




NKK JOINT VENTURE
 Airside Road Tunnel Landaui Road System Project
 Environmental Impact Project
 Perumahan Puncakmuti Paksi Baru
 Reclamation Date: 12/05/2014
 Measured By: JPT

Installation Location: Section A
 Block: BEW12

Reading Date	Pit No.	Depth (m)	Reading		
			Reading 1	Reading 2	Average
21-05-04 (Base Reading)	PZ-A1	2	8	8	8
	PZ-A2	3	41	41	41
	PZ-A3	4	78	78	78
24-05-04	PZ-A1	2	5	5	5
	PZ-A2	3	38	38	38
	PZ-A3	4	65	65	65
24-08-04	PZ-A1	2	4	4	4
	PZ-A2	3	38	38	38
	PZ-A3	4	61	61	61
01-05-04	PZ-A1	2	13	13	13
	PZ-A2	3	41	40	40.5
	PZ-A3	4	68	65	65
03-05-04	PZ-A1	2	12	12	12
	PZ-A2	3	33	33	33
	PZ-A3	4	62	62	62
03-05-04	PZ-A1	2	10	10	10
	PZ-A2	3	34	34	34
	PZ-A3	4	62	62	62
04-05-04	PZ-A1	2	11	11	11
	PZ-A2	3	34	34	34
	PZ-A3	4	62	62	62
09-05-04	PZ-A1	2	14	14	14
	PZ-A2	3	46	46	46
	PZ-A3	4	63	63	63
12-05-04	PZ-A1	2	16	16	16
	PZ-A2	3	44	44	44
	PZ-A3	4	62	62	62
16-05-04	PZ-A1	2	14	14	14
	PZ-A2	3	43	42	42
	PZ-A3	4	63	63	63
17-05-04	PZ-A1	2	11	11	11
	PZ-A2	3	41	41	41
	PZ-A3	4	63	63	63
21-05-04	PZ-A1	2	10	10	10
	PZ-A2	3	40	40	40
	PZ-A3	4	63	63	63
27-05-04	PZ-A1	2	11	11	11
	PZ-A2	3	42	42	42
	PZ-A3	4	60	60	60



NNSK JOINT VENTURE



Astra

Astra Base Terminal Landside Road System Project

Amoyambal Airport Project

Perumahan Pendukung PABD Dam Baru

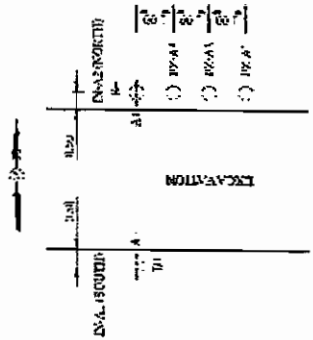
 Evaluation Date: 13/05/2004

Installation Location: Section A
 BMV: BEW.12
 Measured By: PPT

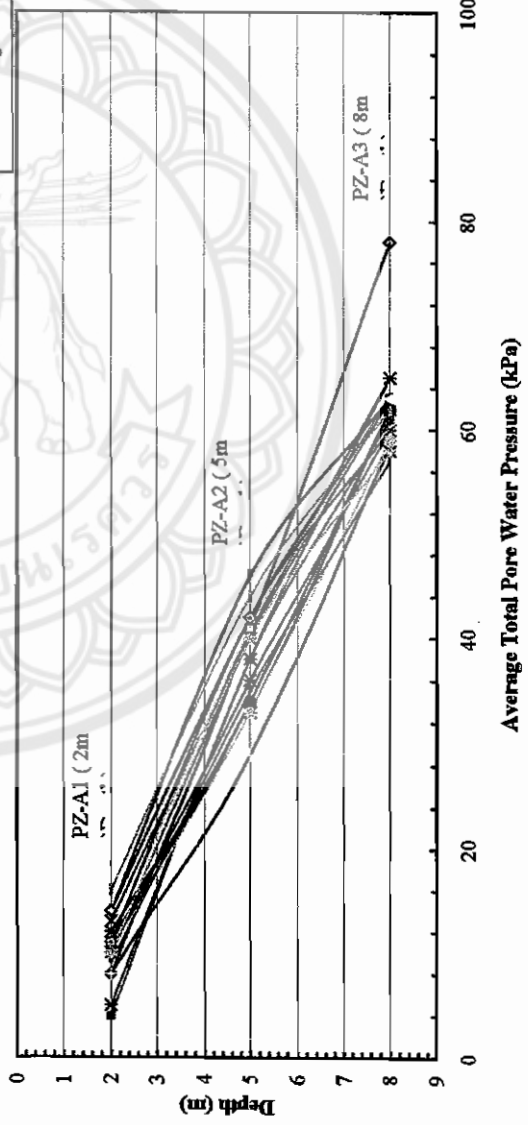
Reading Date	No. No	Depth (m)	Reading			Average
			Reading 1	Reading 2	Reading 3	
02-10-04	PZ-A1	2	10	10	10	10
	PZ-A2	5	36	36	36	36
	PZ-A3	8	60	60	60	60
13-10-04	PZ-A1	2	18	18	18	18
	PZ-A2	5	33	33	33	33
	PZ-A3	8	59	59	59	59
21-10-04	PZ-A1	2	8	8	8	8
	PZ-A2	5	29	29	29	29
	PZ-A3	8	58	59	58.5	58.5
28-10-04	PZ-A1	2	9	9	9	9
	PZ-A2	5	35	35	35	35
	PZ-A3	8	57	57	57	57
03-11-04	PZ-A1	2	10	10	10	10
	PZ-A2	5	40	40	40	40
	PZ-A3	8	58	58	58	58
12-11-04	PZ-A1	2	10	10	10	10
	PZ-A2	5	40	40	40	40
	PZ-A3	8	58	58	58	58

Construction Activity
 24/8/04: Began Excavation
 24/8/04: Excavation Level 1m
 25/8/04: Installed Strut Layer 1
 28/8/04: Excavation Level 3.5 m.
 30/8/04: Installed Strut Level 2
 2/9/04 : Excavation Level 6.0 m.
 8/9/04 : Installed Strut Level 3
 9/9/04 : Excavation Level 8.5 m.
 27/9/04: Removed Rrnut Level 3
 3/10/04 : Base Slab Completed
 8/10/04: Removed Strut Level 2
 3/11/04: Removed Strut Level 1
 10/11/04: Roof Slab Completed
 16/11/04: Piezometer PZ-A1 to PZ-A3 was Damaged and Monitoring Terminated

PIEZOMETER MONITORING RESULTS
 Alrside Road Tunnel - Landside Road System
 Suvarnabhumi Airport Project
 Average Total Pore Water Pressure With Depth
 Section A (BEW12)
 PZ-A1 to PZ-A3



- ◆ 25-05-04
- * 24-08-04
- 25-08-04
- 01-09-04
- * 02-09-04
- 03-09-04
- 05-09-04
- 09-09-04
- 12-09-04
- 16-09-04
- 17-09-04
- 21-09-04
- 27-09-04
- * 05-10-04
- 13-10-04
- 21-10-04
- 28-10-04
- * 05-11-04
- 12-11-04



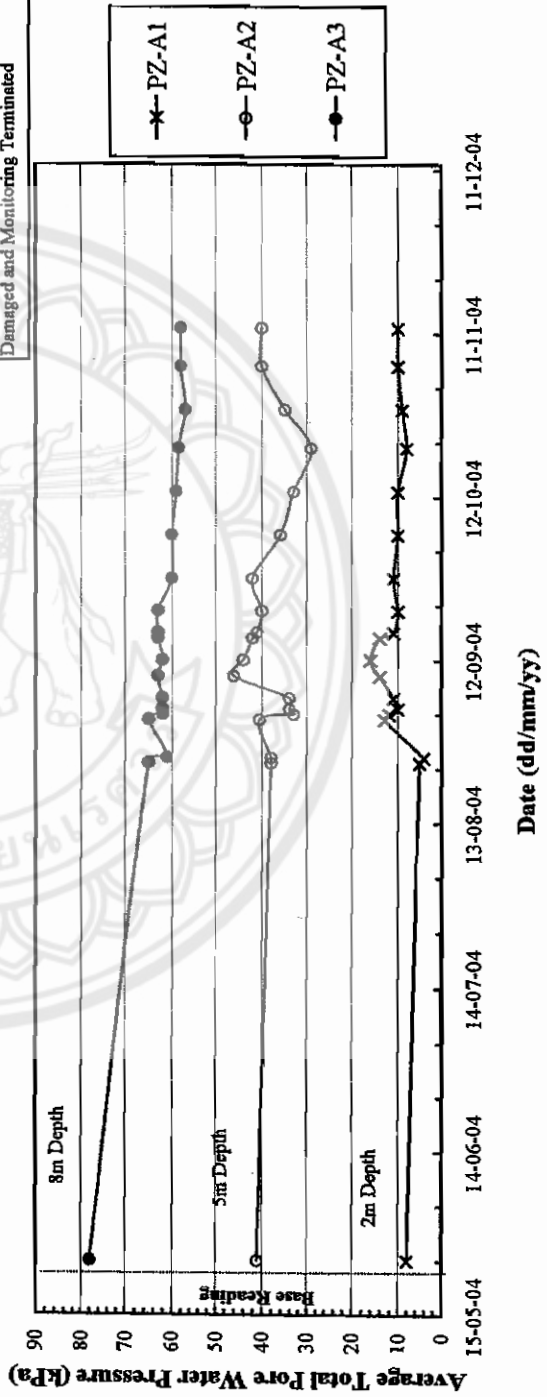
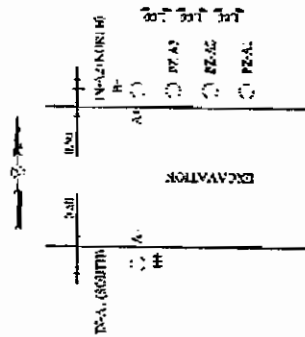
Construction Activity
 24/8/04: Began Excavation
 24/8/04: Excavation Level 1m
 25/8/04: Installed Strut Layer 1
 28/8/04: Excavation Level 3.5 m.
 30/8/04: Installed Strut Level 2
 2/9/04 : Excavation Level 6.0 m.
 8/9/04 : Installed Strut Level 3
 9/9/04 : Excavation Level 8.5 m.
 27/9/04 : Removed Rrnut Level 3
 3/10/04 : Base Slab Completed
 8/10/04 : Removed Strut Level 2
 3/11/04 : Removed Strut Level 1
 10/11/04 : Roof Slab Completed
 16/11/04: Piezometer PZ-A1 to PZ-A3 was Damaged and Monitoring Terminated

PIEZOMETER MONITORING

PESJI TS
Airside Road Tunnel - Landside Road System
Suvarnabhumi Airport Project

Average Total Pore Water Pressure With Time

Section A (BEW12)



NNK JOINT VENTURE



NKKM Corporation Co., Ltd. The NKKM Joint Co., Ltd. NKKM Corporation Co., Ltd.

Aktivita Sosial Terhadap Lingkungan Sosial Sistem Project

Bermain Sosial Masyarakat Project

Pencapaian Transkriptif Field Data Sheet

Installation Location : Swetica B

Installation Date : 4-30-2004

Book : 112/W9

Monitoring Date	Sha. No.	Depth (m)	Reading		Average
			Reading 1	Reading 2	
30-04-04	PZ-81	2	15	15	15
	PZ-82	3	39	38	38.5
	PZ-83	4	80	79	79.5
	PZ-84	2	13	13	13
	PZ-85	5	36	36	36
	PZ-86	8	81	81	81
03-05-04	PZ-81	2	14	14	14
	PZ-82	5	38	38	38
	PZ-83	8	79	79	79
	PZ-84	2	13	13	13
	PZ-85	5	36	35	35.5
	PZ-86	8	81	81	81
07-07-04	PZ-81	2	15	15	15
	PZ-82	3	40	40	40
	PZ-83	8	77	77	77
	PZ-84	2	15	15	15
	PZ-85	5	37	37	37
	PZ-86	8	79	79	79
08-05-04	PZ-81	2	15	15	15
	PZ-82	5	43	42	42.5
	PZ-83	8	75	75	75
	PZ-84	2	17	17	17
	PZ-85	5	41	41	41
	PZ-86	8	76	76	76
18-05-04	PZ-81	2	16	16	16
	PZ-82	5	45	46	45.5
	PZ-83	8	70	70	70
	PZ-84	2	19	19	19
	PZ-85	5	45	46	45.5
	PZ-86	8	74	74	74

NVA JOINT VENTURE



At-Risk Road Tunnel-Landside based System Project
Sewerage/Storm Water Project
Perimeter Plasometer Field Data Sheet
 Installation Date: 4/5/04
 Monitored By: JPT

Installation Location: Section B
 Block: BLEWS

Monitoring Date	Pis No.	Depth (m)	Reading			Average
			Reading 1	Reading 2	Reading 3	
12-05-04	P2-B1	2	16	16	16	16
	P2-B2	3	45	44	44	44.3
	P2-B3	8	71	71	71	71
	P2-B4	2	18	18	18	18
	P2-B5	1	45	45	45	45
	P2-B6	8	74	74	74	74
13-05-04	P2-B1	2	18	17	17	17.3
	P2-B2	3	47	47	47	47
	P2-B3	8	72	72	72	72
	P2-B4	2	21	20	20	20.5
	P2-B5	1	46	46	46	46
	P2-B6	8	74	74	74	74
17-05-04	P2-B1	2	22	22	22	22
	P2-B2	5	43	43	43	43
	P2-B3	8	67	67	67	67
	P2-B4	2	24	24	24	24
	P2-B5	1	46	46	46	46
	P2-B6	8	71	71	71	71
18-05-04	P2-B1	2	20	20	20	20
	P2-B2	3	49	49	49	49
	P2-B3	8	64	64	64	64
	P2-B4	2	24	24	24	24
	P2-B5	1	47	47	47	47
	P2-B6	8	69	69	69	69

NNK JOINT VENTURE



Abrukda Road, Tumbang Landulda Road Bypass Project
Samarahmaha Airport Project
Perimeter Measurement Field Data Sheet

Installation Location: Section B

Installation Date: 4/20/2004

Monitored By: PPT

Note: Perimeter PZ204 was damaged on 25 April 2004.

Monitoring Date	Pie No.	Depth (m)	Reading		Average
			Reading 1	Reading 2	
21-03-04	PZ-B1	2	20	19	19.5
	PZ-B2	5	45	46	46
	PZ-B3	8	68	68	68
	PZ-B4	2	-	-	-
	PZ-B5	5	51	51	51
26-03-04	PZ-B1	2	17	17	17
	PZ-B2	5	46	46	46
	PZ-B3	8	69	69	69
	PZ-B4	2	-	-	-
	PZ-B5	5	48	48	48
31-03-04	PZ-B1	2	16	16	16
	PZ-B2	5	46	46	46
	PZ-B3	8	68	68	68
	PZ-B4	2	24	24	24
	PZ-B5	5	51	52	51.5
01-05-04	PZ-B1	2	16	16	16
	PZ-B2	5	46	46	46
	PZ-B3	8	70	70	70
	PZ-B4	2	21	21	21
	PZ-B5	5	51	51	51
	PZ-B6	8	77	77	77

NNK JOINT VENTURE



Alimul Huda 'Amor-Landfill Road System Project
 Gubernurhutan Airport Project
 Pemasalahan Pemasangan PPH Data Sheet

Installation Location : Road 04 B
 Disk: 011WP
 Note : Pocometer PZ-84 was damaged on 11 June 2004.
 Monitoring Date : Installation Date : 4-10/2004
 Number of PZ : 77

Monitoring Date	Pie No.	Depth (cm)	Reading		Average
			Reading 1	Reading 2	
31-05-04	PZ-81	2	16	16	16
	PZ-82	3	46	46	46
	PZ-83	8	68	68	68
	PZ-84	2	24	24	24
01-06-04	PZ-85	3	51	52	51,5
	PZ-86	8	71	71	71
	PZ-81	2	16	16	16
	PZ-83	3	46	46	46
03-06-04	PZ-83	8	76	76	76
	PZ-84	2	21	21	21
	PZ-83	3	51	51	51
	PZ-86	8	77	77	77
04-06-04	PZ-81	2	18	18	18
	PZ-82	3	50	51	50,5
	PZ-83	8	76	75	75,5
	PZ-84	2	21	20	20,5
04-06-04	PZ-81	3	51	51	51
	PZ-86	8	76	76	76
	PZ-81	2	17	17	17
	PZ-82	3	47	47	47
11-06-04	PZ-83	8	78	78	78
	PZ-84	2	23	22	22
	PZ-85	3	52	52	52
	PZ-86	8	77	77	77
11-06-04	PZ-81	2	19	20	19,5
	PZ-82	3	47	47	47
	PZ-83	8	71	71	71
	PZ-84	2	.	.	.
11-06-04	PZ-85	3	51	50	50,5
	PZ-86	8	72	72	72

Monitoring Date	Pie No.	Depth (cm)	Reading I		Reading 2		Average
			Reading 1	Reading 2	Reading 1	Reading 2	
21-06-04	PZ-B1	3	18	18	46	46	18
	PZ-B2	4	46	46	78	78	46
	PZ-B3	8	78	78	-	-	78
	PZ-B4	2	-	-	49	49	-
	PZ-B5	3	49	49	76	76	49
	PZ-B6	8	76	76	-	-	76
	PZ-B1	2	19	19	44	44	19
	PZ-B2	3	44	44	74	74	44
05-07-04	PZ-B3	8	74	74	-	-	74
	PZ-B4	2	-	-	49	49	-
	PZ-B5	3	49	49	75	75	49
	PZ-B6	8	75	75	-	-	75
	PZ-B1	2	19	19	40	40	19
	PZ-B2	3	40	40	65	65	40
	PZ-B3	8	65	65	-	-	65
	PZ-B4	2	-	-	45	45	-
09-07-04	PZ-B5	3	45	45	70	70	45
	PZ-B6	8	70	70	-	-	70
	PZ-B1	2	15	15	30	30	15
	PZ-B2	3	30	30	53	53	30
	PZ-B3	8	53	53	-	-	53
	PZ-B4	2	-	-	26	26	-
	PZ-B5	3	26	26	63	63	26
	PZ-B6	8	63	63	-	-	63
21-07-04	PZ-B1	2	8	8	29	29	8
	PZ-B2	3	30	30	43	43	30
	PZ-B3	8	43	43	19	19	43
	PZ-B4	2	19	19	40	40	19
	PZ-B5	3	40	40	75	75	40
	PZ-B6	8	75	75	-	-	75
	PZ-B1	2	8	8	29	29	8
	PZ-B2	3	30	30	43	43	30
PZ-B3	8	43	43	19	19	43	
PZ-B4	2	19	19	40	40	19	
PZ-B5	3	40	40	75	75	40	
PZ-B6	8	75	75	-	-	75	

ANK JOINT VENTURE



Abulhasan Road Tunnel-Landfill Remediation System Project

Sourabaya Airport Project

Parameter Parameter PZ-81 Data Sheet

Installation Location : Station B

Installation Date : 14-10-2004

Noted by JPT

Note : Parameter PZ-81 was damaged on 11 June 2004 and repaired on 12 July 2004.

Parameter PZ-83 was damaged on 9 July 2004 and repaired on 12 July 2004.

Parameter PZ-84 was damaged on 11 August 2004.

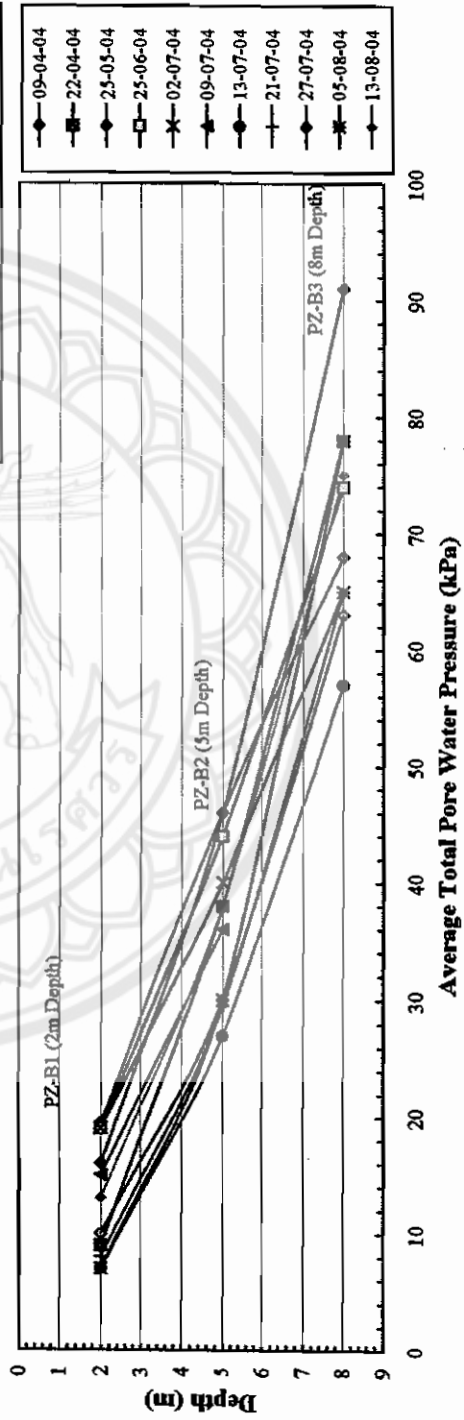
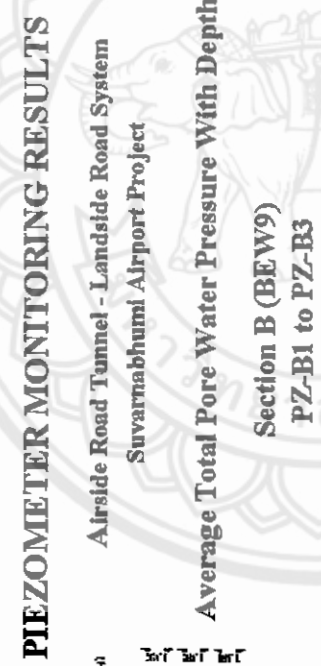
Parameter PZ-84-85 was damaged on 14 August 2004 due to sheet pile removal.

Parameter PZ-81-83 was damaged on 17 August 2004 by sheet pile removal.

Monitoring Date	Pile No.	Depth (m)	Reading		Average
			Reading 1	Reading 2	
27-07-04	PZ-81	2	10	10	10
	PZ-82	3	30	30	30
	PZ-83	4	63	63	63
	PZ-84	2	19	19	19
	PZ-85	5	43	43	43
	PZ-86	8	72	72	72
01-08-04	PZ-81	2	7	7	7
	PZ-82	3	30	30	30
	PZ-83	4	78	78	78
	PZ-84	2	19	19	19
	PZ-85	5	44	44	44
	PZ-86	8	83	83	83
13-08-04	PZ-81	2	13	13	13
	PZ-82	3	38	38	38
	PZ-83	4	75	75	75
	PZ-84	2	.	.	.
	PZ-85	5	48	48	48
	PZ-86	8	81	81	81

PIEZOMETER MONITORING RESULTS
Airside Road Tunnel - Landside Road System
Suvarnabhumi Airport Project
Average Total Pore Water Pressure With Depth
Section B (BEW9)
PZ-B1 to PZ-B3

Construction Activity
 3 May 04 : 2nd Strut Completed
 3 May 04 : 1st&2nd Struts Preloaded
 17 May 04 : Excavation Level 6.0m
 19 May 04 : 3rd Strut Completed
 20 May 04 : 3rd Strut Preloaded
 25 May 04 : Excavation Level 8.5m
 1 Jun 04 : 4th Strut Completed
 3 Jun 04 : Excavation Level 10.5m
 9 Jun 04 : 4th Strut Removed
 19 Jun 04 : Base Slab Completed
 30 Jun 04 : Removed Strut Level 3
 8 Jul 04 : Wall Completed ; Top -6.4 m.
 19 Jul 04 : Removed strut Level 2
 3 Aug 04 : Removed Strut Level 1
 12 Aug 04 : Wall Completed
 17 Aug 04 : Sheet Pile Removal Piezometer Damaged and Terminated



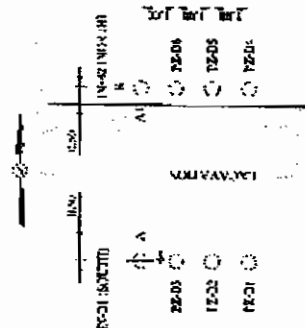
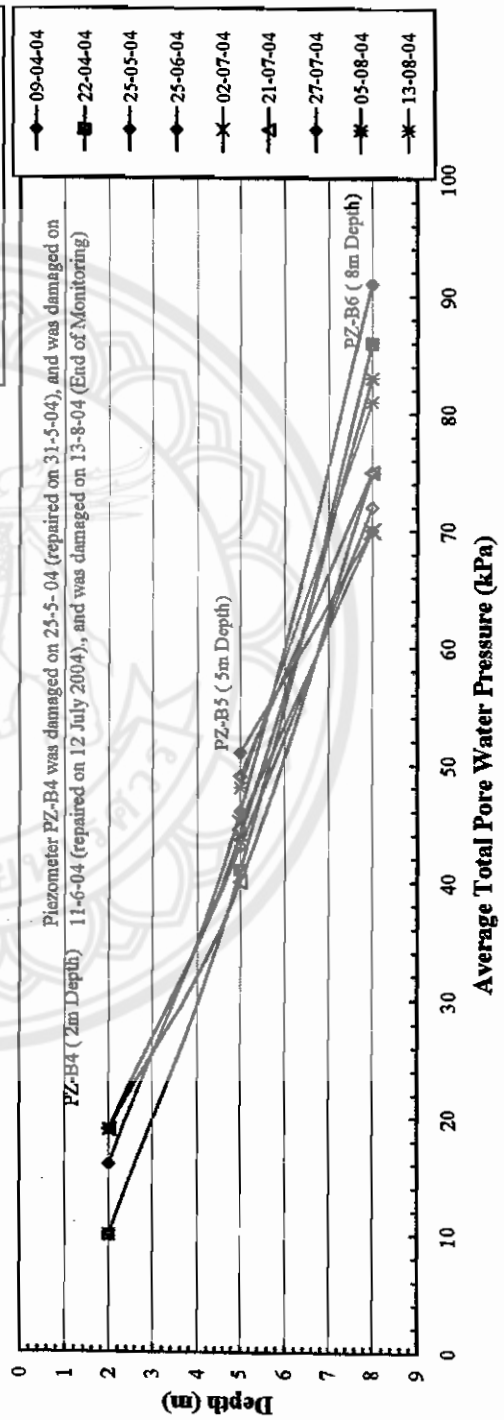
PIEZOMETER MONITORING

Airside Road Tunnel - Landside Road System
 Suvarnabhumi Airport Project

Average Total Pore Water Pressure With Depth
 Section B (BEW9)
 PZ-B4 to PZ-B6

Construction Activity

- 3 May 04 : 2nd Strut Completed
- 5 May 04 : 1st & 2nd Struts Preloaded
- 17 May 04 : Excavation Level 6.0m
- 19 May 04 : 3rd Strut Completed
- 20 May 04 : 3rd Strut Preloaded
- 24 May 04 : Excavation Level 8.5m
- 1 Jun 04 : 4th Strut Completed
- 3 Jun 04 : Excavation Level 10.5m
- 9 Jun 04 : 4th Strut Removed
- 19 Jun 04 : Base Slab Completed
- 30 Jun 04 : Removed Strut Level 3
- 8 Jul 04 : Wall Completed ; Top -6.4 m.
- 19 Jul 04 : Removed strut Level 2
- 3 Aug 04 : Removed Strut Level 1
- 12 Aug 04 : Top Slab Completed
- 14 Aug 04 : Sheet Pile Removal ; Piezometers damaged and rehabilitated



PIEZOMETER MONITORING RESULTS

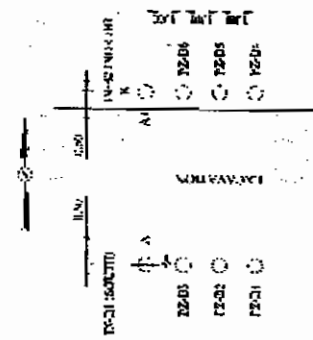
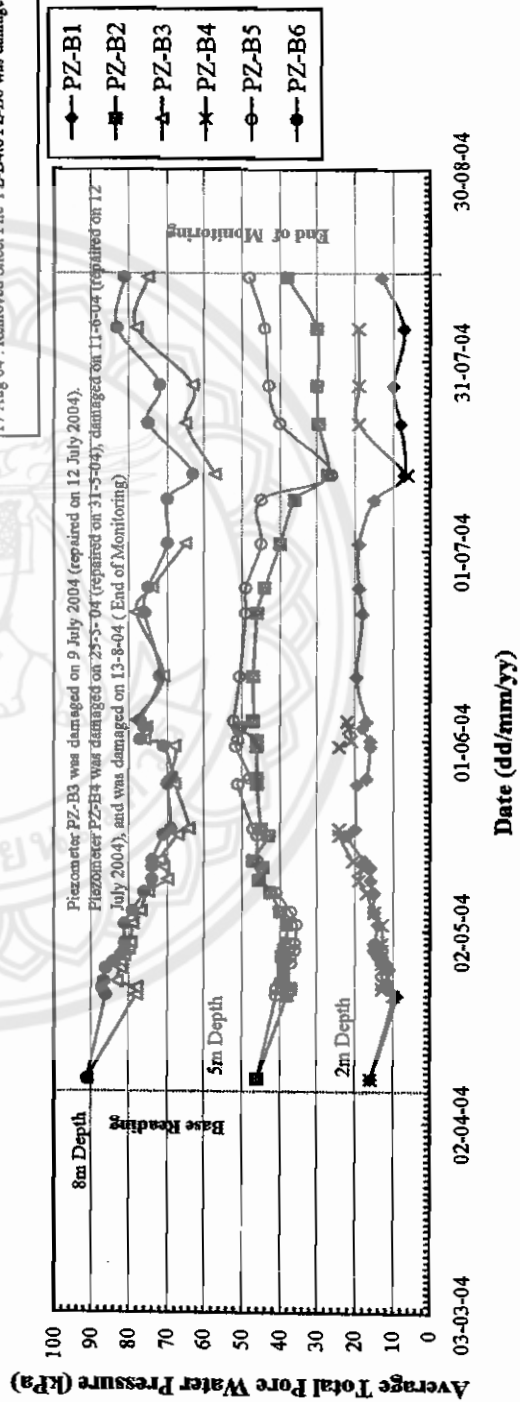
Airside Road Tunnel - Landside Road System
Suvarnabhumi Airport Project

Average Total Pore Water Pressure With Time

Section B (BEW9)

Construction Activity

- 3 May 04 : 2nd Strut Completed
- 5 May 04 : 1st&2nd Struts Preloaded
- 17 May 04 : Excavation Level 6.0m
- 19 May 04 : 3rd Strut Completed
- 20 May 04 : 3rd Strut Preloaded
- 25 May 04 : Excavation Level 8.5m
- 1 Jun 04 : 4th Strut Completed
- 3 Jun 04 : Excavation Level 10.5m
- 9 Jun 04 : 4th Strut Removed
- 19 Jun 04 : Base Slab Completed
- 30 Jun 04 : Removed Strut Level 3
- 8 Jul 04 : Wall Completed ; Top -6.4 m.
- 19 Jul 04 : Removed strut Level 2
- 3 Aug 04 : Removed Strut Level 1
- 14 Aug 04 : Removed Sheet Pile PZ-B1 to PZ-B3 was damaged
- 17 Aug 04 : Removed Sheet Pile PZ-B4to PZ-B6 was damaged



NNK JOINT VENTURE



Al-Baida Road Tunnel-Landslide Based System Project
Soranankhami Airport Project

Pneumatic Piezometer Field Data Sheet

Installation Location : Section C

Block : BEW67

Installation Date : 5/04/04

Monitored By : PPT

Measuring Date	Pie No.	Depth (m)	Reading 1		Reading 2		Average
			Reading 1	Reading 2	Reading 1	Reading 2	
27-05-04	PZ-C1	2	5	5	5	5	5
	PZ-C2	5	30	30	30	30	30
	PZ-C3	8	53	53	53	53	53
	PZ-C4	2	5	5	5	5	5
	PZ-C5	5	40	40	40	40	40
	PZ-C6	8	52	52	52	52	52
03-06-04	PZ-C1	2	4	4	4	4	4
	PZ-C2	5	29	29	29	29	29
	PZ-C3	8	49	49	49	49	49
	PZ-C4	2	3	3	3	3	3
	PZ-C5	5	38	37	37.5	37.5	37.5
	PZ-C6	8	46	44	44	44	44
11-06-04	PZ-C1	2	1	1	1	1	1
	PZ-C2	5	27	27	27	27	27
	PZ-C3	8	45	45	45	45	45
	PZ-C4	2	3	4	3.5	3.5	3.5
	PZ-C5	5	35	35	35	35	35
	PZ-C6	8	42	41	41.5	41.5	41.5
21-06-04	PZ-C1	2	3	3	3	3	3
	PZ-C2	5	28	28	28	28	28
	PZ-C3	8	47	47	47	47	47
	PZ-C4	2	8	8	8	8	8
	PZ-C5	5	33	33	33	33	33
	PZ-C6	8	41	41	41	41	41
24-06-04	PZ-C1	2	3	3	3	3	3
	PZ-C2	5	30	30	30	30	30
	PZ-C3	8	47	47	47	47	47
	PZ-C4	2	6	6	6	6	6
	PZ-C5	5	33	33	33	33	33
	PZ-C6	8	40	40	40	40	40

Pneumatic Piezometer Read Data Sheet

Installation Location : Section C
Book : BSWS7
Installation Date : 5/11/14
Monitored by : PPT

Measuring Date	Pie No.	Depth (m)	Reading			Average
			Reading 1	Reading 2	Reading 3	
25-06-04	PZ-C1	2	3	3	3	3
	PZ-C2	3	30	30	30	30
	PZ-C3	8	47	47	47	47
	PZ-C4	2	6	6	6	6
	PZ-C5	3	33	33	33	33
	PZ-C6	8	40	40	40	40
03-07-04	PZ-C1	2	3	3	3	3
	PZ-C2	3	16	16	16	16
	PZ-C3	8	45	45	45	45
	PZ-C4	2	3	3	3	3
	PZ-C5	3	32	32	32	32
	PZ-C6	8	40	40	40	40
04-07-04	PZ-C1	2	3	3	3	3
	PZ-C2	3	24	23	23.5	23.5
	PZ-C3	8	48	48	48	48
	PZ-C4	2	3	3	3	3
	PZ-C5	3	20	20	20	20
	PZ-C6	8	43	43	43	43
13-07-04	PZ-C1	2	8	8	8	8
	PZ-C2	3	20	20	20	20
	PZ-C3	8	46	46	46	46
	PZ-C4	2	3	3	3	3
	PZ-C5	3	30	30	30	30
	PZ-C6	8	42	42	42	42
23-07-04	PZ-C1	2	0	0	0	0
	PZ-C2	3	31	30	30.5	30.5
	PZ-C3	8	48	48	48	48
	PZ-C4	2	7	7	7	7
	PZ-C5	3	39	39	39	39
	PZ-C6	8	46	46	46	46

NSK JOINT VENTURE



Airside Road Tunnel, Landfill Road System Project
Barambahani Airport Project

Pneumatic Piezometer Field Data Sheet

Installation Location : Section C

Installation Date : 2/04/03

Block : BSW67

Measured By : PPT

Monitoring Date	Pie No.	Depth (m)	Reading			Average
			Reading 1	Reading 2	Reading 3	
02-07-04	PZ-C1	2	3	3	3	3
	PZ-C2	5	16	16	16	16
	PZ-C3	8	45	45	45	45
	PZ-C4	2	3	3	3	3
	PZ-C5	5	32	32	32	32
	PZ-C6	8	40	40	40	40
04-07-04	PZ-C1	2	3	3	3	3
	PZ-C2	5	24	23	23.5	23.5
	PZ-C3	8	48	48	48	48
	PZ-C4	2	3	3	3	3
	PZ-C5	5	29	29	29	29
	PZ-C6	8	43	43	43	43
13-07-04	PZ-C1	2	8	8	8	8
	PZ-C2	5	20	20	20	20
	PZ-C3	8	46	46	46	46
	PZ-C4	2	5	5	5	5
	PZ-C5	5	30	30	30	30
	PZ-C6	8	42	42	42	42
21-07-04	PZ-C1	2	0	0	0	0
	PZ-C2	5	31	30	30.5	30.5
	PZ-C3	8	48	48	48	48
	PZ-C4	2	7	7	7	7
	PZ-C5	5	39	39	39	39
	PZ-C6	8	46	46	46	46
27-07-04	PZ-C1	2	0	0	0	0
	PZ-C2	5	28	28	28	28
	PZ-C3	8	47	47	47	47
	PZ-C4	2	6	6	6	6
	PZ-C5	5	38	38	38	38
	PZ-C6	8	45	45	45	45
04-08-04	PZ-C1	2	0	0	0	0
	PZ-C2	5	30	30	30	30
	PZ-C3	8	47	47	47	47
	PZ-C4	2	8	8	8	8
	PZ-C5	5	39	39	39	39
	PZ-C6	8	44	44	44	44



Almalki Road Tunnel-Landfill Road System Project

Barambahani Airport Project

Pneumatic Piezometer Field Data Sheet

Installation Location : Section C

Block : BERW67

Note : Piezometer PZ-C1 to PZ-C3 was damaged on 7 August 2018 due to fiber pile removal

Piezometer PZ-C4-PZ-C6 was damaged on 13 August 2018 due to earth backfill.

Installation Date : 5/6/04

Monitored By : PPT

Monitoring Date	Piez. No.	Depth (m)	Reading		Average
			Reading 1	Reading 2	
05-08-04	PZ-C1	2	0	0	0
	PZ-C2	5	30	30	30
	PZ-C3	8	47	47	47
	PZ-C4	2	8	8	8
	PZ-C5	5	39	39	39
	PZ-C6	8	41	44	44
13-08-04	PZ-C1	2	-	-	-
	PZ-C2	5	-	-	-
	PZ-C3	8	-	-	-
	PZ-C4	2	17	17	17
	PZ-C5	5	52	52	52
	PZ-C6	8	63	63	63

PIEZOMETER MONITORING RESULTS

Airside Road Tunnel - Landside Road System

Suvarnabhumi Airport Project

Average Total Pore Water Pressure With Depth

Section C (BEW6/7)

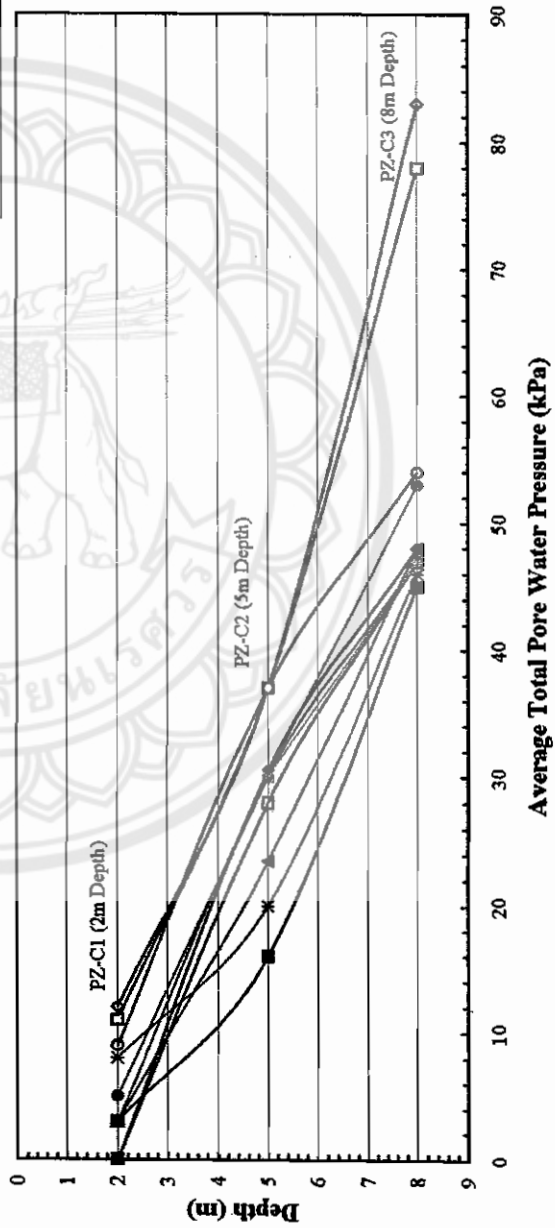
PZ-C1 to PZ-C3

Construction Activity

- 7 Apr 04 : Excavation Level 3.5m
- 8 Apr 04 : 2nd Strut Completed
- 19 Apr 04 : Excavation Level 6.0m
- 20 Apr 04 : 3rd Strut Completed
- 30 Apr 04 : Excavation Level 8.5m
- 4 May 04 : 1st 2nd 3rd Struts Preloaded
- 21 Jun 04 : Base Slab Completed
- 27 Jun 04 : 3rd Strut Removed
- 26 Jul 04 : Wall Completed, Top 4.5m Depth
- 7 Jul 04 : 2nd Strut Removed
- 19 Jul 04 : 1st Strut Removed
- 4 Aug 04 : Wall Completed
- 7 Aug 04 : Removed Sheet Pile

PZ-C1 - PZ-C3 damaged and terminated

◆	27-03-04
□	07-04-04
○	30-04-04
●	27-05-04
+	25-06-04
■	02-07-04
▲	08-07-04
*	13-07-04
◆	23-07-04
□	27-07-04
*	05-08-04



PIEZOMETER MONITORING RESULTS

Airside Road Tunnel - Landside Road System

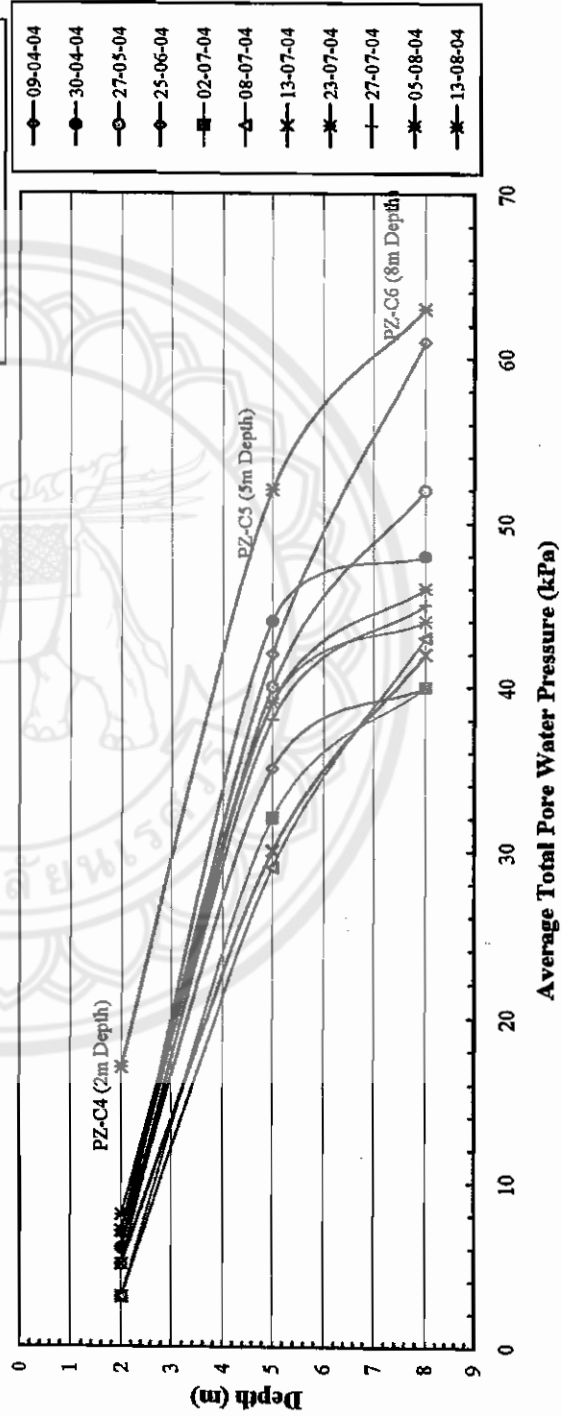
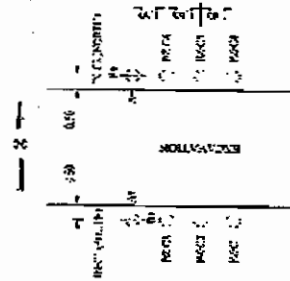
Suvarnabhumi Airport Project

Average Total Pore Water Pressure With Depth

Section C (BEW6/7)
PZ-C4 to PZ-C6

Construction Activity

7 Apr 04	Excavation Level 3.5m
8 Apr 04	2nd Strut Completed
19 Apr 04	Excavation Level 6.0m
20 Apr 04	3rd Strut Completed
30 Apr 04	Excavation Level 8.5m
4 May 04	1st 2nd 3rd Struts Preloaded
27 May 04	Base Slab Completed
21 Jun 04	3rd Strut Removed
26 Jul 04	Wall Completed, Top 4.5m Depth
7 Jul 04	2nd Strut Removed
19 Jul 04	1st Strut Removed
4 Aug 04	Wall Completed
7 Aug 04	Sheet Pile Removal
15 Aug 04	PZ-C4-PZ-C6 damaged and terminated



PIEZOMETER MONITORING RESULTS

Airside Road Tunnel - Landside Road System

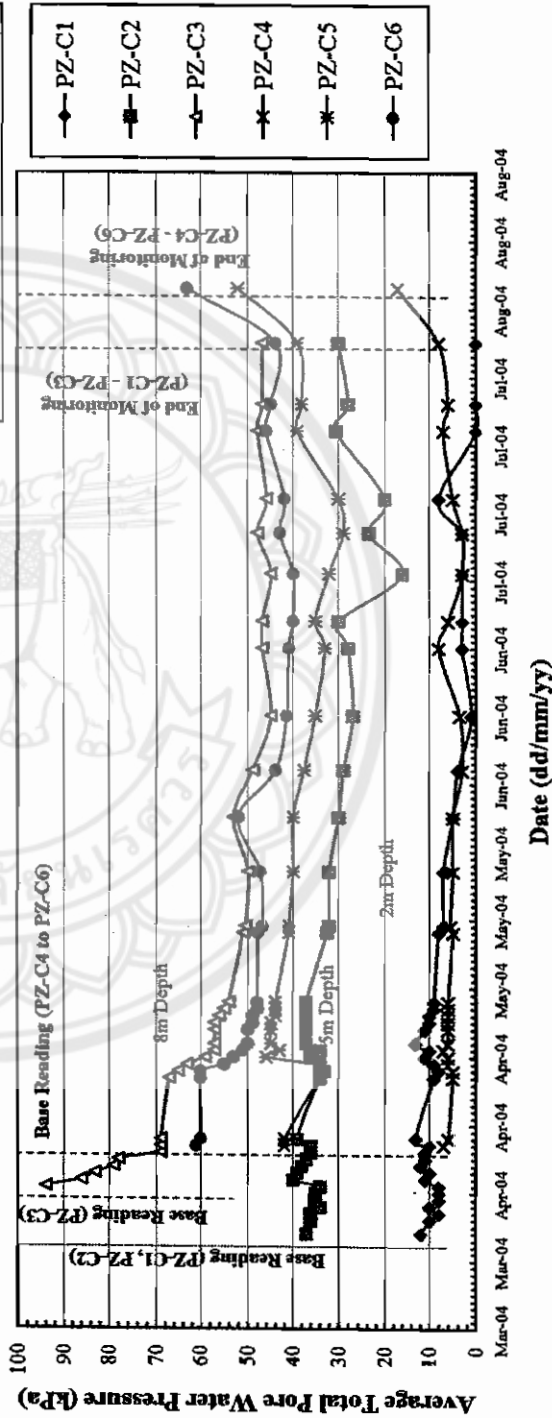
Suvarnabhumi Airport Project

Average Total Pore Water Pressure With Time

Section C (BEW6/7)

Construction Activity

- 7 Apr 04 : Excavation Level 3.5m
- 8 Apr 04 : 2nd Street Completed
- 19 Apr 04 : Excavation Level 6.0m
- 20 Apr 04 : 3rd Street Completed
- 4 May 04 : Excavation Level 8.5m
- 27 May 04 : Base Slab Completed
- 21 Jun 04 : 3rd Street Removed
- 26 Jul 04 : Wall Completed, Top 4.5m Depth
- 7 Jul 04 : 2nd Street Removed
- 19 Jul 04 : 1st Street Removed
- 4 Aug 04 : Wall Completed
- 7 Aug 04 : Removed Shot Pile/ PZ-C1 - PZ-C3 damaged and terminated
- 12 Aug 04 : PZ-C4 - PZ-C6 damaged and terminated




NNK JOINT VENTURE
 Maldives Construction Co. Ltd. The Niyam Road Co. Ltd. Kooli Thin Engineers Co. Ltd.
Alcides Road Tunnel-Landfill Road Systems Project
Seyunabandhi Airport Project
 Preconcrete Formwork Field Data Sheet
 Installation Location: Section D
 Block: BEW4
 Installation Date: 16/7/2004
 Measured By: FTT

Measuring Date	Pile No.	Depth (m)	Reading			Average
			Reading 1	Reading 2		
30-04-04	PZ-01	2	20	20	20	20
	PZ-02	5	40	40	40	40
	PZ-03	8	61	61	61	61
06-05-04	PZ-01	2	20	20	20	20
	PZ-02	5	38	38	38	38
	PZ-03	8	60	59	59.5	59.5
11-05-04	PZ-01	2	19	19	19	19
	PZ-02	5	39	39	39	39
	PZ-03	8	60	60	60	60
20-05-04	PZ-01	2	19	19	19	19
	PZ-02	5	38	38	38	38
	PZ-03	8	55	55	55	55
27-05-04	PZ-01	2	19	19	19	19
	PZ-02	5	38	38	38	38
	PZ-03	8	55	55	55	55
03-06-04	PZ-01	2	19	19	19	19
	PZ-02	5	40	40	40	40
	PZ-03	8	60	60	60	60
11-06-04	PZ-01	2	18	18	18	18
	PZ-02	5	42	41	41.5	41.5
	PZ-03	8	58	58	58	58
14-06-04	PZ-01	2	19	19	19	19
	PZ-02	5	38	38	38	38
	PZ-03	8	58	58	58	58

Installation Location : Section D
 Block : BEWA

Monitoring Date	Pie No.	Depth (m)	Reading		Average
			Reading 1	Reading 2	
16-06-04	PZ-D1	2	16	18	18
	PZ-D2	3	39	39	39
	PZ-D3	8	55	59	55
22-06-04	PZ-D1	2	24	24	24
	PZ-D2	3	48	43	43
	PZ-D3	8	55	51	55
23-06-04	PZ-D1	2	23	23	23
	PZ-D2	4	37	37	37
	PZ-D3	8	54	54	54
24-06-04	PZ-D1	2	23	23	23
	PZ-D2	5	39	39	39
	PZ-D3	8	53	53	53
25-06-04	PZ-D1	2	23	23	23
	PZ-D2	5	41	41	41
	PZ-D3	8	54	54	54
30-06-04	PZ-D1	2	23	23	23
	PZ-D2	4	41	41	41
	PZ-D3	8	54	54	54
01-07-04	PZ-D1	2	25	23	23
	PZ-D2	3	43	42	42.5
	PZ-D3	8	54	52	53
07-07-04	PZ-D1	2	23	28	25
	PZ-D2	5	41	41	41
	PZ-D3	8	59	59	59

Alor Gajah Road Tunnel Landfill Road System Project
 Seremban/Alor Gajah Project
 Preliminary Proforma Field Data Sheet
 Installation Location : Section D
 Block: 333W4
 Installation Date: 1/05/2004
 Measured By: JFT

Measuring Date	Pie No.	Depth (m)	Reading			Average
			Reading 1	Reading 2	Reading 3	
20-06-04	PZ-01	2	23	23	23	23
	PZ-02	3	41	41	41	41
	PZ-03	8	54	54	54	54
30-06-04	PZ-01	2	23	23	23	23
	PZ-02	5	41	41	41	41
	PZ-03	8	54	54	54	54
01-07-04	PZ-01	2	23	23	23	23
	PZ-02	5	43	42	42.5	42.5
	PZ-03	8	54	52	53	53
07-07-04	PZ-01	2	23	23	23	23
	PZ-02	3	41	41	41	41
	PZ-03	8	58	50	50	50
16-07-04	PZ-01	2	23	23	23	23
	PZ-02	5	35	35	35	35
	PZ-03	8	50	50	50	50
23-07-04	PZ-01	2	23	23	23	23
	PZ-02	3	39	39	39	39
	PZ-03	8	51	51	51	51
29-07-04	PZ-01	2	22	22	22	22
	PZ-02	5	35	35	35	35
	PZ-03	8	55	55	55	55
03-08-04	PZ-01	2	16	15	15.5	15.5
	PZ-02	3	34	34	34	34
	PZ-03	8	53	53	53	53
18-08-04	PZ-01	2	20	16	18	18
	PZ-02	5	35	34	34.5	34.5
	PZ-03	8	53	53	53	53
25-08-04	PZ-01	2	18	18	18	18
	PZ-02	5	35	35	35	35
	PZ-03	8	53	53	53	53
01-09-04	PZ-01	2	14	14	14	14
	PZ-02	5	34	34	34	34
	PZ-03	8	56	56	56	56

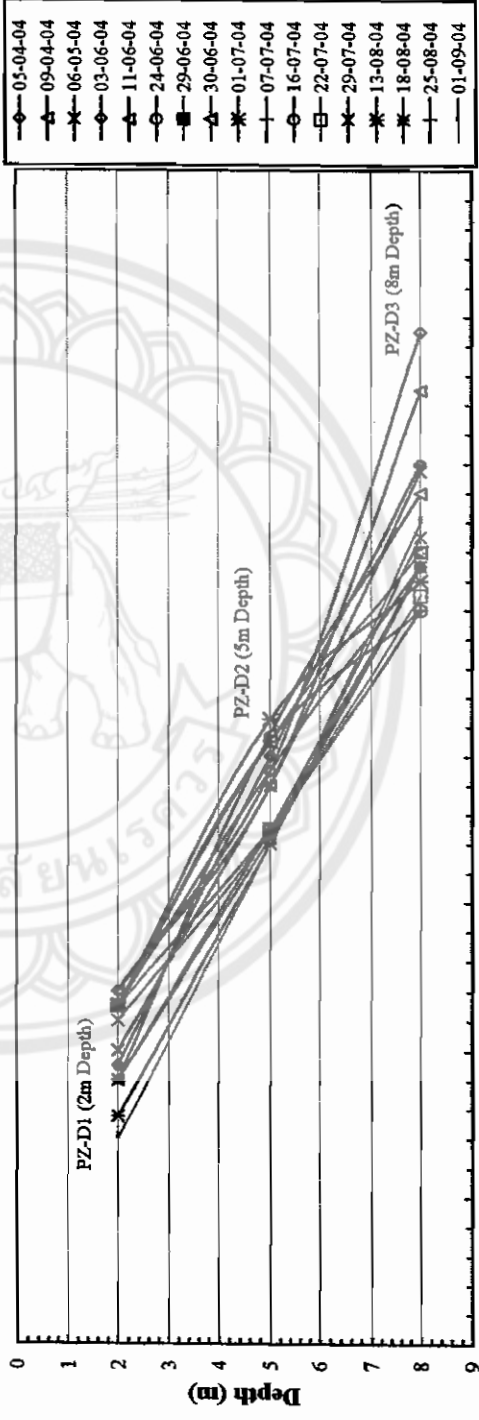
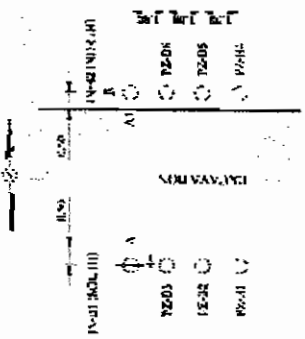
PIEZOMETER MONITORING RESULTS

Airside Road Tunnel - Landside Road System Suvarnabhumi Airport Project

Average Total Pore Water Pressure With Section D (BEW4) PZ-D1 to PZ-D3

Construction Activity

- 4 Apr 04 : 1st Strut Completed
- 9 Apr 04 : Excavation Level 3.5m
- 9 Apr 04 : 2nd Strut Completed
- 4 May 04 : 1st & 2nd Struts Preloaded
- 20 May 04 : 3rd Strut of BEW3 Removed
- 11 Jun 04 : Excavation at BEW3 to BEW2
- 23 Jun 04 : Excavation Level 6.5m
- 27 Jun 04 : 3rd Strut Completed
- 1 Jul 04 : Excavation Level 7.5m
- 15 Jul 04 : Removed Strut Level 3
- 28 Aug 04 : Removed Strut Level 2
- 30 Aug 04 : Base Slab Completed
- 10 Sep 04 : Piezometer was damaged and Terminated



Average Total Pore Water Pressure (kPa)

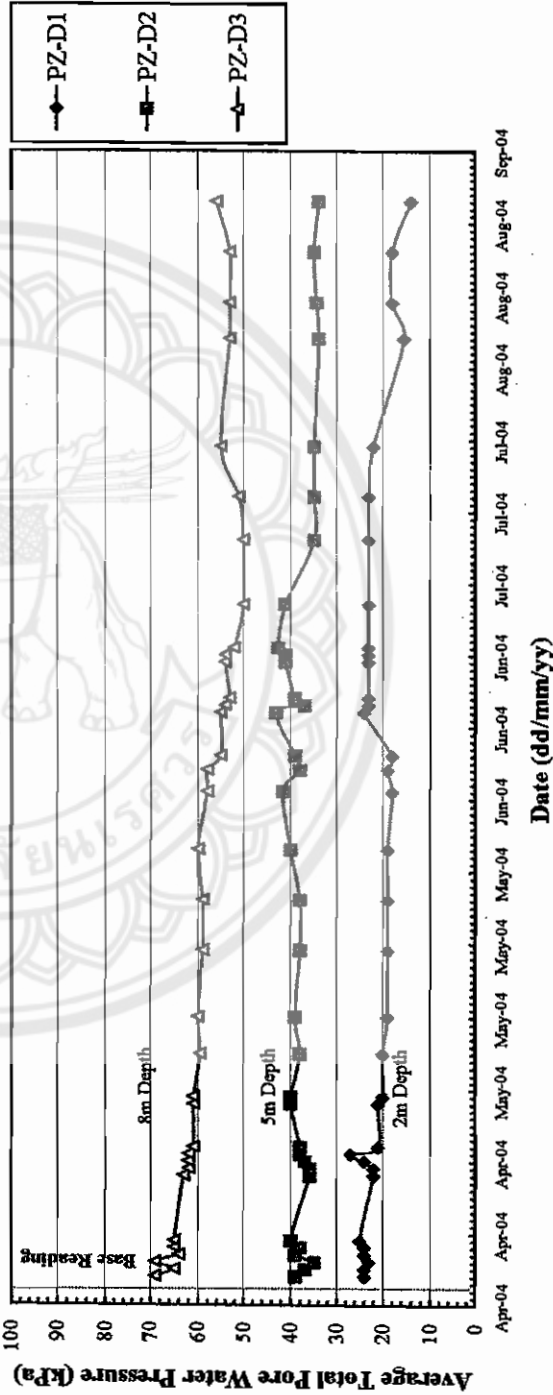
PIEZOMETER MONITORING RESULTS

Airside Road Tunnel - Landside Road System Suvarnabhumi Airport Project

Average Total Pore Water Pressure With Time

Section D (BEW4)

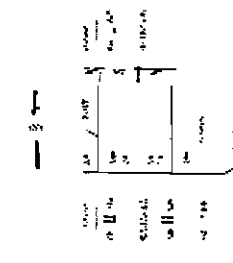
Construction Activity
 4 Apr 04 : 1st Strut Completed
 9 Apr 04 : Excavation Level 3.5m
 9 Apr 04 : 2nd Strut Completed
 4 May 04 : 1st/2nd Struts Preloaded
 20 May 04 : 3rd Strut of BEW3 Removed
 11 Jun 04 : Excavation at BEW3 to BEW2
 23 Jun 04 : Excavation Level 6.5m
 27 Jun 04 : 3rd Strut Completed
 1 Jul 04 : Excavation Level 7.5m
 15 Jul 04 : Removed Strut Level 3
 28 Aug 04 : Removed Slab Level 2
 30 Aug 04 : Base Blab Completed
 10 Sep 04 : Piezometer was damaged and Terminated



ภาคผนวก ข

ตารางและกราฟแสดงผลการตรวจวัดจากเครื่องมือ Strain Gauge

NNK JOINT VENTURE
 NNK Construction Co., Ltd. & NNK Engineering Co., Ltd.
Altride Road Tunnel-Landside Road System Project
 Srirachhulam Airport Project
Strain Gauge Monitoring



Strain Level : 1 (Lim. Basah)
 Monitored By : EYT
 Installation Date : 23/08/2004
 Weather : Cloudy
 Initial Reading Date : 23/08/2004

Installation Location : Station A
 Block : BEW12

Date	A1E			A1W			Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Temp. (°C)	CF-Temp.			
25-08-04	2438.21	36.0	0.00	-73.04	35.8	0.00	-72.30	-56.34	Initial Reading
26-08-04	2165.17								Exc. Level 1m Depth
30-08-04									Initial Strut Level 2
01-09-04	2266.32	37.1	-0.27	-172.15	36.4	0.18	-183.28	-64.90	Exc. Level 3.5m Depth
02-09-04	2264.17	30.6	-2.22	-176.26	30.0	-1.74	-189.02	-66.70	Exc. Level 6.0m Depth
03-09-04	2264.84	31.6	-1.92	-175.28	31.4	-1.32	-186.79	-66.11	Exc. Level 6.0m Depth
05-09-04	2294.69	31.1	-2.07	-145.58	30.6	-1.56	-188.27	-55.48	Exc. Level 6.0m Depth
08-09-04	2300.41	35.1	-0.87	-138.66	35.4	-0.72	-130.30	-92.76	Exc. Level 6.0m Depth
09-09-04	2295.27	32.7	-1.39	-144.53	31.5	-1.29	-137.18	-55.09	Initial Strut Level 3
10-09-04	2301.86	32.1	-1.77	-138.12	32.1	-1.11	-133.26	-45.69	Exc. Level 4.5m Depth
12-09-04	2309.40	40.1	0.63	-128.18	38.1	0.69	-139.94	-33.20	
16-09-04	2303.73	36.6	-0.42	-134.90	38.1	0.69	-145.84	-48.96	
17-09-04	2308.07	31.7	-1.89	-132.03	31.3	-1.35	-137.97	-51.26	
21-09-04	2325.53	35.2	-0.84	-113.70	34.9	-0.27	-124.51	-40.38	
27-09-04	2346.51	38.2	0.06	-91.64	36.9	0.93	-103.92	-43.50	Remove Strut Layer 3
03-10-04								-35.71	Base Slab Completed
09-10-04	2360.67	37.2	-0.24	-77.78	39.2	1.02	-82.91	-29.34	
08-10-04									Remove Strut Layer 2
13-10-04	2351.35	38.0	0.00	-86.86	39.0	0.96	-94.24	-33.07	
21-10-04	2341.09	36.0	-0.60	-97.72	36.2	0.12	-105.43	-37.09	
28-10-04	2254.96	35.8	-0.66	-183.94	36.1	0.09	-186.06	-68.68	Concrete Wall Pouring
05-11-04									Remove Strut Layer 1

STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
Suvarnabhumi Airport

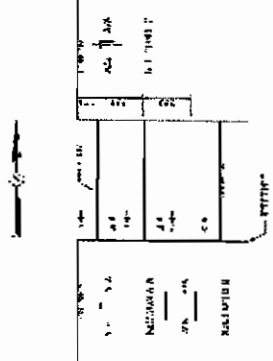
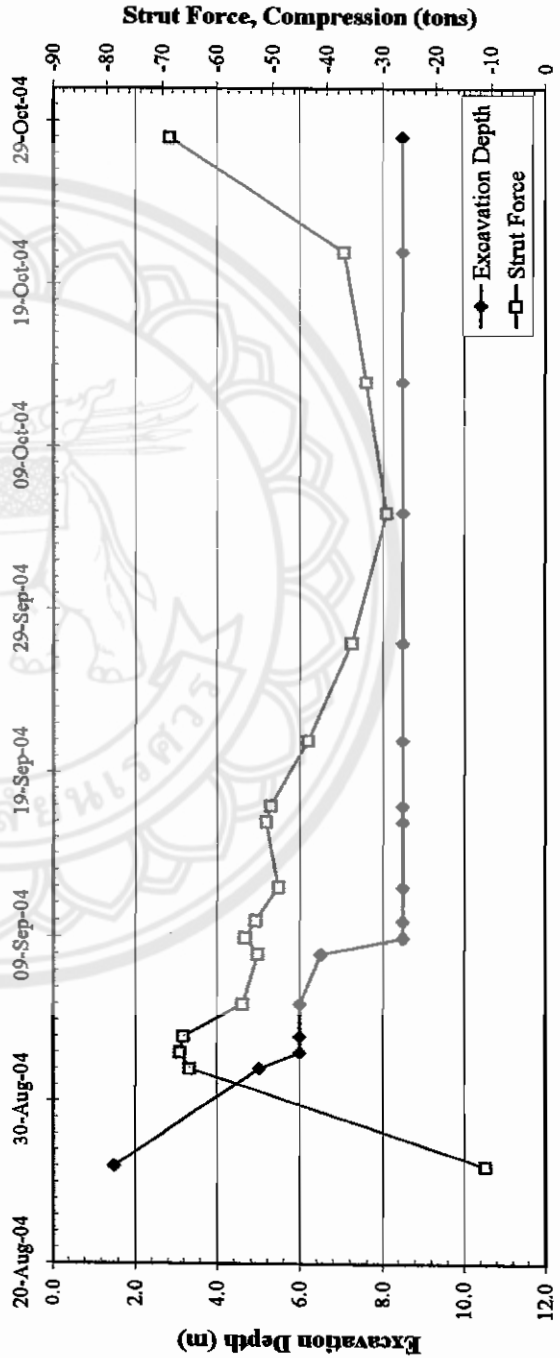
Strut Force and Excavation Depth with Time

Section A (BEW12)
Strut Layer 1 : A1E and A1W

Construction Activity

24 Aug 04	: Began Excavation
24 Aug 04	: Excavation Level 1.0m
25 Aug 04	: Install Strut Level 1
28 Aug 04	: Excavation Level 3.5m
30 Aug 04	: Install Strut Level 2
2 Sep 04	: Excavation Level 6.0m
8 Sep 04	: Install Strut Level 3
9 Sep 04	: Excavation Level 8.5m
27 Sep 04	: Removed Strut Level 3
3 Oct 04	: Base Slab Completed
8 Oct 04	: Removed Strut Level 2
3 Nov 04	: Removed Strut Layer 1

Date (dd/mm/yy)





Installation Location: Section A
 Block: BEV/2
 Strain Level: 2 (3.5m Depth)
 Installation Date: 28/02 Initial Reading Date: 28/02/04
 Weather: Cloudy
 Monitored By: JET

Date	A2P		A2W		Force (t)	Construction Activity
	Strain (x10 ⁻⁵)	Temp. (°C)	CF-Temp. (°C)	CF-Temp. Change (x10 ⁻⁵)		
02-09-04	2487.31	30.6	30.0			Initial Reading (Exc. Lev)
03-09-04	2264.17	29.9	30.5	-23.89	-81.70	Exc. Level 6.0m
04-09-04	2265.71	30.8	31.0	-22.90	-81.19	Exc. Level 6.0m
08-09-04	2264.41	36.1	35.2	-22.71	-81.10	Exc. Level 6.0m
09-09-04	2220.05	33.6	33.2	-26.56	-98.01	Install Strut Level 3
10-09-04	2229.34	31.2	31.0	-27.59	-98.38	Exc. Level 8.5m
12-09-04	2228.38	36.2	36.4	-25.65	-93.92	
16-09-04	2225.18	37.2	37.6	-26.13	-93.26	
17-09-04	2213.37	29.2	29.4	-27.36	-95.01	
21-09-04	2229.26	33.6	34.1	-27.33	-92.45	
27-09-04	2189.93	35.8	37.0	-29.62	-107.85	Remove Strut Layer 3
03-10-04	2188.43	35.3	37.5	-29.67	-108.29	Base Slab Completed
08-10-04						Remove Strut Layer 2
						Monitoring Terminated

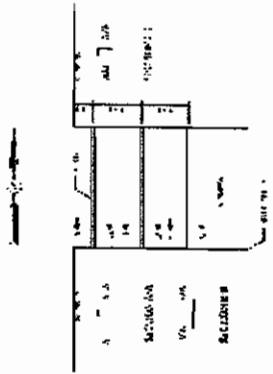
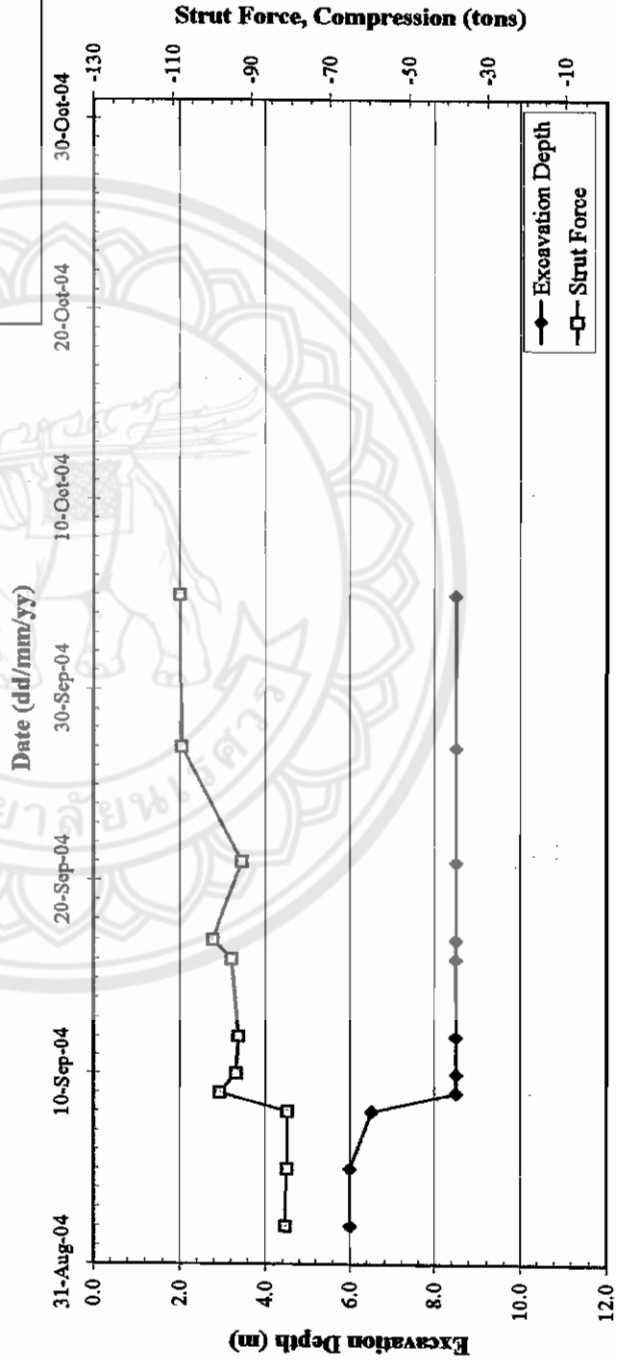
STRAIN GAUGES MONITORING RESULTS

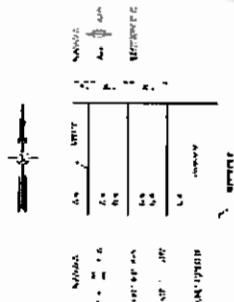
Airside Tunnel - Landside Road System
Suvannabhumi Airport

Strut Force and Excavation Depth with Time

Section A (BEW12)
Strut Layer 2 : A2E and A2W

Construction Activity	
24 Aug 04	: Began Excavation
24 Aug 04	: Excavation Level 1.0m
25 Aug 04	: Install Strut Level 1
28 Aug 04	: Excavation Level 3.5m
30 Aug 04	: Install Strut Level 2
2 Sep 04	: Excavation Level 6.0m
8 Sep 04	: Install Strut Level 3
9 Sep 04	: Excavation Level 8.5m
27 Sep 04	: Removed Strut Level 3
3 Oct 04	: Base Slab Completed
8 Oct 04	: Removed Strut Level 2





Installation Location : Station A
Block : BEW12

Strain Level : 3.16m (Depth)
Monitored By : PET

Installation Date : 8/09/2004
Weather : Sunny

Initial reading Date : 8/09/2004
Base Reading Reset : 09/2004

Date	A3E		A3W		Average Strain Change	Force (t)	Construction Activity
	Strain ($\times 10^{-5}$)	Temp. (°C)	CF-Temp.	Strain Change ($\times 10^{-5}$)			
08-09-04	1810.00	33.8	-	-	-	-	-
09-09-04	1566.10	31.9	-0.57	-284.47	-284.44	+103.88	3rd Slab, Exc. depth 6m (Initial Reading)
10-09-04	1564.63	31.9	-0.57	-285.94	-285.46	-104.25	Exc Level 8.5m.
12-09-04	1564.97	37.5	1.11	-283.92	-283.97	-103.70	Base Slab Completed
17-09-04	1566.69	37.5	1.11	-282.20	-283.28	-103.45	-
18-09-04	1570.22	29.1	-1.41	-281.19	-282.56	-103.19	-
21-09-04	1568.03	33.4	-0.12	-282.09	-282.68	-103.23	-
27-09-04	1626.07	36.9	0.93	-223.00	-224.75	-82.08	Slab Layer 3 removed after reading

STRAIN GAUGES MONITORING RESULTS

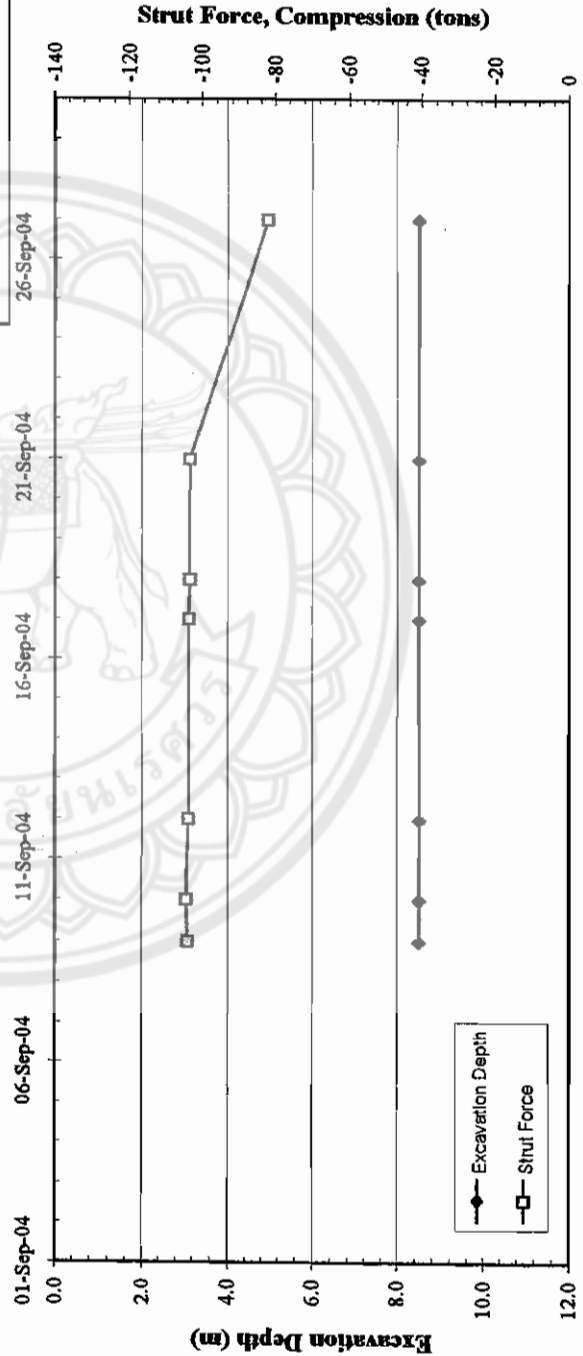
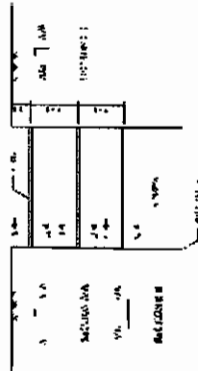
Alrside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section A (BEW12)
Strut Layer 1 (A3E and A3W)

Date (dd/mm/yy)

Construction Activity	
24 Aug 04	: Began Excavation
24 Aug 04	: Excavation Level 1.0m
25 Aug 04	: Install Strut Level 1
28 Aug 04	: Excavation Level 3.5m
30 Aug 04	: Install Strut Level 2
2 Sep 04	: Excavation Level 6.0m
8 Sep 04	: Install Strut Level 3
9 Sep 04	: Excavation Level 8.5m
27 Sep 04	: Removed Strut Level 3
3 Oct 04	: Base Slab Completed





NKK JOINT VENTURE

 NKK Joint Venture Ltd.

 240/4 Road Tunnel-Landslide Road System Project

 Suvarnabhumi Airport Project

 Strain Gauge Monitoring



Initial reading Date : 26/04/2004
 Base Reading Reset : 20/05/2004 (After Hydraulic Jack Released)

Installation Date : 24/04/2004
 Weather : Sunny

Spud Level : 1.1m (Depth)
 Monitored By : PZI

Installation Location : Section B
 Block : BEW2

Date	B1E		B1W		Poreo (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	Temp. (°C)	Strain Change (x10 ⁻⁶)		
26-05-04	0.00	0.0	0.0	-2002.5	-731.29	ST7: Exc. Level 8.5m
31-05-04	0.00	0.0	0.0	-2002.50	-731.29	ST7: Exc. Level 8.5m
01-06-04	0.00	0.00	0.00	-2002.50	-731.29	(Excavation toward BEW10)
03-06-04	0.00	0.0	0.0	-2002.50	-731.29	ST8: Installed 4th Strut
04-06-04	0.00	0.00	0.00	-2002.50	-731.29	ST9: Exc. Level 10.5m
05-06-04	0.00	0.00	0.00	-2002.50	-731.29	ST9: Exc. Level 10.5m
11-06-04	0.00	0.00	0.00	-2002.50	-731.29	ST10: 4th Strut Removed
18-06-04	0.00	0.00	0.00	-2002.50	-731.29	Preparing for Reinforcing Arrangement
19-06-04	0.00	0.00	0.00	-2002.50	-731.29	Preparing for Concrete Base Slab
23-06-04	0.00	0.00	0.00	-2002.50	-731.29	ST11: Base Slab Completed
30-06-04	0.00	0.00	0.00	-2002.50	-731.29	No Activity
02-07-04	0.00	0.00	0.00	-2002.50	-731.29	3rd Strut Removed
07-07-04	0.00	0.00	0.00	-2002.50	-731.29	Wall Reinforcing Arrangement
09-07-04	0.00	0.00	0.00	-2002.50	-731.29	Wall Completed, Top Level 6.4 m
13-07-04	0.00	0.00	0.00	-2002.50	-731.29	No Activity
19-07-04	0.00	0.00	0.00	-2002.50	-731.29	No Activity
21-07-04	0.00	0.00	0.00	-2002.50	-731.29	2nd Strut Removed
28-07-04	0.00	0.00	0.00	-2002.50	-731.29	No Activity
03-08-04	0.00	0.00	0.00	-2002.50	-731.29	No Activity
						1st Strut Removed

STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
Suvarnabhumi Airport

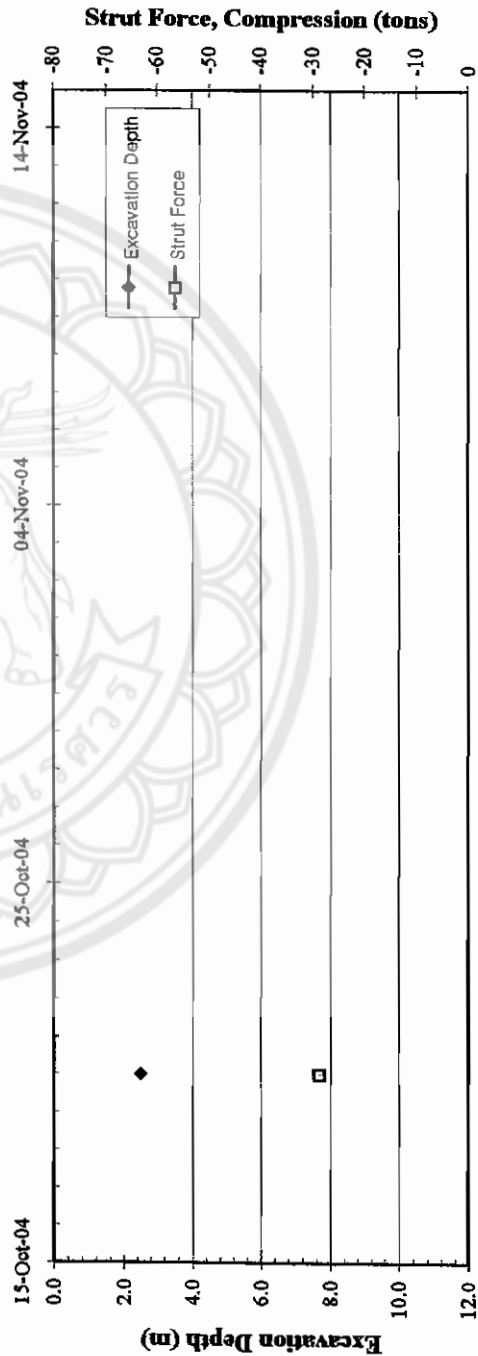
Strut Force and Excavation Depth with Time

Section F (BES)

Strut Layer 1 : FIN and FIS

Date (dd/mm/yy)

Construction Activity	
3 May 04	: 2nd Strut Completed
5 May 04	: 1st Strut Preloaded
17 May 04	: Excavation Level 6.0m
19 May 04	: 3rd Strut Completed
25 May 04	: Excavation Level 8.5m
1 Jun 04	: 4th Strut Completed
3 Jun 04	: Excavation Level 10.5m
9 Jun 04	: 4th Strut Removed
19 Jun 04	: Base Slab Completed
30 Jun 04	: 3rd Strut Removed
7 Jul 04	: Wall Completed
	Top Wall 6.4m Depth
19 Jul 04	: 2nd Strut Removed
3 Aug 04	: 1st Strut Removed





Installation Location : Section B
Block : BEW9

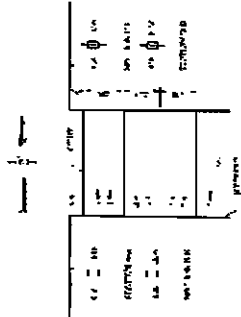
Strut Level : 2 (2.0m Depth)
Monitored By : PPT

Installation Date : 2/05/2014
Weather : Sunny

Initial reading Date : 2/05/2014
Base Reading Reset : 2/05/2014 (after Hydraulic Jack Preload)

Date	BZE		B2W		Strain Change (x10 ⁻⁶)	Strain (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)						
04-05-04	2625.00	30.7	0.00	-	2389.00	30.7	0.00	-27.13	Initial Reading (Exc. Level 4m)	
05-05-04	2365.60	30.7	0.00	-87.19	2501.81	30.7	0.00	-74.30	Before Preload, Exc. Level 4m	
05-05-04	2414.43	30.7	0.00	-212.49	2376.51	30.7	0.00	-77.23	Preload : Load Reading 75 tons	
05-05-04	2390.77	30.7	0.00	-233.92	2355.08	30.7	0.00	-85.48	Preload : Load Reading 85 tons	
08-05-04	2423.82	31.5	0.32	-211.60	2377.32	30.9	0.08	-75.31	Exc. Level 4m	
10-05-04	2410.09	34.4	1.48	-214.67	2373.05	33.9	1.28	-78.17	Exc. Level 4m	
12-05-04	2384.93	34.0	1.32	-234.42	2353.42	33.6	1.16	-86.40	Exc. Level 4m	
13-05-04	2362.97	34.2	1.40	-261.61	2326.15	33.8	1.24	-95.36	Exc. Level 4m	
17-05-04	2281.71	28.0	-1.08	-342.61	2247.43	28.1	-1.04	-125.44	ST5: Exc. Level 6m	
18-05-04	2278.01	37.4	2.68	-344.40	2242.04	37.1	2.56	-125.75	Exc. Level 6m	
19-05-04									ST6: 3rd Strut Completed	
20-05-04	2296.40	32.2	0.60	-328.72	2259.07	31.7	0.40	-220.04	Preload 5th Strut, Exc. Level 6m	
24-05-04	2318.72	36.7	2.40	-306.52	2277.08	37.6	2.76	-111.94	ST7: Exc. Level 8.5m	
26-05-04	2311.97	32.3	0.64	-315.24	2270.38	32.0	0.52	-115.12	ST7: Exc. Level 8.5m	
31-05-04	2332.16	37.5	2.72	-298.05	2286.51	36.8	2.44	-107.40	ST7: Exc. Level 8.5m (Excavation toward BEW10)	

Almide Road Tunnel-Landside Road System Project
Suvarnabhumi Airport Project
Strain Gauge Monitoring



Installation Location : Section B
 Block : BEW2
 Strain Level : 2.03m Depth
 Monitored By : PTT

Installation Date : 5/05/2004
 Weather : Sunny

Initial reading Date : 5/05/2004
 Base Reading Reset : 5/05/2004 (after Hydraulic Jack Preloaded)

Date	B2E		B2W		Strain Change (x10 ⁻⁶)	Strain (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	Temp. (°C)	CF-Temp.								
31-03-04	2332.16	37.3	36.8	2.44	-290.12	2288.51	36.8	2.44	-298.03	-294.08	-107.40	ST7: Exc. Level 8.3m
01-06-04	2344.42	39.1	38.7	3.20	-277.22	2300.59	38.7	3.20	-285.21	-281.21	-102.70	(Excavation toward BEW10)
03-06-04	2333.73	38.0	37.3	2.64	-288.35	2291.64	37.3	2.64	-294.72	-293.33	-106.47	ST8: Installed 4th Strut
04-06-04	2327.73	36.2	34.9	2.08	-295.07	2283.33	34.9	2.08	-303.59	-299.93	-109.31	ST9: Exc. Level 10.5m
09-06-04	2337.14	33.1	32.4	0.68	-286.90	2290.19	32.4	0.68	-298.13	-292.51	-106.82	ST10: 4th Strut Removed
19-06-04	2333.79	33.1	32.4	0.68	-290.25	2305.19	32.4	0.68	-283.13	-276.69	-101.04	Preparing for Reinforcing Arrangement
25-06-04	2337.14	34.3	32.7	0.80	-286.42	2288.37	32.7	0.80	-299.83	-293.12	-107.03	ST11: Bas Slab Completed
30-06-04	2178.67	37.3	35.6	1.96	-443.69	2129.69	35.6	1.96	-457.35	-450.52	-164.33	No Activity
07-07-04	2187.86	37.1	36.9	2.48	-434.58	2137.02	36.9	2.48	-449.50	-442.04	-161.43	No Activity
09-07-04	2141.50	33.4	33.9	1.28	-482.42	2098.66	33.9	1.28	-489.06	-483.74	-177.39	3rd Strut Removed
13-07-04												Wall Completed, Top Level 6.4 m
19-07-04												2nd Strut Removed

STRAIN GAUGES MONITORING RESULTS

Alrside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

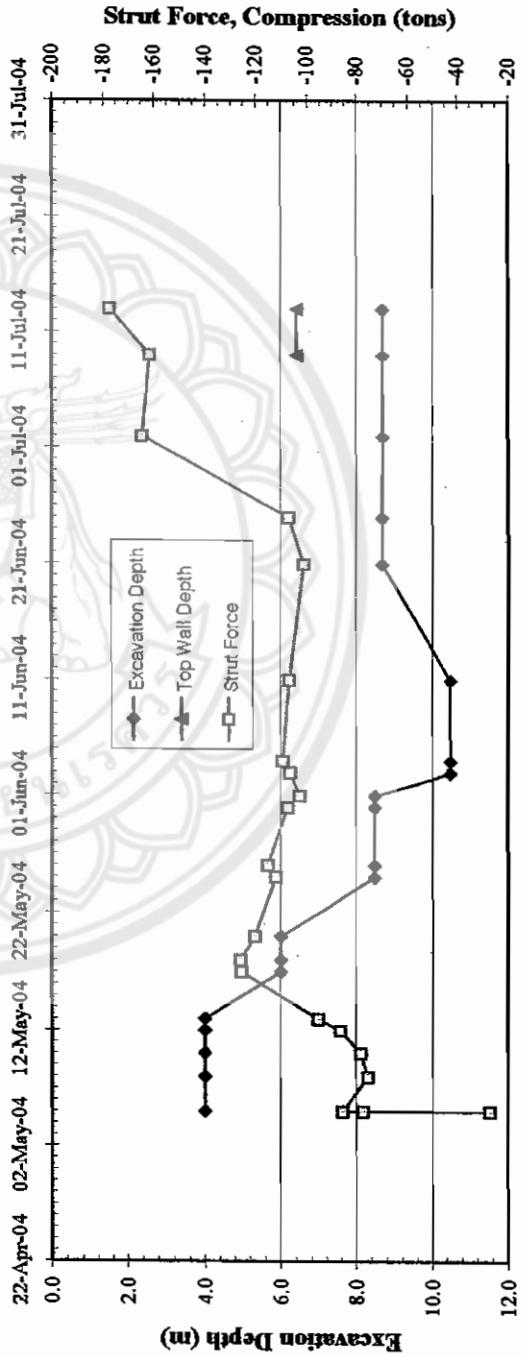
Section B (BEW9)

Strut Layer 2 : B2E and B2W

Construction Activity

3 May 04	: 2nd Strut Completed
5 May 04	: 1st Strut Preloaded
17 May 04	: Excavation Level 6.0m
19 May 04	: 3rd Strut Completed
25 May 04	: Excavation Level 8.5m
1 Jun 04	: 4th Strut Completed
3 Jun 04	: Excavation Level 10.5m
9 Jun 04	: 4th Strut Removed
19 Jun 04	: Base Slab Completed
30 Jun 04	: 3rd Strut Removed
7 Jul 04	: Wall Completed
19 Jul 04	: Top Wall 6.4m Depth
19 Jul 04	: 2nd Strut Removed

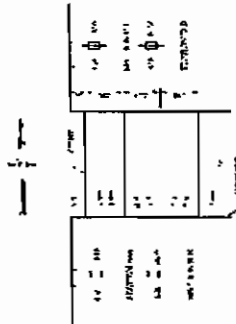
Date (dd/mm/yy)





Altride Road Tunnel-Landside Road System Project
Suvannabhumi Airport Project

Strain Gauge Monitoring



Installation Location : Section B
 Block : BEY2
 Initial Reading Date : 2003/2004 (After Hydraulic Jack Prestressed)
 Installation Date : 2003/2004
 Weather : Cloudy
 Strut Level : 2 (6m Depth)
 Monitored By : JPT

Date	B3E		B3W		Average Strain Change	Force (t)	Construction Activity
	Strain ($\times 10^{-6}$)	Temp. (°C)	Temp. (°C)	CF-Temp.			
20-01-04	2685.56	31.8	2787.80	31.8	-176.89	-65.62	Initial Reading (Exc. Level 6m)
20-05-04	2505.03	31.8	2608.99	31.8	-220.57	-80.38	Before Prestress, Exc. Level 6m
20-01-04	2463.94	31.8	2587.24	31.8	-246.56	-91.33	Prestressed : Load Reading 80 tons
20-05-04	2431.96	31.8	2541.24	31.8	-317.91	-116.10	Prestressed : Load Reading 90 tons
25-03-04	2364.65	32.5	2472.50	35.2	-315.23	-117.32	ST8: Exc. Level 8.5m
26-05-04	2263.71	30.3	2464.56	31.4	-322.17	-117.32	ST8: Exc. Level 8.5m
31-03-04	2281.52	35.6	2388.56	35.6	-400.50	-146.26	ST8: Exc. Level 8.5m
01-06-04	2343.01	37.9	2425.30	38.5	-351.21	-128.26	(Excavation toward BEW10)
03-06-04	2348.99	37.7	2420.98	37.1	-352.76	-128.82	ST9: Installed 4th Strut
04-06-04	2346.80	35.8	2419.63	36.0	-350.84	-128.12	ST10: Exc. Level 10.5m
09-06-04							ST10: Exc. Level 10.5m
11-06-04							4th Strut Removed
14-06-04	2293.80	29.9	2370.17	29.9	-405.27	-148.00	3rd Strut inaccessable for measurement
19-06-04							Preparing for Reinforcing Arrangement
21-06-04	2310.66	37.2	2386.23	37.4	-386.59	-141.18	Reinforcing Arrangement
23-06-04	2305.88	34.1	2377.76	33.4	-394.43	-144.04	Base Slab Completed
30-06-04							No Activity
							No Activity
							3rd Strut Removed

STRAIN GAUGES MONITORING RESULTS

Alrside Tunnel - Landside Road System
Suvarnabhumi Airport

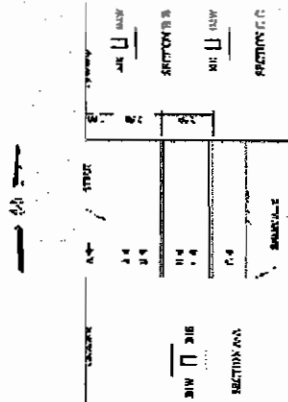
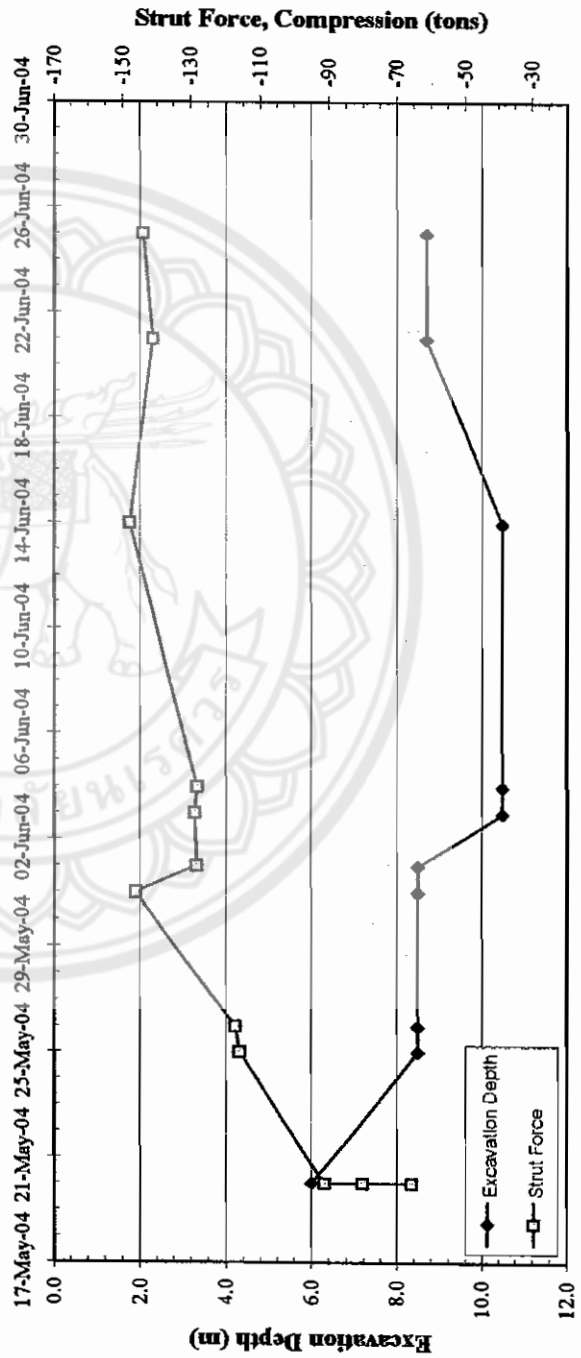
Strut Force and Excavation Depth with Time

Section B (BEW9)

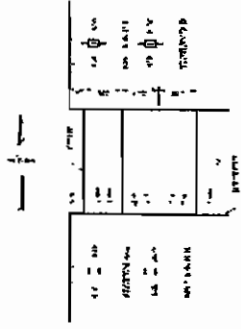
Strut Layer 3 : B3E and B3W

Date (dd/mm/yy)

Construction Activity	
3 May 04	: 2nd Strut Completed
17 May 04	: Excavation Level 6.0m
19 May 04	: 3rd Strut Completed
20 May 04	: 2nd Strut Preloaded
25 May 04	: Excavation Level 8.5m
1 Jun 04	: 4th Strut Completed
3 Jun 04	: Excavation Level 10.5m
9 Jun 04	: 4th Strut Removed
19 Jun 04	: Base Slab Completed



Strain Gauge Monitoring



Installation Location : Section B
 Block : BEW2

Strain Level : 4 (10.5m Depth)
 Monitored By : RTI

Installation Date : 3/06/2004
 Weather : Cloudy

Initial Reading Date : 3/06/2004

Date	B4E		B4W		Force (t)	Average Strain Change	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)			
03-06-04	2231.59	36.1		2702.83			Initial Reading (Exc. Level 10.5m) Exc. Level 10.5m 4th Strut Removed
04-06-04	1948.77	35.2	-0.27	2418.89	-0.30	-283.66	
09-06-04							

STRAIN GAUGES MONITORING RESULTS

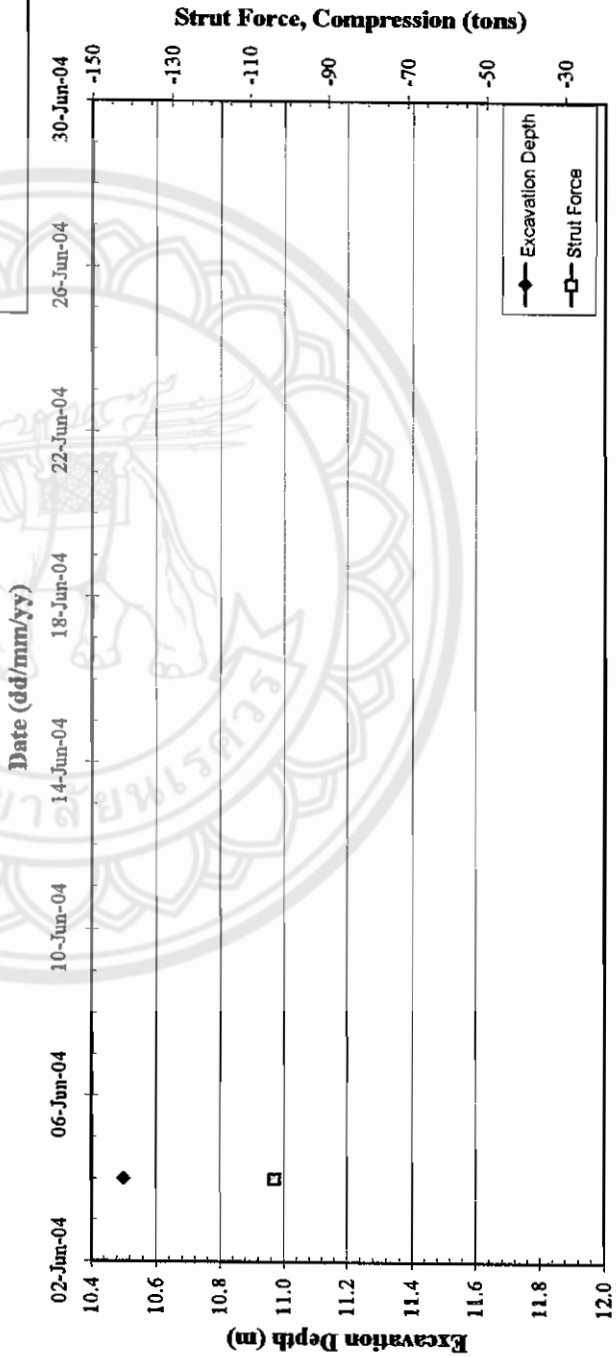
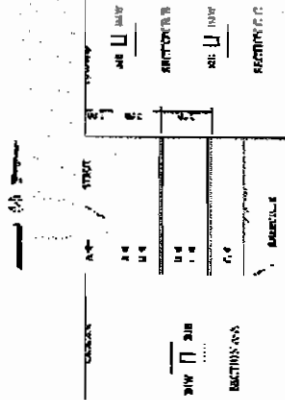
Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section B (BEW9)
Strut Layer 4 : B4E and B4W

Construction Activity

3 May 04	: 2nd Strut Completed
17 May 04	: Excavation Level 6.0m
19 May 04	: 3rd Strut Completed
20 May 04	: 2nd Strut Preloaded
25 May 04	: Excavation Level 8.5m
1 Jun 04	: 4th Strut Completed
3 Jun 04	: Excavation Level 10.5m
9 Jun 04	: 4th Strut Removed
19 Jun 04	: Base Slab Completed



◆ Excavation Depth
□ Strut Force

NNK JOINT VENTURE


Altrside Road Tunnel-Landside Road System Project
 Sivrasabhorni Airport Project

Strain Gauge Monitoring

Installation Location : Station C
 Block : BEV67

Strut Level : 1.1(m Depth)
 Monitored By : JPT

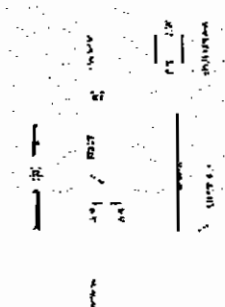
Installation Date : 27/03/2004
 Weather : Sunny

Initial Reading Date : 27/03/2004
 Base Reading Read : 4/03/2004 (After Hydraulic Jack Released)

Date	CIE		C1W		Average Strain Change		Force (k)	Construction Activity	
	Strain (x10 ⁻⁶)	Temp. (C)	Temp. (C)	CF-Temp.	Strain Change (x10 ⁻⁶)	CF-Temp.			
27-03-04	1204.00	38.1			1661.00			Initial Reading	
29-03-04	1184.86	36.4	-23.20	-3.06	1658.92	36.1	-1.62		
30-03-04	1182.32	38.0	-22.86	-0.18	1637.01	38.3	2.34		
31-03-04	1182.65	38.2	-21.17	0.18	1639.31	37.9	1.62		
01-04-04	1177.48	37.2	-29.14	-1.62	1632.97	36.2	-1.44		
02-04-04	1174.48	36.4	-33.38	-3.06	1623.98	36.3	2.34		
03-04-04	1173.21	37.7	-32.51	-0.72	1628.02	36.9	-0.18		
04-04-04	1154.76	35.9	-54.20	-5.96	1599.88	37.0	0.00		
05-04-04	1169.87	37.6	-16.03	-0.90	1623.17	38.0	1.60		
06-04-04	1124.32	36.6	-83.38	-2.70	1578.43	36.6	-0.72		
07-04-04	1043.14	33.0	-171.04	-0.18	1497.36	32.8	-7.56		
08-04-04	1092.18	37.3	-113.26	-1.44	1515.47	37.5	0.90		
09-04-04	1092.72	36.4	-115.34	-3.06	1536.57	37.5	0.90		
10-04-04	1092.72	35.7	-110.60	-4.32	1547.29	36.1	-1.62		
19-04-04	1098.72	36.1	-109.88	-5.60	1555.60	36.2	-1.44		
20-04-04	1105.18	38.3	-99.46	0.36	1565.51	37.5	0.90		
									ST3: Excavation Level 3.5m
									ST4: 2nd Strut Completed
									ST5: Excavation Level 6m



Alrside Road Tunnel-Landside Road System Project
 Suvarnabhumi Airport Project
Strain Gauge Monitoring



Installation Location : Station C
 Block : BEW67

Strut Level : 1 (in Depth)
 Monitored By : JPT

Installation Date : 27/03/2004
 Weather : Sunny

Initial Reading Date : 27/03/2004
 Base Reading Revert : 4/05/2004 (After Hydraulic Jack Preloaded)

Date	CIE		CIW		Strain Change (x10 ⁻⁶)	Strain (x10 ⁻⁶)	Temp. (°C)	CF-Temp. (°C)	Strain Change (x10 ⁻⁶)	Average Strain Change	Force (t)	Construction Activity
	Temp. (°C)	CF-Temp.	Temp. (°C)	CF-Temp.								
20-04-04	1101.18	38.3	0.36	0.90	-99.46	1563.51	37.4	0.90	-94.99	-97.02	-35.43	3rd Strut Installation
21-04-04	1139.77	41.1	5.40	8.10	-59.83	1606.45	41.5	8.10	-46.43	-53.14	-19.41	ST16: 3rd Strut Completed
22-04-04	1131.81	36.6	-2.70	-1.26	-75.89	1589.20	36.3	-1.26	-72.76	-74.32	-27.14	Before Preload 3rd Strut 20 t
22-04-04	1131.70	37.2	-1.62	-0.36	-74.92	1589.27	36.8	-0.36	-72.09	-73.51	-26.84	ST7: After Preload 3rd Strut 20 t
23-04-04	1145.31	37.6	-0.90	2.70	-60.59	1599.30	38.5	2.70	-59.00	-55.80	-21.84	
24-04-04	1128.12	38.3	0.36	2.52	-76.32	1584.42	38.4	2.52	-74.06	-73.29	-27.49	Excavating
26-04-04	1136.66	38.3	0.36	2.34	-67.98	1595.01	38.1	2.34	-63.63	-68.80	-24.03	Exc. Level 7m
27-04-04	1139.89	37.8	-0.34	2.88	-65.65	1595.26	38.6	2.88	-62.86	-64.25	-23.47	Exc. Level 7m
28-04-04	1091.80	29.8	-14.94	-11.16	-128.14	1542.22	30.8	-11.16	-129.94	-129.04	-47.12	Exc. & Prepare for Lean Concrete (Morning Rain)
29-04-04	1131.77	39.3	2.16	6.84	-69.07	1584.60	40.8	6.84	-69.36	-65.31	-25.31	Exc. & Prepare for Lean Concrete
30-04-04	1129.22	39.3	2.16	2.88	-73.62	1582.52	38.6	2.88	-75.60	-74.61	-27.23	ST8: Exc. Level 8.5m
04-05-04	1126.16	38.1	0.00	0.00	-78.84	1580.15	37.0	0.00	-71.85	-75.34	-27.51	Before Preload (Exc. Level 8.5 m)
04-05-04	1116.48	38.1	0.00	0.00	-88.52	1575.43	37.0	0.00	-85.57	-87.05	-31.79	Preloaded : Load Reading 23 tons
04-05-04	1080.27	38.1	0.00	0.00	-124.73	1546.14	37.0	0.00	-114.86	-119.80	-43.71	Preloaded : Load Reading 33 tons
11-05-04	1100.45	34.3	-3.04	-4.50	-109.59	1538.54	34.3	-4.50	-106.96	-108.28	-59.54	Exc. Level 8.5m
19-05-04	1132.91	36.5	-2.88	2.16	-75.37	1583.85	38.2	2.16	-74.99	-75.18	-27.46	Exc. Level 8.5m (Rein Arrangement)
27-05-04	1123.24	34.2	-5.22	-2.88	-84.96	1578.31	35.4	-2.88	-85.57	-85.27	-31.14	Exc. Level 8.5m (Base Slab Completed)

STRAIN GAUGES MONITORING RESULTS

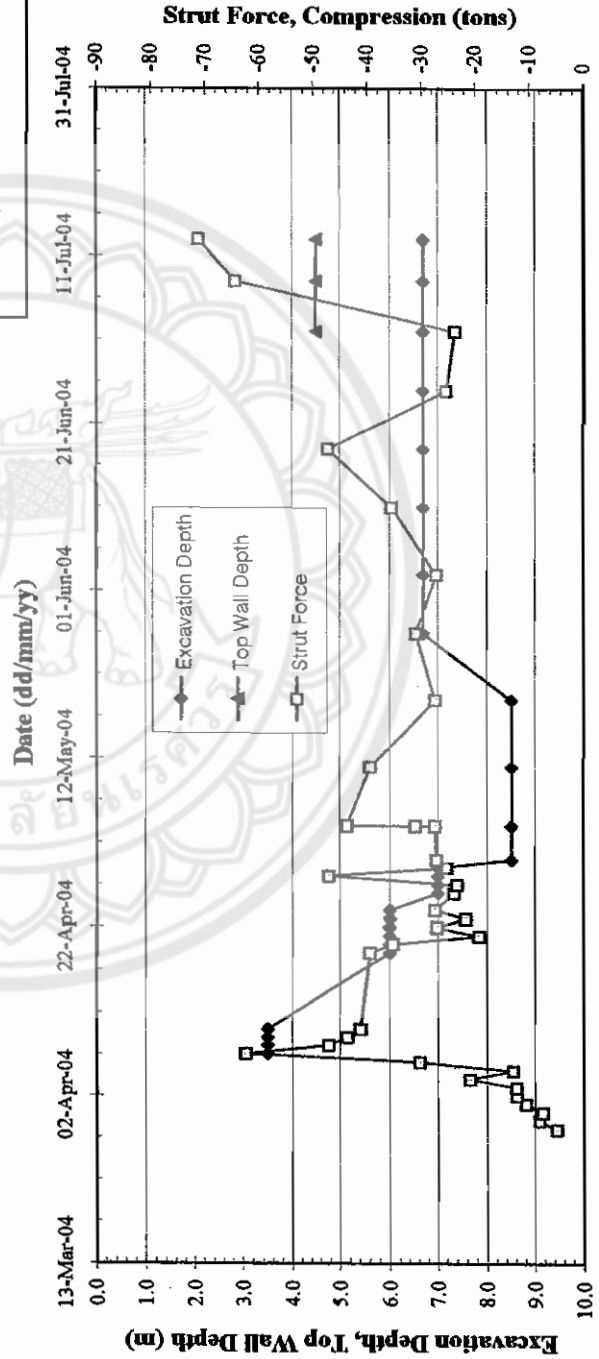
Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section C (BEW6/7)
Strut Layer 1 : C1E and C1W

Construction Activity

7 Apr 04	: Excavation Level 3.5m
8 Apr 04	: 2nd Strut Completed
19 Apr 04	: Excavation Level 6.0m
20 Apr 04	: 3rd Strut Completed
30 Apr 04	: Excavation Level 8.5m
4 May 04	: 1st Strut Preloaded
27 May 04	: Base Slab Completed
21 Jun 04	: 3rd Strut Removed
26 Jun 04	: Wall Level 1 Completed (Top Wall, 4.5m Depth)
7 Jun 04	: 2nd Strut Removed
19 Jun 04	: 1st Strut Removed





Alhside Road Tunnel-Landside Road System Project
Sriarabhami Airport Project
Strain Gauge Monitoring



Initial Reading Date : 8/04/2004
 Base Reading Rest : 40952004 (After Hydraulic Jack Prestress)

Installation Date : 8/04/2004
 Weather : Sunny

Strut Level : 2 (3.5m Depth)
 Monitored By : PPT

Installation Location : Section C
 Block : BEW67

Date	C1E		C2W		Average Strain Change (10 ⁻⁴)	Force (t)	Construction Activity
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp.	Temp. (°C)			
08-04-04	1693.00	40.1	-	39.9	-	-	Initial Reading
09-04-04	1672.64	36.4	-6.66	36.1	-26.24	-10.09	
10-04-04	1653.04	36.2	-7.02	36.7	-45.91	-17.30	STS: Exc. Level 6m
19-04-04	1510.62	36.7	-6.12	36.7	-169.65	-63.76	3rd Strut Installation
20-04-04	1458.85	38.7	-2.52	38.6	-212.76	-82.43	ST6: 3rd Strut Completed
21-04-04	1479.60	42.2	3.78	42.9	-188.70	-73.10	Before Prestress 3rd Strut = 90 t
22-04-04	1474.30	38.9	-2.16	37.0	-205.00	-78.13	ST7: After Prestress 3rd Strut = 30 t
22-04-04	1519.39	38.9	-2.16	38.2	-164.18	-62.44	
23-04-04	1523.27	38.5	-2.88	38.8	-158.66	-60.30	Excavating
24-04-04	1519.50	40.5	0.72	39.8	-163.22	-61.53	Exc. Level 7m
26-04-04	1525.27	40.0	-0.18	39.7	-157.53	-59.75	Exc. Level 7m
27-04-04	1536.80	40.0	-0.18	41.0	-146.57	-55.68	Exc. & Prepare for Lean Concrete (Morning Rain)
28-04-04	1500.82	30.0	-18.18	30.6	-196.54	-74.66	Exc. & Prepare for Lean Concrete
29-04-04	1544.64	41.0	1.62	42.3	-135.24	-31.85	STS: Exc. Level 8.5m
30-04-04	1568.80	39.4	-1.26	39.3	-110.08	-43.37	Before Prestress (Exc. Level 8.5 m)
04-05-04	1554.44	40.1	0.60	39.9	-126.62	-46.24	Prestress: Load Reading 47 tons
04-05-04	1536.37	40.1	0.00	39.9	-123.30	-51.44	Prestress: Load Reading 70 tons
04-05-04	1458.62	40.1	0.00	39.9	-185.57	-77.05	Exc. Level 8.5m
11-05-04	1518.87	36.3	-6.84	35.2	-132.05	-61.17	Exc. Level 8.5m (Rain Arrangement)
19-05-04	1545.03	39.1	-1.80	42.1	-131.91	-52.16	Exc. Level 8.5m (Base Slab Completed)
27-05-04	1535.45	36.5	-6.48	37.5	-139.26	-55.56	

Construction Activity

7 Apr 04	: Excavation Level 3.5m
8 Apr 04	: 2nd Strut Completed
19 Apr 04	: Excavation Level 6.0m
20 Apr 04	: 3rd Strut Completed
30 Apr 04	: Excavation Level 8.5m
4 May 04	: 1st Strut Preloaded
27 May 04	: Base Slab Completed
21 Jun 04	: 3rd Strut Removed
26 Jun 04	: Wall Level 1 Completed (Top Wall, 4.5m Depth)
7 Jun 04	: 2nd Strut Removed
19 Jun 04	: 1st Strut Removed

STRAIN GAUGES MONITORING RESULTS

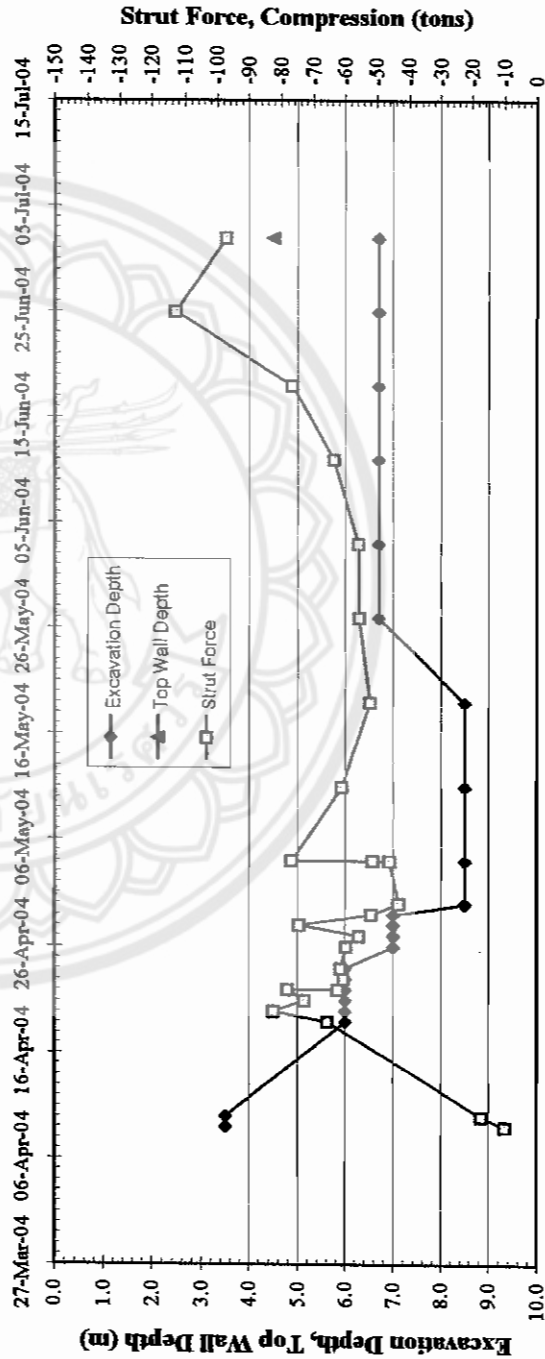
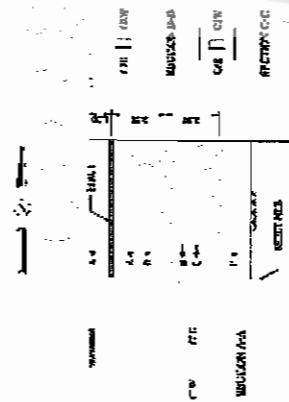
Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section C (BEW6/7)

Strut Layer 2 : C2E and C2W

Date (dd/mm/yy)



NNK JOINT VENTURE

Alrside Road Tunnel-Landside Road System Project
 Suvarnabhumi Airport Project

Strain Gauge Monitoring



Installation Location: Section C
 Block: BEV67

Strut Level: 3 (6m Depth)
 Monitored By: EPT

Installation Date: 24/04/2004
 Weather: Sunny

Initial Reading Date: 26/04/04
 Base Reading Reset: 4/7/04 (After Hydraulic Jack Preloaded)

Date	C9E		C9W		Strain Change ($\times 10^{-5}$)	Strain ($\times 10^{-5}$)	Temp. (°C)	CF-Temp.	CF-Temp. (°C)	Strain Change ($\times 10^{-5}$)	Average Strain Change	Preload (t)	Construction Activity
	Strain ($\times 10^{-5}$)	Temp. (°C)	Strain Change ($\times 10^{-5}$)	Temp. (°C)									
26-04-04	2780.30	38.1	-	-	2688.45	38.6	-	-	-	-	-	-	Initial Reading - Exc. Level 7m
27-04-04	2373.37	37.4	-0.49	-0.28	2597.32	38.2	-0.49	-0.28	-181.41	-194.42	-71.00	-71.00	No Activity - Exc. Level 7m
28-04-04	2173.80	28.6	-6.63	-6.58	2506.47	29.2	-6.63	-6.58	-188.56	-200.86	-73.35	-73.35	Exc. & Prepare for Lean Concrete (Morning Rain)
29-04-04	2522.91	39.1	0.70	0.91	2454.36	39.9	0.70	0.91	-233.18	-244.93	-89.45	-89.45	Exc. & Prepare for Lean Concrete
30-04-04	2484.56	38.5	0.28	-0.42	2414.50	38.0	0.28	-0.42	-274.37	-279.91	-102.22	-102.22	SFS, Exc. Level 8.5 m
04-05-04	2463.70	38.1	0.00	0.00	2367.84	38.6	0.00	0.00	-320.61	-318.60	-116.35	-116.35	Before Preload (Exc. Level 8.5 m)
04-05-04	2436.19	38.1	0.00	0.00	2346.08	38.6	0.00	0.00	-342.37	-343.04	-123.28	-123.28	Preloaded : Load Reading 121 tons
04-05-04	2423.03	38.1	0.00	0.00	2329.83	38.6	0.00	0.00	-338.61	-337.94	-130.72	-130.72	Preloaded : Load Reading 133 tons
11-05-04	2491.36	34.9	-2.24	-2.94	2395.38	34.4	-2.24	-2.94	-296.01	-293.60	-107.22	-107.22	Exc. Level 8.5m
19-05-04	2497.96	37.8	-0.21	0.63	2400.34	39.5	-0.21	0.63	-287.48	-285.02	-104.88	-104.88	Exc. Level 8.5m
27-05-04													3rd Strut being removed

STRAIN GAUGES MONITORING RESULTS

Altside Tunnel - Landside Road System
Savarnabhumi Airport

Strut Force and Excavation Depth with Time

Section C (BEW6/7)

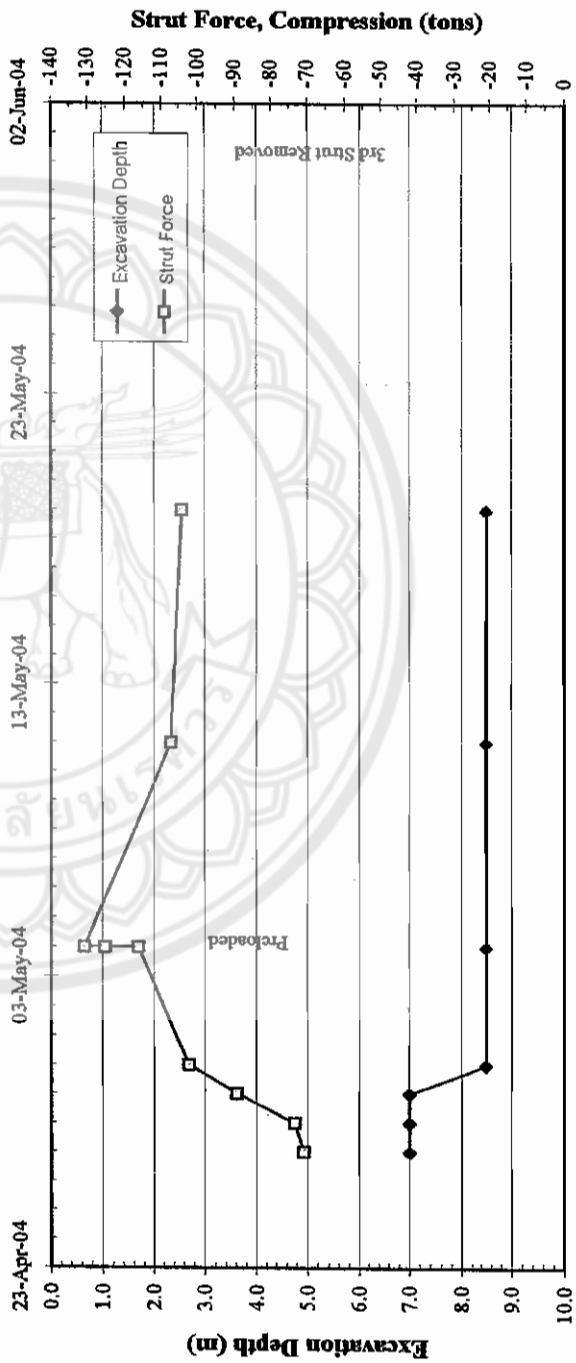
Strut Layer 3 : C3E and C3W

Date (dd/mm/yy)

13-May-04

23-May-04

02-Jun-04



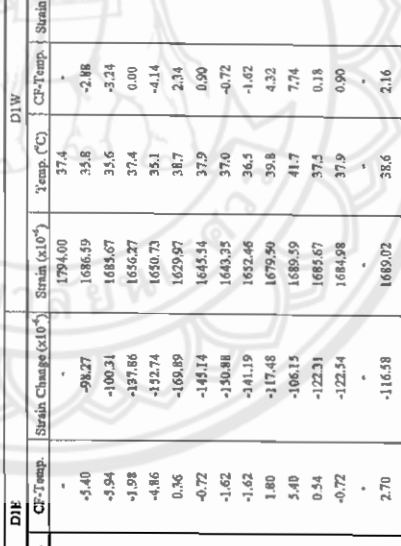


Alfside Road Tunnel-Landside Road System Project
 Suvarnabhumi Airport Project
Strain Gauge Monitoring



Installation Location : Station D
 Block : BEV4
 Strut Level : 1.1m (Depth)
 Installation Date : 2/04/2004
 Weather : Sunny
 Initial Reading Date : 3/04/2004
 Base Reading Revet : 40922004 (After Hydraulic Jack Protocol)

Date	D1E		D1W		Force (t)	Consentation Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	Strain Change (x10 ⁻⁶)	Temp. (°C)		
03-04-04	3120.00	38.1	-	37.4	-	Initial Reading
04-04-04	3027.13	35.1	-5.40	35.8	-34.08	ST2: 1st Strat Completed
05-04-04	3023.63	34.8	-5.94	35.6	-38.69	
06-04-04	2984.12	37.0	-1.98	37.4	-90.32	
07-04-04	2972.12	35.4	-4.86	35.1	-54.81	
08-04-04	2942.75	38.3	0.36	38.7	-60.54	
09-04-04	2975.58	37.7	-0.72	37.9	-55.44	ST3&4: Exc. 3.5m - 2nd Strat Completed
10-04-04	2970.74	37.2	-1.62	37.0	-55.19	
19-04-04	2980.43	37.2	-1.62	36.3	-51.92	Exc. Level : 4m (north), 5m (north)
20-04-04	3000.72	39.1	1.80	39.8	-41.57	Exc. Level : 4m (south), 5m (north)
21-04-04	3008.45	41.1	5.40	41.7	-37.03	Exc. Level : 4m (south), 5m (north)
22-04-04	2997.15	38.4	0.54	37.5	-42.08	No activity
23-04-04	2998.18	37.7	-0.72	37.9	-42.12	No activity
24-04-04	-	-	-	-	-	No activity
30-04-04	3000.72	39.6	2.70	38.6	-40.06	Exc. Level : 4m (north), 5m (north)





Alfreida Road Tunnel-Landside Road System Project
 Suvarnabhumi Airport Project
Strain Gauge Monitoring

Installation Location : **Station D**
 Block : **BEW5**

Installation Date : **20/4/2004**
 Weather : **Sunny**

Strut Level : **1.1m Depth**
 Monitored By : **PET**

Initial Reading Date : **30/4/2004**
 Base Reading Reset : **4/05/2004 (After Hydraulic Jack Preloaded)**

Date	DIE		DIW		Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁵)	Temp. (°C)	CP-Temp. (°C)	Strain Change (x10 ⁻⁵)			
30-04-04	3080.72	38.6	2.70	-116.58	-109.70	-40.06	Exc. Level : 4m (south), 5m (north)
04-05-04	3095.91	38.1	0.00	-114.09	-106.42	-38.86	Preloaded : Load Reading 40 tons
04-05-04	2986.19	38.1	0.00	-133.81	-124.59	-45.50	Exc. Level : 4m (south), 5m (north)
06-05-04	3019.98	34.2	-5.22	-105.24	-102.48	-37.43	Preloaded : Load Reading 47 tons
11-05-04	2994.61	37.4	-1.26	-126.65	-117.95	-43.07	Exc. Level : 4m (south), 5m (north)
20-05-04	2981.46	33.7	-7.82	-146.46	-140.21	-51.20	Exc. Level : 4m (south), 5m (north)
27-05-04	3012.23	36.2	-3.42	-111.17	-105.10	-38.38	(3rd Strut of BEW5 Removed)
03-06-04	2988.30	38.7	2.88	-118.82	-110.69	-40.42	Exc. Level : 4m (south), 5m (north)
11-06-04	2988.04	33.2	-8.82	-140.78	-133.47	-48.74	Exc. Level : 4m (south), 5m (north)
14-06-04	2990.57	33.1	-9.00	-138.45	-128.81	-47.04	(Excavation at BEW-3 toward DIEW-2)
16-06-04	2999.22	34.2	-7.02	-127.80	-120.64	-44.06	Exc. Level : 4m (south), 5m (north)
22-06-04	3018.13	34.9	-3.96	-105.83	-97.63	-35.66	Exc. Level : 4m (south), 5m (north)
23-06-04	3015.14	33.2	-8.82	-113.68	-107.48	-39.23	Exc. Level : 6m (south), 6.5m (north)
24-06-04	3048.35	37.0	-1.98	-73.63	-66.74	-24.37	Exc. Level : 6.5m
28-06-04	3043.56	33.4	-4.86	-81.36	-75.60	-26.88	Exc. Level : 6.5m
29-06-04	3054.75	37.8	-0.34	-65.79	-55.54	-20.28	Exc. Level : 6.5m



Altrside Road Tunnel-Landside Road System Project
Savarnabhuml Airport Project
Strain Gauge Monitoring

Installation Location : Section D
 Block : BEWA

Stut Level : 1 (in Danish)
 Monitored By : EPT

Insulation Date : 2/04/2004
 Weather : Sunny

Initial Reading Date : 3/04/2004
 Base Reading Reset : 4/03/2004 (After Hydraulic Jack Preload)

Date	DIE		DIW		Strain Change (x10 ⁻⁶)	Temp. (°C)	Strain (x10 ⁻⁶)	Temp. (°C)	Strain Change (x10 ⁻⁶)	Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	Strain Change (x10 ⁻⁶)	Temp. (°C)								
24-06-04	3048.35	37.0	-73.63	1.80	1735.95	36.4	-59.85	-1.80	-66.74	-24.37	Exc. Level : 6.5m	
27-06-04											3rd Stut Completed	
28-06-04	3043.30	35.4	-81.36	-4.50	1732.66	34.9	-65.84	-4.50	-73.60	-26.88	Exc. Level : 6.5m, 3rd Stut Preloaded	
29-06-04	3054.75	37.8	-65.79	-2.34	1751.03	36.1	-45.29	-2.34	-53.54	-20.28	Exc. Level : 6.5m	
30-06-04	3044.77	36.2	-3.42	-3.42	1735.89	35.5	-61.33	-3.42	-70.09	-25.60	Exc. Level : 7.5m (N), 6.5m (S)	
01-07-04	3033.25	38.8	1.26	1.33	1742.64	38.3	-49.83	1.33	-57.66	-21.06	Exc. Level : 7.5m	
07-07-04	3036.47	37.5	-84.61	-0.18	1722.69	37.3	-71.49	-0.18	-78.03	-28.50	Exc. Level : 7.5m	
15-07-04											3rd Stut Removed	
16-07-04	3052.96	40.9	-62.00	0.34	1751.05	37.7	-42.41	0.34	-52.20	-19.06	Exc. Level : 7.5m	
23-07-04	3045.00	35.2	-80.22	-5.04	1741.02	34.6	-58.02	-5.04	-69.12	-24.24	Exc. Level : 7.5m	
29-07-04	3031.92	35.2	-73.30	-3.60	1741.25	35.4	-56.35	-3.60	-64.82	-23.67	Exc. Level : 7.5m	
04-08-04	3058.13	37.6	-62.75	-1.26	1752.78	36.7	-42.48	-1.26	-52.61	-19.21	Reinforcing Arrangement	
10-08-04	3043.96	33.4	-84.30	-10.08	1744.14	31.8	-69.94	-10.08	-72.22	-26.37	Reinforcing Arrangement	
18-08-04	3051.61	36.8	-60.73	-2.34	1752.78	35.8	-44.10	-2.34	-52.41	-19.14	Reinforcing Arrangement	
23-08-04	3059.30	36.3	-63.94	-3.38	1757.63	34.3	-41.95	-3.38	-52.95	-19.34	Reinforcing Arrangement	
28-08-04											2nd Stut Removed	
30-08-04											Base Slab Completed	
01-09-04	2988.15	38.9	-130.41	1.44	1690.63	38.8	-100.85	1.44	-114.63	-42.23	No Activity	
10-09-04	2948.60	33.7	-179.32	-7.92	1662.61	32.8	-139.67	-7.92	-159.50	-58.25	No Activity	
18-09-04	2928.65	36.6	-194.05	-2.70	1642.31	35.8	-154.57	-2.70	-174.31	-63.66	No Activity	
21-09-04	2926.95	35.7	-187.37	-4.32	1639.31	36.1	-156.31	-4.32	-171.84	-62.75	No Activity	

Construction Activity

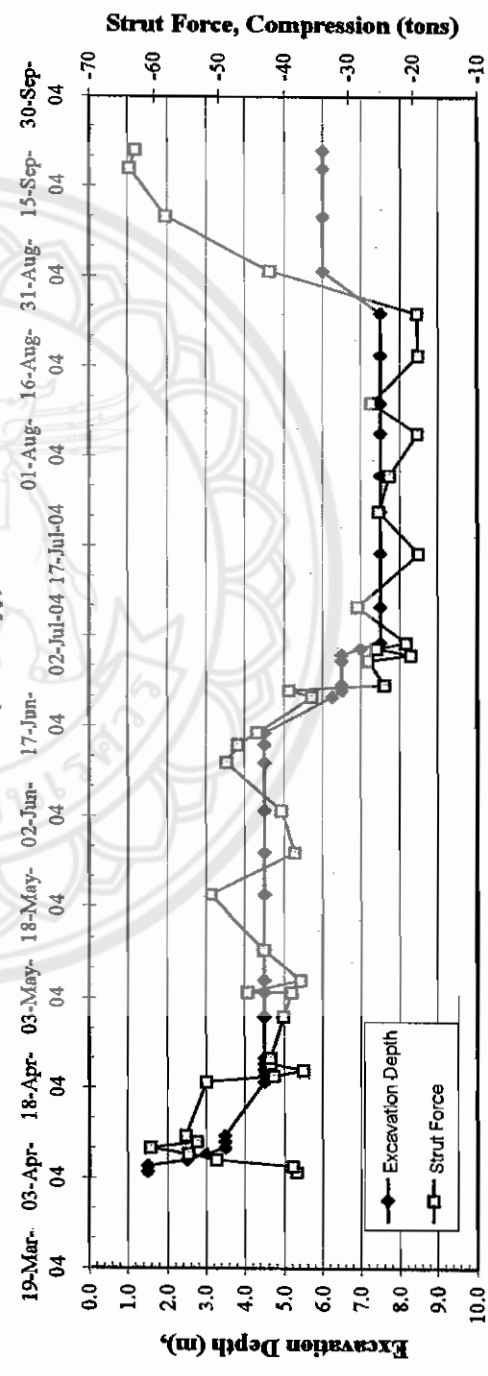
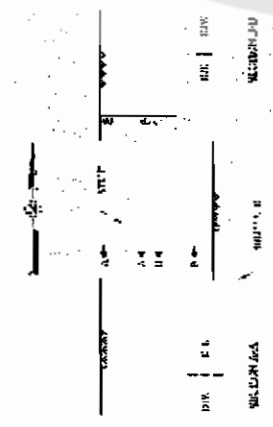
4 Apr 04	: 1st Strut Completed
9 Apr 04	: Excavation Level 3.5m
9 Apr 04	: 2nd Strut Completed
4 May 04	: 1st Strut Preloaded
20 May 04	: 3rd Strut of BEW5 Removed
11 Jun 04	: Excavation at BEW3 to BEW2
23 Jun 04	: Excavation Level 6.5m
27 Jun 04	: 3rd Strut Completed
28 Jun 04	: 3rd Strut Preloaded
1 Jul 04	: Excavation Level 7.5m
15 Jul 04	: 3rd Strut Removed
28 Aug 04	: 2nd Strut Removed
30 Aug 04	: Base Slab Completed
4 Oct 04	: 1st Strut Removed

STRAIN GAUGES MONITORING RESULTS
 Alrside Tunnel - Landside Road System
 Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section D (BEW4)
 Strut Layer 1 : DIE and DIW

Date (dd/mm/yy)



NNK JOINT VENTURE
 Altride Road Tunnel-Landside Road System Project
 Suvarnabhumi Airport Project

Strain Gauge Monitoring



Installation Location : Section D
 Block : BEV4

Strut Level : 2.0 (3m Depth)
 Monitored By : JPEI

Installation Date : 20/04/2004 (DZE) & 20/04/2004 (DZW, Reinstallation)
 Initial Reading Date : 10/03/2004 (DZE) & 20/04/2004 (DZW)
 Base Reading Reset : 4/05/2004 (After Hydraulic Jack Provided)

Weather : Sunny

Date	DZE			DZW			Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Temp. (°C)	CF-Temp.		
10-04-04	2173.15	36.5	-	-75.66	-	-	-13.82	Initial Reading - DZE
19-04-04	2096.77	36.9	0.72	-83.24	34.7	-	-30.40	Exc. Level : 4m (south), 5m (north)
20-04-04	2086.85	38.2	3.06	-54.35	1341.56	-	-83.24	(Initial Reading - DZW)
21-04-04	2112.68	39.9	6.12	-69.11	1264.43	11.34	-60.07	Exc. Level : 4m (south), 5m (north)
22-04-04	2102.42	37.4	1.62	-68.05	1259.12	3.06	-74.25	No Activity
23-04-04	2102.76	37.8	2.34	-86.46	1258.20	5.13	-73.14	No Activity
24-04-04	-	-	-	-110.06	1242.32	5.40	-90.05	No Activity
30-04-04	2083.28	38.4	3.42	-125.85	1222.34	0.00	-114.64	Exc. Level : 4m (south), 5m (north)
04-05-04	2063.10	36.5	0.00	-134.27	1214.50	0.00	-126.46	Exc. Level : 4m (south), 5m (north)
04-05-04	2047.30	36.5	0.00	-94.24	1208.50	0.00	-135.67	Preloaded : Load Reading 45 tons
04-05-04	2038.88	36.5	0.00	-130.99	1236.40	3.96	-97.72	Preloaded : Load Reading 50 tons
06-05-04	2031.43	35.1	-2.52	-133.36	1222.80	0.36	-124.25	Exc. Level : 4m (south), 5m (north)
11-05-04	2043.78	36.1	-0.72	-142.47	1193.51	-4.32	-142.87	Exc. Level : 4m (south), 5m (north)
20-05-04	2045.91	33.1	-6.12	-142.47	1216.11	-0.18	-134.05	Exc. Level : 4m (south), 5m (north)
27-05-04	2032.31	35.6	-1.62	-142.47	1216.11	-0.18	-134.05	(3rd Strut of BEV4 Removed) Exc. Level : 4m (south), 5m (north)

NNK JOINT VENTURE

Alrwide Road Tunnel-Landside Road System Project
 Suvarnabhumi Airport Project
Strain Gauge Monitoring

Installation Location : Section D
 Block : BEVA
 Installation Date : 20/4/2004 (D2D) & 20/4/04 (D2W Reinstallation)
 Weather : Sunny
 Initial Reading Date : 16/04/2004 (D2E) & 20/4/04 (D2W)
 Base Reading Refert : 405/2004 (After Hydraulic Jack Proloaded)

Date	D2E			D2W			Average Strain Change (ε)	Perce (%)	Construction Activity
	Strain (ε10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (ε10 ⁻⁶)	Temp. (°C)	CF-Temp.			
27-05-04	2032.31	35.6	-1.62	-142.47	35.6	-0.18	-134.03	-48.25	Exc. Level : 4m (south), 5m (north)
09-06-04	2024.47	39.0	4.50	-144.19	39.8	7.38	-135.22	-49.38	Exc. Level : 4m (south), 5m (north)
11-06-04	1984.11	32.6	-7.02	+196.07	32.9	-5.04	-183.00	-66.83	Exc. Level : 4m (south), 5m (north)
14-06-04	1986.53	31.6	-8.82	-195.45	1179.32	-7.38	-182.53	-66.66	(Observation at BEVA3 lowered BEVA2)
16-06-04	1982.95	35.4	-5.58	-193.78	1175.63	-4.32	-185.01	-66.83	Exc. Level : 4m (south), 5m (north)
22-06-04	1921.03	34.8	-3.06	-255.18	1118.90	-1.02	-239.73	-87.55	Exc. Level : 6m (south), 6.5m (north)
23-06-04	1884.47	32.4	-7.38	-296.06	1079.12	-5.94	-282.22	-103.06	Exc. Level : 6.5m
24-06-04	1890.24	35.9	-1.08	-283.99	1093.65	1.62	-263.14	-96.83	Exc. Level : 6.5m
27-06-04	1867.81	34.3	-3.96	-309.30	1070.41	-2.70	-273.85	-106.48	3rd Strut Completed
29-06-04	1921.61	36.9	0.72	-250.83	1123.28	0.18	-234.46	-85.62	Exc. Level : 6.5m
30-06-04	1900.10	35.1	-2.52	-275.57	1096.01	-2.70	-248.25	-95.65	Exc. Level : 7.5m (N) 6.5m (S)
01-07-04	1919.41	38.0	2.70	-251.04	1118.26	3.78	-235.28	-85.92	Exc. Level : 7.5m
07-07-04	1919.99	36.5	3.60	-249.56	1115.21	5.22	-233.33	-85.95	Exc. Level : 7.5m
15-07-04	1876.29	40.8	7.74	-289.13	1081.88	7.38	-270.71	-98.86	3rd Strut Removed
23-07-04	1873.17	34.6	-3.42	-303.40	1078.77	-2.16	-284.18	-103.78	Exc. Level : 7.5m
29-07-04	1871.44	35.6	-1.62	-303.33	1076.23	0.90	-283.88	-103.67	Exc. Level : 7.5m



STRAIN GAUGES MONITORING RESULTS

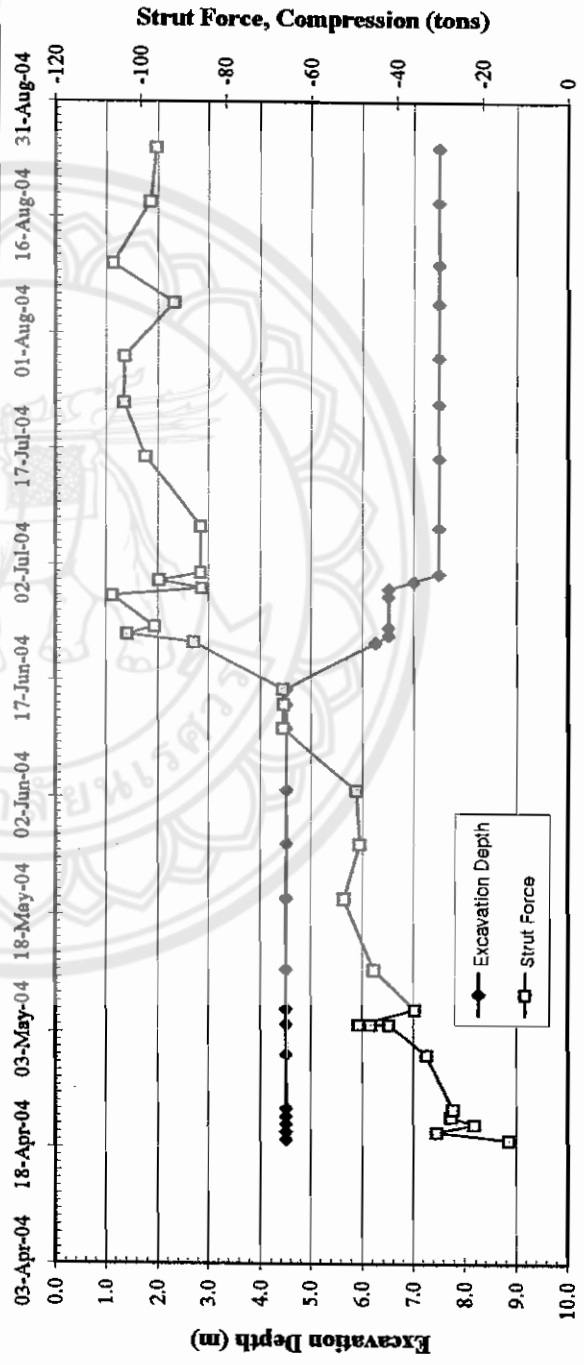
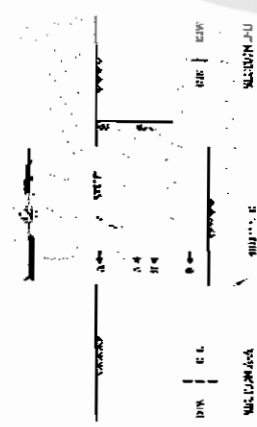
Airside Tunnel - Landside Road System
Suvannabhumi Airport

Strut Force and Excavation Depth with Time

Section D (BEW4)
Strut Layer 2 : D2E and D2W

Date (dd/mm/yy)

Construction Activity	
4 Apr 04	: 1st Strut Completed
9 Apr 04	: Excavation Level 3.5m
9 Apr 04	: 2nd Strut Completed
4 May 04	: 1st Strut Preloaded
20 May 04	: 3rd Strut of BEW5 Removed
11 Jun 04	: Excavation at BEW3 to BEW2
23 Jun 04	: Excavation Level 6.5m
27 Jun 04	: 3rd Strut Completed
28 Jun 04	: 3rd Strut Preloaded
1 Jul 04	: Excavation Level 7.5m
15 Jul 04	: 3rd Strut Removed



STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System

Suvarnabhumi Airport

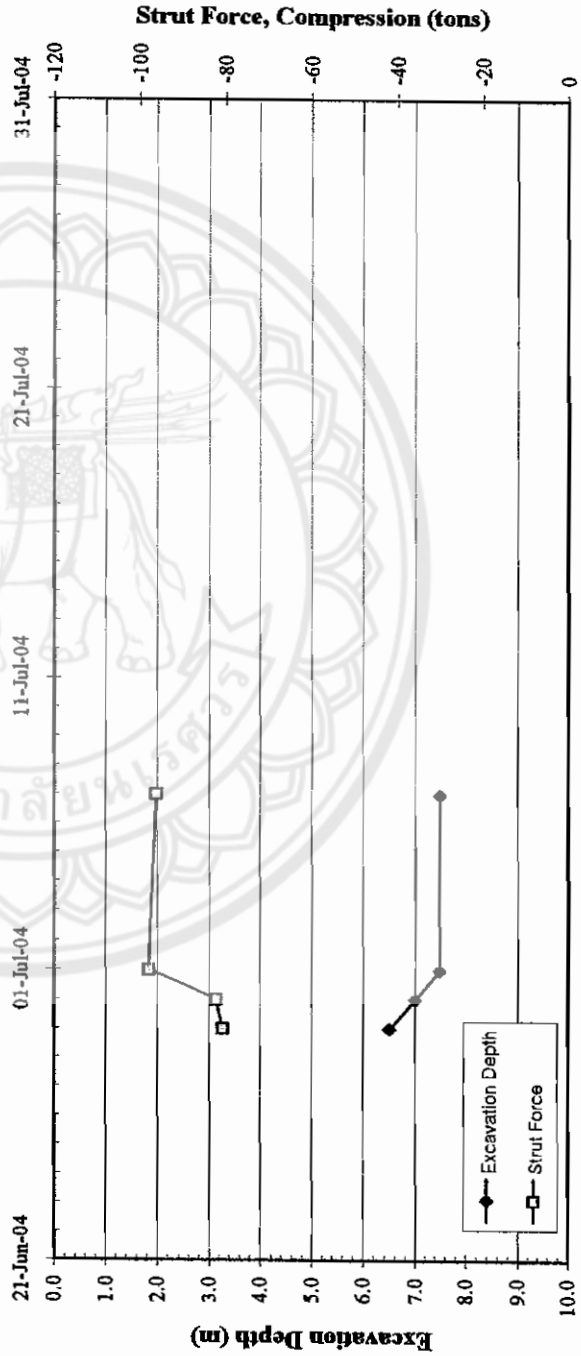
Strut Force and Excavation Depth with Time

Section D (BEW/4)

Strut Layer 3 : D3E and D3W

Date (dd/mm/yy)

Construction Activity	
4 Apr 04	: 1st Strut Completed
9 Apr 04	: Excavation Level 3.5m
9 Apr 04	: 2nd Strut Completed
4 May 04	: 1st Strut Preloaded
20 May 04	: 3rd Strut of BEW5 Removed
11 Jun 04	: Excavation at BEW3 to BEW2
23 Jun 04	: Excavation Level 6.5m
27 Jun 04	: 3rd Strut Completed
28 Jun 04	: 3rd Strut Preloaded
1 Jul 04	: Excavation Level 7.5m
15 Jul 04	: 3rd Strut Removed



DATE	DEPTH (m)	STRUT FORCE (tons)
01-Jun-04	0.0	0
11-Jul-04	2.0	-10
21-Jul-04	3.5	-20
31-Jul-04	7.5	-100

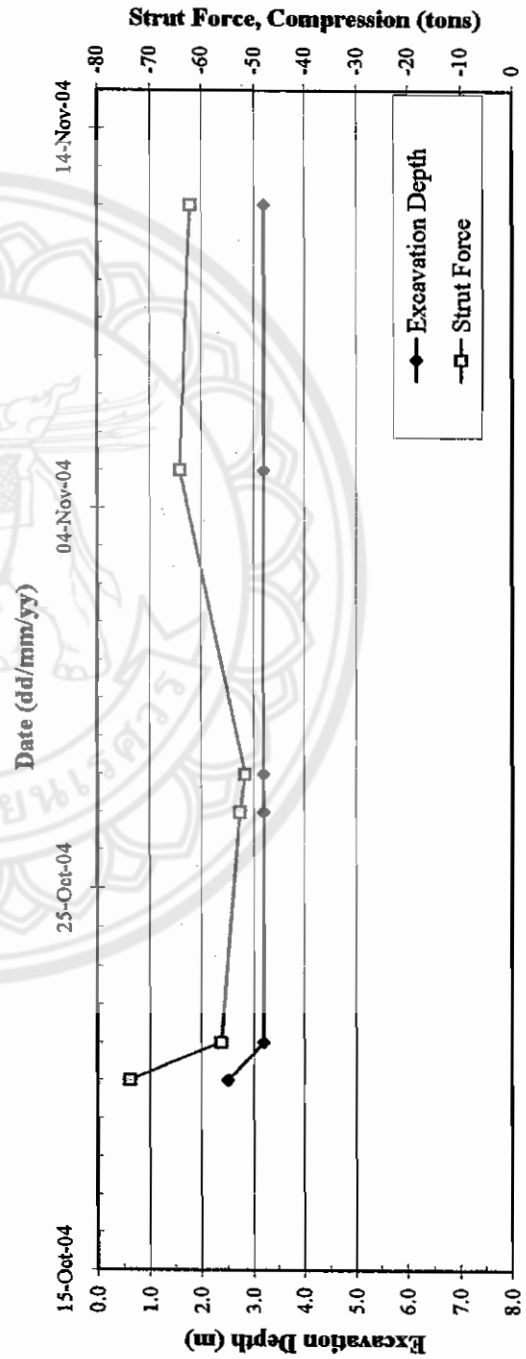
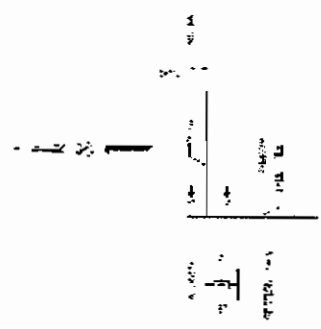
STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section F (BE5)
Strut Layer 1 : FIN and FIS

Construction Activity	
13 Oct 04	: Began Excavation, 1.5m Depth
17 Oct 04	: 1st Strut Installed
20 Oct 04	: Excavation Level 2.5m
21 Oct 04	: Excavation Level 3.2m
4 Nov 04	: Base Slab Completed
13/11/04	: Removed Strut Level 1



NNK JOINT VENTURE

Side Road Tunnel-Landside Road System Project
Suvarnabhumi Airport Project

Strain Gauge Monitoring



Installation Location : Section G
Block : BEVGE2
Strut Level : 1.1m (Depth)
Installation Date : 4/06/2014 (after Hydraulic Jack Preloaded)
Weather : Cloudy
Monitored By : EYI

Date	GIN			GIS			Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	Temp. Change (°C)	Strain (x10 ⁻⁶)	Temp. (°C)	Temp. Change (°C)		
04-06-04	2475.95	38.2	-	2400.56	37.7	-	-	Before Preload, Exo. Level 1.5m
04-06-04	2444.69	37.3	-0.27	2371.56	37.1	-0.18	-10.35	Preloaded: Load Reading 10 tons
04-06-04	2406.05	37.3	-0.27	2328.34	36.7	-0.30	-71.34	Preloaded: Load Reading 25 tons
04-06-04	2348.03	37.2	-0.30	2292.52	36.0	-0.51	-108.55	Preloaded: Load Reading 45 tons
08-06-04	2396.99	30.6	-2.28	2318.87	30.2	-2.25	-82.59	No Activity
11-06-04	2370.31	30.8	-2.22	2286.83	30.1	-2.28	-116.01	Exo.Level 1.5m (N), 2.5m (S)
14-06-04	2309.66	32.2	-1.80	2228.26	31.1	-1.98	-174.28	Exo.Level 4.0m
15-06-04	2307.08	29.9	-2.49	2224.61	31.2	-1.95	-177.90	2nd Strut Completed
16-06-04	2301.65	33.2	-1.50	2218.97	31.7	-1.81	-183.41	Exo.Level 4.0m
17-06-04								2nd Strut Preloaded
21-06-04	2336.59	36.7	-0.43	2257.19	34.9	-0.84	-144.21	Exo.Level 4.0m (BEE) 6.0m (BEE)
22-06-04	2325.40	30.6	-2.28	2246.00	34.7	-0.90	-155.46	Exo.Level 4.0m (BEE) 6.0m (BEE)
28-06-04	2364.16	33.9	-1.29	2287.81	32.9	-1.44	-114.19	Exo.Level 6.0m
29-06-04	2384.88	37.2	-0.30	2309.34	35.5	-0.67	-91.89	Exo.Level 6.0m
03-07-04								2nd Strut Layer Removed
06-07-04	2280.78	36.6	-0.48	2209.31	38.0	0.09	-193.40	Slab Reinforcing Arrangement
13-07-04	2292.04	36.0	-0.66	2223.88	34.4	-0.59	-177.67	Slab Reinforcing Arrangement
16-07-04								Base Slab Completed
20-07-04	2285.07	39.7	0.43	2217.82	38.9	0.36	-182.38	Depth of Top Slab 4.3m
28-07-04	2278.38	34.1	-1.23	2215.73	33.0	-1.41	-185.24	Depth of Top Slab 4.3m

STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

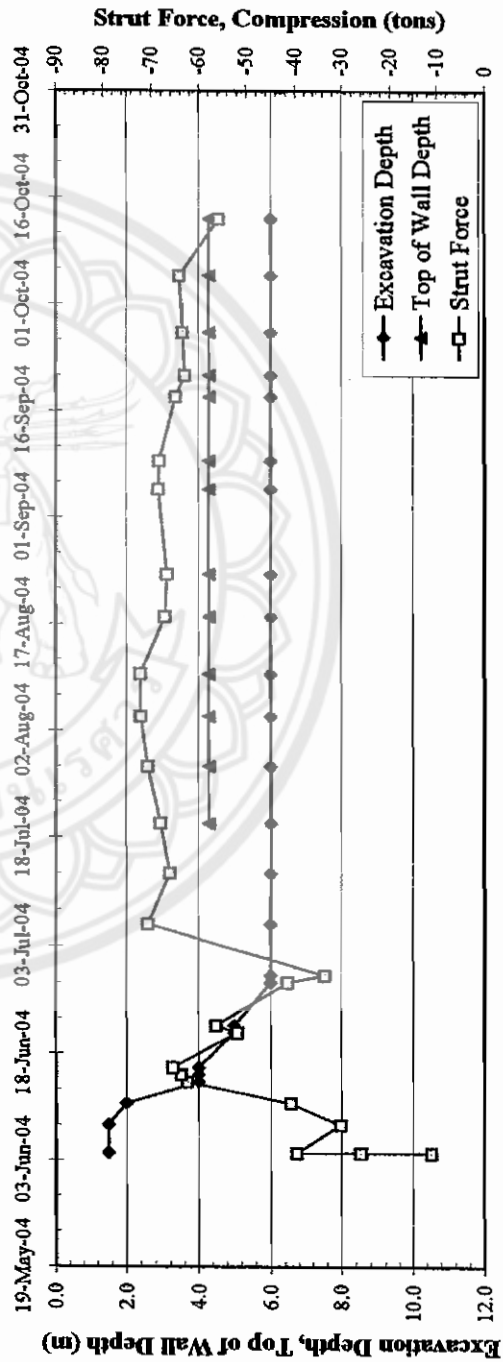
Section G (BE8/9)

Strut Layer 1 : GIN and GIS

Date (dd/mm/yy)

Construction Activity

1 Jun 04	: Began Excavation
1 Apr 04	: Excavation Level 1.5m
3 Jun 04	: 1st Strut Completed
4 Jun 04	: 1st Strut Preloaded
14 Jun 04	: Excavation Level 4.0m
15 Jun 04	: 2nd Strut Completed
17 Jun 04	: 2nd Strut Preloaded
21 Jun 04	: Exo. Level 6.0 (BE9)
	Exo. Level 4.0m (BE8)
28 Jun 04	: Exo. Level 6.0m
3 Jul 04	: 2nd Strut Removed
15 Jul 04	: Base Slab Completed
19 Sep 04	: Side Wall Completed
21 Oct 04	: Strut Level 1 Removed



STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

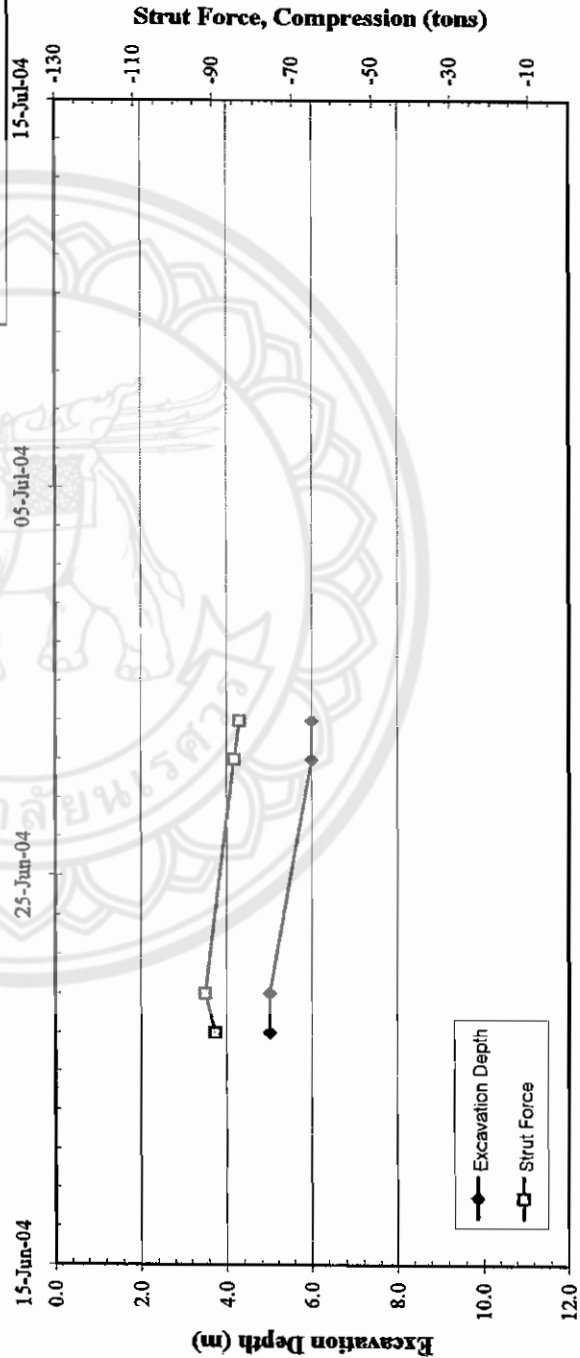
Section G (BE8/9)

Strut Layer 2 : G2N and G2S

Date (dd/mm/yy)

Construction Activity

1 Jun 04	: Began Excavation
1 Apr 04	: Excavation Level 1.5m
3 Jun 04	: 1st Strut Completed
4 Jun 04	: 1st Strut Preloaded
14 Jun 04	: Excavation Level 4.0m
15 Jun 04	: 2nd Strut Completed
17 Jun 04	: 2nd Strut Preloaded
21 Jun 04	: Exc. Level 6.0 (BE9)
	: Exc. Level 4.0m (BE8)
28 Jun 04	: Exc. Level 6.0m
3 Jul 04	: 2nd Strut Removed
15 Jul 04	: Base Slab Completed

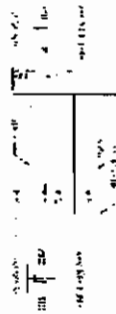


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NNK JOINT VENTURE

Abreide Road Tunnel-Landside Road System Project
Saravahubundi Airport Project

Strain Gauge Monitoring



Strain Level : 1 (Um Depth)
 Installation Date : 20/12/2004
 Weather : Sunny
 Initial Reading Date : 20/12/2004
 Monitored By : RET

Installation Location : Section II
 Block : BE12

Date	HIN		HIS		Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	CP-Temp.	Strain Change (x10 ⁻⁶)			
09-12-04	2374.28	33.0	-	2374.10	-	-	Initial Reading
13-12-04	2397.52	33.8	0.24	2196.28	-176.50	-64.46	Excavation Level 4.0m
15-12-04	2417.11	30.0	-0.90	2214.34	-159.26	-58.16	Excavation Level 4.5m
21-12-04	2433.17	35.8	0.84	2231.24	-141.50	-51.60	Excavation Level 6.5m
27-12-04	2429.58	35.8	0.84	2227.65	-144.89	-52.91	Excavation Level 6.5m
05-01-05	2437.76	31.4	-0.48	2236.62	-136.98	-50.02	Excavation Level 6.5m
10-01-05	2448.25	34.8	0.54	2248.27	-125.30	-48.79	Pile Cut Off
26-01-05	2446.24	33.2	0.06	2250.06	-126.14	-46.06	Pile Cut Off Completed
04-02-05	2450.87	30.8	-0.66	2251.89	-123.18	-45.15	Lean Concrete Slab
07-02-05	-	-	-	-	-	-	Base Slab Completed
09-02-05	2450.87	33.0	0.00	2250.99	-123.42	-45.07	Wall Reinforcing Arrangement
17-02-05	2451.33	32.1	-0.27	2251.44	-123.23	-45.00	Wall Reinforcing Arrangement
18-02-05	-	-	-	-	-	-	Removed Strut Layer 2
24-02-05	2449.62	34.9	0.57	2249.82	-124.09	-45.32	Wall Reinforcing Arrangement
02-03-05	2442.39	35.5	0.75	2247.40	-131.22	-47.92	Wall Reinforcing Arrangement
10-03-05	-	-	-	-	-	-	Removed Strut Layer 1
							Monitoring Terminated

STRAIN GAUGES MONITORING RESULTS

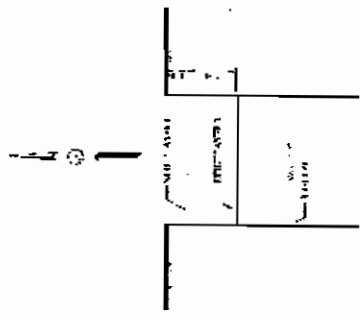
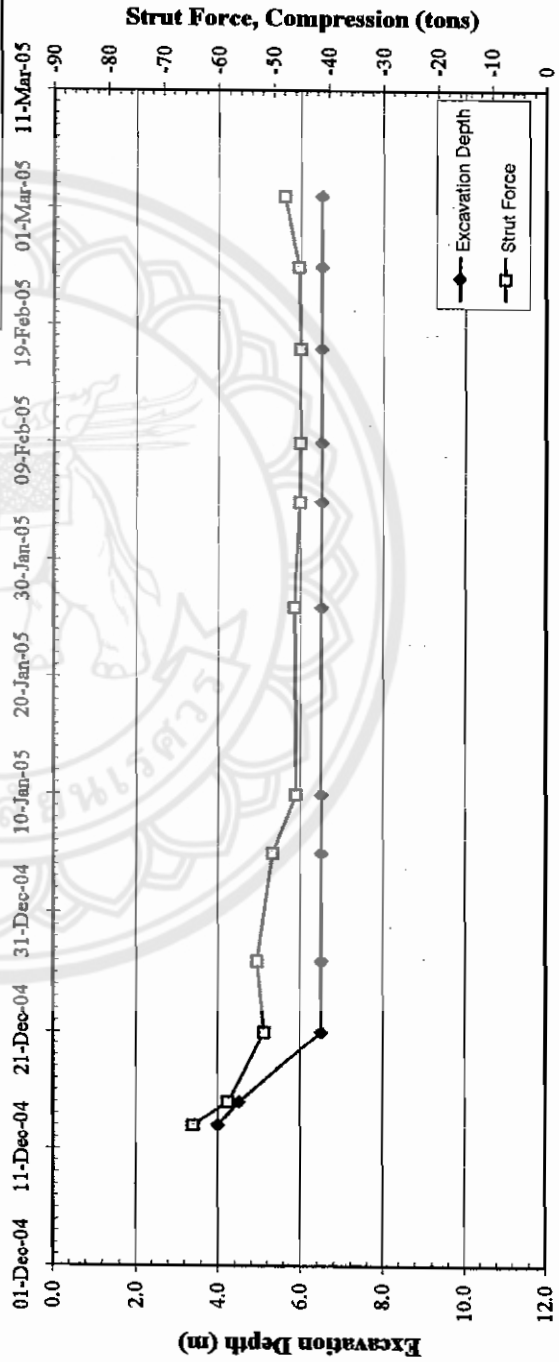
Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section H (BE12)
Strut Layer 1 : H1N and H1S

Date (dd/mm/yy)

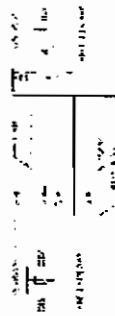
Construction Activity	
24/11/04	: Began Excavation
27/11/04	: Adjust Sheet Pile Level
29/11/04	: Excavation Level 1.0 m
2/12/04	: Installed Strut Level 1
7/12/04	: Excavation Level 4.0 m
9/12/04	: Installed Strut Level 2
21/12/04	: Excavation Level 6.5m
7/02/05	: Base Slab Completed
18/02/05	: Removed Strut Layer 2
10/03/05	: Removed Strut Layer 1
Monitoring Terminated	





Alrside Road Tunnel-Landside Road System Project
Suvarnabhumi Airport Project

Strain Gauge Monitoring



Installation Location : Section II
 Block : BE12
 Slew Level : 2.13.5m Depth
 Measured By : PET
 Installation Date : 9/12/2004
 Weather : Sunny
 Initial Reading Date : 9/12/2004

Date	H2N		H2B		Strain Change (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	Strain (x10 ⁻⁶)	Temp. (°C)										
09-12-04	2716.09	35.2	-	-	1721.09	34.8	-	-	-	-	-	-	-	Initial Reading
13-12-04	2422.39	33.8	-0.42	-0.36	1423.87	34.6	-0.36	-294.13	-0.36	-0.36	-295.38	-294.85	-107.68	Excavation Level 4.0m
15-12-04	2436.15	30.3	1.47	-1.14	1426.48	32.0	-1.14	-291.41	0.69	0.69	-295.75	-293.38	-107.21	Excavation Level 4.5m
21-12-04	2443.86	37.2	0.60	0.69	1447.60	38.1	0.69	-271.64	0.69	0.69	-272.80	-272.22	-99.41	Excavation Level 6.5m
27-12-04	2440.27	37.2	0.60	0.69	1444.91	38.1	0.69	-275.22	0.69	0.69	-275.49	-275.36	-100.46	Excavation Level 6.5m
09-01-05	2456.03	31.2	-1.20	-1.29	1460.77	31.3	-1.29	-261.26	0.84	0.84	-261.61	-261.44	-95.47	Excavation Level 6.5m
10-01-05	2469.58	36.7	0.45	0.84	1475.36	36.6	0.84	-246.06	0.84	0.84	-244.89	-245.47	-89.64	Pile Cut Off
26-01-05	2472.76	32.4	-0.84	-1.02	1473.90	32.4	-1.02	-244.17	-1.02	-1.02	-248.21	-246.19	-89.91	Pile Cut Off Completed
04-02-05	2473.45	30.7	-1.35	-1.53	1478.52	30.7	-1.53	-243.99	-1.53	-1.53	-244.10	-244.04	-89.12	Left Concrete Slab
07-02-05	-	-	-	-	-	-	-	-	-	-	-	-	-	Base Slab Completed
09-02-05	2475.66	32.0	-0.96	-1.11	1480.72	32.1	-1.11	-241.39	-1.11	-1.11	-241.48	-241.44	-88.17	Wall Reinforcing Arrangement
17-02-05	2476.39	31.5	-1.11	-1.29	1481.46	31.5	-1.29	-240.81	-1.29	-1.29	-240.92	-240.86	-87.96	Wall Reinforcing Arrangement
18-02-05	-	-	-	-	-	-	-	-	-	-	-	-	-	Removed Strut Layer 2
														Monitoring Terminated

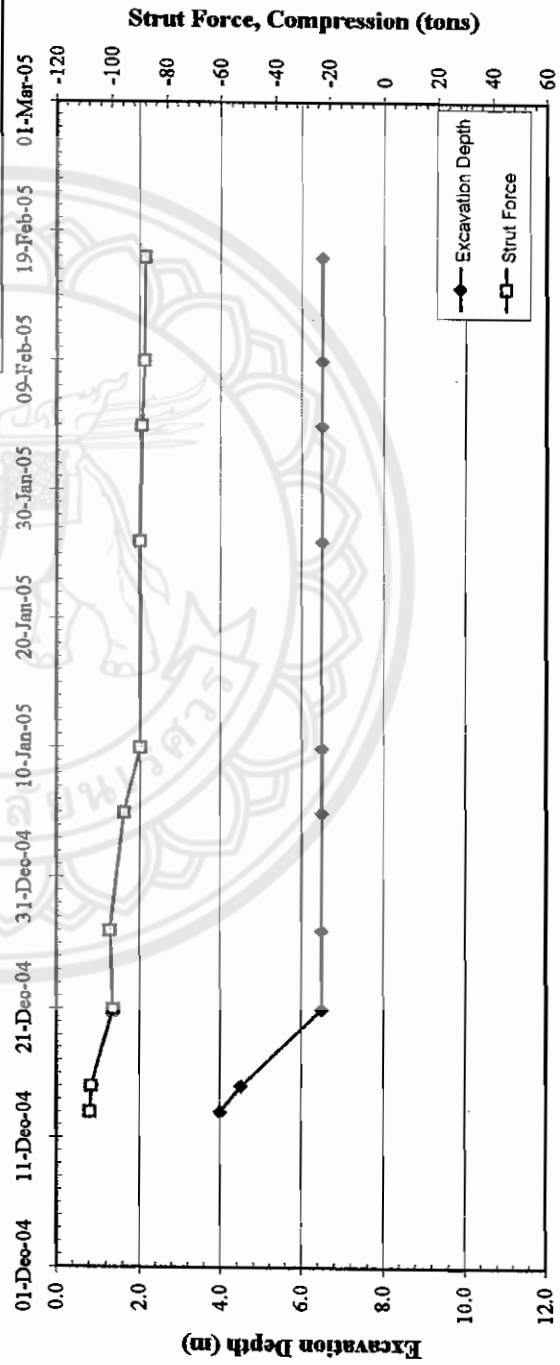
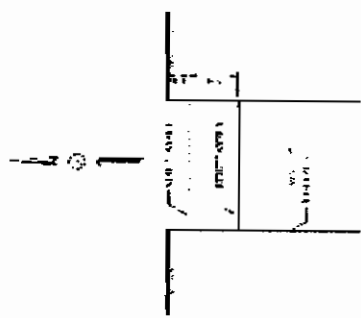
STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section H (BE12)
Strut Layer 2 : H2N and H2S

Construction Activity	
24/11/04	Began Excavation
27/11/04	Adjust Sheet Pile Level
29/11/04	Excavation Level 1.0 m
2/12/04	Installed Strut Level 1
7/12/04	Excavation Level 4.0 m
9/12/04	Installed Strut Level 2
21/12/04	Excavation Level 6.5m
7/02/05	Base Slab Completed
18/02/05	Removed Strut Layer 2
	Monitoring Terminated

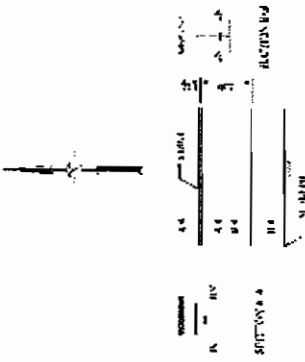


STRAIN GAUGES MONITORING RESULTS

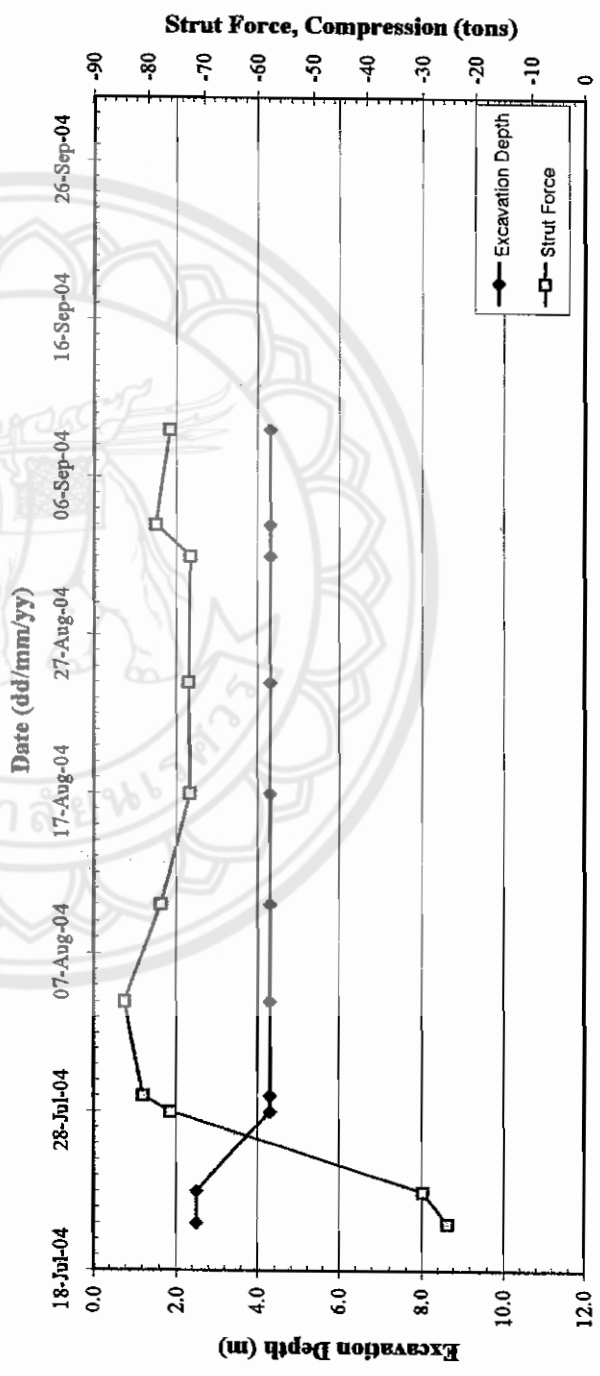
Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section I (BE15)
Strut Layer I : I1N and I1S



Construction Activity	
14 Jul 04	: Began Excavation
16 Jul 04	: Excavation Level 1.5m
19 Jul 04	: 1st Strut Completed
20 Jul 04	: Excavation Level 2.5m
28 Jul 04	: Excavation Level 4.3m
15 Sep 04	: Strain Gauges Damaged and Terminated



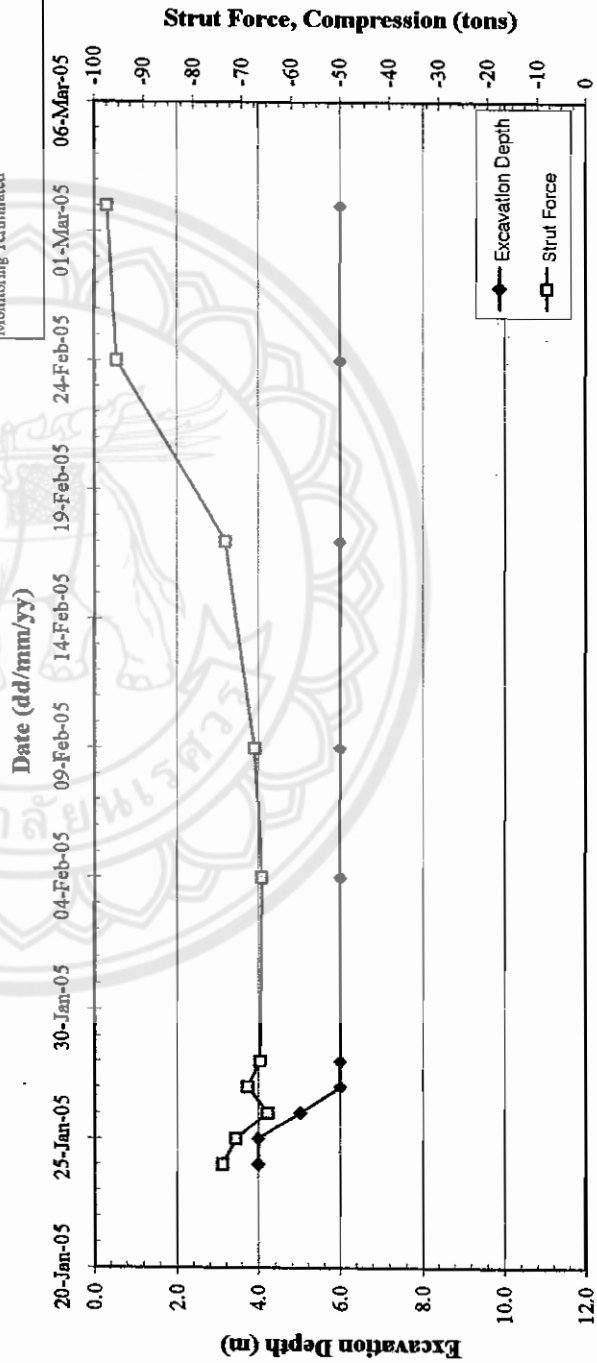
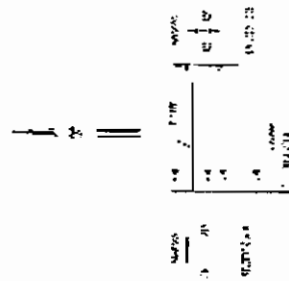
STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section J (BW9)
Strut Layer 1 : J1N and J1S

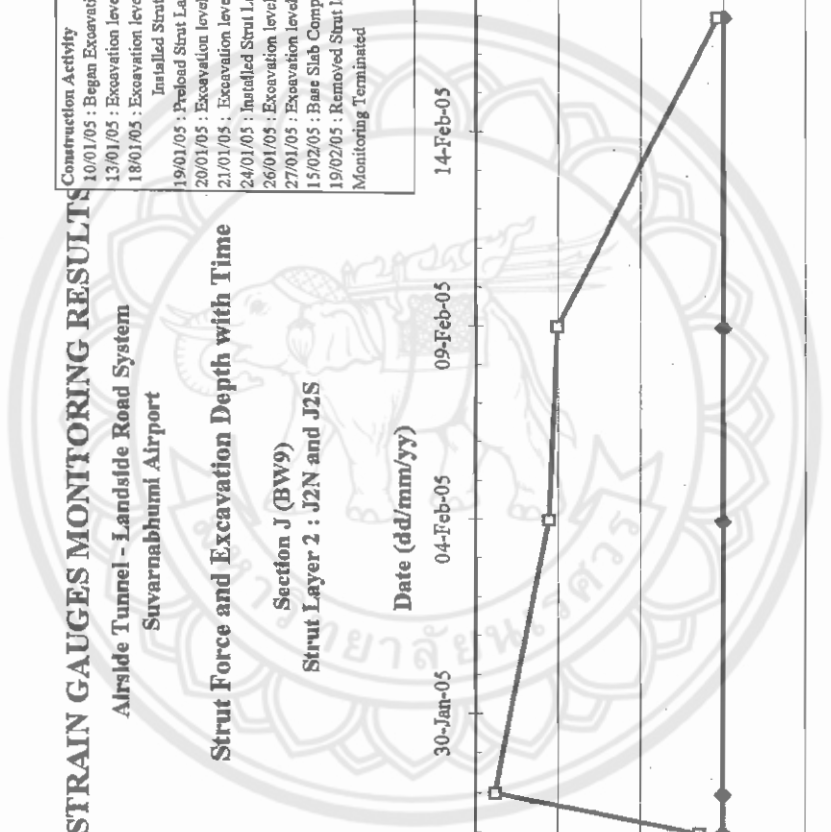
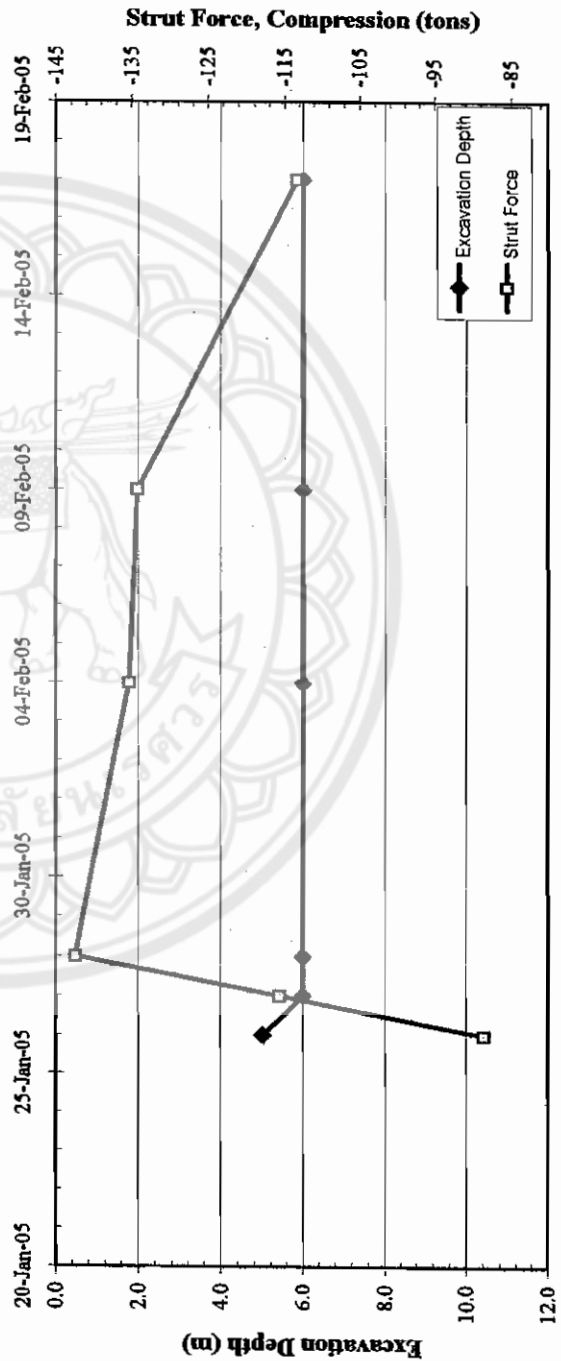
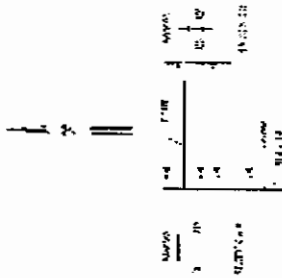
Construction Activity
 10/01/05 : Began Excavation
 13/01/05 : Excavation level -1.0 m
 18/01/05 : Excavation level -1.5 m and Installed Strut Layer 1 (-1.0 m.)
 19/01/05 : Prolong Strut Layer 1
 20/01/05 : Excavation level -3.5 m
 21/01/05 : Excavation level -4.0 m
 24/01/05 : Installed Strut Layer 2 (-3.5 m.)
 26/01/05 : Excavation level -5.0 m
 27/01/05 : Excavation level -6.0m/Lean concrete slab
 15/02/05 : Base Slab Completed
 19/02/05 : Removed Strut layer 2
 9/03/05 : Removed Strut layer 1
 Monitoring Terminated



STRAIN GAUGES MONITORING RESULTS
Alrside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time
Section J (BW9)
Strut Layer 2 : J2N and J2S

Construction Activity
 10/01/05 : Began Excavation
 13/01/05 : Excavation level -1.0 m
 18/01/05 : Excavation level -1.5 m and
 Installed Strut Layer 1 (-1.0 m.)
 19/01/05 : Preload Strut Layer 1
 20/01/05 : Excavation level -3.5 m
 21/01/05 : Excavation level -4.0 m
 24/01/05 : Installed Strut Layer 2 (-3.5 m.)
 26/01/05 : Excavation level -5.0 m
 27/01/05 : Excavation level -6.0 m/Lean concrete slab
 15/02/05 : Base Slab Completed
 19/02/05 : Removed Strut Layer 2
 Monitoring Terminated





NNK JOINT VENTURE

Altside Road Tunnel-Landside Road System Project

Suvarnabhumi Airport Project

Strain Gauge Monitoring

Installation Date : 3/1/2003
 Initial Reading Date : 3/1/2003
 Weather : Sunny

Installation Location : Station K
 Block : EW8

Date	K1N			K1S			Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Temp. (C)	CF-Temp.		
04-01-05	2460.63	32.8	-	2465.10	34.5	-	-	Initial Reading
06-01-05	2312.98	32.7	-0.03	-147.67	35.9	0.42	-147.89	Excavation Level 4.0m
08-01-05	2330.85	33.6	0.24	-129.83	34.8	0.39	-129.62	Excavation Level 5.0m/6.0m
10-01-05	2336.11	34.7	0.57	-123.94	35.8	0.39	-123.37	Excavation Level 5.0m/6.0m
11-01-05	2314.17	33.7	0.27	-146.17	34.9	0.12	-144.10	Excavation Level 6.5m
12-01-05	2348.74	32.2	-0.18	-112.06	34.2	-0.09	-108.62	Excavation Level 6.5m
13-01-05	2345.33	34.4	0.78	-114.51	37.7	0.96	-109.44	Excavation Level 6.5m
17-01-05	2351.56	32.9	0.03	-109.03	36.0	0.45	-108.51	Pile Cut Off
26-01-05	2351.88	33.3	0.15	-108.58	32.9	-0.48	-107.82	Pile Cut Off Completed
30-01-05	-	-	-	-	-	-	-	Base Slab Completed
04-02-05	2338.10	34.8	0.60	-101.92	34.6	0.03	-101.87	Wall Reinforcing Arrangement
09-02-05	2334.09	33.5	0.21	-106.32	33.3	-0.36	-106.87	Wall Reinforcing Arrangement
12-02-05	-	-	-	-	-	-	-	Removed Strut Layer 2
17-02-05	2278.71	33.8	0.30	-181.61	33.6	-0.27	-182.84	Wall Reinforcing Arrangement
24-02-05	2252.84	34.4	0.48	-277.30	33.8	-0.21	-277.38	Wall Reinforcing Arrangement
02-03-05	2256.32	33.1	0.69	-233.61	34.4	-0.03	-234.85	Wall Reinforcing Arrangement
09-03-05	-	-	-	-	-	-	-	Removed Strut Layer 1
								Monitoring Terminated

STRAIN GAUGES MONITORING RESULTS

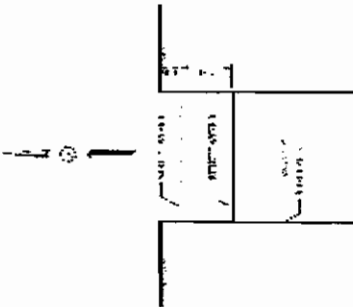
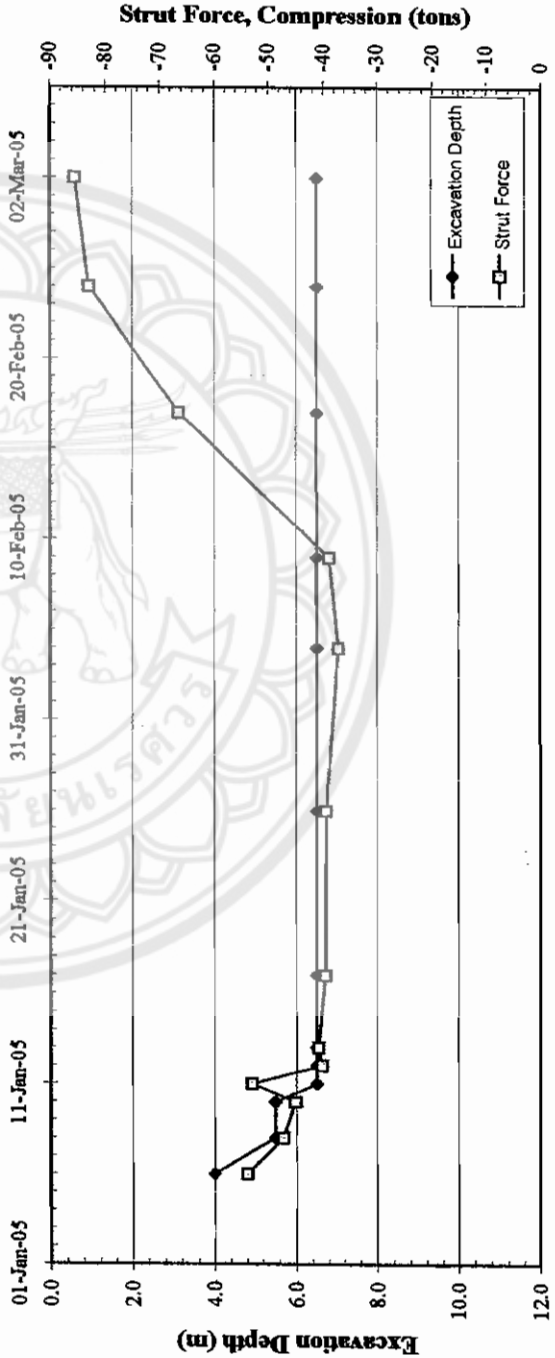
Airside Tunnel - Landside Road System
 Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section K (BW8)
 Strut Layer 1 : K1N and K1S

Construction Activity
 6/1/05 : Excavation Level 4.0 m
 11/1/05 : Excavation Level 6.5m
 17/1/05 : Pile Cut Off
 30/1/05 : Base Slab Completed
 12/02/05 : Removed Strut Layer 2
 9/03/05 : Removed Strut Layer 1
 Monitoring Terminated

Date (dd/mm/yy)



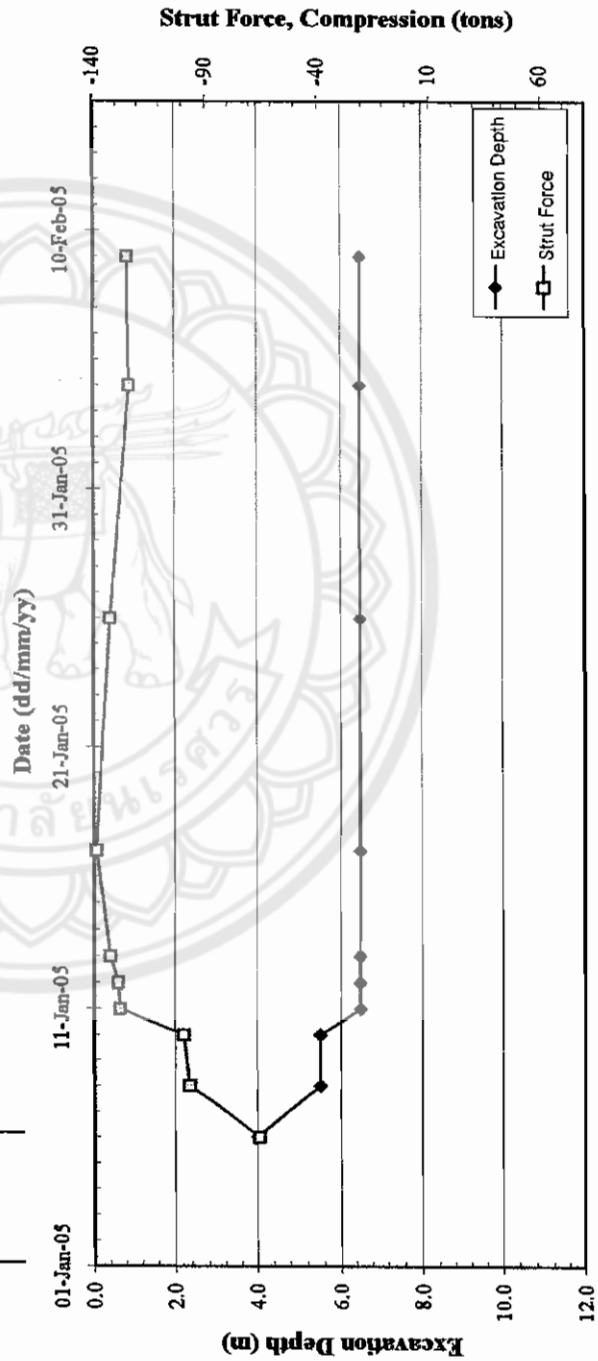
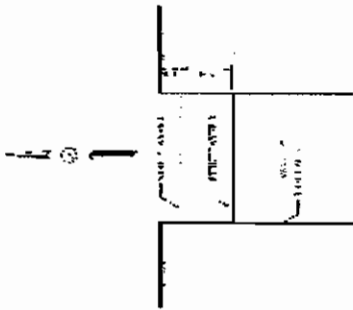
Construction Activity
 6/1/05 : Excavation Level 4.0 m
 11/1/05 : Excavation Level 6.5m
 17/1/05 : Pile Cut Off
 30/1/05 : Base Slab Completed
 12/02/05 : Removed Strut Layer 2
 Monitoring Terminated

STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
 Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section K (BW/8)
 Strut Layer 2 : K2N and K2S

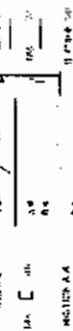




NKK JOINT VENTURE

 Altride Road Tunnel-Landside Road System Project

 Savarnabhumil Airport Project



Strut Level : 1.0m Depth
 Monitored By: IFFT

Installation Date : 6/1/2003
 Weather : Sunny

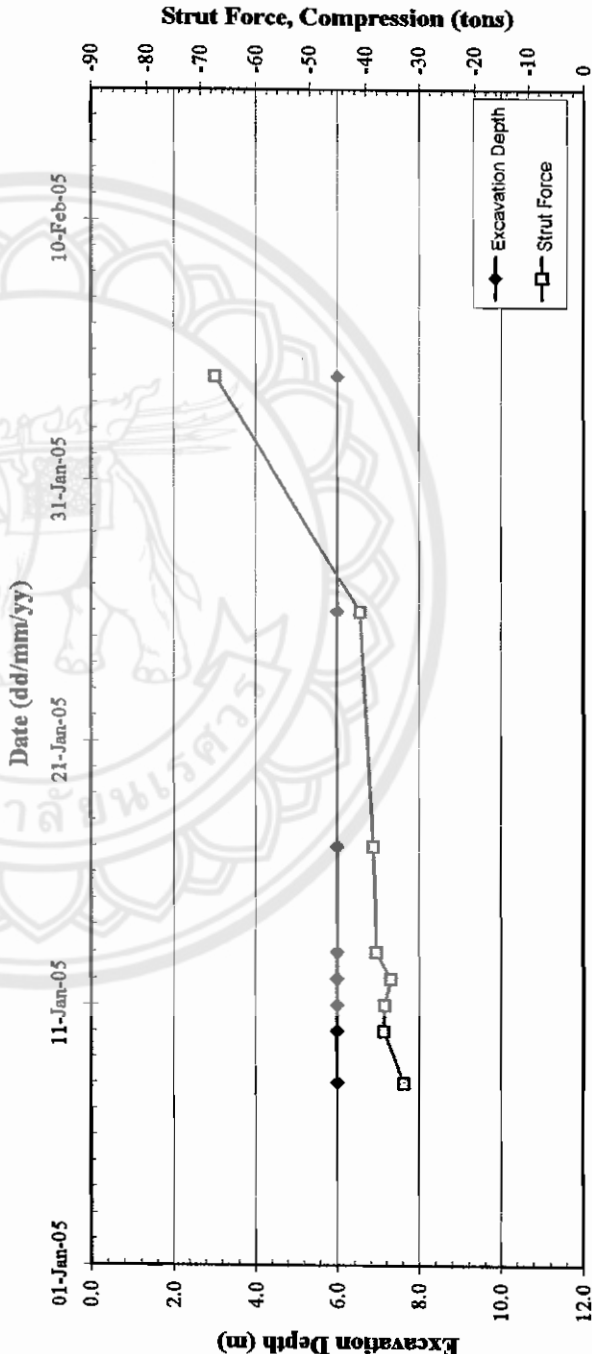
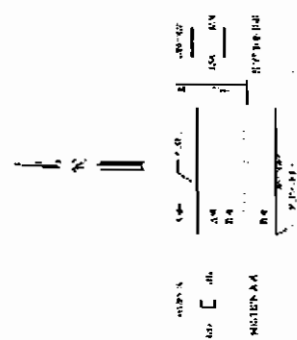
Initial Reading Date : 6/1/2003

Installation Location : Section L
 Block : EW&Z

Date	L1N		L1S		Strain Change (x10 ⁻⁵)	Temp. (°C)	CF-Temp.	Strain (x10 ⁻⁵)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁵)	Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁵)	Temp. (°C)	Strain (x10 ⁻⁵)	Temp. (°C)										
06-01-03	2370.02	34.1	-	37.0	2650.77	37.0	-	-	-	-	-	-	-	Initial Reading
08-01-03	2280.38	34.1	0.00	37.0	2541.13	37.0	0.00	-89.64	-89.64	-89.64	-89.64	-32.74	-32.74	Excavation Level 6.0m
10-01-03	2267.84	34.5	0.12	35.7	2533.33	35.7	-0.19	-97.83	-97.83	-97.83	-99.04	-36.50	-36.50	Excavation Level 6.0m
11-01-03	2268.90	34.5	0.12	37.1	2532.72	37.1	0.03	-99.31	-99.31	-99.31	-99.31	-36.34	-36.34	Excavation Level 6.0m
12-01-03	2273.55	32.1	-0.60	33.9	2536.62	33.9	-0.93	-93.29	-93.29	-93.29	-96.18	-35.12	-35.12	Excavation Level 6.0m
13-01-03	2266.12	35.6	0.45	36.6	2556.45	36.6	-0.12	-104.44	-104.44	-104.44	-103.93	-37.96	-37.96	Excavation Level 6.0m
17-01-03	2264.16	32.7	-0.42	36.0	2566.56	36.0	-0.30	-104.52	-104.52	-104.52	-105.40	-38.49	-38.49	Excavation Level 6.0m
26-01-03	2257.22	32.8	-0.39	32.7	2521.33	32.7	-1.29	-110.73	-110.73	-110.73	-111.96	-40.89	-40.89	Base Slab Completed
31-01-03	-	-	-	-	-	-	-	-	-	-	-	-	-	Removed Strut layer 2
04-02-03	2189.76	34.9	0.24	33.9	2443.18	33.9	-0.93	-188.52	-188.52	-188.52	-184.27	-67.29	-67.29	Removed Strut layer 2
09-02-03	2180.38	34.3	0.06	33.9	2442.05	33.9	-0.93	-189.65	-189.65	-189.65	-189.62	-69.25	-69.25	Removed Strut layer 2
17-02-03	-	-	-	-	-	-	-	-	-	-	-	-	-	Removed Strut layer 1
														Monitoring Terminated

Construction Activity
 4/1/05 : Excavation Level 6.0m
 26/1/05 : Base Slab Completed
 31/1/05 : Removed Strut Layer 2
 17/02/05 : Removed Strut Layer 1
 Monitoring Terminated

STRAIN GAUGES MONITORING RESULTS
 Airside Tunnel - Landside Road System
 Suvarnabhumi Airport
 Section L (BW6/7)
 Strut Layer 1 : L1N and L1S



STRAIN GAUGES MONITORING RESULTS

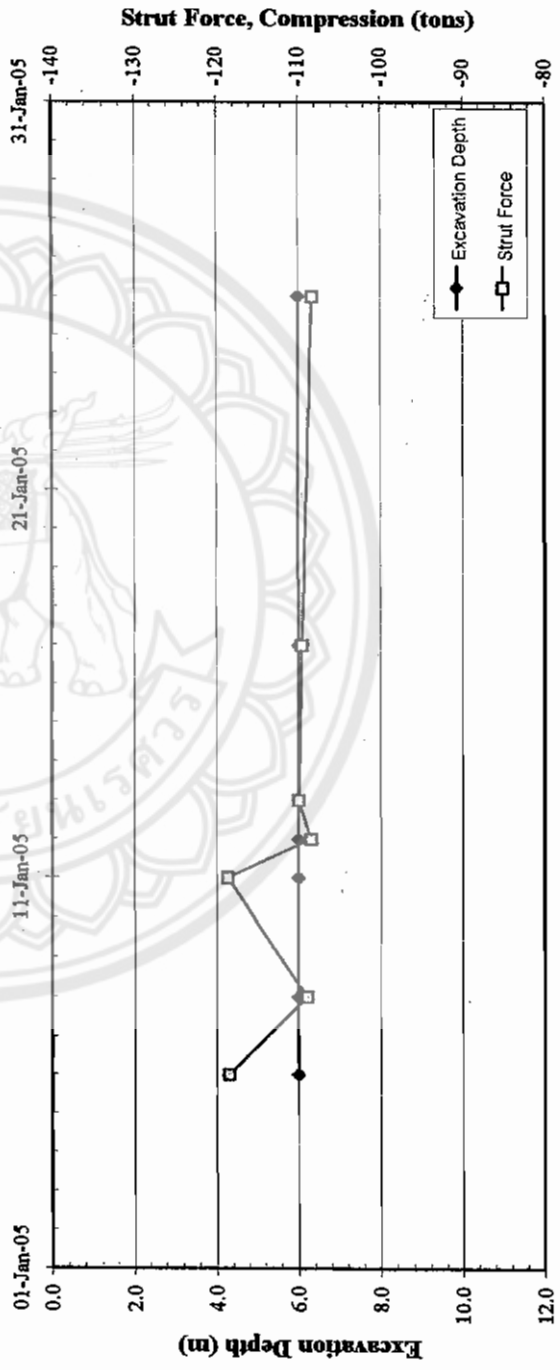
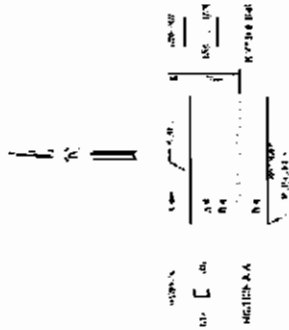
Alrside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section L (BW6/7)
Strut Layer 2 : L2N and L2S

Date (dd/mm/yy)

Construction Activity
4/1/05 : Excavation Level 6.0m
26/1/05 : Base Slab Completed
31/01/05 : Removed Strut layer 2
Monitoring Terminated





Alpside Road Tunnel-Landslide Road System Project
Sivamabhumi Airport Project
Strain Gauge Monitoring



Installation Location : Section M
 Block : BEWA
 Start Level : 1.1(m.Damb)
 Monitored By : PET
 Initial reading Date : 26/04/2004
 Final Reading Date : 05/05/2004 (After Hydraulic Jack Preloaded)
 Installation Date : 24/04/2004
 Weather : Sunny

Date	MIE		MIW		Strain Change (x10 ⁻⁶)	Strain (x10 ⁻⁶)	Temp. (C)	CF-Temp.	Strain Change (x10 ⁻⁶)	CF-Temp.	Strain Change (x10 ⁻⁶)	Temp. (C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (C)	Strain Change (x10 ⁻⁶)	Temp. (C)													
26-04-04	2678.48	41.4	-	41.8	-	2811.75	41.8	-	-	-	-	-	-	-	-	-	2nd Strut. Exc. depth 4m (Initial Reading)
27-04-04	2540.72	38.7	-1.08	40.0	-128.84	2678.71	40.0	-0.72	-137.76	-0.72	-137.76	40.0	-0.72	-133.30	-48.68	-48.68	Excavating
28-04-04	2576.68	31.5	-3.95	31.0	-105.76	2702.16	31.0	-4.32	-113.90	-4.32	-113.90	31.0	-4.32	-109.83	-40.11	-40.11	Excavating
29-04-04	2616.60	40.5	-0.32	42.7	-62.20	2744.14	42.7	0.36	-67.25	0.36	-67.25	42.7	0.36	-64.72	-23.64	-23.64	Excavating
30-04-04	2610.87	40.0	-0.56	38.7	-68.17	2746.65	38.7	-1.24	-66.53	-1.24	-66.53	38.7	-1.24	-67.35	-24.60	-24.60	ST13: Exc. Level 7m
03-05-04	2612.70	38.2	-1.28	37.8	-67.96	2746.87	37.8	-1.60	-66.47	-1.60	-66.47	37.8	-1.60	-66.77	-24.38	-24.38	ST16: 3rd Strut Completed
04-05-04	2618.22	41.4	0.00	41.8	-60.26	2751.31	41.8	0.00	-60.44	0.00	-60.44	41.8	0.00	-60.35	-22.04	-22.04	Before Preload, Exc. Level 7m
04-05-04	2593.43	41.4	0.00	41.8	-79.05	2732.27	41.8	0.00	-79.47	0.00	-79.47	41.8	0.00	-79.26	-28.95	-28.95	Preloaded : Load Reading 15 tons
04-05-04	2593.19	41.4	0.00	41.8	-85.29	2726.93	41.8	0.00	-84.82	0.00	-84.82	41.8	0.00	-85.05	-31.05	-31.05	Preloaded : Load Reading 15 tons
08-05-04	2618.36	33.3	-3.24	33.7	-63.36	2754.98	33.7	-3.24	-60.01	-3.24	-60.01	33.7	-3.24	-61.69	-22.33	-22.33	ST77: Exc. Level 8.5m
10-05-04	2635.39	36.1	-2.12	35.5	-45.21	2770.85	35.5	-2.52	-43.41	-2.52	-43.41	35.5	-2.52	-44.31	-16.18	-16.18	ST78: 4th Strut Completed
11-05-04	2626.23	36.9	-1.80	35.7	-54.05	2764.28	35.7	-2.44	-45.90	-2.44	-45.90	35.7	-2.44	-51.98	-18.98	-18.98	Exc. Level 8.5m
12-05-04	2633.99	36.8	-1.84	37.2	-46.33	2768.10	37.2	-1.84	-45.40	-1.84	-45.40	37.2	-1.84	-45.91	-16.76	-16.76	Exc. Level 8.5m
14-05-04	2627.98	35.6	-2.32	35.1	-52.81	2762.30	35.1	-2.68	-52.13	-2.68	-52.13	35.1	-2.68	-52.47	-19.16	-19.16	Exc. Level 9.5m
15-05-04	2636.72	38.5	-1.16	37.2	-42.91	2775.24	37.2	-1.84	-38.55	-1.84	-38.55	37.2	-1.84	-40.63	-14.84	-14.84	Exc. Level 10.5m
19-05-04	2633.48	38.0	-1.36	41.1	-46.36	2761.23	41.1	-0.28	-50.79	-0.28	-50.79	41.1	-0.28	-48.58	-17.74	-17.74	Exc. Level 10.5m
21-05-04																	4th Strut Removed



Strain Gauge Monitoring



Initial reading Date : 26/04/2004
 Base Reading Reser : 405/2004 (After Hydraulic Jack Released)

Installation Date : 24/04/2004
 Weather : Sunny

Strut Level : 1 (1m Depth)
 Monitored By : PPT

Installation Location : Station M
 Block : BEXX

Date	MIE		MIW		Strain Change (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Temp. (°C)	CF-Temp.	Strain Change (x10 ⁻⁶)	Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (°C)	Strain (x10 ⁻⁶)	Temp. (°C)										
19-05-04	2633.48	38.0	-1.36	41.1	-46.36	2761.23	-0.28	-50.79	41.1	-0.28	-50.79	-48.58	-17.74	Exc. Level 10.5m
24-05-04														4th Strut Removed
31-05-04	2644.37	37.7	-1.48	37.1	-35.39	2780.32	-1.88	-53.31	37.1	-1.88	-53.31	-34.35	-12.54	Reinforcing Arrangement
03-06-04	2643.99	39.1	-0.92	38.8	-34.41	2775.43	-1.20	-37.51	38.8	-1.20	-37.51	-36.46	-13.32	Preparing for Concrete Base Slab
11-06-04	2644.02	34.6	-2.72	35.2	-37.18	2777.03	-2.64	-37.36	35.2	-2.64	-37.36	-37.27	-13.61	Base Slab was completed
18-06-04	2645.19	30.0	-4.56	29.8	-37.85	2775.76	-4.80	-40.79	29.8	-4.80	-40.79	-39.32	-14.36	No Activity
24-06-04	2662.40	36.0	-2.16	34.7	-18.24	2796.68	-2.84	-17.91	34.7	-2.84	-17.91	-18.07	-6.60	3rd Strut Removed
29-06-04	2675.49	36.1	-2.12	34.4	-5.11	2813.32	-2.56	-0.99	34.4	-2.56	-0.99	-3.05	-1.11	No Activity
02-07-04	2673.30	38.1	-1.32	36.7	-6.49	2812.46	-2.04	-1.32	36.7	-2.04	-1.32	-5.91	-1.43	Concrete Wall Pouring
07-07-04														Wall Completed, Top Level 6.4 m
09-07-04	2673.47	39.9	-0.20	39.0	-5.20	2809.10	-1.12	-3.77	39.0	-1.12	-3.77	-4.49	-1.64	No Activity
13-07-04	2674.22	36.3	0.00	35.2	-4.23	2810.43	-2.64	-3.95	35.2	-2.64	-3.95	-4.10	-1.50	2nd Strut Removed after Reading
21-07-04	2660.22	37.6	0.00	36.8	-18.26	2795.80	-2.00	-17.95	36.8	-2.00	-17.95	-18.10	-6.61	No Activity
28-07-04	2583.93	37.6	0.00	37.5	-94.55	2719.81	-1.72	-93.65	37.5	-1.72	-93.65	-94.10	-34.37	No Activity
05-08-04	2597.53	37.1	0.00	36.0	-80.94	2730.43	-2.32	-83.63	36.0	-2.32	-83.63	-82.29	-30.05	No Activity
13-08-04	2584.92	37.0	0.00	34.9	-93.56	2723.55	-2.76	-90.97	34.9	-2.76	-90.97	-92.27	-33.69	No Activity
17-08-04														1st Strut Removed

STRAIN GAUGES MONITORING RESULTS

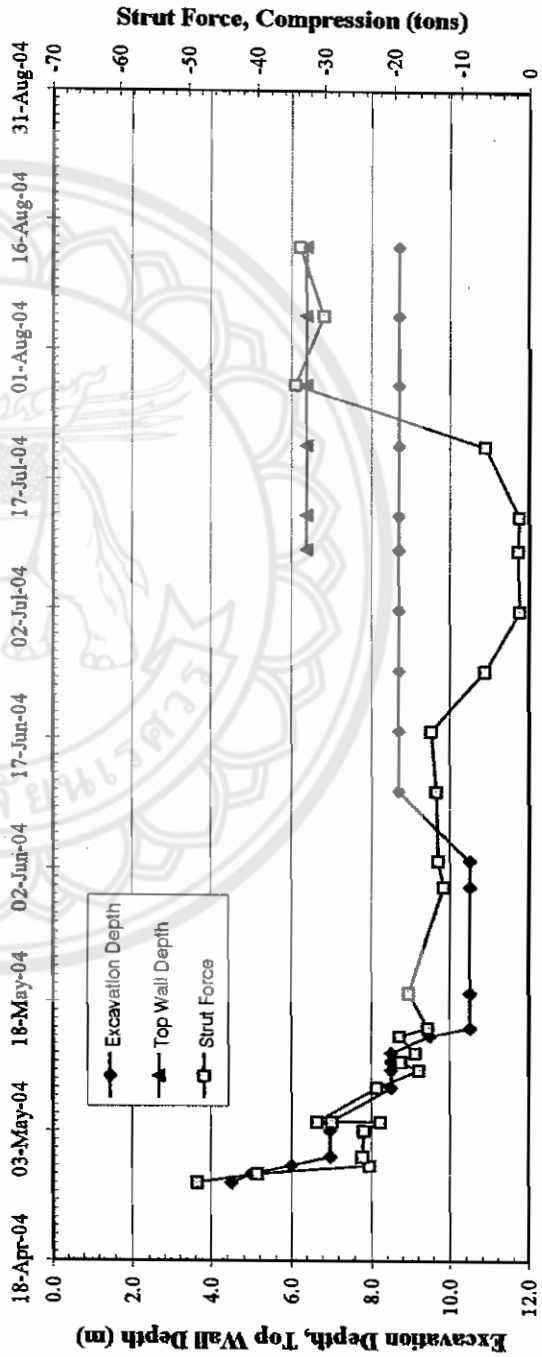
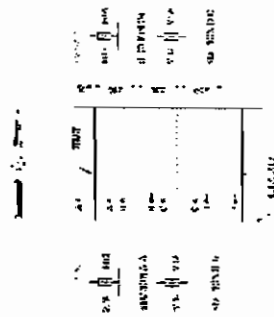
Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section M (BEWS)
Strut Layer 1 : M1E and MIW

Construction Activity

- 3 May 04 : 3rd Strut Completed
- 4 May 04 : 1st Strut Preloaded
- 8 May 04 : Excavation Level 8.5m
- 10 May 04 : 4th Strut Completed
- 15 May 04 : Excavation Level 10.5m
- 25 May 04 : 4th Strut Removed
- 5 Jun 04 : Base Slab Completed
- 25 Jun 04 : 3rd Strut Removed
- 7 Jul 04 : Wall Completed,
Top Wall 6.4m Depth
- 13 Jul 04 : 2nd Strut Removed
- 17 Aug 04 : 1st Strut Removed



NNK JOINT VENTURE

Airside Road Tunnel-Landside Road System Project
Srirangabudhi Airport Project
Strain Gauge Monitoring



Installation Location : Section M
 Block : BERE

Span Level : 2.03m Depth
 Monitored By : FZL

Installation Date : 24/04/2004
 Weather : Sunny

Initial Reading Date : 28/04/2004
 Base Reading Reset : 4.03/2004

Date	MZE		M2W		Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (C)	CF-Temp. (C)	Strain Change (x10 ⁻⁶)		
28-04-04	2419.38	28.5	29.2	2230.86		
29-04-04	2164.37	39.7	41.7	1988.93	-234.92	2nd Strut, Excavating (Initial Reading)
30-04-04	2174.98	38.6	38.1	2000.26	-244.65	Excavating
03-05-04	2214.56	36.4	36.2	2030.21	-200.45	ST5: Exc. Level 7m
04-05-04	2216.45	32.2	31.0	2035.97	-199.09	ST6: 3rd Strut Completed
08-05-04	2213.64	31.9	31.3	2094.73	-160.11	Exc. Level 7m
10-05-04	2273.34	34.8	33.8	2112.30	-139.66	ST7: Exc. Level 8.5m
11-05-04	2264.20	36.0	34.3	2105.82	-148.22	ST8: 4th Strut Completed
12-05-04	2262.72	35.8	34.2	2102.72	-150.56	Exc. Level 8.5m
14-05-04	2261.30	34.9	34.2	2100.35	-152.38	Exc. Level 8.5m
15-05-04	2272.84	36.9	35.1	2110.22	-141.45	Exc. Level 9.5m
19-05-04	2268.15	27.8	40.5	2109.11	-144.90	Exc. Level 10.5m
25-05-04	2283.30	38.2	37.5	2130.38	-124.38	Exc. Level 10.5m
31-04-04			2.49	-117.99	-45.50	4th Strut Removed Reinforcing Arrangement

STRAIN GAUGES MONITORING RESULTS

Alrside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

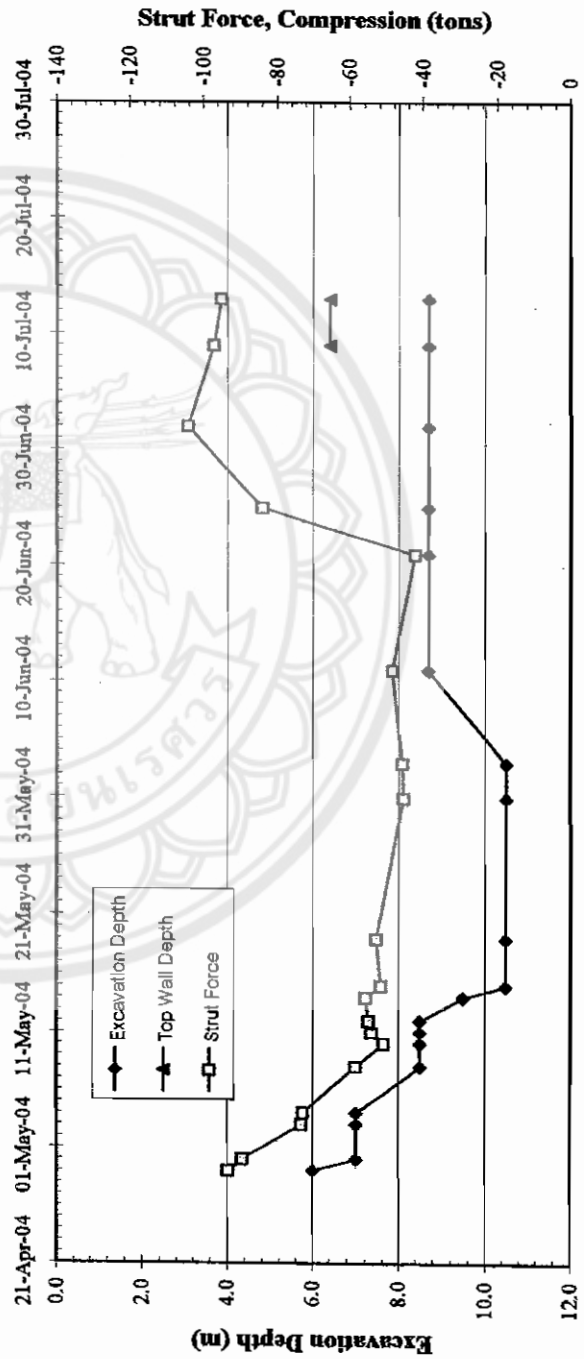
Section M (BEW8)

Strut Layer 2 : M2E and M2W

Date (dd/mm/yy)

Construction Activity	
3 May 04	: 3rd Strut Completed
4 May 04	: 1st Strut Preloaded
8 May 04	: Excavation Level 8.5m
10 May 04	: 4th Strut Completed
15 May 04	: Excavation Level 10.5m
25 May 04	: 4th Strut Removed
5 Jun 04	: Base Slab Completed
25 Jun 04	: 3rd Strut Removed
7 Jul 04	: Wall Completed,
13 Jul 04	: 2nd Strut Removed

Strut ID	Strut Type	Strut Length (m)	Strut Force (tons)
M2E	Strut	4.0	-40
M2W	Strut	4.0	-40
M2E	Strut	4.0	-40
M2W	Strut	4.0	-40
M2E	Strut	4.0	-40
M2W	Strut	4.0	-40





Aliride Road Tunnel-Landside Road System Project
 Surarambhum Airport Project
Strain Gauge Monitoring

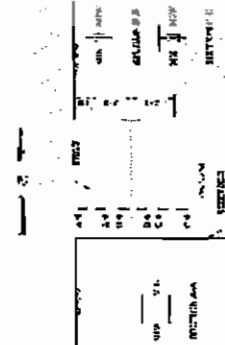
Installation Location : Section M
 Block : BEV3

Spout Level : 3 (Km Daroh)
 Monitored By : JPT

Initial reading Date : 30/5/2004
 Base Reading Reat : 4032200.1 (After Hydraulic Jack Preload)

Date	MSE		MSW		Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁵)	Temp. (°C)	Temp. (°C)	CF-Temp. Strain Change (x10 ⁻⁵)			
03-05-04	2345.00	37.4	37.4	2673.00	-	-	3rd Stret, Exc. depth 7m (Initial Reading)
04-05-04	2391.91	37.4	37.4	2520.62	-153.73	-56.14	Before Preload, Exc Level 7m
04-05-04	2384.53	37.4	37.4	2559.71	-162.88	-59.48	Preload : Load Reading 60 tons
04-05-04	2344.32	37.4	37.4	2484.88	-100.40	-69.33	Preload : Load Reading 70 tons
08-05-04	2241.79	31.3	30.4	2390.20	-295.62	-108.10	ST7: Exc. Level 8.5m
10-05-04	2280.39	33.7	33.4	2436.44	-252.74	-92.30	ST8: 4th Stret Completed
11-05-04	2272.93	33.1	34.1	2439.30	-259.73	-94.83	Exc. Level 8.5m
12-05-04	2269.74	34.7	34.1	2439.31	-261.38	-95.45	Exc. Level 8.5m
14-05-04	2259.58	34.2	33.8	2422.19	-270.13	-98.65	Exc. Level 9.5m
15-05-04	2276.64	37.7	35.4	2439.23	-252.32	-92.14	Exc. Level 10.5m
19-05-04	2278.25	38.0	37.9	2440.09	-230.67	-91.34	Exc. Level 10.5m
25-05-04							4th Stret Removed
31-05-04	2195.82	37.6	36.3	2363.10	-525.68	-120.39	Reinforcing Arrangement

Strain Gauge Monitoring



Installation Location : Station M
Block : BEVE

Strut Level : 3 (from Depth)
Monitored By : JPTI

Installation Date : 3.05.2004
Weather : Sunny

Initial reading Date : 3.05.2004
Base Reading Reset : 4.04.2004 (After Hydraulic Jack Withdrawal)

Date	NBE			MSW			Average Strain Change	Force (t)	Construction Activity
	Strain ($\times 10^{-6}$)	Temp. (°C)	CP-Temp.	Strain ($\times 10^{-6}$)	Temp. (°C)	CP-Temp.			
31-03-04	2195.82	37.6	0.06	2365.10	36.3	-0.33	-329.68	-120.39	Reinforcing Arrangement Preparing for Concrete Base Slab 3rd Strut inessential for Measurement (Base Slab was Completed) No Activity No Activity Strut 3 removed after the reading
04-06-04	2192.87	38.8	0.42	2263.77	37.5	0.03	-431.45	-121.04	
11-06-04									
14-06-04	2217.16	31.9	-1.65	2385.41	31.0	-1.92	-310.30	-115.39	
21-06-04	2217.00	36.7	-0.21	2385.02	35.6	-0.44	-309.36	-112.98	
25-06-04	2216.47	36.5	-0.27	2386.67	34.5	-0.87	-309.00	-112.84	

STRAIN GAUGES MONITORING RESULTS

Airside Tunnel - Landside Road System
Suvarnabhumi Airport

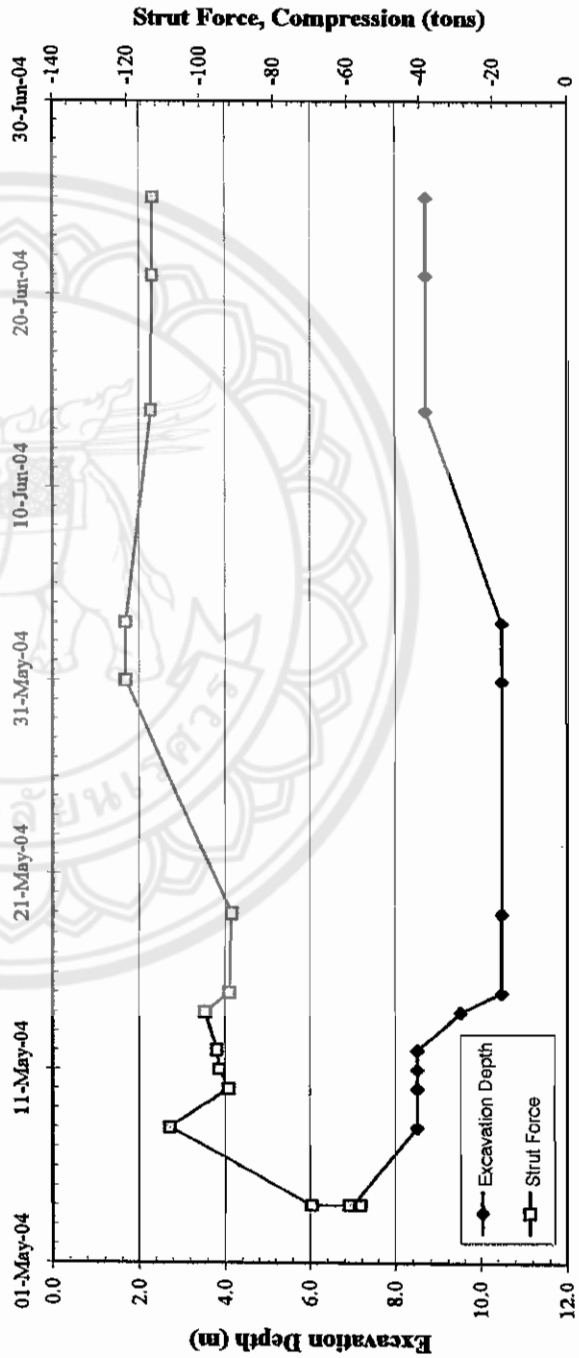
Strut Force and Excavation Depth with Time

Section M (BEW8)

Strut Layer 3 : M3E and M3W

Date (dd/mm/yy)

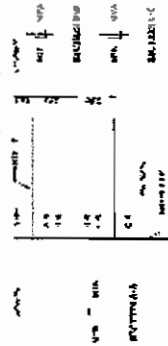
Construction Activity	
3 May 04	: 3rd Strut Completed
4 May 04	: 3rd Strut Preloaded
8 May 04	: Excavation Level 8.5m
10 May 04	: 4th Strut Completed
15 May 04	: Excavation Level 10.5m
25 May 04	: 4th Strut Removed
5 Jun 04	: Base Slab Completed
25 Jun 04	: 3rd Strut Removed



Strut ID	Depth (m)	Force (tons)
M3E	3.5	-10
M3W	3.5	-10
M3E	4.0	-15
M3W	4.0	-15
M3E	4.0	-100
M3W	4.0	-100



NKK JOINT VENTURE
 Alralde Road Tunnel-Landside Road System Project
 Sarvarahmuni Airport Project
Strain Gauge Monitoring



Installation Location : Station M
Block : BEW8

Sheet Level : 4 (8.5m Depth)
Monitored By : PET

Installation Date : 10/05/2004
Weather : Sunny

Initial reading Date : 10/05/2004

Date	MAE		N4W		Average Strain Change	Force (t)	Construction Activity
	Temp. (°C)	CF-Temp.	Temp. (°C)	CF-Temp.			
10-05-04	33.9	-	32.3	-	-	-	4th Street Completed, Exc. depth 8.5m (Initial Reading)
11-05-04	32.7	-0.36	32.1	-0.06	-127.41	-46.83	Exc. depth 8.5m
12-05-04	33.0	-0.27	32.4	0.03	-172.12	-48.25	Exc. depth 8.5m
14-05-04	32.1	-0.54	31.9	-0.12	-195.23	-71.30	Exc. depth 9.5m
15-05-04	34.6	0.21	33.6	0.39	-222.99	-31.43	Exc. depth 10.5m
19-05-04	37.4	1.05	37.8	1.65	-231.81	-84.63	Exc. depth 10.5m
25-05-04							4th Street Removed

STRAIN GAUGES MONITORING RESULTS

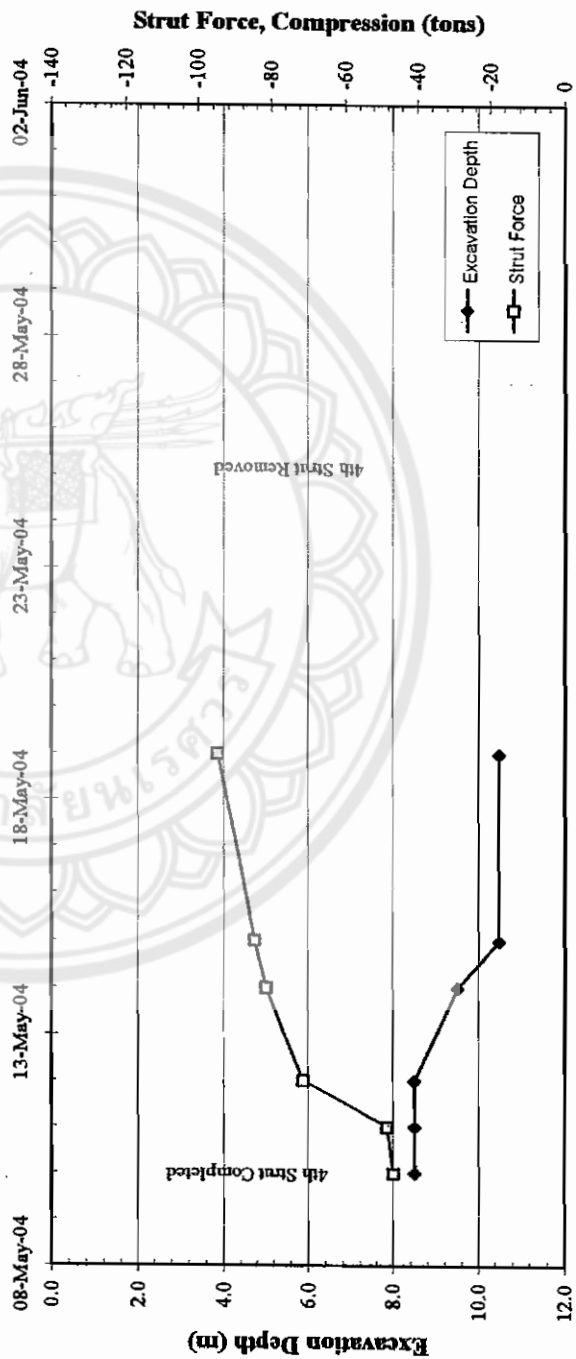
Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section M (BEW8)
Strut Layer 4 : M4E and M4W

Date (dd/mm/yy)

NO.	DATE	DEPTH (m)	STRUT FORCE (tons)
01	08-May-04	8.0	-40
02	13-May-04	8.0	-40
03	13-May-04	8.0	-40
04	13-May-04	8.0	-40
05	13-May-04	8.0	-40
06	13-May-04	8.0	-40
07	13-May-04	8.0	-40
08	13-May-04	8.0	-40
09	13-May-04	8.0	-40
10	13-May-04	8.0	-40
11	13-May-04	8.0	-40
12	13-May-04	8.0	-40
13	13-May-04	8.0	-40
14	13-May-04	8.0	-40
15	13-May-04	8.0	-40
16	13-May-04	8.0	-40
17	13-May-04	8.0	-40
18	13-May-04	8.0	-40
19	13-May-04	8.0	-40
20	13-May-04	8.0	-40
21	13-May-04	8.0	-40
22	13-May-04	8.0	-40
23	13-May-04	8.0	-40
24	13-May-04	8.0	-40
25	13-May-04	8.0	-40
26	13-May-04	8.0	-40
27	13-May-04	8.0	-40
28	13-May-04	8.0	-40
29	13-May-04	8.0	-40
30	13-May-04	8.0	-40
31	13-May-04	8.0	-40
32	13-May-04	8.0	-40
33	13-May-04	8.0	-40
34	13-May-04	8.0	-40
35	13-May-04	8.0	-40
36	13-May-04	8.0	-40
37	13-May-04	8.0	-40
38	13-May-04	8.0	-40
39	13-May-04	8.0	-40
40	13-May-04	8.0	-40
41	13-May-04	8.0	-40
42	13-May-04	8.0	-40
43	13-May-04	8.0	-40
44	13-May-04	8.0	-40
45	13-May-04	8.0	-40
46	13-May-04	8.0	-40
47	13-May-04	8.0	-40
48	13-May-04	8.0	-40
49	13-May-04	8.0	-40
50	13-May-04	8.0	-40
51	13-May-04	8.0	-40
52	13-May-04	8.0	-40
53	13-May-04	8.0	-40
54	13-May-04	8.0	-40
55	13-May-04	8.0	-40
56	13-May-04	8.0	-40
57	13-May-04	8.0	-40
58	13-May-04	8.0	-40
59	13-May-04	8.0	-40
60	13-May-04	8.0	-40
61	13-May-04	8.0	-40
62	13-May-04	8.0	-40
63	13-May-04	8.0	-40
64	13-May-04	8.0	-40
65	13-May-04	8.0	-40
66	13-May-04	8.0	-40
67	13-May-04	8.0	-40
68	13-May-04	8.0	-40
69	13-May-04	8.0	-40
70	13-May-04	8.0	-40
71	13-May-04	8.0	-40
72	13-May-04	8.0	-40
73	13-May-04	8.0	-40
74	13-May-04	8.0	-40
75	13-May-04	8.0	-40
76	13-May-04	8.0	-40
77	13-May-04	8.0	-40
78	13-May-04	8.0	-40
79	13-May-04	8.0	-40
80	13-May-04	8.0	-40
81	13-May-04	8.0	-40
82	13-May-04	8.0	-40
83	13-May-04	8.0	-40
84	13-May-04	8.0	-40
85	13-May-04	8.0	-40
86	13-May-04	8.0	-40
87	13-May-04	8.0	-40
88	13-May-04	8.0	-40
89	13-May-04	8.0	-40
90	13-May-04	8.0	-40
91	13-May-04	8.0	-40
92	13-May-04	8.0	-40
93	13-May-04	8.0	-40
94	13-May-04	8.0	-40
95	13-May-04	8.0	-40
96	13-May-04	8.0	-40
97	13-May-04	8.0	-40
98	13-May-04	8.0	-40
99	13-May-04	8.0	-40
100	13-May-04	8.0	-40





Strain Gauge Monitoring

Installation Location : Section N
 Block : BEV3
 Span Level : 1 & 2 (Lm & 3.5m Depth) Installation Date : 27/03/2017 Initial Reading Date : 27/3/04
 Date Reading Taken : 02/04
 Weather : Sunny
 Other Parameters Not Provided : N/E & H/W Only

Date	N/E			N/W			Force (t)	Continuation Authority
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp./Strain Change (x10 ⁻⁴ /°C)	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp./Strain Change (x10 ⁻⁴ /°C)		
27-03-04	2698.00	38.4	-	2329.00	40.9	-	-	Initial Reading
29-03-04	2349.77	36.2	-3.96	2083.09	37.9	-5.40	-201.27	-94.41
30-03-04	2405.12	37.7	-1.26	2120.29	40.3	-1.68	-209.79	-206.96
31-03-04	2428.76	37.9	-0.96	2155.00	39.3	-2.88	-176.88	-63.19
01-04-04	2475.16	36.0	-4.32	2207.53	37.8	-5.58	-126.63	-132.91
02-04-04	2523.78	35.0	-6.12	2255.67	37.6	-5.94	-79.27	-84.80
03-04-04	2528.51	36.9	-2.76	2275.05	38.2	-4.86	-70.50	-23.75

Date	N/E			N/W			Force (t)	Continuation Authority
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp./Strain Change (x10 ⁻⁴ /°C)	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp./Strain Change (x10 ⁻⁴ /°C)		
27-03-04	2189.42	37.6	-	4393.15	38.8	-	-	Initial Reading
29-03-04	2088.33	35.9	-3.06	4323.15	36.2	-4.68	-79.40	-29.00
30-03-04	2038.30	38.1	0.90	4311.97	38.5	-0.34	-81.72	-38.70
31-03-04	1999.89	38.2	1.08	4235.17	38.3	-0.90	-158.86	-67.07
01-04-04	1867.21	36.7	-1.62	4089.06	36.9	-3.82	-397.51	-472.38
02-04-04	1710.69	35.5	-3.78	4008.23	36.1	-4.86	-389.78	-426.14
03-04-04	1683.25	36.4	-2.16	3981.13	37.0	-3.24	-411.79	-164.99

NNK JOINT VENTURE
Joint-Landslide Road System Project
Irattahalli Airport Project

WIP - secvdr Gauge Monitoring

Installation Location - Section N
 Block: BEB2
 Strut Level 1 & 2 (1m & 1.5m Depth) Installation Date : 27/03/200 Initial Reading Date : 27/04
 Base Reading Report : 4/5/04 (After Hydraulic Jack Pressed) - N/E & N/W Only
 Monitored By: ZEP
 Weather: Sunny

Date	N/E			N/W			Force (t)	Construction Activity
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp./Strain Change (x10 ⁻⁴)	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp./Strain Change (x10 ⁻⁴)		
04-04-04	2114.67	35.2	-9.76	2257.17	37.0	-7.02	-88.97	-9.49
05-04-04	2123.66	37.2	-2.16	2209.97	37.2	-6.66	-76.09	-27.79
06-04-04	2128.16	35.4	-5.40	2276.20	36.6	-7.74	-72.89	-25.62
07-04-04	2128.51	34.1	-7.74	2274.93	34.5	-10.80	-76.03	-21.77
08-04-04	2116.63	38.4	0.00	2243.10	41.4	0.90	-86.38	-32.20
09-04-04	2125.83	37.4	-1.80	2218.09	38.0	-5.22	-80.64	-29.23
10-04-04	2142.11	36.7	-3.06	2272.62	39.2	-3.06	-64.19	-23.44

Date	N/E			N/W			Force (t)	Construction Activity
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp./Strain Change (x10 ⁻⁴)	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp./Strain Change (x10 ⁻⁴)		
04-04-04	1653.04	34.8	-5.04	1948.61	35.6	-7.76	-43.30	-97.43
05-04-04	1654.44	37.1	-0.90	1932.93	38.1	-1.26	-43.88	-174.86
06-04-04	1642.77	26.9	-1.26	1933.73	38.1	-1.26	-46.67	-180.51
07-04-04	1640.81	34.8	-5.04	1938.38	39.1	-6.66	-461.23	-197.44
08-04-04	1683.56	38.6	1.80	1966.71	41.7	5.72	-421.21	-181.66
09-04-04	1732.72	38.4	1.44	4019.55	39.4	1.08	-372.54	-164.93
10-04-04	1741.48	38.4	1.44	4027.02	38.7	-0.18	-366.30	-148.76

NKK JOINT VENTURE
anet-Landside Road System Project
Prabumul Airport Project

Strain Gauge Monitoring

Installation Location: Section N
 Block: BEW3

Steel Level 1 (1.62 (1m & 3.5m Depth) Installation Date: 27/03/200 Initial Reading Date: 27/2/04
 Base Reading Reset: 45/04 (After Hydraulic Jack Released)
 Vendor: SUXU

Date	N1E			N1W			Force (t)	Construction Activity
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp. strain Change (x10 ⁻⁴)	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp. strain Change (x10 ⁻⁴)		
19-04-04	2527.47	37.0	-2.52	2265.24	38.1	-1.04	-27.71	
20-04-04	2540.38	39.8	2.43	2289.92	40.8	-0.18	-17.98	No Slew, EXC. 7.0m
21-04-04	2530.58	41.1	4.86	2272.28	43.9	5.40	-20.98	Preparation for Lean Concrete
22-04-04	2537.04	38.7	0.54	2235.32	39.8	-1.98	-23.39	After Precast 2nd Str = 50t (2&Lean)
23-04-04	2555.14	37.8	-1.08	2287.15	40.1	-1.44	-17.75	No Activity
24-04-04	2550.19	37.4	-1.80	2279.66	39.6	-2.34	-20.32	No Activity
26-04-04	2552.72	40.1	3.96	2283.92	42.1	2.16	-17.37	No Activity

Date	N2E			N2W			Force (t)	Construction Activity
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp. strain Change (x10 ⁻⁴)	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp. strain Change (x10 ⁻⁴)		
19-04-04	1736.87	37.0	-1.08	4038.57	37.6	-2.16	-149.79	
20-04-04	1740.36	38.3	1.26	4065.15	39.3	0.90	-148.58	3rd Slew, EXC. 7.0m
21-04-04	1751.17	39.4	3.24	4066.96	40.3	3.06	-145.74	Preparation for Lean Concrete
22-04-04	1758.32	38.4	1.44	4026.22	38.5	-0.36	-141.87	After Precast 2nd Str = 50t (2&Lean)
23-04-04	1764.43	38.1	0.90	4030.82	39.6	1.44	-139.83	No Activity
24-04-04	1769.62	38.3	1.26	4034.63	39.1	0.54	-138.13	No Activity
26-04-04	1790.26	40.7	5.58	4061.50	42.1	5.94	-127.14	No Activity

NNK JOINT VENTURE

nnk-Landside Road System Project
Irababund Airport Project

Strain Gauge Monitoring

Installation Location : Section N
 Block : BEV3
 Sheet Level : 1 & 2 (1m & 3.5m Depth) Installation Date : 27/03/2010 Initial Reading Date : 27/3/04
 Monitored By : GET Washer : SUNNY Date Reading Reset : 4/5/04 (After Hydraulic Jack Preloaded)

Sheet Level 1 (1m Depth)

Date	N1E			N1W			Force (t)	Construction Activity			
	Strain (x10 ⁻⁴)	Temp. (C)	CF-Temp./Strain Change (x10 ⁻⁴)	Strain (x10 ⁻⁴)	Temp. (C)	CF-Temp./Strain Change (x10 ⁻⁴)					
04-05-04	2584.57	38.4	0.00	-43.63	2303.53	40.9	0.00	-25.47	-34.55	-12.02	Before Preload (Esp. Level 9.0m)
04-05-04	2347.76	38.4	0.00	-60.24	2270.66	40.9	0.00	-38.34	-59.29	-21.65	Preloaded : Load Reading 18 ton
04-05-04	2313.98	38.4	0.00	-94.02	2237.91	40.9	0.00	-91.09	-92.55	-33.80	Preloaded : Load Reading 28 ton
11-05-04	2339.38	37.3	-1.98	-79.40	2287.61	38.1	-5.04	-46.43	-58.41	-21.33	No Activity (Reinf. Arrangement)
20-05-04	2330.24	34.2	-7.56	-83.32	2271.59	35.3	-10.08	-57.49	-76.41	-27.90	No Activity (Base Slab Completed)
27-05-04	2553.07	35.2	-5.76	-60.69	2289.34	36.9	-7.20	-46.86	-53.77	-19.64	No Activity

Sheet Level 1 (3.5m Depth)

Date	N2E			N2W			Force (t)	Construction Activity			
	Strain (x10 ⁻⁴)	Temp. (C)	CF-Temp./Strain Change (x10 ⁻⁴)	Strain (x10 ⁻⁴)	Temp. (C)	CF-Temp./Strain Change (x10 ⁻⁴)					
4/5/04	1652.46	40.3	4.86	-112.10	3980.16	40.7	3.42	-459.37	-483.83	-177.42	Before Preload (Esp. Level 9.0m)
4/5/04	1654.01	40.3	4.86	-530.53	3911.48	40.7	3.42	-478.25	-504.40	-184.20	Preloaded : Load Reading 140 ton (minimum scale of gauge reading at 140)
11/5/04	1637.49	36.8	-1.44	-533.27	3915.97	36.0	-5.84	-482.31	-507.74	-485.42	No Activity (Reinf. Arrangement)
20/5/04	1632.28	34.1	-6.30	-643.44	3909.17	24.2	-8.28	-492.26	-517.85	-489.11	No Activity (Base Slab Completed)
27/5/04	1672.76	35.6	-3.60	-500.26	3944.00	36.3	-4.50	-453.65	-476.96	-174.18	No Activity

NKK JOINT VENTURE

nnel-Landaide Road System Project
Oranabal Airport Project

Water Gauge Monitoring

Installation Location: Section N
 Block: REV2
 Installation Date: 27/03/2004 Initial Reading Due: 27/3/04
 Rise Reading Rate: 45/04 (After Hydraulic Jack Protocolled)
 Weather: Sunny

Date	N1E				N1W				Force (t)	Construction Activity	
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp. (°C)	Strain Change (x10 ⁻⁴)	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp. (°C)	Strain Change (x10 ⁻⁴)			
27-05-04	2553.07	35.2	-5.76	-60.69	2280.34	36.9	-7.20	-46.86	-53.77	-19.54	No Activity
02-06-04	2543.84	39.4	1.80	-62.36	2282.66	41.9	1.80	-44.54	-53.46	-19.52	No Activity
11-06-04	2541.88	35.2	-9.36	-75.48	2276.43	35.1	-10.44	-63.01	-69.24	-23.29	No Activity
23-06-04	2528.39	35.5	-5.22	-84.83	2277.01	36.0	-8.82	-60.81	-72.82	-26.59	No Activity
26-06-04	2530.93	37.9	-6.90	-77.97	2277.24	38.7	-3.96	-55.72	-66.85	-24.41	Wall Completed, Top Level 4.5m
02-07-04	2542.81	35.3	-5.58	-70.77	2281.16	38.6	-4.14	-51.98	-61.18	-22.41	No Activity

Date	N2E				N2W				Force (t)	Construction Activity	
	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp. (°C)	Strain Change (x10 ⁻⁴)	Strain (x10 ⁻⁴)	Temp. (°C)	CF-Temp. (°C)	Strain Change (x10 ⁻⁴)			
27/5/04	1672.76	35.6	-9.60	-500.26	3944.00	36.3	-4.50	-43.65	-476.66	-174.18	No Activity
3/6/04	1698.84	40.3	4.86	-516.02	3915.31	41.0	5.06	-473.67	-494.85	-180.71	No Activity
11-06-04	1669.12	33.8	-6.84	-536.13	3907.79	34.3	-8.10	-493.46	-514.80	-188.06	No Activity
25-06-04	1670.60	35.7	-3.42	-562.24	3888.76	34.9	-7.02	-511.41	-536.82	-195.04	No Activity
02-07-04	1644.39	38.2	1.08	-523.95	3917.70	38.1	-1.26	-476.70	-500.33	-182.71	Wall Completed, Top Level 4.5m
23-07-04	1657.07	36.1	-2.70	-515.04	3923.24	38.1	-1.26	-471.17	-489.11	-180.08	No Activity

STRAIN GAUGES MONITORING RESULTS

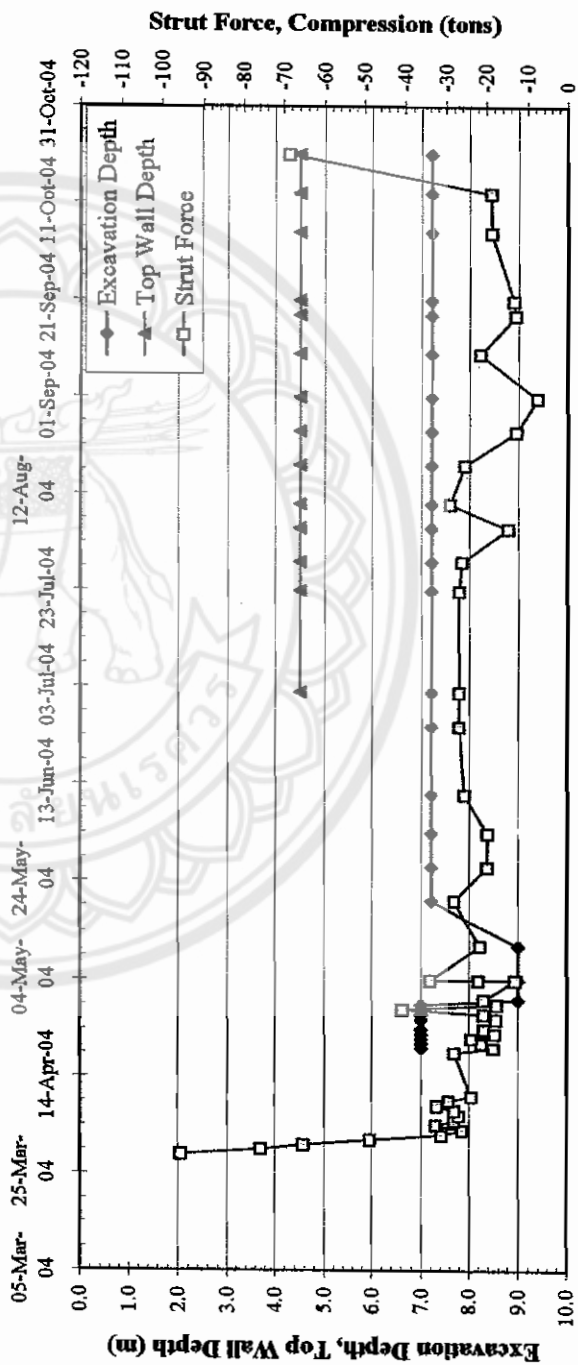
Alrside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section N (BEW5)
Strut Layer 1 : N1E and NIW

Date (dd/mm/yy)

Construction Activity
 3 May 04 : 3rd Strut Removed
 4 May 04 : 1st Strut Preloaded
 20 May 04 : Base Slab Completed
 26 Jun 04 : Wall Completed
 (Top Wall 4.5m Depth)
 29 Sep 04 : 2nd Strut Removed



STRAIN GAUGES MONITORING RESULTS

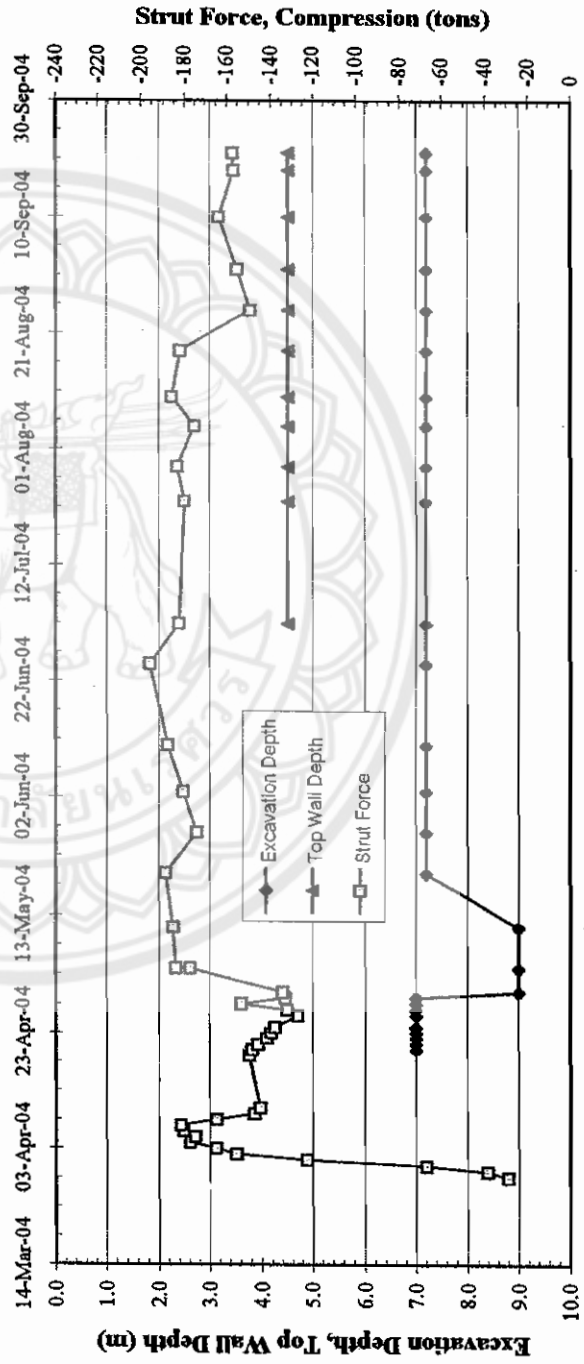
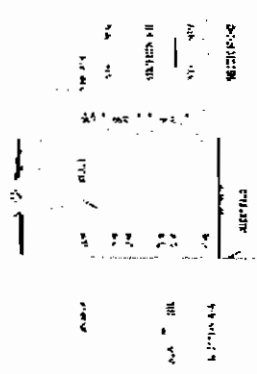
Airside Tunnel - Landside Road System
Suvarnabhumi Airport

Strut Force and Excavation Depth with Time

Section N (BEW5)
Strut Layer 2 : N2E and N2W

Date (dd/mm/yy)

Construction Activity
3 May 04 : 3rd Strut Removed
4 May 04 : 1st Strut Preloaded
20 May 04 : Base Slab Completed
26 Jun 04 : Wall Completed
(Top Wall 4.5m Depth)



NNK JOINT VENTURE

Altride Road Tunnel-Landside Road System Project
Suvarnabhumi Airport Project

Strain Gauge Monitoring

Installation Date : 20/04/2004 (N3V) & 21/04/04 (N3E, Reinforcement)
 Initial Reading Date : 21/04/2004 (N3E) & 21/04/04 (N3V)
 Base Reading Date : 22/04/04 (After Hydraulic Jack Preload)

Stew Level : 3.6m Depth
 Monitored By : PPT

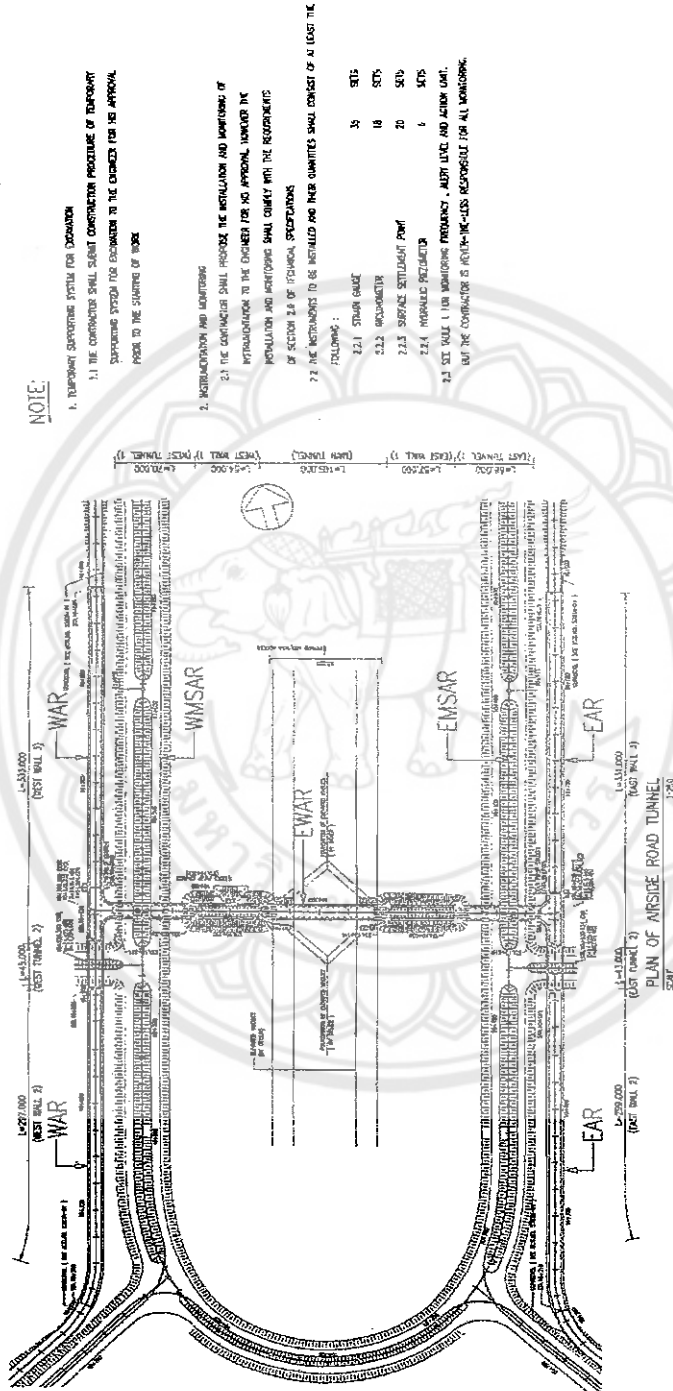
Installation Location : Section X
 Block : BEW4

Date	N3E			N3V			Average Strain Change	Force (t)	Construction Activity
	Strain (x10 ⁻⁶)	Temp. (C)	CF-Temp.	Strain (x10 ⁻⁶)	Temp. (C)	CF-Temp.			
09-04-04				2390.48	38.8	-			
10-04-04				2165.91	36.2	-4.68	-29.24	-10.68	
19-04-04				2341.24	36.4	-4.32	-43.56	-19.46	
20-04-04				2328.21	38.3	-0.90	-63.17	-23.07	
21-04-04	1055.13	37.1		2275.97	41.9	5.58	-108.93	-39.78	
22-04-04	917.67	37.1	0.00	2237.52	35.8	-5.40	-137.91	-50.36	Initial Reading - N3V
23-04-04	925.06	37.8	1.26	2284.44	37.5	-2.34	-128.60	-46.96	
24-04-04	925.21	37.3	0.36	2238.44	37.1	-3.06	-133.33	-48.69	
26-04-04	953.54	41.2	7.38	2293.38	41.0	3.96	-93.14	-34.21	
27-04-04	948.35	40.2	5.38	2281.96	40.8	3.60	-104.91	-37.64	
28-04-04	908.57	28.8	-14.94	2248.75	29.0	-17.64	-150.36	-58.59	
29-04-04	950.31	40.9	6.84	2270.32	43.0	7.56	-160.43	-38.45	
30-04-04	952.15	39.6	4.50	2276.43	38.9	0.18	-112.60	-108.79	No Activity (3rd Strut, Exc. 9.0m)
03-05-04							-113.87	-38.77	3rd Strut Removed

NO.	DATE	TIME	BY
1	21/04/04	10:00	PPT
2	21/04/04	10:15	PPT
3	21/04/04	10:30	PPT
4	21/04/04	10:45	PPT
5	21/04/04	11:00	PPT

ภาคผนวก ก

รูปแปลนของ AIRSIDE ROAD TUNNEL



- NOTE:**
1. THE CONTRACTOR SHALL SUBMIT CONSTRUCTION PROCEDURE OF TEMPORARY INSTRUMENTATION FOR EXAMINATION TO THE ENGINEER FOR HIS APPROVAL PRIOR TO THE STARTING OF WORKS
 2. INSTRUMENTATION AND MONITORING
 - 2.1 THE CONTRACTOR SHALL PROVIDE THE INSTRUMENTATION AND MONITORING INFORMATION TO THE ENGINEER FOR HIS APPROVAL. HOWEVER THE INSTRUMENTATION AND MONITORING SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 2.6 OF TECHNICAL SPECIFICATIONS
 - 2.2 THE INSTRUMENTATION TO BE INSTALLED AND THEIR QUANTITIES SHALL CONSIST OF AT LEAST THE FOLLOWING:

2.2.1 STRAIN GAUGE	35	SETS
2.2.2 DISPLACEMENT	18	SETS
2.2.3 SURFACE SETTLEMENT POINT	20	SETS
2.2.4 INTERNAL SETTLEMENTS	6	SETS
 - 2.3 SET VALUE WITH MONITORING FREQUENCY, ALERT LEVEL AND ACTION PLAN. BUT THE CONTRACTOR IS RESPONSIBLE FOR ALL MONITORING.

TABLE 1 : INSTRUMENTATION AND MONITORING (DEPENDING UPON SYSTEM OR TEMPORARY WORKS)

SYSTEM INSTRUMENTATION	INSTRUMENTING FREQUENCY	ALERT LEVEL	ACTION PLAN	REMARKS
STRAIN GAUGE	ONCE PER WEEK	TO BE PROVIDED	TO BE PROVIDED	DEFINED IN STRUCTURAL DESIGN
DISPLACEMENT	ONCE PER WEEK	1/200 OF EXPOSURE DEPTH	1/100 OF EXPOSURE DEPTH	
SURFACE SETTLEMENT POINT	ONCE PER WEEK	1/200 OF EXPOSURE DEPTH	1/200 OF EXPOSURE DEPTH	
INTERNAL SETTLEMENTS	ONCE PER WEEK	1/200 OF EXPOSURE DEPTH	1/200 OF EXPOSURE DEPTH	