED IF THE FOOTING RESISTANCE MEASURED IN STEP 3 IS GREATER THAN 10 OHMS. INSTALL COUNTERPOISE PARALLEL TO PHASE CONDUCTORS ON ONE SIDE OF TOWER AS SHOWN. MEASURE TOWER FOOTING RESISTANCE.

STEP 5
 TO BE USED IF THE FOOTING RESISTANCE MEASURED IN STEP 4 IS GREATER THAN 10 OHMS. INSTALL COUNTERPOISE PARALLEL TO PHASE CONDUCTORS ON SECOND SIDE OF TOWER AS SHOWN. MEASURE TOWER FOOTING RESISTANCE.



STUB ANGLE TYPE 1

STUB ANGLE TYPE 2

ISO
 TSEB 1999

CAD
 CENTER

DO NOT AMEND
 MANUALLY

REV. NO. JOB NO. JOB DESCRIPTION

DATE JULY 20, 2007

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DESIGNED V. PHUCHONG
 CHECKED P. PITHAK
 APPROVED P. PITHAK
 DATE 27/7/07

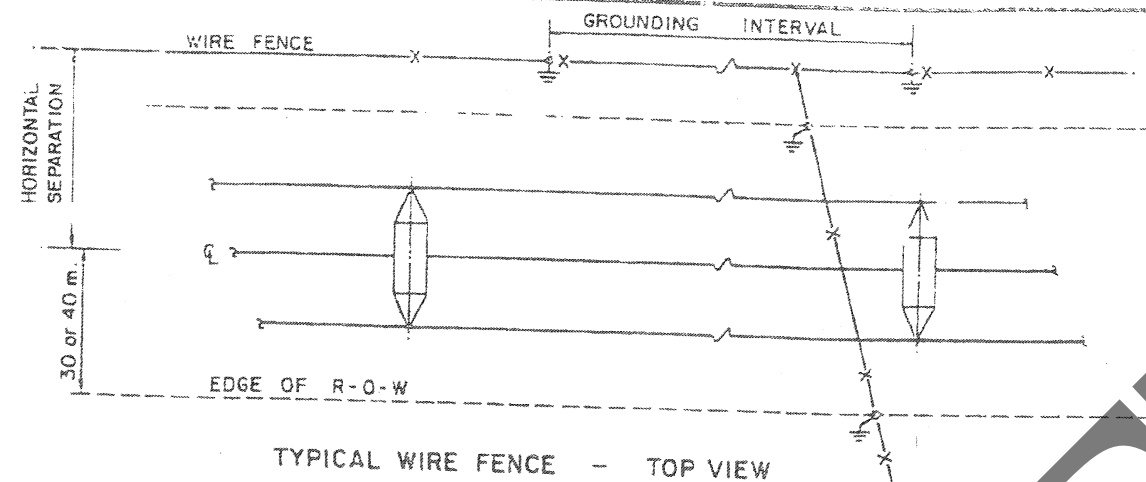
500 KV TRANSMISSION LINE

TOWER GROUNDING

JOB NO. REPLACING DWG. NO. DWG. NO. E31-003

TABLE 1

AVERAGE HORIZONTAL SEPARATION	APPROXIMATE GROUNDING INTERVAL
30 m.	25 m.
40 m.	35 m.
50 m.	45 m.
100 m.	60 m.



TYPICAL WIRE FENCE - TOP VIEW

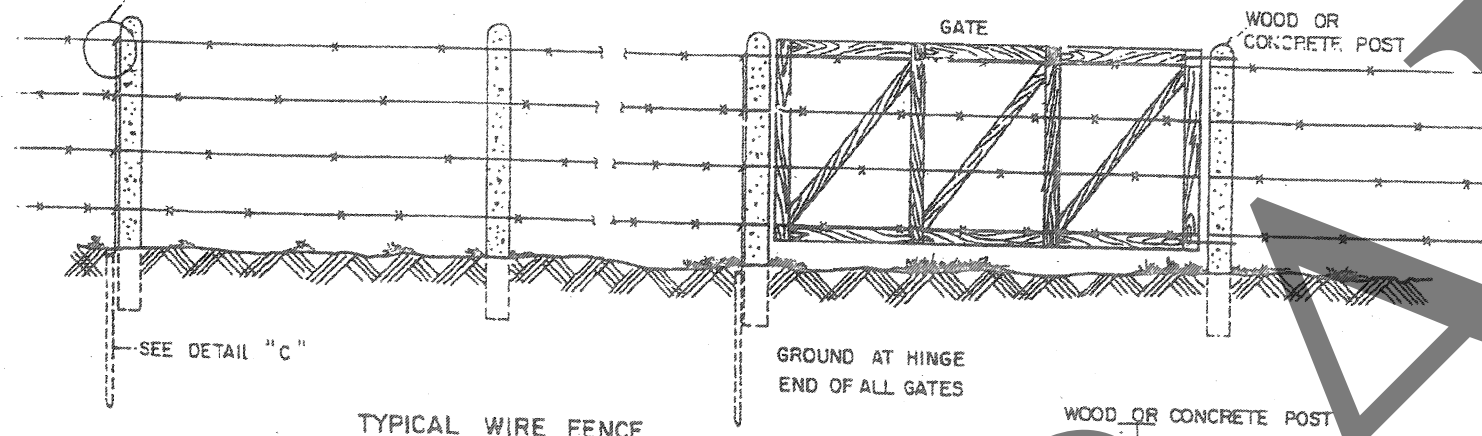
BILL OF MATERIAL

ITEM NO.	DESCRIPTION	QUANTITY PER FENCE GROUND	QUANTITY PER METAL OBJECT GND.
①	16 mm X 3 m. (5/8" X 10') GALVANIZED STEEL GND. ROD	1	1
②	GALVANIZED DOUBLE SADDLE GROUND ROD CLAMP	1	1
③	8 mm (5/16") 7-STRAND GALVANIZED STEEL GROUND WIRE	2 m.	AS REQ'D (EST. 6 m.)
④	GALVANIZED CRIMPET	AS REQ'D (EST. 4)	—
⑤	19 mm. DIA. BRONZE SPLIT BOLT	—	AS REQ'D (EST. 1)
⑥	9.5 mm. (3/8") GALVANIZED STEEL STAPLES	—	AS REQ'D (EST. 14)

NOTES

- FENCES CROSSING UNDER THE 500 KV TRANSMISSION LINE ARE TO BE GROUNDED AT EACH EDGE OF THE RIGHT OF WAY. FENCES PARALLELING THE TRANSMISSION LINE ARE TO BE GROUNDED AT INTERVALS GIVEN IN TABLE 1. GROUNDING INTERVALS MAY BE ADJUSTED AT THE DISCRETION OF EGAT.
- ALL LARGE CONDUCTING OBJECTS OR LARGE PARTS OF OBJECTS WITHIN 60 METERS OF THE TRANSMISSION LINE CENTERLINE ARE TO BE GROUNDED, THIS REQUIREMENT MAY BE VARIED AT THE DISCRETION OF EGAT.
- ALL FENCE WIRE AND METAL SURFACES TO WHICH GROUND WIRES ARE TO BE CONNECTED SHALL BE CLEANED OF SCALE AND RUST AND THEN COATED WITH AN OXIDE-INHIBITING COMPOUND.
- EGAT WILL DETERMINE WHAT GROUNDING, IF ANY, IS REQUIRED FOR ELECTRIC FENCES.
- GALVANIZING SHALL BE IN ACCORDANCE WITH ASTM A153 EXCEPT THAT THE WEIGHT OF ZINC COATING SHALL EXCEED THAT REQUIRED BY ASTM BY THIRTY PERCENT.

SEE DETAIL "A"



TYPICAL WIRE FENCE

SEE DETAIL "B"

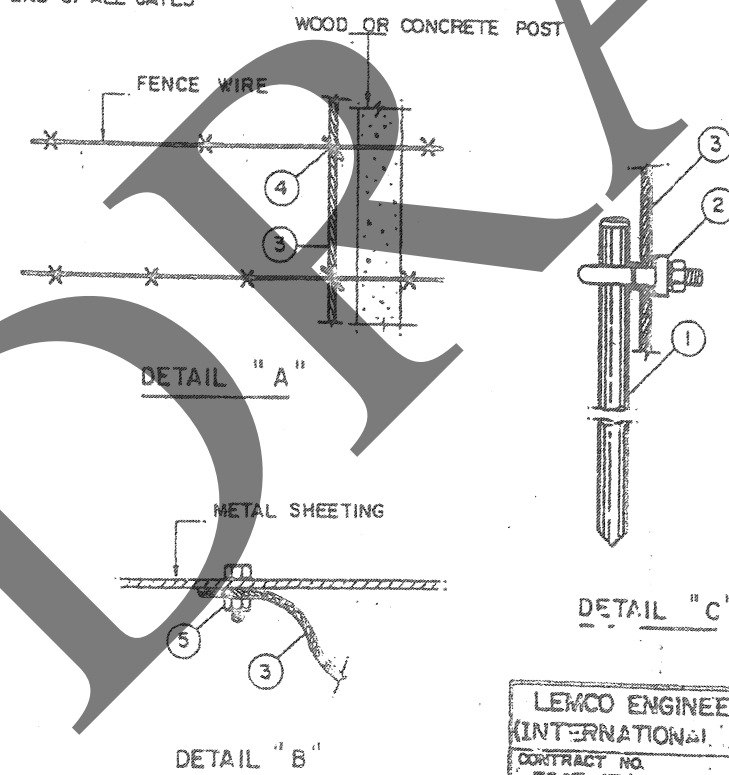
DRIIP LOOP

STAPLE GROUND WIRE THROUGH METAL SHEETING AND INTO BUILDING FRAMING EVERY 0.5 METER

⑥

SEE DETAIL "C"

TYPICAL METAL STRUCTURE



DETAIL "C"

LEMCO ENGINEERS
(INTERNATIONAL, INC.)

CONTRACT NO.
EGAT 47/1-30-5036

REVIEWED

CHECKED

SUBMITTED

RECOMMENDED

PROJECT MANAGER

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DESIGNED BY: [Signature]

DESIGNED BY: [Signature]

DRAWN BY: [Signature]

CHECKED BY: [Signature]

APPROVED BY: [Signature]

DATE: [Date]

500 KV TRANSMISSION SYSTEM PROJECT

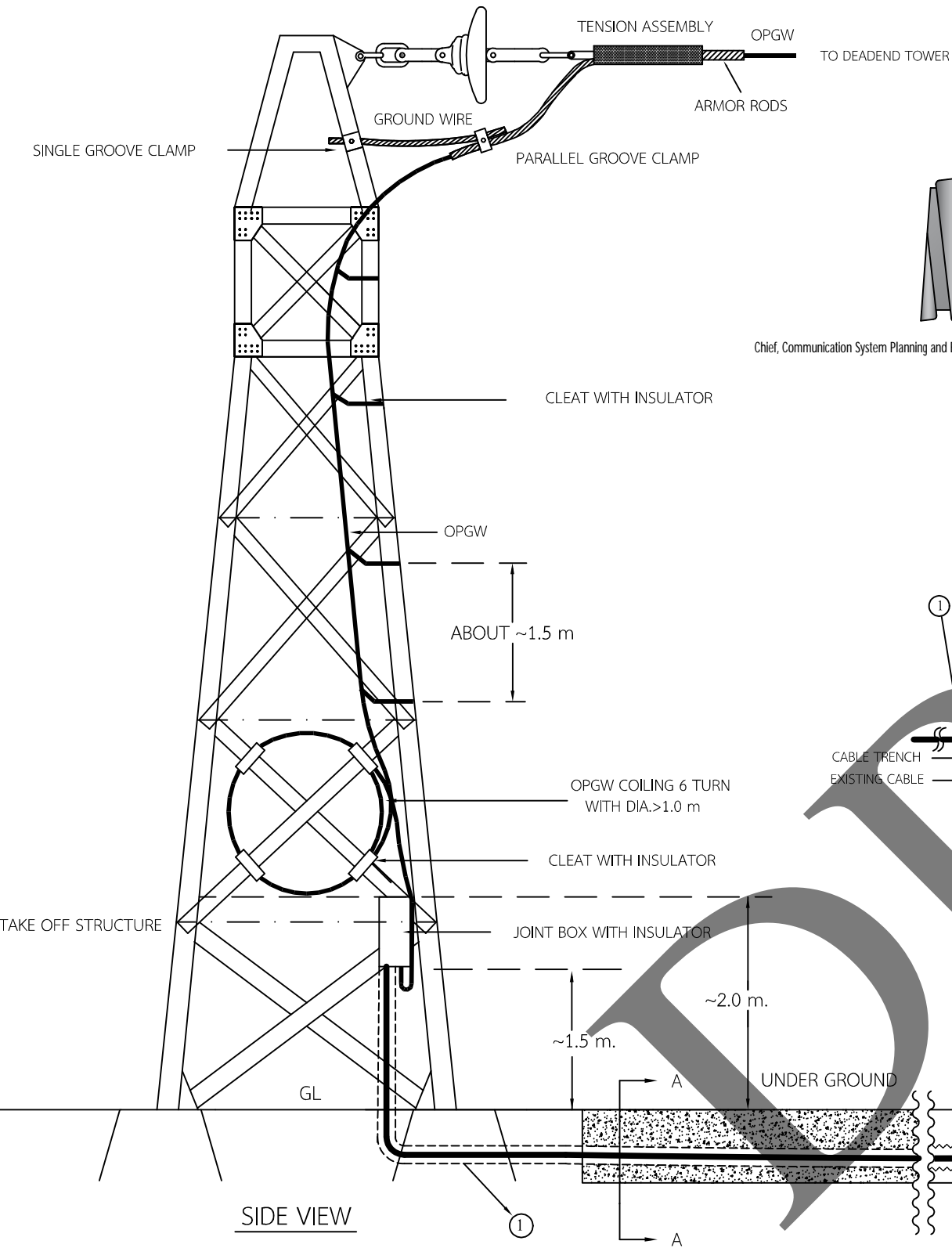
FENCE / METAL OBJECT GROUNDING
500 KV TRANSMISSION SYSTEM

JOB NO. [Number] REPLACING Dwg. No. [Number] Dwg. No. [Number]

MM-EHVLS-T-15.2 500 KV-T-15.2

NO.	DATE	REVISION	CONCURRED	APPROVED
1	11.91	REVISED TITLE BLOCK FOR FUTURE ENVL. PROJECT		

TAKE OFF STRUCTURE WITH INSULATOR ANSI CLASS 52-4 OR EQUIVALENT OR AS SPECIFIED ELSEWHERE



NAME PLATE :

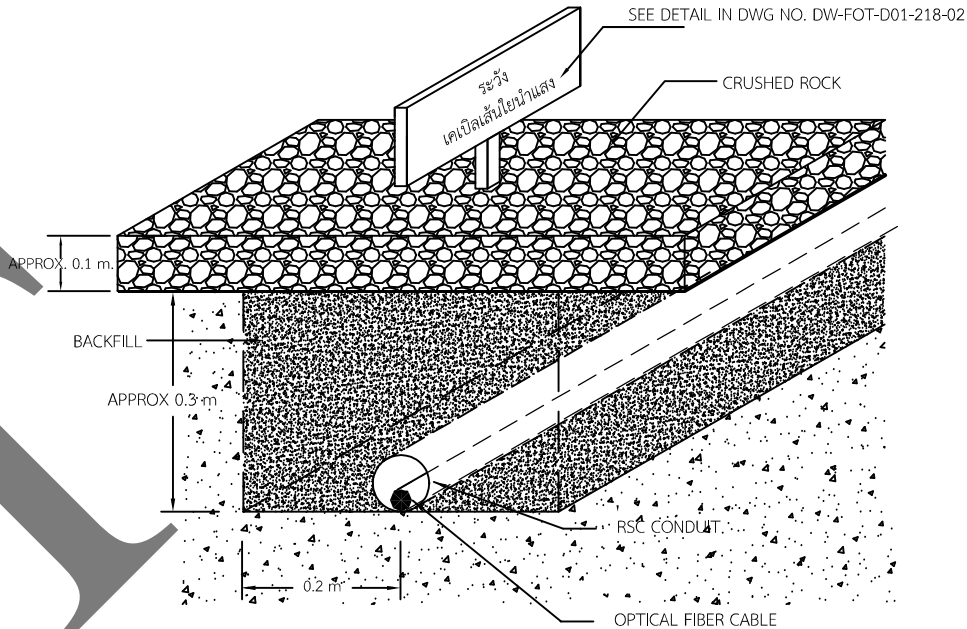
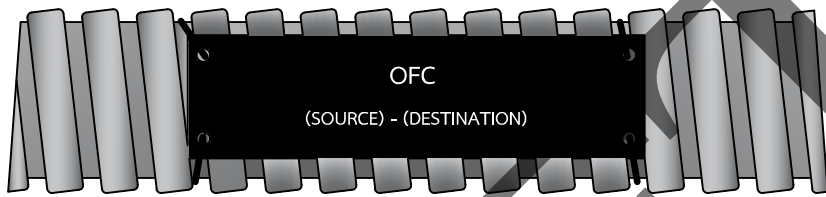
AN ALUMINUM NAME PLATE, FEATURING A BLACK-PAINTED BACKGROUND WITH STAMPED OR ENGRAVED WHITE-PAINTED CHARACTERS, SHALL BE INSTALLED ON EFLEX LOCATED IN CABLE TRENCH.

NOTE :

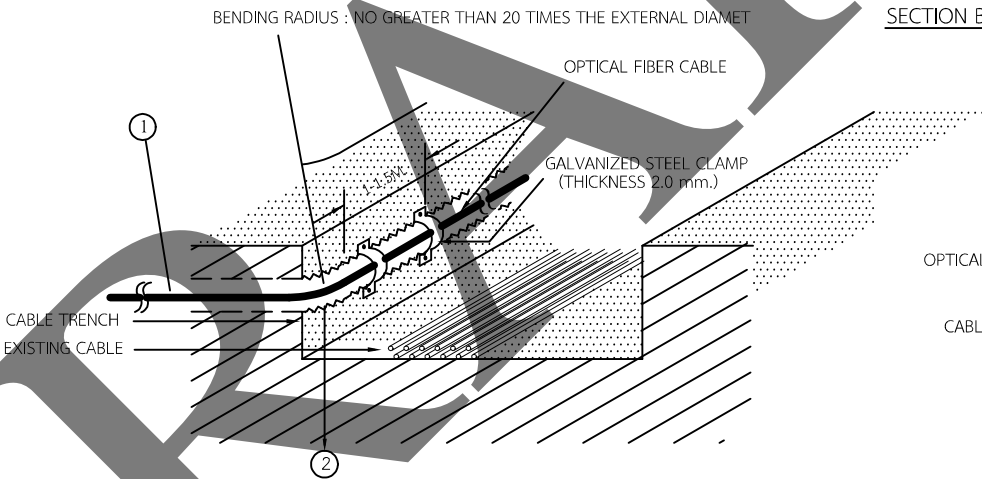
THE NAME PLATE SHALL BE INSTALLED AT BOTH THE STARTING AND ENDING POINT OF THE CONDUIT, AT INTERVALS OF EVERY 50 METERS AND AT THE STARTING AND ENDING POINT OF ANY BENDS OR DIRECTIONAL CHANGES.

Chief, Communication System Planning and Engineering Department

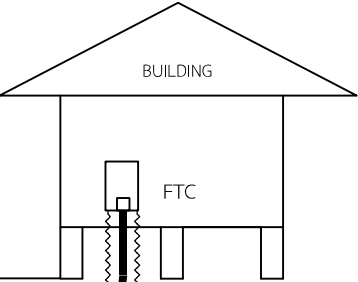
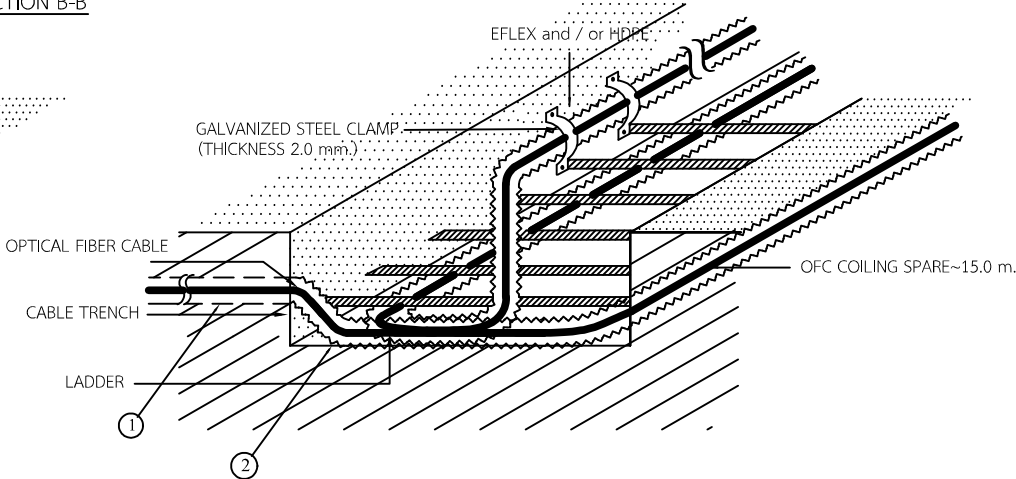
LABEL OF EFLEX CONDUIT IN CABLE TRENCH



SECTION A-A (UNDER GROUND)



SECTION B-B



SUBSTATION

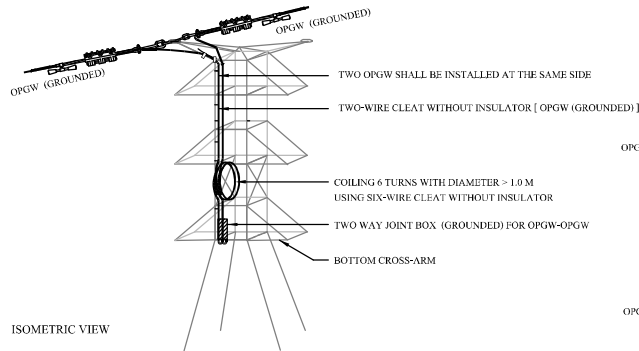
NOTE

- ① = OFC IN RSC 1.25"
② = OFC IN EFLEX and / or HDPE 30 mm.

		DESIGNED.....WARISA K.	REVISED BY..... <i>S. Watchara</i>	ELECTRICITY GENERATING AUTHORITY OF THAILAND		REVISION	
		DRAWN..... <i>J.Manu</i>	(..... <i>Mr. Watchara Sukviyan</i>)	COMMUNICATION SYSTEM DIVISION		0008	
30MAY16	EDIT "UNDER GROUND DEPTH"	CHECKED.....WARISA K.	18 May 2025 DATE	DRAWING NAME		DWG. NO.	
26APR13	ADD "OR EQUIVALENT ANSI TYPE"	APPROVED BY <i>S. Watchara</i>	18 May 2025 DATE	CONFIGURATION OF OFC AND OPGW WITH INSULATOR (TAKE OFF STRUCTURE TO BUILDING)		DW-FOT-D01-202	
DATE	DESCRIPTION	Chief, Communication System Planning and Engineering Department		REGION/STATION		-02	
				EQUIPMENT		96	
				PROJECT		CPE JOB NO.	
				PAGE NO. P1			

TYPE AND INSTALLATION OF JONT BOX FOR 115 KV , 230 KV & 500 KV (GROUNDED)

TWO WAY JOINT BOX (GROUNDED) FOR OPGW-OPGW



ISOMETRIC VIEW

TOP VIEW

NOTE:
OPGW = COMPOSITED OVERHEAD GROUND WIRE WITH OPTICAL FIBER
NM = NON-METALLIC OPTICAL FIBER CABLE

= JOIN BOX FOR OPGW-OPGW

= JOIN BOX FOR OPGW-OFC

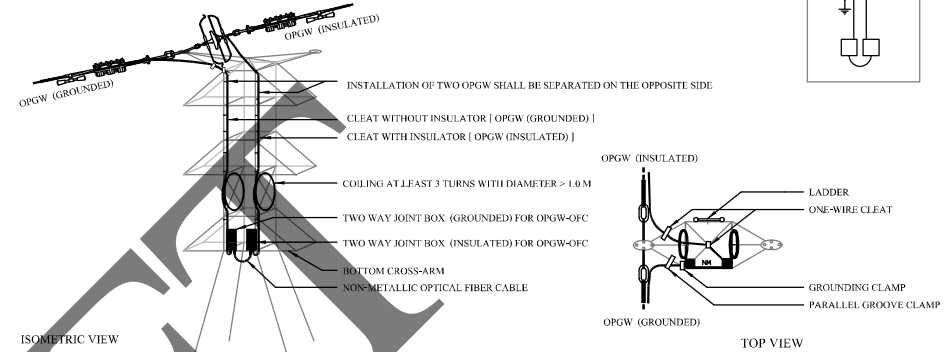
= OPGW TENSION (GROUNDED)

= OPGW TENSION (INSULATED)

* JUMPER CLAMPS SHALL BE PROVIDED & INSTALLED IF SPECIFIED IN PRICE SCHEDULE

TYPE AND INSTALLATION OF JONT BOX FOR 500 KV (GROUNDED & INSULATED)

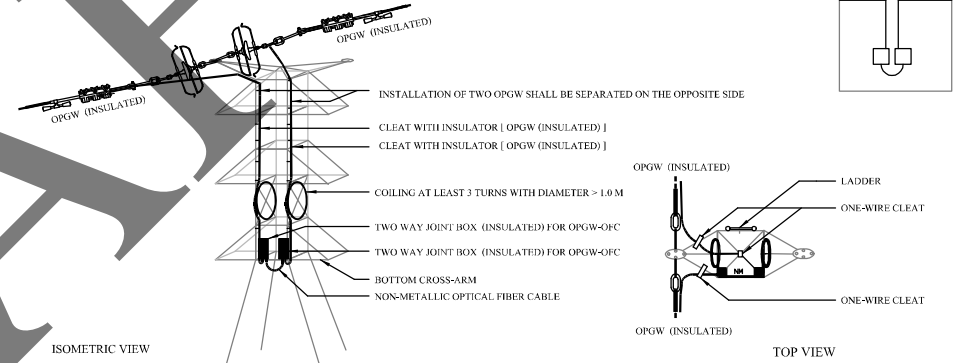
TWO WAY JOINT BOX (GROUNDED) FOR OPGW- OFC AND TWO WAY JOINTBOX (INSULATED) FOR OPGW- OFC



ISOMETRIC VIEW

TOP VIEW

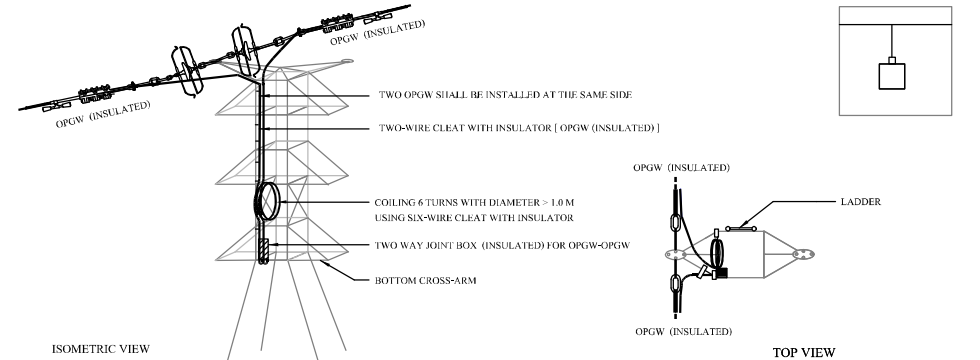
TWO WAY JOINT BOX (INSULATED) OPGW- OFC AND TWO WAY JOINTBOX (INSULATED) FOR OPGW- OFC



ISOMETRIC VIEW

TOP VIEW

TWO WAY JOINT BOX (INSULATED) OPGW- OPGW



ISOMETRIC VIEW

TOP VIEW

DATE	DESCRIPTION

DESIGNED... J.Saelao

DRAWN... Jatupon

CHECKED... J.Saelao

APPROVED BY... J.Saelao

REVISED BY... S.Watchara

(Watchara Sukvinyan...)

30/09/2025
DATE30/09/2025
DATE

(Somprasong/Pattanakunchareonkij)

ELECTRICITY GENERATING AUTHORITY OF THAILAND
COMMUNICATION SYSTEM DIVISION

DRAWING NAME TYPE AND INSTALLATION OF JOINT BOX

REGION/STATION TYPICAL

EQUIPMENT

OPGW & OFC

PROJECT

PAGE NO.

P1

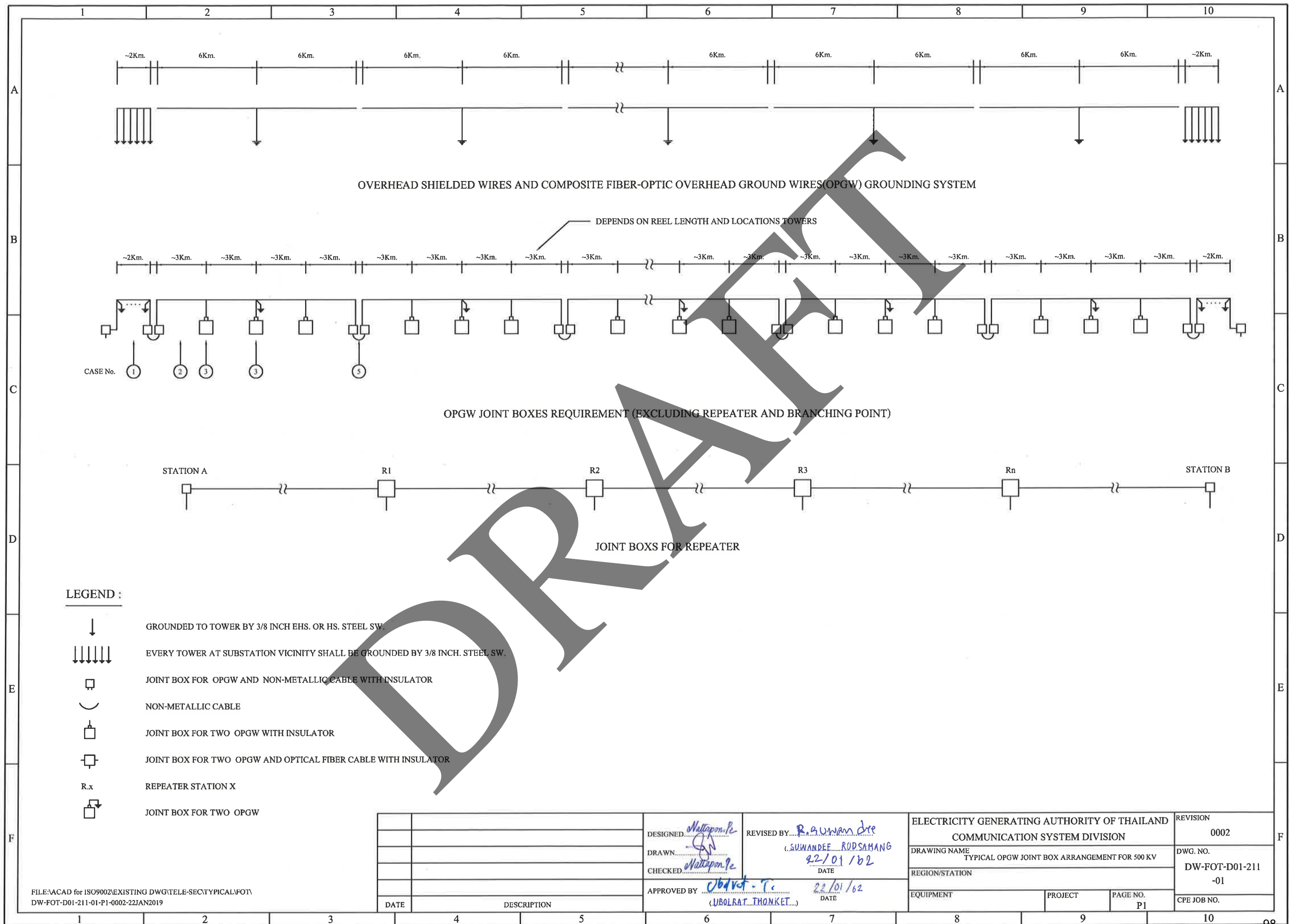
REVISION

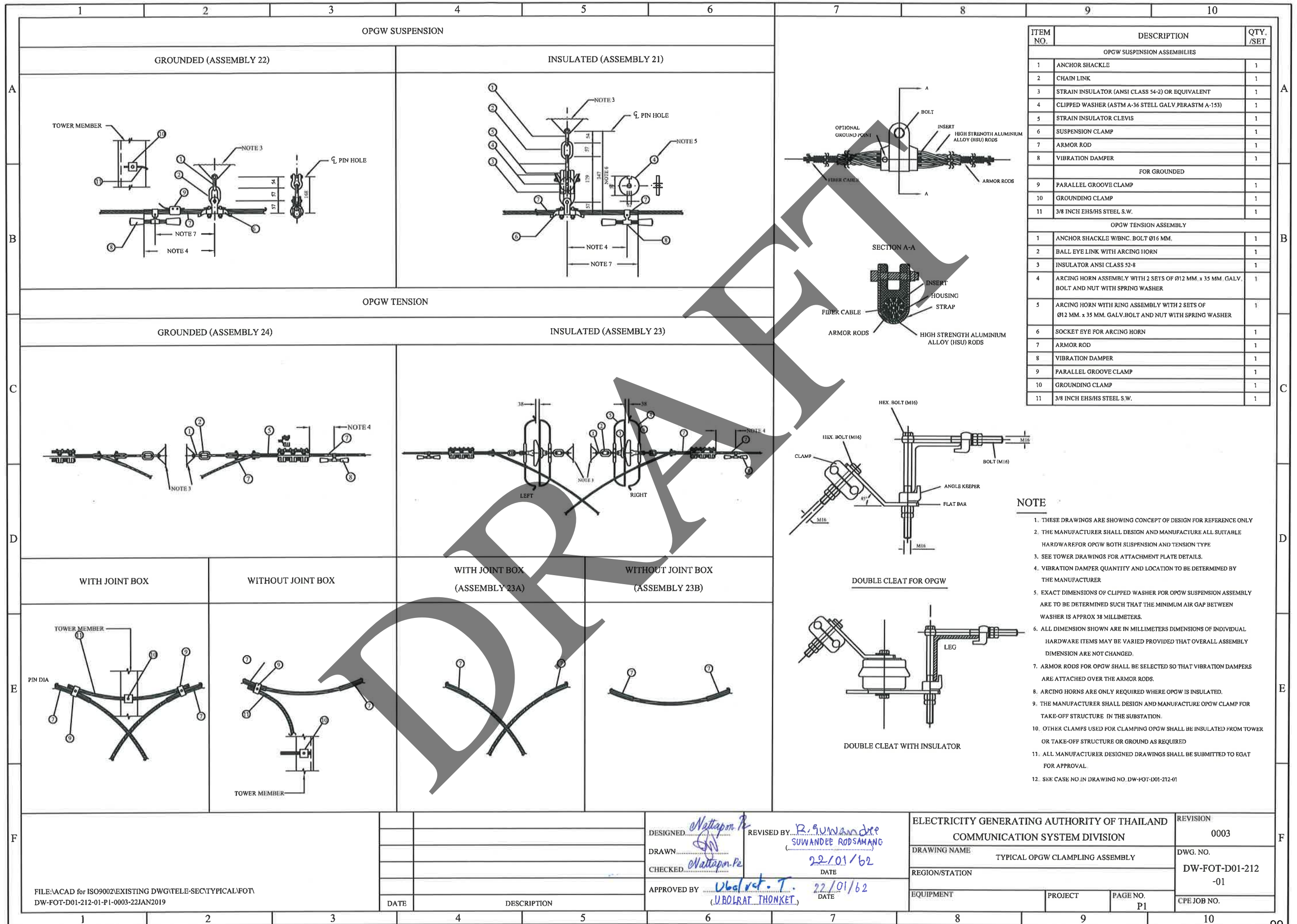
0004

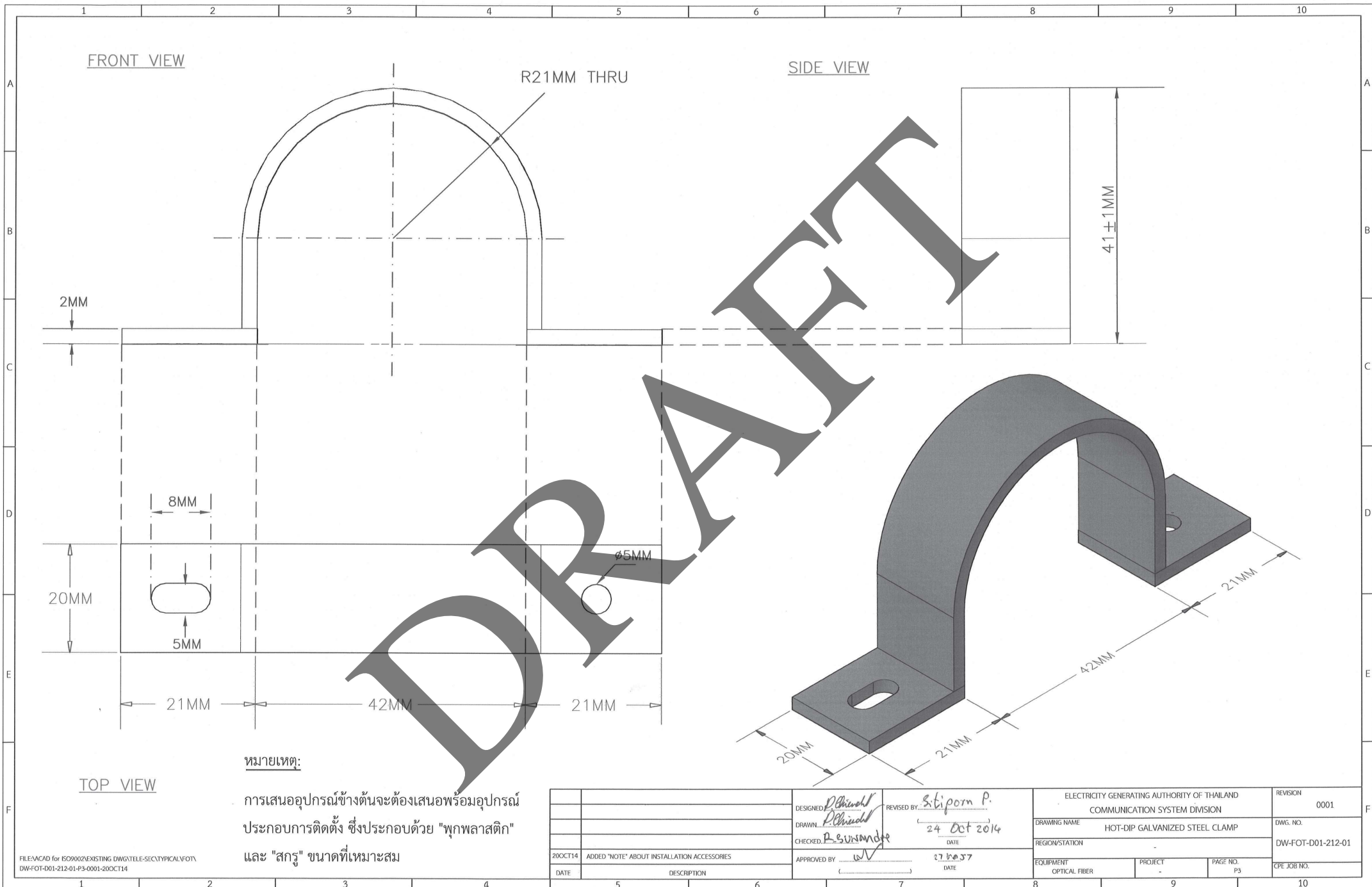
DWG. NO.

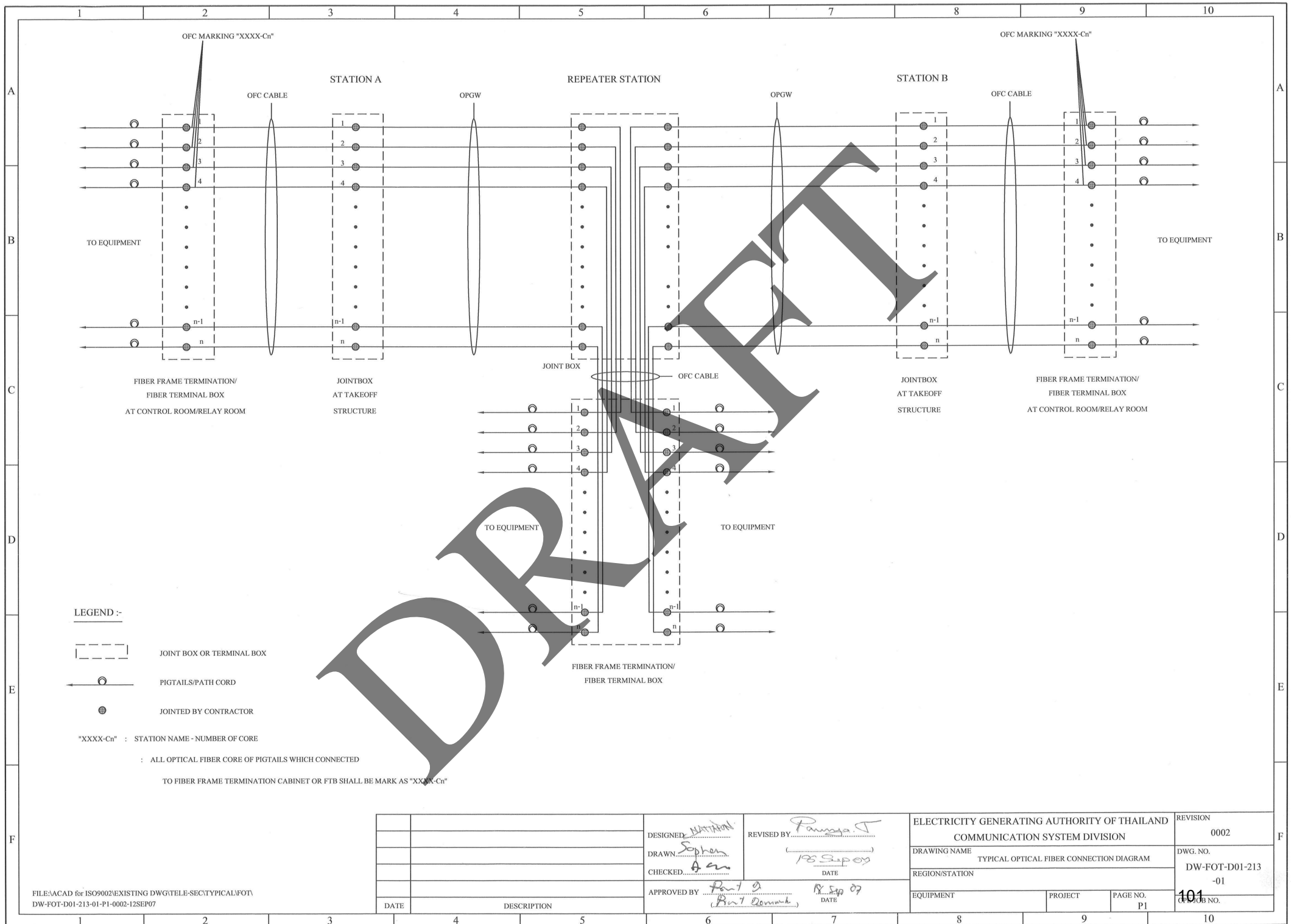
DW-FOT-D01-207-01

CPE JOB NO.









LEGEND :-



JOINT BOX OR TERMINAL BOX



PIGTAILS/PATH CORD



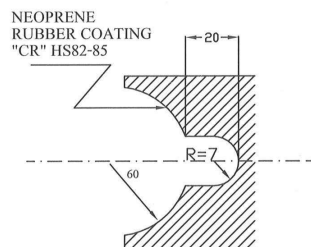
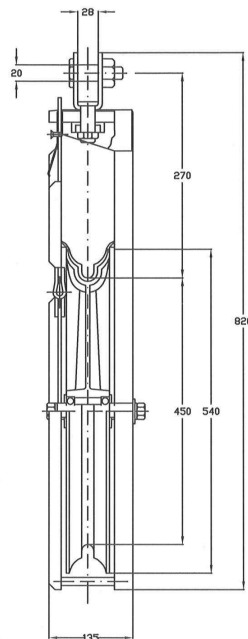
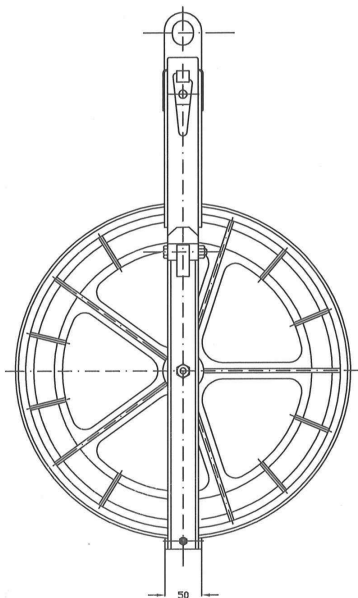
JOINTED BY CONTRACTOR

"XXXX-Cn" : STATION NAME - NUMBER OF CORE

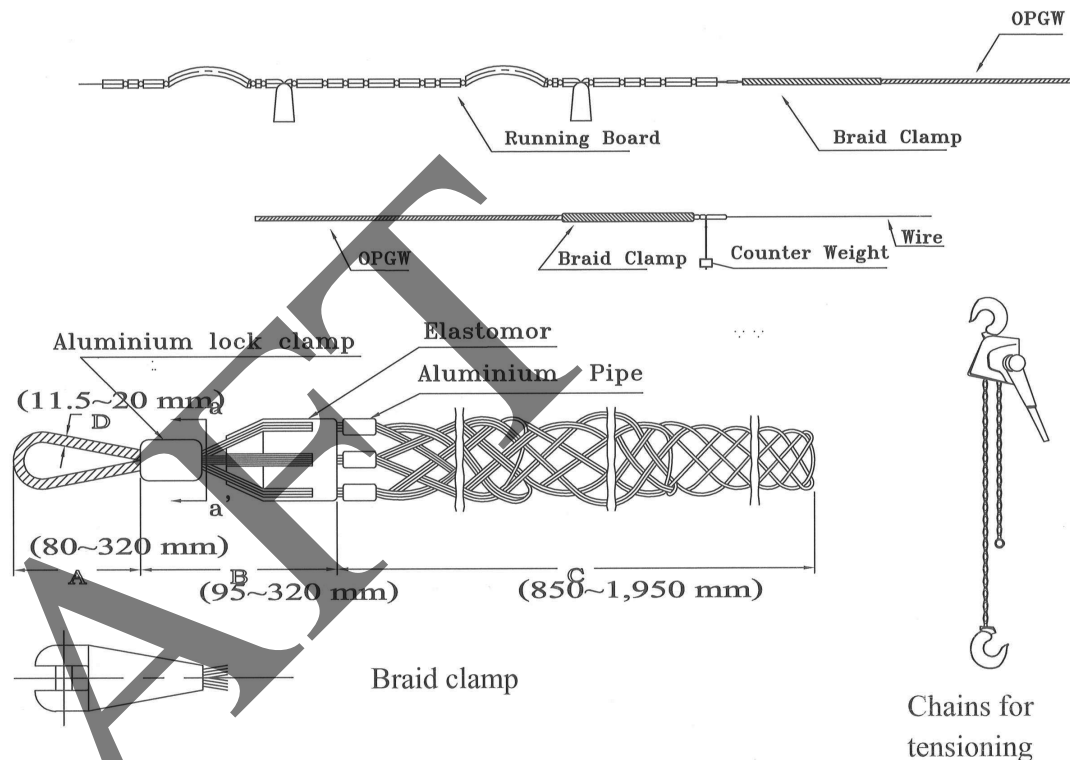
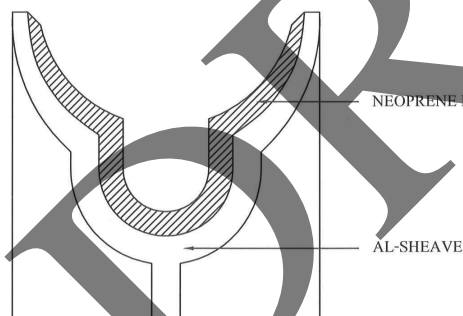
: ALL OPTICAL FIBER CORE OF PIGTAILS WHICH CONNECTED

TO FIBER FRAME TERMINATION CABINET OR FTB SHALL BE MARK AS "XXXX-Cn"

		DESIGNED..... <i>Suphan</i>	REVISED BY..... <i>Panna T</i>	ELECTRICITY GENERATING AUTHORITY OF THAILAND COMMUNICATION SYSTEM DIVISION			REVISION 0002
		DRAWN..... <i>A an</i>	DATE..... <i>18 Sep 07</i>	DRAWING NAME TYPICAL OPTICAL FIBER CONNECTION DIAGRAM			DWG. NO. DW-FOT-D01-213
		CHECKED.....		REGION/STATION			-01
		APPROVED BY..... <i>Panna T</i>	DATE..... <i>18 Sep 07</i>				
DATE	DESCRIPTION			EQUIPMENT	PROJECT	PAGE NO. P1	101



OPGW Stringing Block



NOTE:

1. ALL DIMENSION ARE IN MILLIMETERS.

		DESIGNED <u>Wattana</u>	REVISED BY <u>Panna J</u>	ELECTRICITY GENERATING AUTHORITY OF THAILAND			REVISION	
		DRAWN <u>Sophon</u>	<u>(Panna J)</u>	COMMUNICATION SYSTEM DIVISION			0002	
		CHECKED <u>B. m.</u>	DATE <u>18 Sep 07</u>	DRAWING NAME			DWG. NO.	
				TYPICAL INSTALLATION EQUIPMENT FOR OPGW			DW-FOT-D01-214	
				REGION/STATION			-01	
		APPROVED BY <u>Panna J</u>	<u>18 Sep 07</u>	EQUIPMENT			PAGE NO.	
DATE	DESCRIPTION	<u>Panna J</u>	DATE	PROJECT			P1	
							102	
							PAGE NO.	

DRAWING OF “CAUTION : FIBER OPTIC CABLE” SIGN

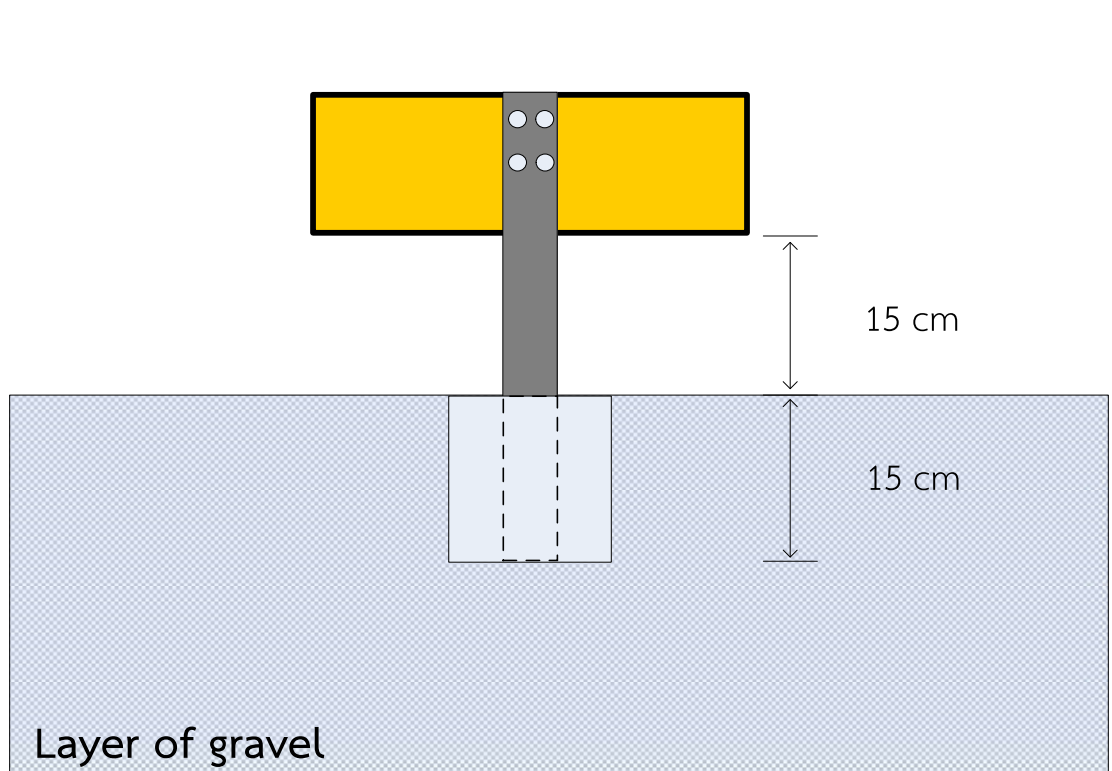
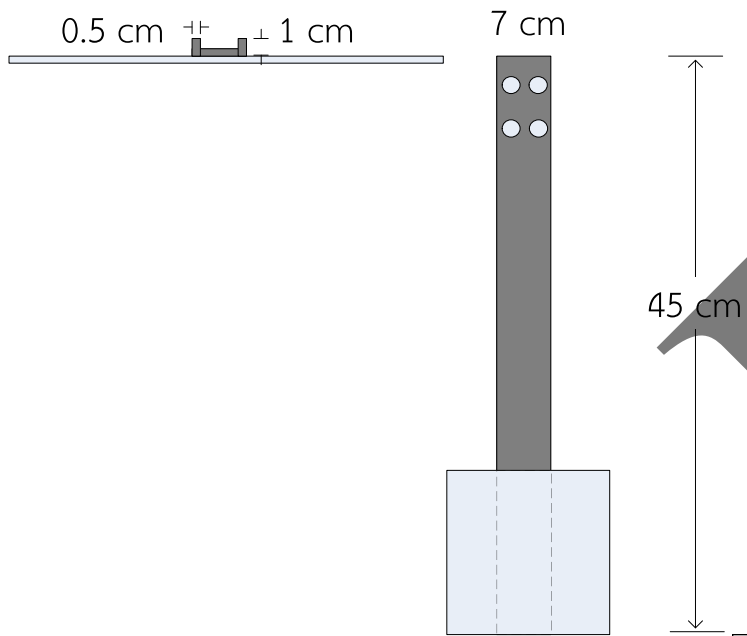


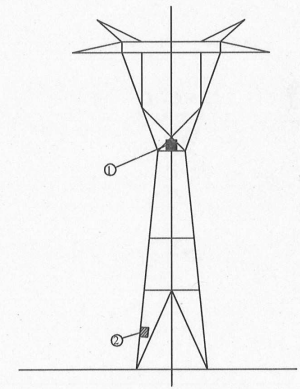
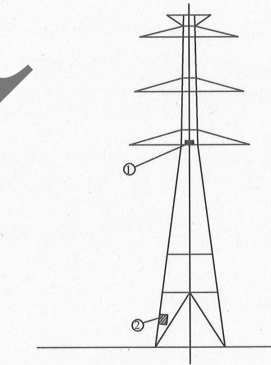
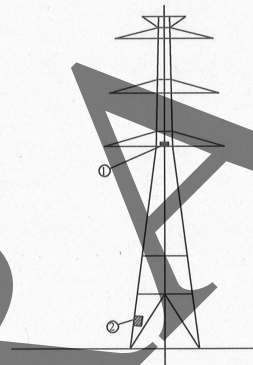
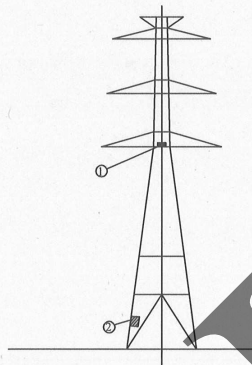
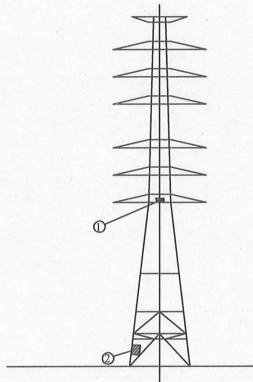
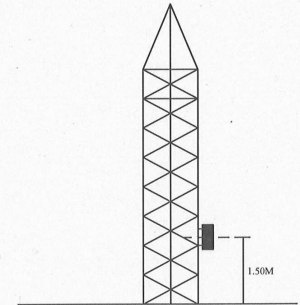
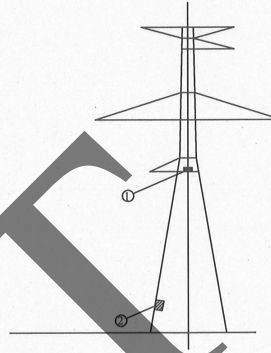
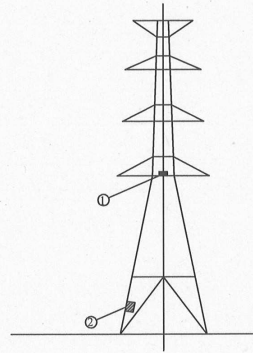
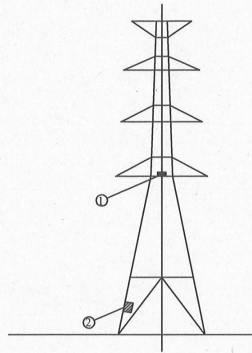
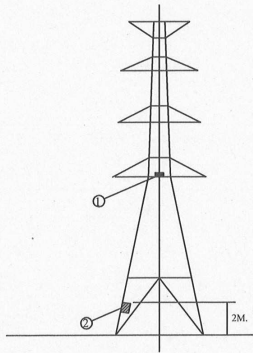
Diagram illustrating sign installation. (Rear view)



- Material : Aluminum
- Size : 15 x 40 cm (W x L)
- Detail : “ระวัง” White letters on a black background
“เคเบิลใยนำแสง” Black letters on a yellow background
- Installation : Install signs along the fiber optic cable route at a height of 15 cm above ground level, with posts installed 15 cm deep at interval of 30-50 meters.
Adjust the signs when changing the current alignment.

- Material : Pole sign made of steel coated with anti-rust primer and finished with black paint
- Size : as per drawing
- Installation : Mount onto the sign plate with 4 sets of rivets and cast into a 15x15x15 cm concrete cube.

DESIGNED	.....<i>S. Watchara</i>	REVISED	.....<i>S. Watchara</i>	ELECTRICITY GENERATING AUTHORITY OF THAILAND	REVISION
DRAWN	.....<i>S. Watchara</i>		(..... <i>Mr. Watchara Sukvinyan</i>)	COMMUNICATION SYSTEM DIVISION	0000
CHECKED	.....<i>S. Watchara</i>		DATE ..24 March 2025..	DRAWING NAME	“Caution : Fiber Optic Cable” sign
				REGION / STATION	
				EQUIPMENT	PROJECT
				OPTICAL FIBER CABLE SYSTEM	PAGE NO.
DATE	DESCRIPTION	APPROVED	DATE ..24 March 2025..		JOB NO.
		(..... <i>Mr. Somprasong Pattanakunchareonkij</i>)			
		Chief, Communication System Planning and Engineering Department			



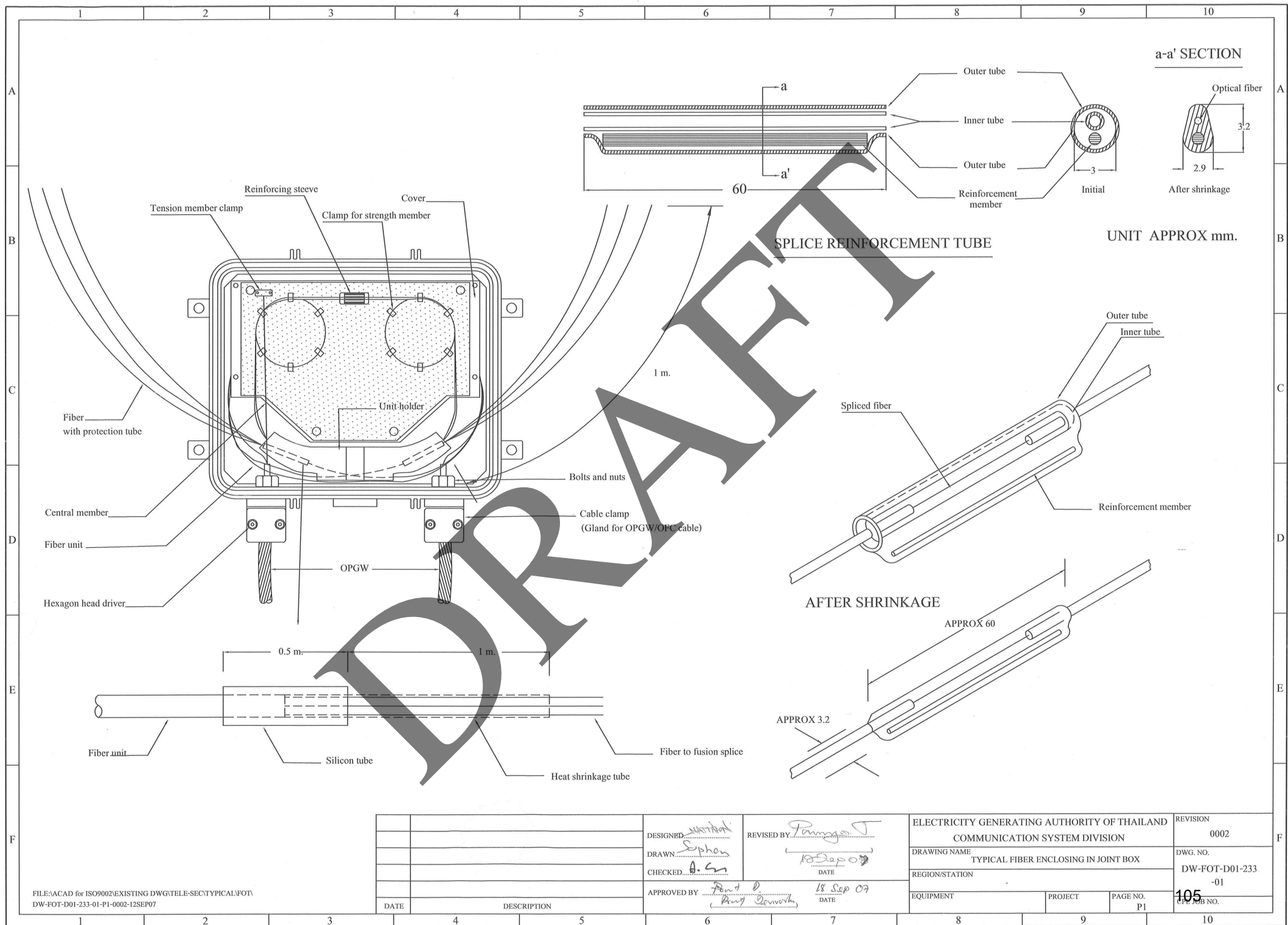
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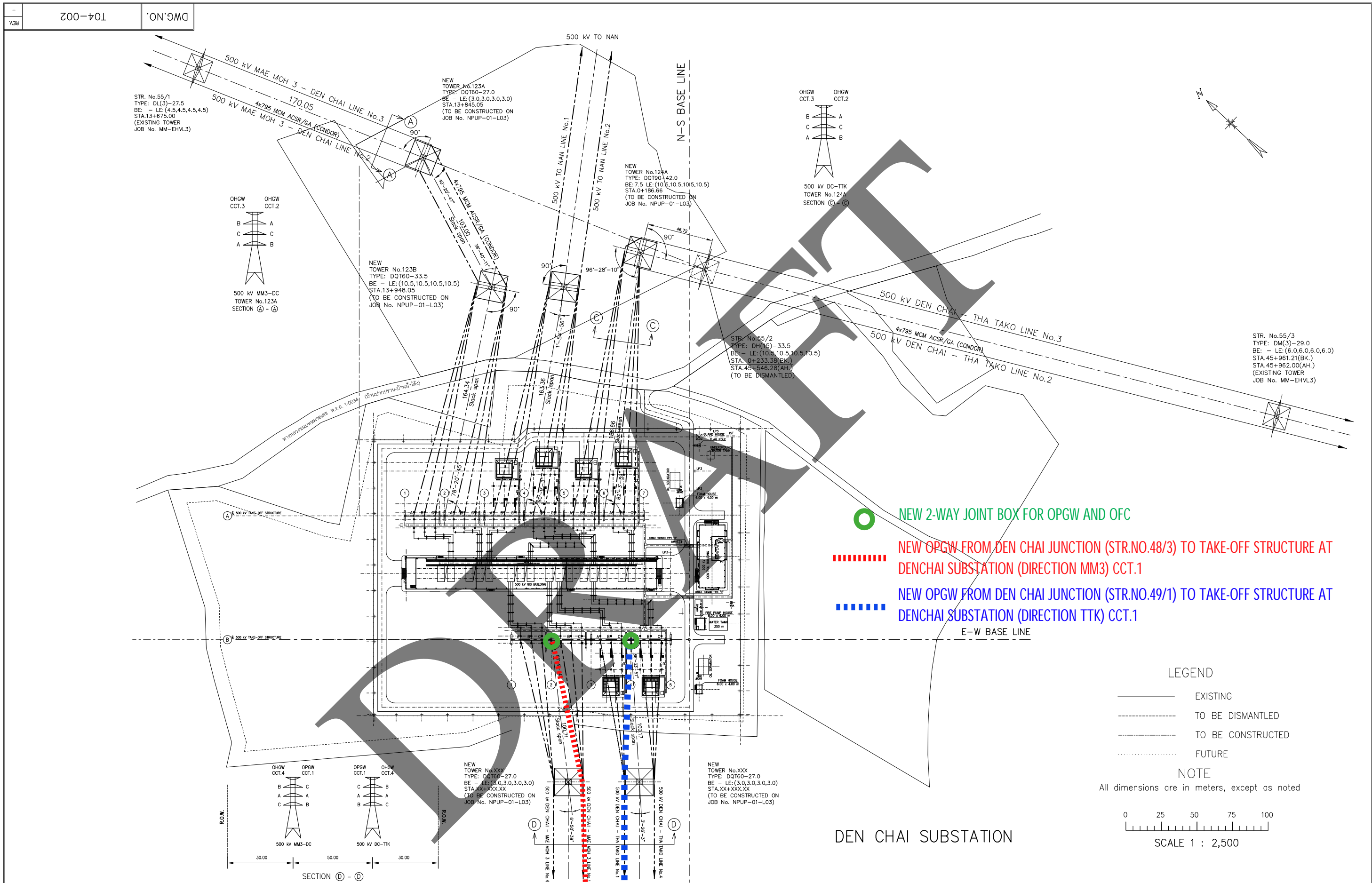
- 1 ALL JOINT BOXES(INSULATED) SHALL BE SEPARATED FROM STEEL STRUCTURE BY INSULATOR WITH INSULATION LEVEL NOT LESS THAN 20 KV.(LOW FREQUENCY WET FLASHOVER)
- 2 JOINT BOXES AND SUITABLE MOUNTING METHOD SHALL BE DESIGNED BY MANUFACTURER FOR FIELD INSTALLATION
- 3 ALL MANUFACTURER DESIGNED DRAWINGS SHALL BE SUBMITTED TO EGAT FOR APPROVALS
- 4 SEE TOWER DRAWING FOR DIMENSION AND ATTACHMENT MEMBERS DETAILS
- 5 SEPARATION BETWEEN TWO JOINT BOXES ON THE SAME TOWER SHALL NOT BE LESS THAN 50.00CM
- 6 WARNING SIGNS ARE TO BE FIELD INSTALLED ON ALL TOWER TO WHICH JOINT BOXES ARE ATTACHED DETAILS OF SUCH SIGNS ARE TO BE APPROVED BY EGAT REFER TO DRAWING CONTAINED HEREIN
- 7 THE OPGW SHALL HAVE THE SURPLUS LENGTH FOR COILING OF 1-2 TURNS WITH THE DIAMETER OF 1 METER TO BE ATTACHED WITH SUITABLE CLAMP ABOVE THE JOINT BOX

NOTE :

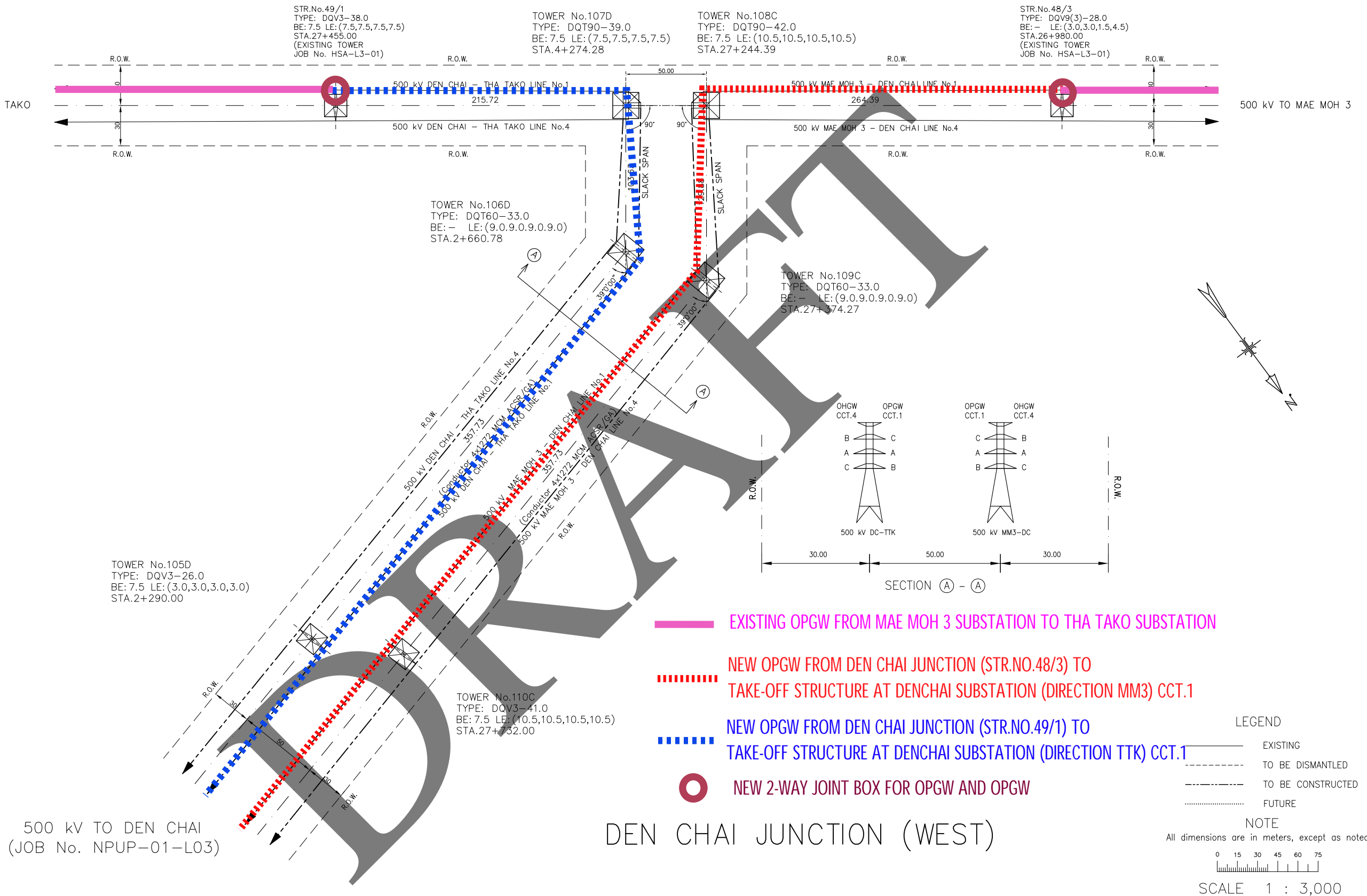
- ① ■ JOINT BOX
② ■ WARNING SIGN AND DANGER SIGN

		DESIGNED..... <i>P. Khinwatt</i>	REVISED BY..... <i>S. Tiporn P</i>	ELECTRICITY GENERATING AUTHORITY OF THAILAND		REVISION	
		DRAWN..... <i>S. Tiporn P</i>	DATE..... <i>21 May 2012</i>	COMMUNICATION SYSTEM DIVISION		0002	
		CHECKED..... <i>R. S. S. S. S.</i>	DATE..... <i>21 May 2012</i>	DRAWING NAME		DWG. NO.	
		APPROVED BY..... <i>P. Khinwatt</i>	DATE..... <i>21 May 2012</i>	TYPICAL OPGW JOINT BOX MOUNTING POSITION		DW-FOT-D01-221	
				REGION/STATION		-01	
				EQUIPMENT		PAGE NO.	
				PROJECT		P1	
				CPE NO.		104	

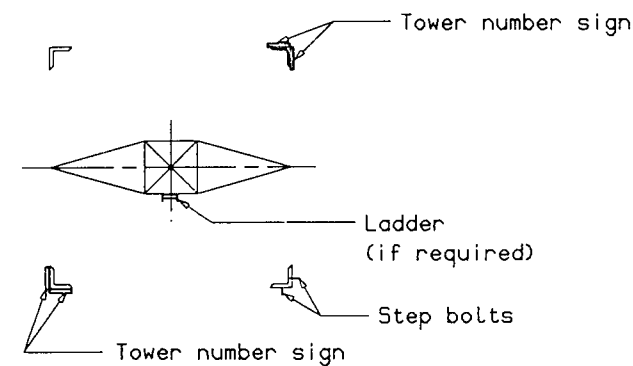
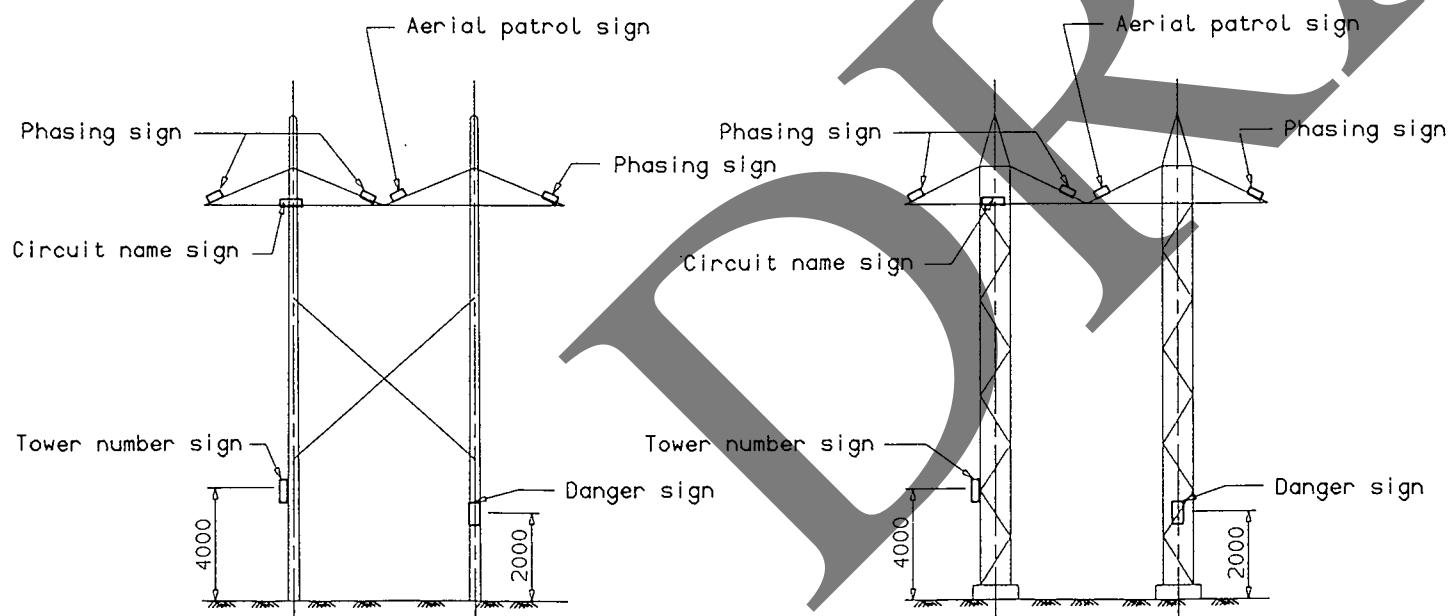
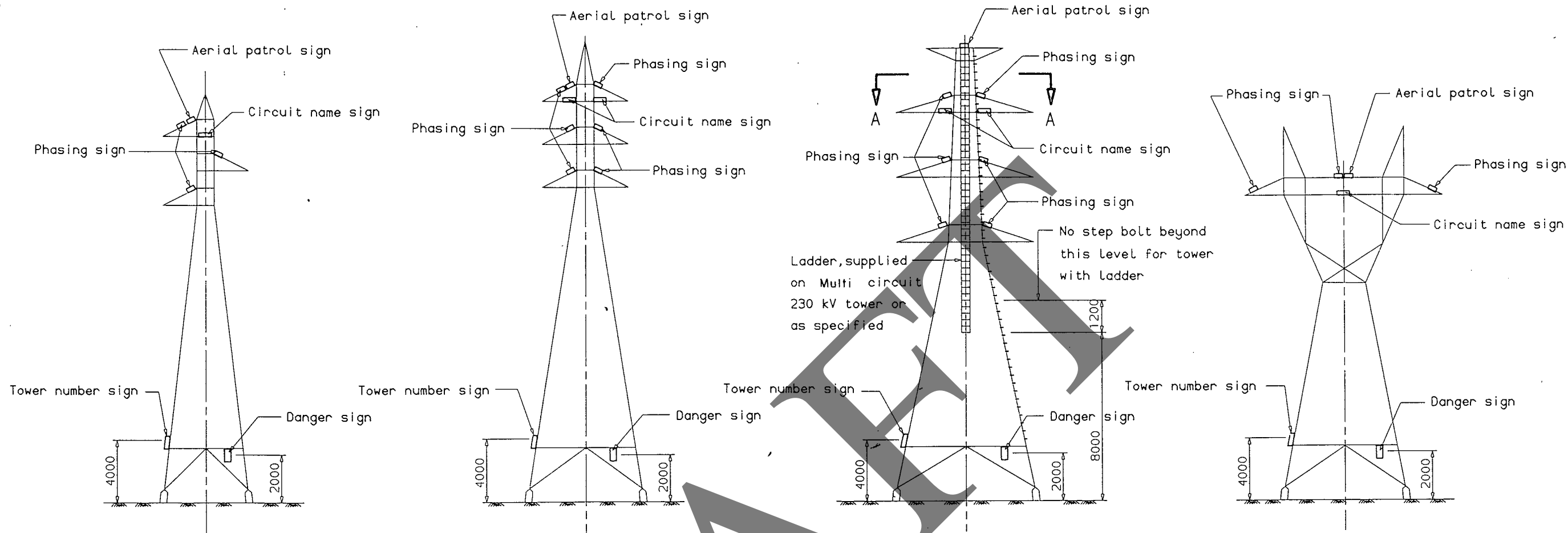




											ELECTRICITY GENERATING AUTHORITY OF THAILAND								
											DRAWN	WARISA K.	RECOMMENDED AND VALIDATED	500 kV NAN – DEN CHAI					
											DESIGNED	WARISA K.	CONCURRED	CHEF, TRANSMISSION LINE ENGINEERING DEPARTMENT	SECTIONALIZING 500 kV MAE MOH 3 – THA TAKO TO DEN CHAI				
											VERIFIED	S. Watanapa	ASSISTANT DIRECTOR, TRANSMISSION SYSTEM ENGINEERING DIVISION	OPGW INSTALLATION AT DEN CHAI SUBSTATION					
											APPROVED	NPUP	DATE	21-JUL-2025	JOB No.	NPUP-01-L02/L03	DWG. No.	OPGW-T04-002-DC	REV.
REV.NO.	JOB NO.	JOB DESCRIPTION				DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE						



												ELECTRICITY GENERATING AUTHORITY OF THAILAND																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						</
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SECTION A-A

NOTES

1. All dimensions are in millimeters.
2. Height indicated on tower is approximately.
3. Step bolts shall be installed on the leg of the tower from the level of 2.5 meters above top of concrete.

TP-109A



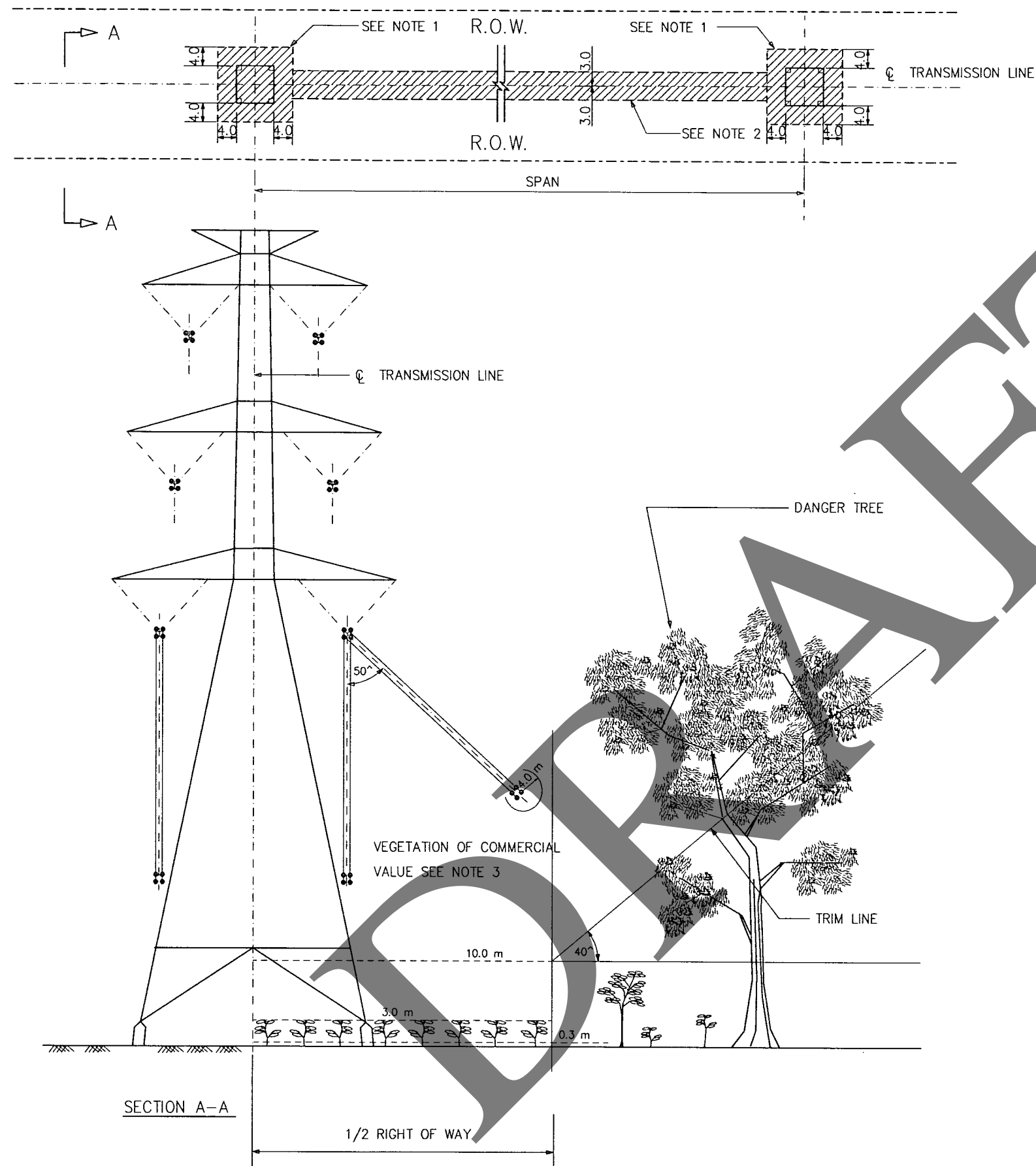
DO NOT AMEND MANUALLY

22-JAN-91 09:30:19
P. 0

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DESIGNED	CLRD.	SUBMITTED	RECOMMENDED	CONCURRED	APPROVED	DATE	JOB NO.	REPLACING DWG. NO.	DWG. NO.	TP-109A	00 REV.	00
DESIGNED	CLRD.	SUBMITTED	RECOMMENDED	CONCURRED	APPROVED	DATE	JOB NO.	REPLACING DWG. NO.	DWG. NO.	TP-109A	00 REV.	00
DRAWN P. Panyayong	CLRD.	SUBMITTED	RECOMMENDED	CONCURRED	APPROVED	DATE	JOB NO.	REPLACING DWG. NO.	DWG. NO.	TP-109A	00 REV.	00
CHECKED Wongsathit	CLRD.	SUBMITTED	RECOMMENDED	CONCURRED	APPROVED	DATE	JOB NO.	REPLACING DWG. NO.	DWG. NO.	TP-109A	00 REV.	00
APPROVED	CLRD.	SUBMITTED	RECOMMENDED	CONCURRED	APPROVED	DATE	JOB NO.	REPLACING DWG. NO.	DWG. NO.	TP-109A	00 REV.	00

TOWER ACCESSORIES INSTALLATION



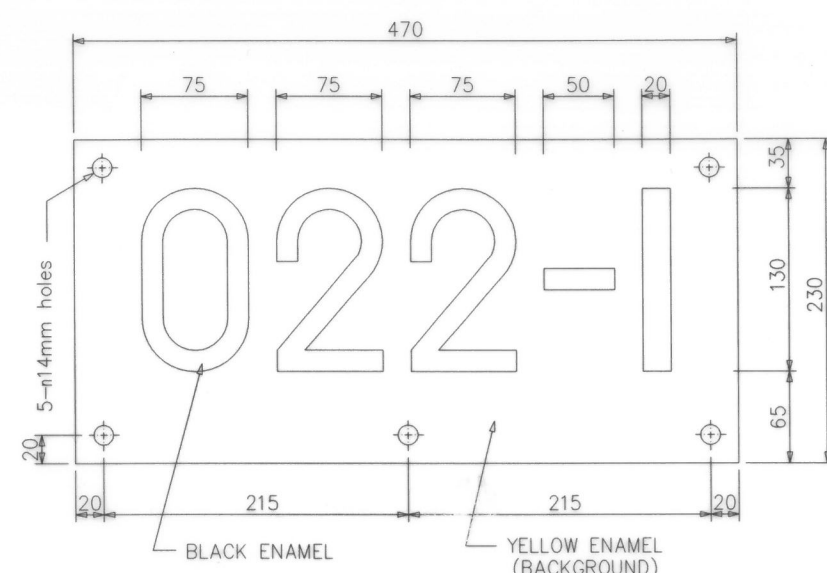
GENERAL NOTES

- ALL VEGETATION WITHIN THE BOUNDARY OF TOWER LEGS AND THE AREA 4 METERS AROUND THE BOUNDARY OF TOWER LEGS SHALL BE CUT OFF AS CLOSE TO THE GROUND AS PRACTICABLE.
- ALL VEGETATION WITHIN THE AREA 3 METERS EACH SIDE OF THE TRANSMISSION LINE CENTER LINE SHALL BE CUT OFF AS CLOSE TO THE GROUND AS PRACTICABLE; EXCEPT ANNUAL PLANTS AND CEREAL.
- ALL VEGETATION OUTSIDE THE AREAS SPECIFIED IN 1 AND 2 UP TO THE EDGE OF THE RIGHT-OF-WAY SHALL BE CUT OFF AS CLOSE TO THE GROUND AS PRACTICABLE, EXCEPT
 - ANNUAL PLANTS AND CEREAL.
 - TREES OR CROPS OF COMMERCIAL VALUE HAVING A MAXIMUM MATURE HEIGHT NOT MORE THAN 3 METERS.
- TREES TO BE STAMPED "FOREST DEPARTMENT" ACCORDING TO THE APPLICABLE FOREST ACT SHALL BE CUT TO A HEIGHT TO NOT MORE THAN 30 CENTIMETERS ABOVE THE GROUND.
- TEAKS AND RUBBER TREES SHALL BE CUT OFF AT A HEIGHT OF ABOUT 30 CENTIMETERS ABOVE GROUND AFTER THE FOLLOWING HAVE BEEN CARRIED OUT
 - ISSUE OF AN APPLICATION FOR PERMISSION FOR PLANTATION OF TEAKS WHICH ARE NOT IN THE FOREST ACCORDING TO THE REGULATIONS OF DEPARTMENT OF FORESTRY, MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT.
 - ISSUE OF AN APPLICATION FOR PERMISSION FOR PLANTATION OF RUBBER TREES WHICH ARE NOT IN THE FOREST ACCORDING TO THE REGULATIONS OF DEPARTMENT OF FORESTRY, MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT.
- ALL SUGAR CANES GROWN SHALL BE CUT OFF AND THEIR STUMPS SHALL COMPLETELY BE DUG OUT.
- DANGER TREES ON THE OUTSIDE OF THE RIGHT-OF-WAY SHALL BE TRIMMED OR REMOVED AS DIRECTED BY EGAT.
- IN DEEP VALLEYS WHERE "SPECIAL CLEARING" IS NOTED ON THE PLAN AND PROFILE, CLEARING MAY BE LIMITED TO A WIDTH OF 15 METERS EITHER SIDE OF THE TRANSMISSION LINE CENTER LINE AS DIRECTED BY EGAT.
- FELLED TREES STAMPED "FOREST DEPARTMENT" SHALL BE TRIMMED AND PILED AT THE SIDE OF THE RIGHT-OF-WAY OR AS DIRECTED BY EGAT.

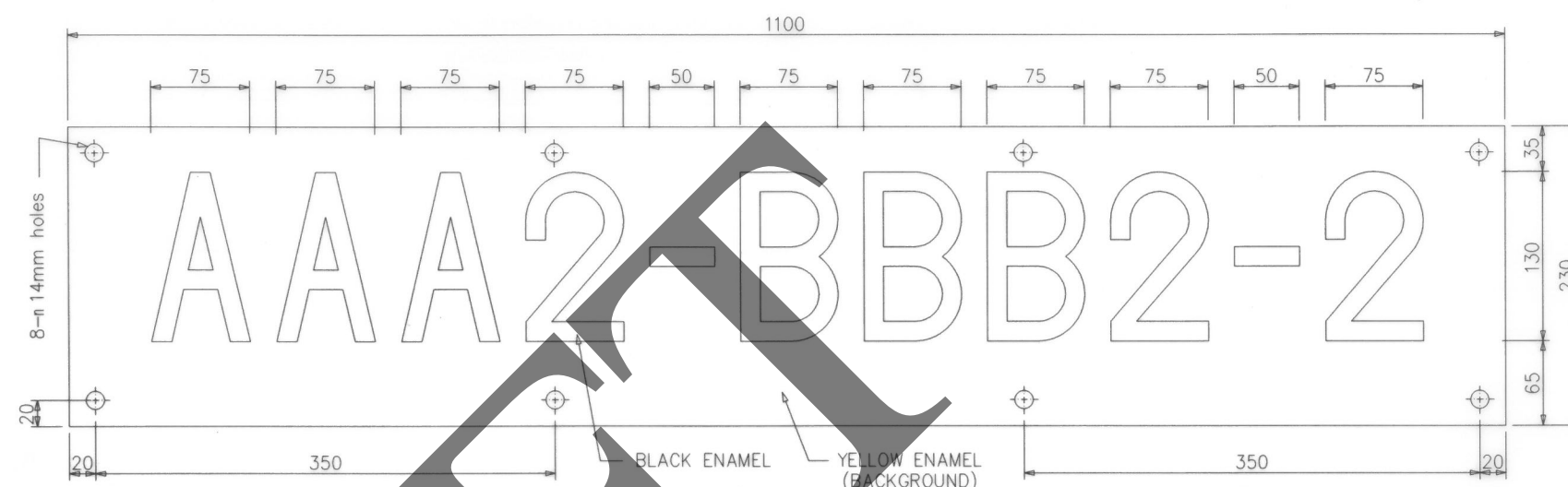
REV. NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
-	-	-	-	-	-	-	-	-	-	-

ELECTRICITY GENERATING AUTHORITY OF THAILAND

DRAWN J. NARONG	VALIDATED [Signature]	500 kV TRANSMISSION LINE
DESIGNED J. Narong	RECOMMENDED [Signature]	RIGHT OF WAY CLEARING
VERIFIED P. Pithak	CONCURRED [Signature]	
APPROVED J. D.	DATE 16/12/16	JOB NO. -
ASSISTANT ENGINEER - TRANSMISSION SYSTEM ENGINEERING	REPLACING DWG. NO. TP-135C rev.1	DWG. NO. TP-135C



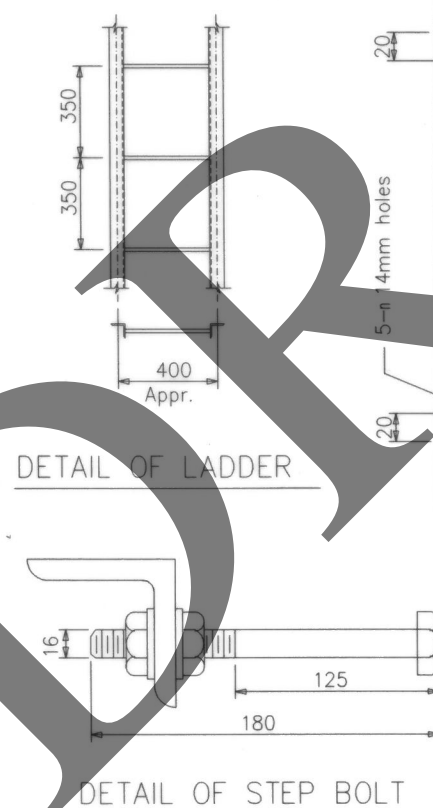
AERIAL PATROL SIGN



CIRCUIT NAME SIGN

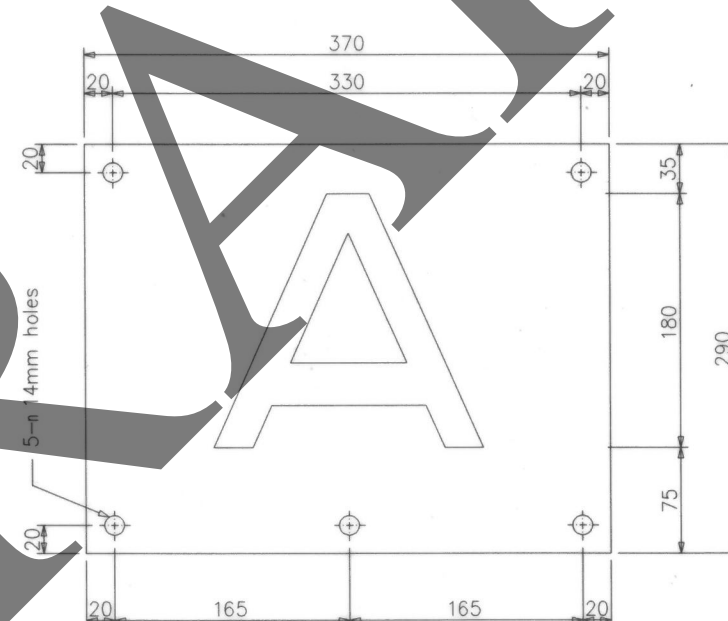


DANGER SIGN



DETAIL OF LADDER

DETAIL OF STEP BOLT



PHASING SIGN

PHASING SIGN COLOR			
PHASING SIGN	A	B	C
FIGURE	WHITE	BLACK	WHITE
BACKGROUND	RED	YELLOW	BLUE

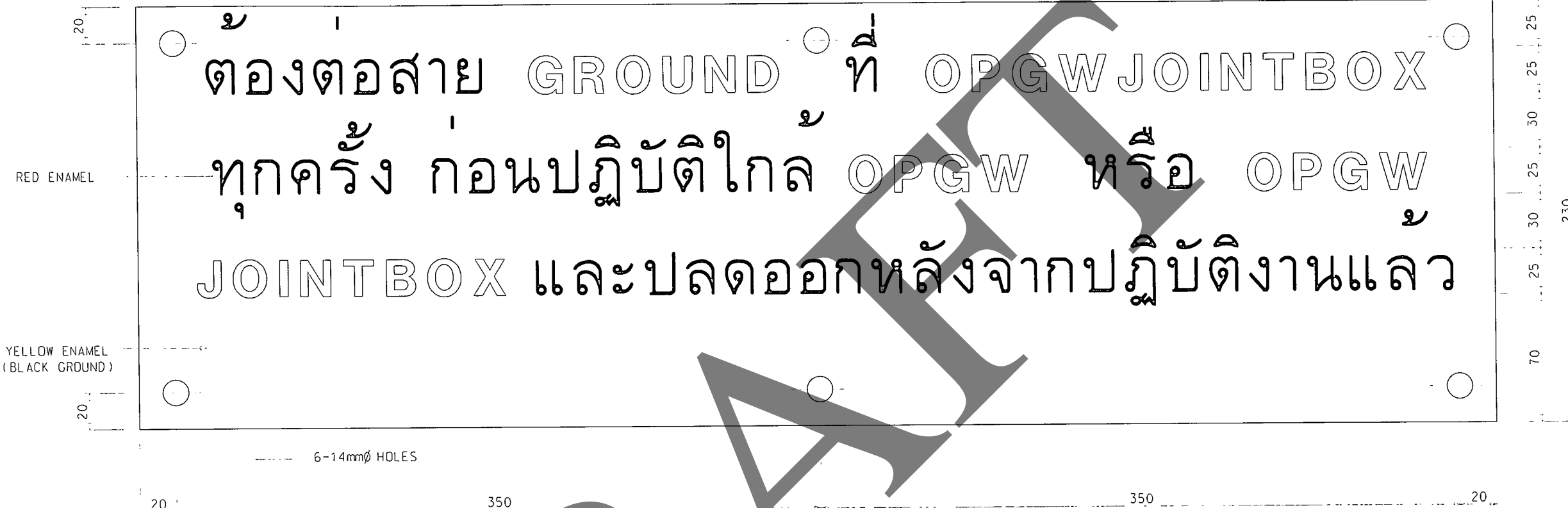
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. LOCATIONS OF ALL SIGNS SHALL BE AS INDICATED ON DWG.NO. TP-109A
3. TOWER NUMBER SIGN SHALL BE STENCILED AT 4.0 METERS ABOVE GROUND LEVEL AND SHALL NOT BE ON THE SAME LEG WITH STEP BOLTS.
4. ALL SIGNS EXCEPT DANGER SIGN SHALL BE DOUBLE-SIDED AND MOUNTED SUCH THAT THEY ARE VISIBLE FROM BOTH SIDES OF THE TOWER.
5. STEP BOLTS SHALL BE INSTALLED ON THE LEG OF THE TOWER FROM THE LEVEL OF 2.5 METERS ABOVE TOP OF CONCRETE.
6. ONE SET OF PHASING SIGN SHALL CONSIST OF 3 PLATES A,B & C.
7. AERIAL PATROL SIGN NUMBER SHALL CONFORM TO STRUCTURE LIST.
8. LETTERS IN CIRCUIT NAME SIGN SHALL BE SYMMETRICALLY ADJUSTED ACCORDING TO NUMBER OF LETTERS REQUIRED.

REV.NO.	JOB NO.	DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE
1	-	CHANGING SYMBOL OF DANGER SIGN	W.Arnon	P.Aunwet	J.Nongornich					

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN W.Arnon					VALIDATED J.Nongornich				
DESIGNED P.Aunwet					RECOMMENDED J.Nongornich				
VERIFIED J.Nongornich					CONCURRED J.Nongornich				
APPROVED J.Nongornich					DATE 18/01/15				
JOB NO. -					REPLACING DWG.NO. TP-150A				
DWG.NO. TP-150B					REV. 1				

740



WARNING SIGN

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. WARNING SIGNS ARE TO BE SUPPLIED AS A SET, CONSISTING OF THE SIGN DETAILED ON THIS DRAWING AND THE STANDARD DANGER SIGN SHOWN ON DRAWING TP-150B.
3. WARNING SIGNS ARE TO BE ATTACHED ADJACENT TO THE ACCOMPANYING JOINT BOX, ON EVERY TOWER AT WHICH A JOINT BOX IS INSTALLED.
4. MATERIALS SHALL BE THE SAME FOR WARNING SIGNS AND DANGER SIGNS.

CLASS OF SOIL	QUALITY OF SOIL	AVERAGE UNIT WEIGHT OF SOIL (Ton/m ³)	ANGLE OF REPOSE (Degree)	NET ULTIMATE SOIL BEARING CAPACITY (Ton/m ²)	HEIGHT OF WATER TABLE	RECOMMENDED TYPE OF FOUNDATION (See note item 5)
I	VERY SOFT -Very poor bearing material with very low resistance to uplift loads.	compression 1.4	0	< 10.0	up to ground level	-Concrete long pile with tie beam CLPBI-A CLPBI-B
		uplift 0.9		App.ultimate skin friction 1,000 kg/m ²		-Concrete long pile without tie beam CLPI -C CLPI -D CLPI -E CLPI -F
II	SOFT -Poor bearing material with low resistance to uplift loads.	compression 1.5	5	> 10.0		-Concrete short pile CSPII-A CSPII-B CSPII-C
		uplift 1.0		App.ultimate skin friction 2,000 kg/m ²		-Raft RFII
III	FAIR -Fair bearing material with fair resistance to uplift loads.	1.2	15	> 25.0	See note 2	-Concrete pad CIII
IV	GOOD -Firm material of good bearing capacity and good resistance to uplift loads in all seasons.	1.7	20	> 50.0	below the bottom of foundation	-Concrete pad CIV
V	HARD -Firm material of very good bearing capacity and very good resistance to uplift loads in all seasons.Decomposed rock is considered to be in this class.	1.9	30	> 75.0		-Concrete pad CV
S	SPECIAL -Any material consisting of fair bearing capacity below 3.5 meter depth but poor bearing capacity or low resistance to uplift loads above this depth.	1.1	10	> 20.0	See note 2	-Special concrete pad CS
R	ROCK -Any rock in situ occur in mass or bedded deposit except disintegrated rock,soluble limestone,shale,slate,hard pan,organic rock or other similar type of rock.			> 150		-Rock foundation R
				App.ultimate skin friction 10 Ton/m ²		

NOTES

- Subsurface investigations are required primarily for classification of soil and selection of foundation type, tests shall also be performed in the layer of soil below the bottom of foundation.
- Consider water table up to ground level for stability against uplift load and water table below bottom of foundation for stability against compression loads.
- EGAT reserves the right to select the type of foundation in any particular class of soil to be constructed for any other class of soil if it is in the economical and engineering safety provision.
- Skin friction resistance tabulated above are for information only. Actual values shall be based on subsurface investigations.
- Any foundation type suffixed by "X1" "X2",and "X3" shall be designed against sulphate attack caused by sea water or sulphate in soil as per Specification C-2, Article BB-26 case 1, case 2 and case 3 with 7.5 cm covering for protection of steel reinforcement respectively.

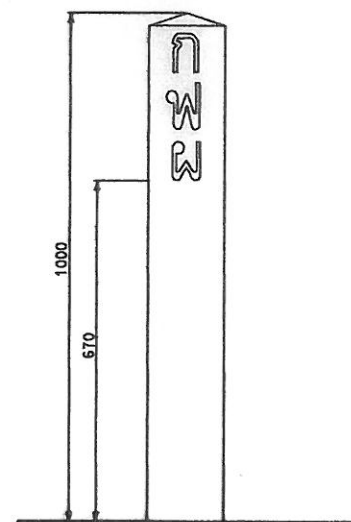
ELECTRICITY GENERATING AUTHORITY OF THAILAND

DESIGNED	DRN	RECOMMENDED	CONCLUDED	APPROVED	DATE	DESIGNED	DRN	RECOMMENDED	CONCLUDED	APPROVED	DATE	DESIGNED	DRN	RECOMMENDED	CONCLUDED	APPROVED	DATE
Chalee						Chalee						Chalee					
CRITERIA AND BASIC DATA FOR CALCULATION AND SELECTION OF FOUNDATION												JOB NO. 112 REPLACING DWG. NO. TP-152		REV. 1			

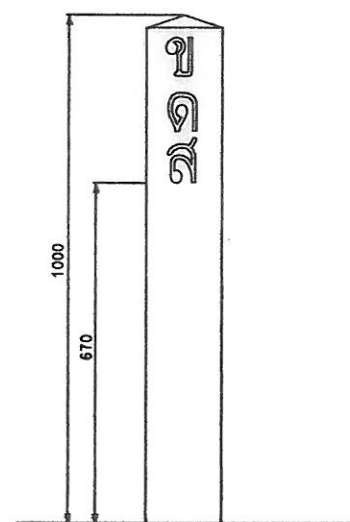
CAD
CENTER

DO NOT AMEND
MANUALLY

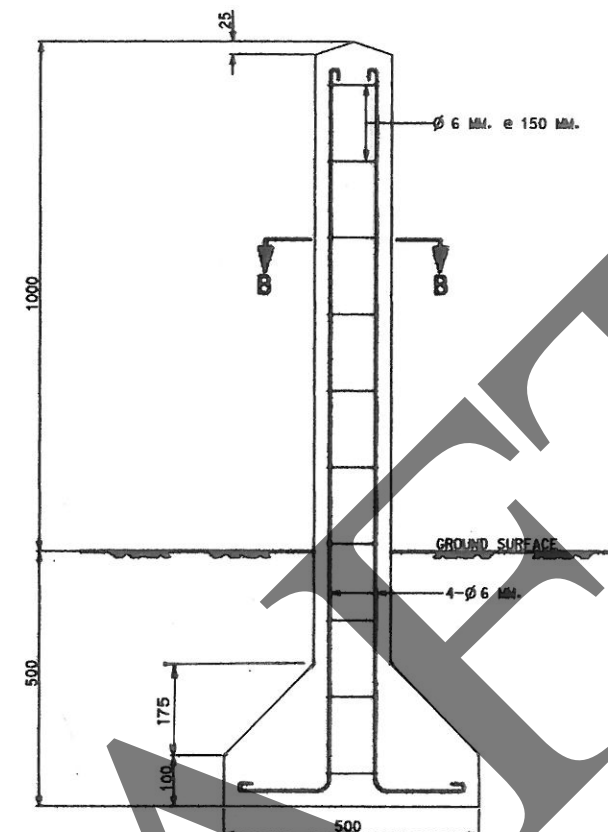
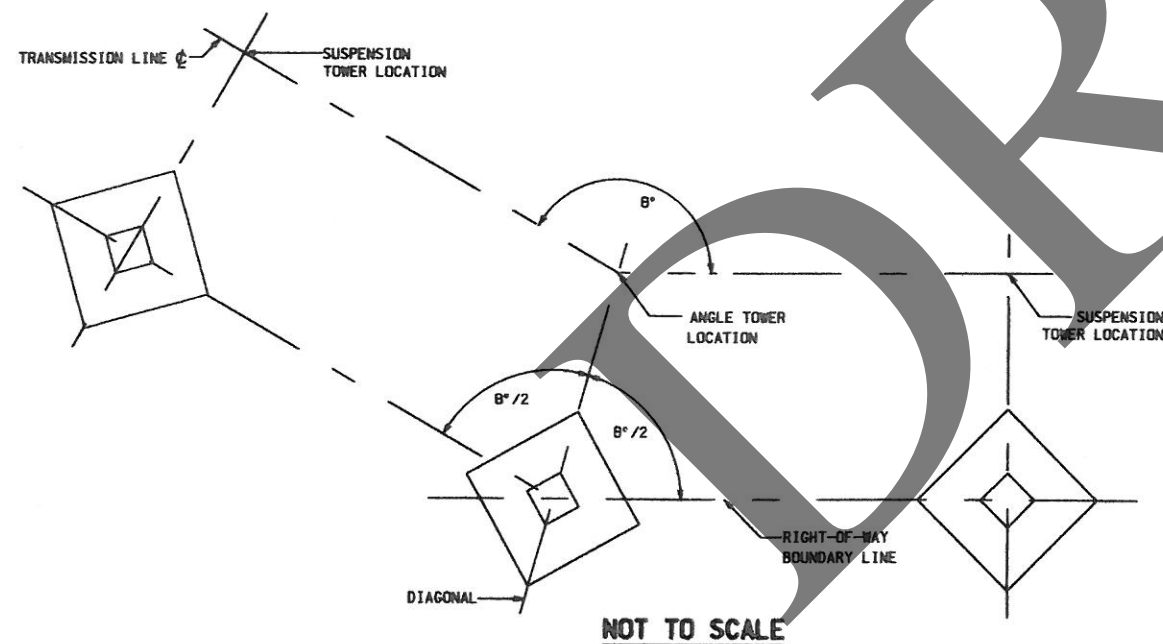
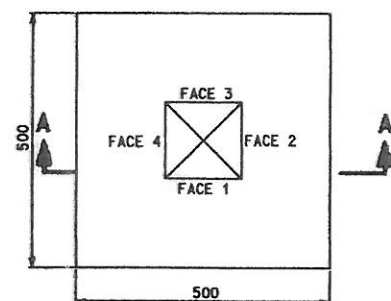
NO.	JOB ASSIG.	JOB DESCRIPTION & REVISION	DESIGNED	CHECKED	APPROVED	DATE
1		RETRACED				



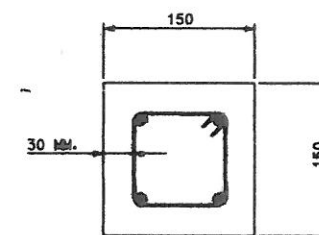
ENGRAVING FACE 1 & 3



ENGRAVING FACE 2 & 4



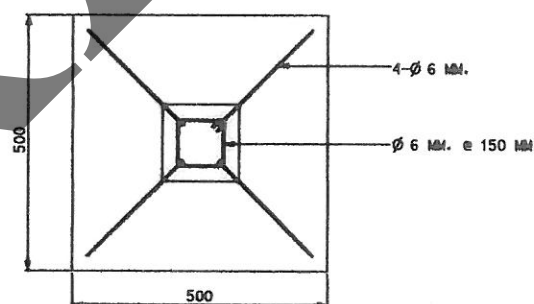
SECTION A-A



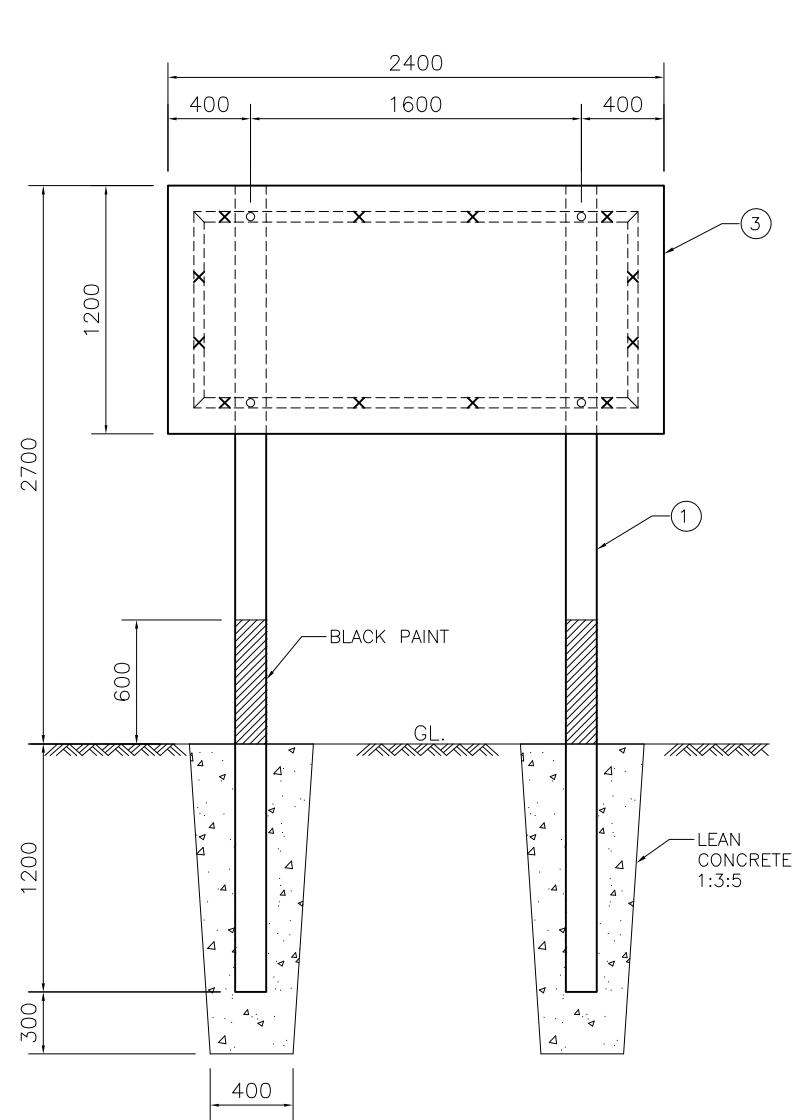
SECTION B-B

NOTES

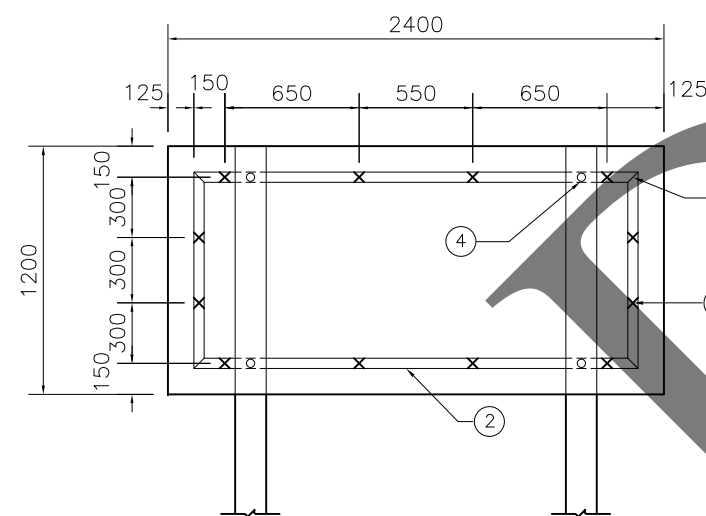
- ALL DIMENSIONS ARE IN MILLIMETERS.
- PRECAST REINFORCED CONCRETE IS TO BE USED.
- BOUNDARY POSTS SHALL BE PLACED AT EACH TOWER LOCATION ALONG RIGHT-OF-WAY BOUNDARY LINE OF THE TRANSMISSION LINE. THE ARRANGEMENT OF THOSE POSTS ARE AS SHOWN.
- BOUNDARY POST SHALL BE PLACED ON ROCK OR ON WELL COMPACTED SOIL IN SUCH A MANNER THAT THE DISTANCE FROM ITS TIP TO THE GROUND SURFACE IS 500 MILLIMETERS THE BACKFILL SOIL IS TO BE WELL COMPACTED.
- ENGRAVING SHALL BE 1 CM. DEEP ON ALL FOUR SIDES LETTERS SHALL BE 5 CM. WIDE AND 8 CM. HIGH.
- PAINTS SHALL BE APPLIED AS THE FOLLOWING.
 - TOP : ORANGE OR RED WITH ENAMEL PAINT.
 - COLUMN ABOVE GROUND LEVEL : WHITE WITH PLASTIC PAINT.
 - ENGRAVING : BLACK WITH ENAMEL PAINT.



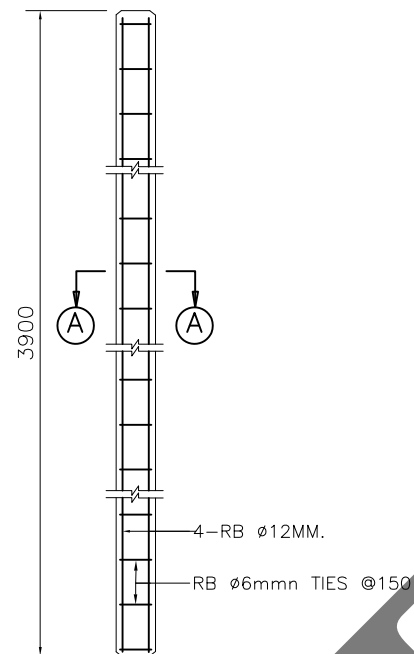
PLAN



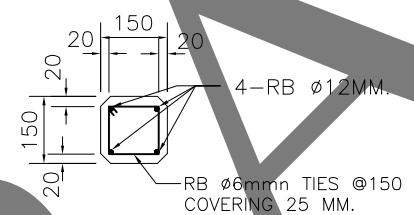
INSTALLATION DETAIL



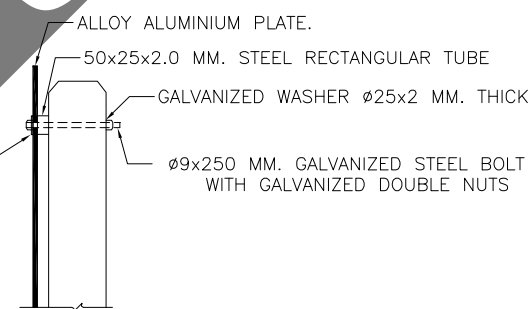
FRAME DETAIL



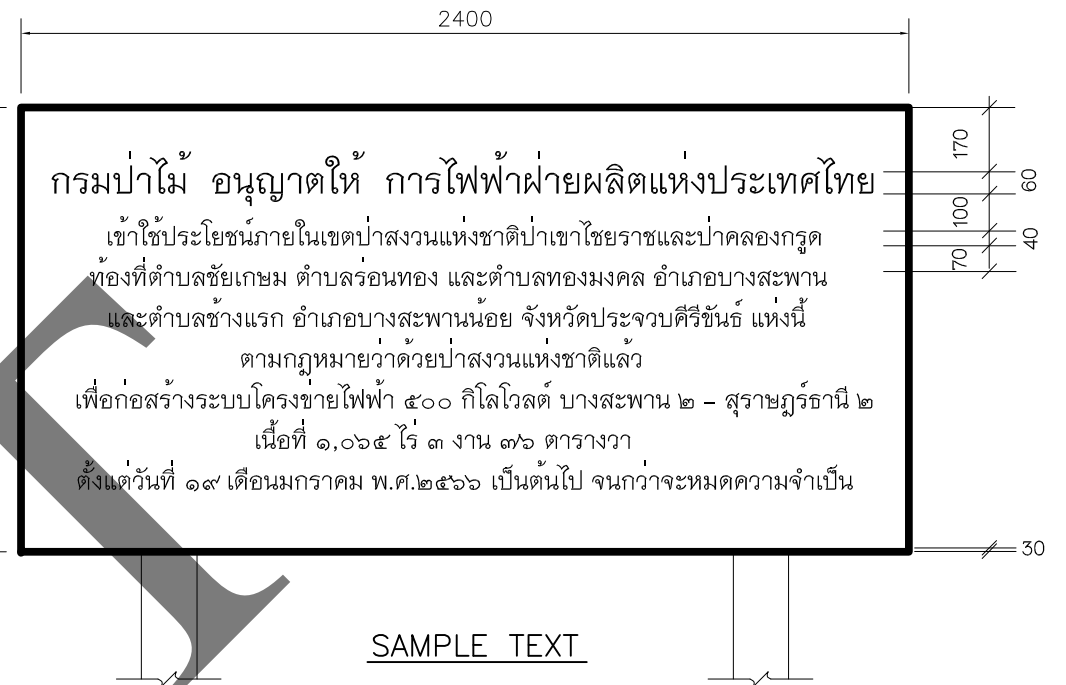
REINFORCE CONCRETE POST DETAIL



SECTION A-A



FIXING OF SIGN PLATE



SAMPLE TEXT

MATERIAL LIST

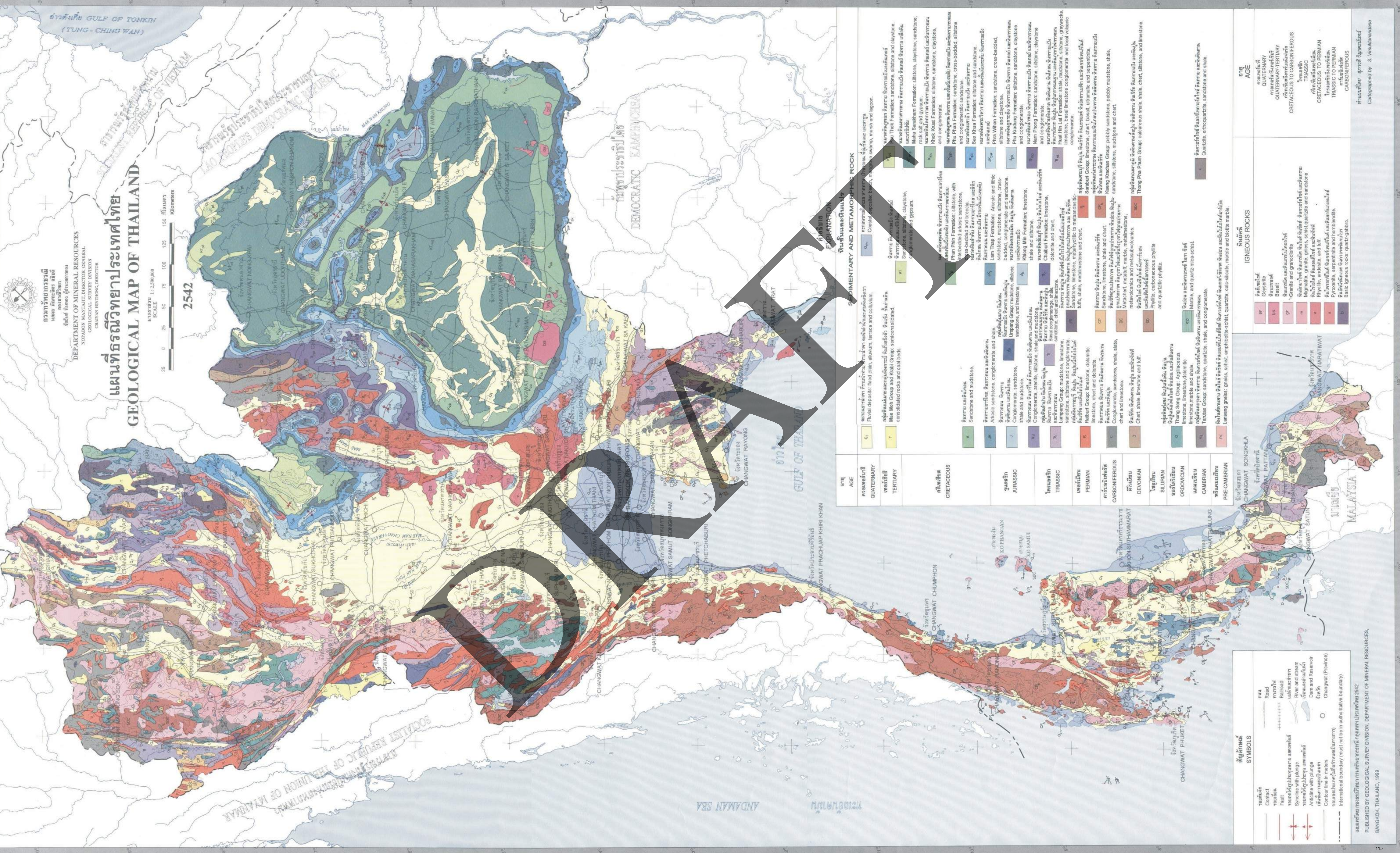
ITEM NO.	QTY.	DESCRIPTION
①	2	WHITE CONCRETE POST
②	1	STEEL RECTANGULAR TUBE 50X25X2.0 MM.
③	1	2400 X 1200 MM. ALLOY ALUMINIUM PLATE THICKNESS 2.00 MM. CONFORM TIS-331 -BACKGROUND COLOUR : YELLOW (C0 M19 Y89 K0) -FIGURE COLOUR : BLACK (C80 M70 Y70 K100) -FIGURE FONT : TH NIRAMIT AS
④	4	DIAMETER 9X250 MM. GALV. BOLT,NUT WITH WASHER
⑤	12	DIAMETER 9X35 MM. GALV. BOLT,NUT WITH SPRING WASHER

NOTE

- 1.ALL DIMENSION ARE IN MILLIMETERS EXCEPT AS NOTED.
- 2.SIGN SHALL BE PREDOMINANTLY INSTALLED ON THE EDGE OF THE RIGHT-OF-WAY BY FACING OUT AT EVERY ENTRANCE TO THE PRESERVED FOREST.
- 3.CONCRETE SHALL HAVE A CYLINDRICAL COMPRESSIVE STRESS OF 210 KSC. IN 28 DAYS.
- 4.ALL REINFORCING BARS SHALL CONFORM TO TIS-20 FOR ROUND BARS AND TIS-24 GRADE SD40 FOR DEFORMED BARS.
- 5.ALL STEEL PARTS SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A123
- 6.ALL BOLT,NUT AND SPRING WASHER SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A153.

REV.NO.	JOB NO.	JOB DESCRIPTION	DRAWN	DESIGNED	VERIFIED	VALIDATED	RECOMMENDED	CONCURRED	APPROVED	DATE

ELECTRICITY GENERATING AUTHORITY OF THAILAND									
DRAWN	ARKET	VALIDATED	R.O.W ACCESS SIGN FOR PRESERVED FORESTS						
DESIGNED	titipong	CHIEF, TRANSMISSION LINE ENGINEERING DEPARTMENT							
VERIFIED	titipong	CONCURRED							
		BOSSANT, TRANSMISSION SYSTEM ENGINEERING DIVISION		JOB NO.	REPLACING DWG.NO.	DWG.NO.	-	REV.	
APPROVED		DATE 8 Nov 2023			TP-161B	TP-161C	-	-	



กรมทรัพยากรธรณี
กรมธรณีวิทยา
DEPARTMENT OF MINERAL RESOURCES
NOTADON MANTAJIT, DIRECTOR, GENERAL
GEOLOGICAL SURVEY DIVISION
CHAYAN HINTONG, DIRECTOR

แผนที่ธรณีวิทยาประเทศไทย
GEOLOGICAL MAP OF THAILAND

มาตราส่วน
SCALE 1:250,000

25 0 25 50 75 100 125 150 กิโลเมตร
Kilometers

2542

สัญลักษณ์ SYMBOLS	สัญลักษณ์ SYMBOLS
รอยต่อ Contact	ถนน Road
รอยเลื่อน Fault	ทางรถไฟ Railroad
รอยคดโค้งของภูเขา Syncline with plunge	แม่น้ำและลำธาร River and stream
รอยคดโค้งของภูเขา Anticline with plunge	เขื่อนและอ่างเก็บน้ำ Dam and Reservoir
เส้นสำรวจน้ำมัน Contour line in meters	จังหวัด (Province) Changwat (Province)
ขอบเขตของประเทศ International boundary (must not be in authoritative boundary)	

อายุ AGE	คำอธิบาย EXPLANATION	หินอัคนี IGNEOUS ROCKS	อายุ AGE
ควอเตอร์นารี QUATERNARY	ตะกอนน้ำท่วม Fluvial deposits: flood plain, alluvium, terrace and colluvium.	หินอัคนี Igneous rocks	ควอเตอร์นารี QUATERNARY
เทเชีย TERTIARY	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	เทเชีย TERTIARY
ครีเทเชียส CRETACEOUS	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	ครีเทเชียส CRETACEOUS
จูแรสซิก JURASSIC	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	จูแรสซิก JURASSIC
ไทรแอสซิก TRIASSIC	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	ไทรแอสซิก TRIASSIC
เพอร์เมียน PERMIAN	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	เพอร์เมียน PERMIAN
คาร์บอนิเฟอรัส CARBONIFEROUS	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	คาร์บอนิเฟอรัส CARBONIFEROUS
เดวียน DEVONIAN	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	เดวียน DEVONIAN
ซิลูเรียน SILURIAN	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	ซิลูเรียน SILURIAN
ออร์โดวิเชียน ORDOVICIAN	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	ออร์โดวิเชียน ORDOVICIAN
แคมเบรียน CAMBRIAN	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	แคมเบรียน CAMBRIAN
พรีแคมเบรียน PRE-CAMBRIAN	หินอัคนี Igneous rocks	หินอัคนี Igneous rocks	พรีแคมเบรียน PRE-CAMBRIAN