



ภาคผนวก ก

ตารางและกราฟแสดงผลการตรวจวัดจากเครื่องมือ Inclinator

มหาวิทยาลัยนเรศวร

INCLINOMETER MONITORING RESULT

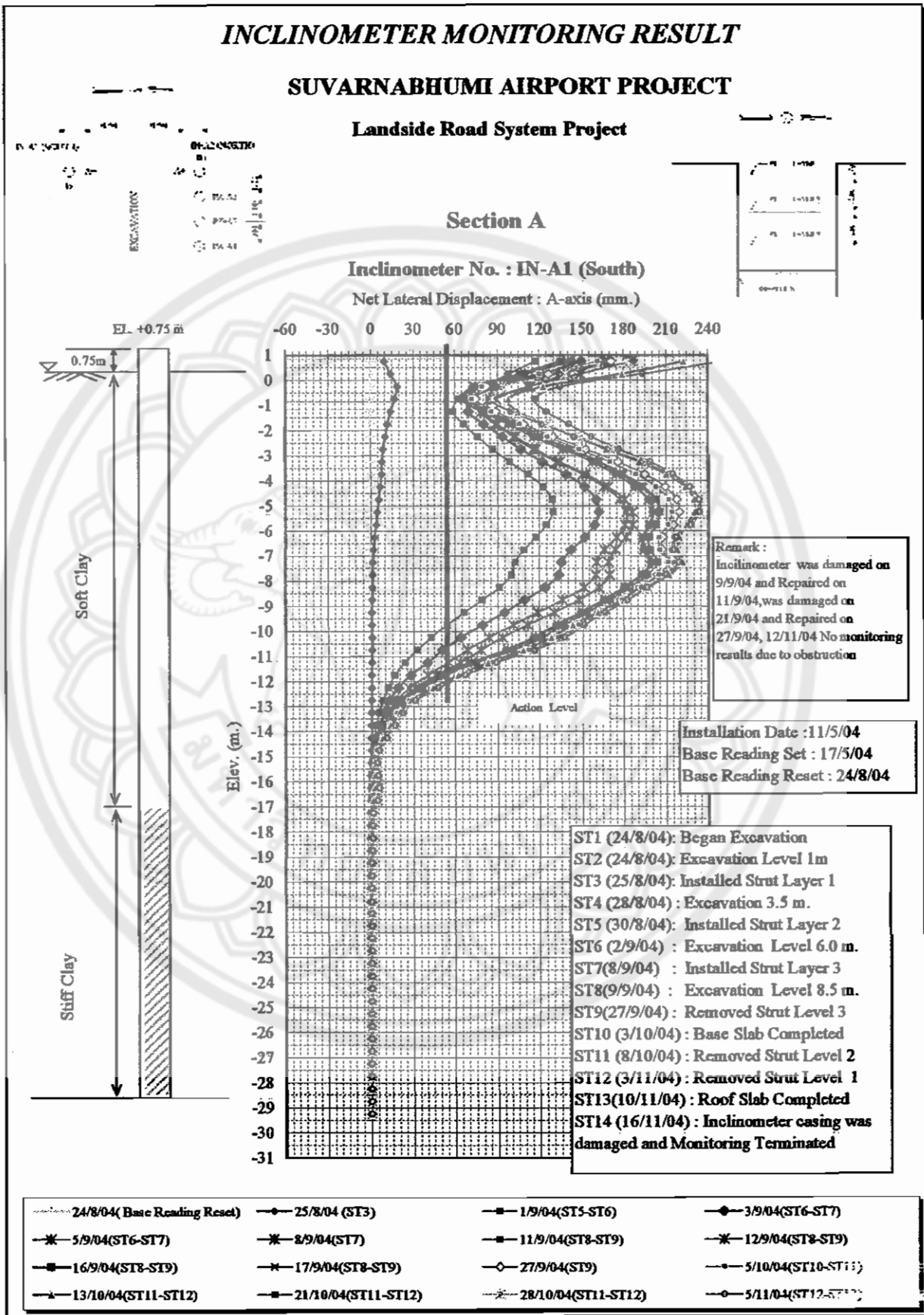
SUARNABHUMI AIRPORT PROJECT

Landside Road System Project

Section A

Inclinometer No. : IN-A1 (South)

Net Lateral Displacement : A-axis (mm.)



INCLINOMETER MONITORING RESULT

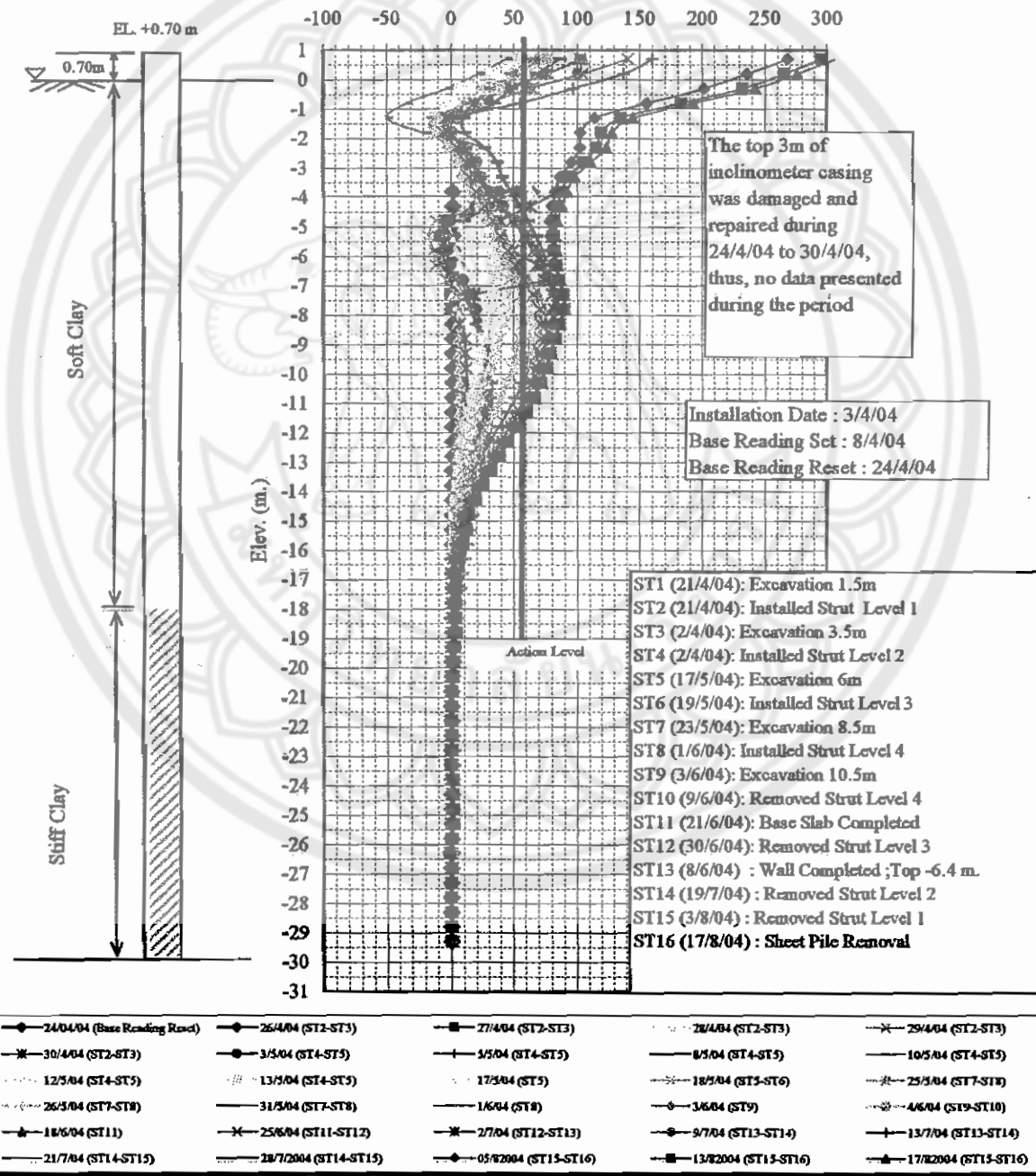
SUARNABHUMI AIRPORT PROJECT

Landside Road System Project

Section B

Inclinometer No. : IN-B1 (South)

Net Lateral Displacement : A-axis (mm.)



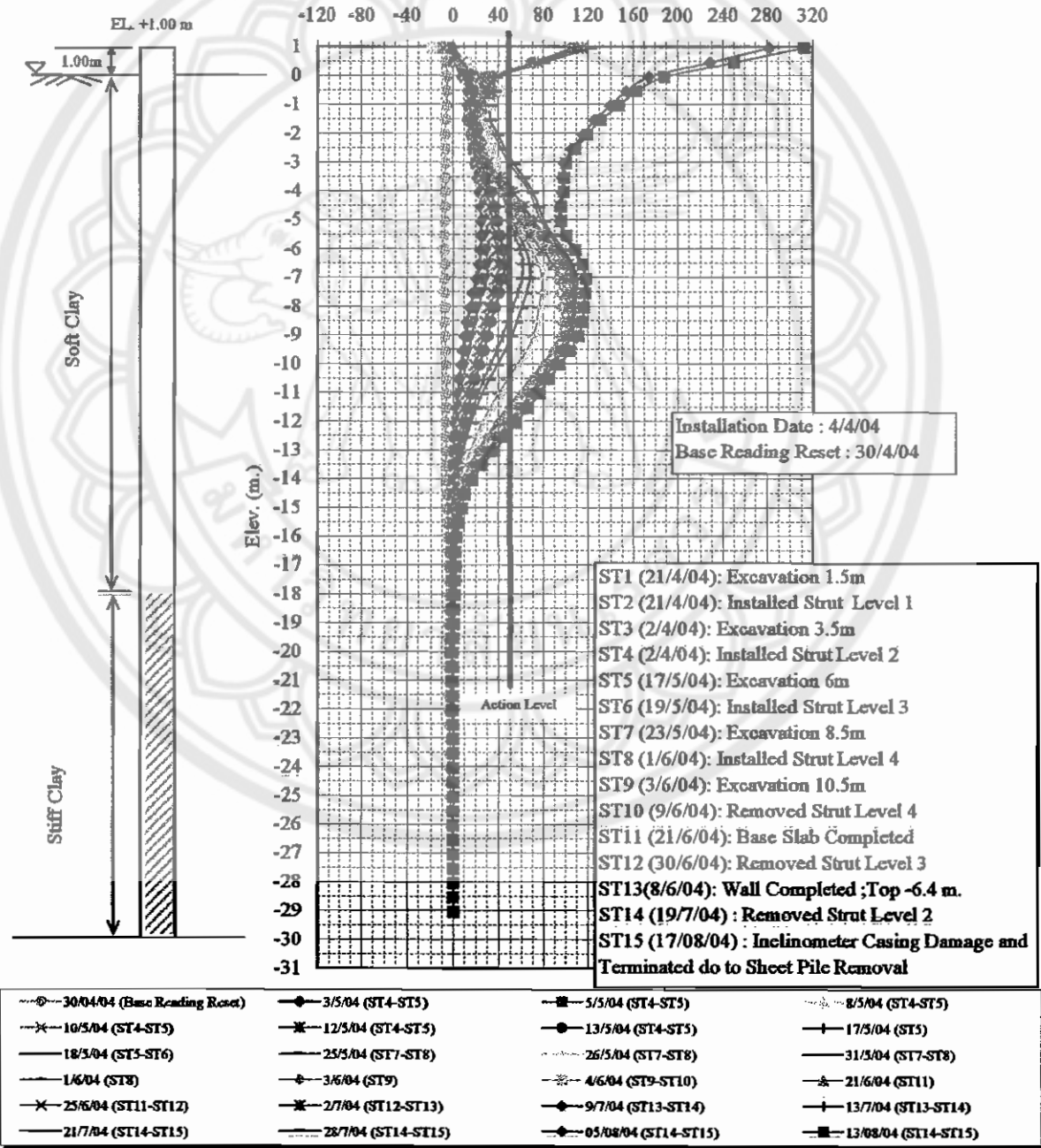
INCLINOMETER MONITORING RESULT SUVARNABHUMI AIRPORT PROJECT

Landside Road System Project

Section B

Inclinometer No. : IN-B2 (North)

Net Lateral Displacement : A-axis (mm.)



INCLINOMETER MONITORING RESULT

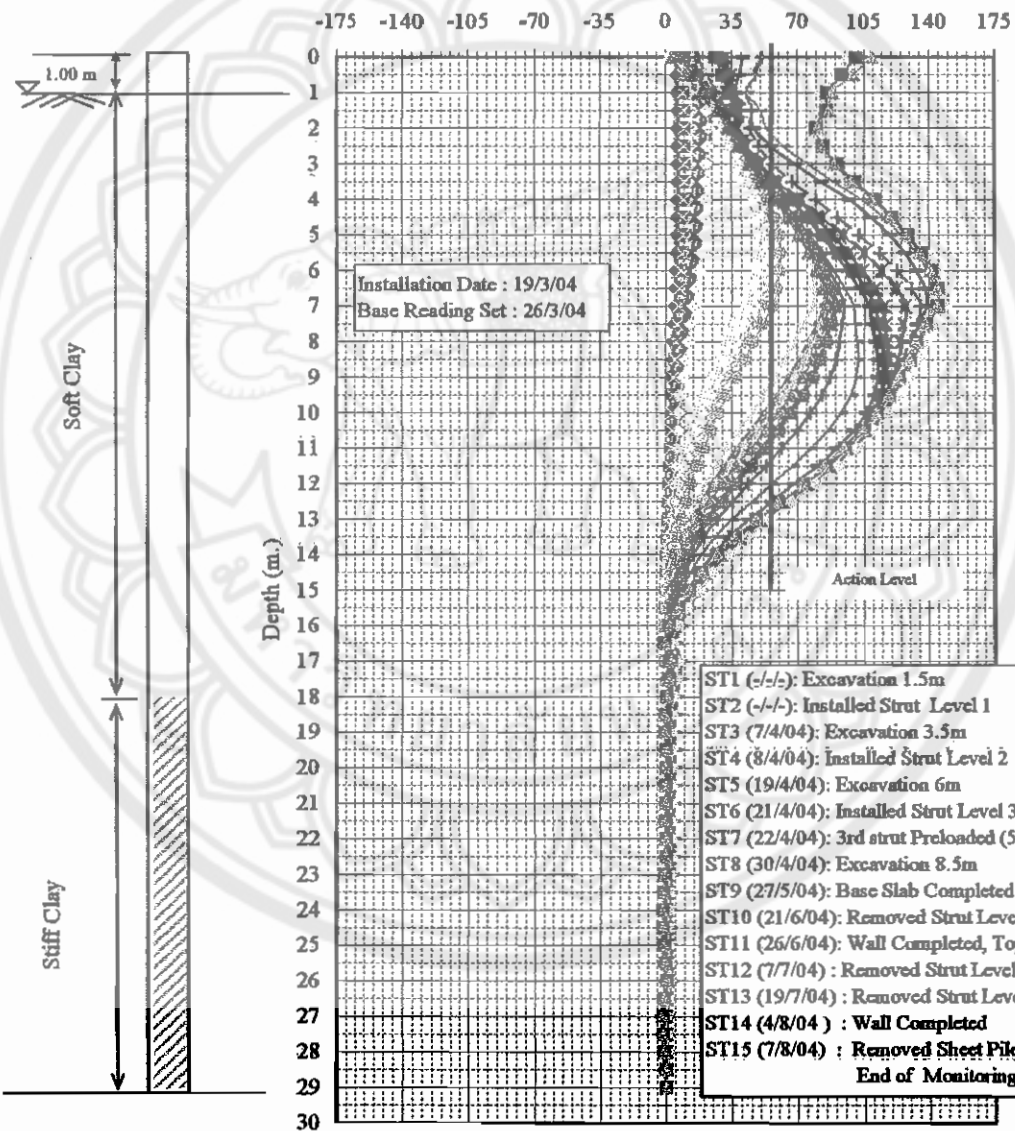
SUARNABHUMI AIRPORT PROJECT

Landside Road System Project

Section C

Inclinometer No. : IN-C1 (South)

Net Lateral Displacement : A-axis (mm.)



| | | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| ● 27/3/04 | ■ 29/3/04 | ○ 30/3/04 | × 31/3/04 | ✱ 01/4/04 | ● 02/4/04 |
| ⊕ 03/4/04 | ■ 04/4/04 | ○ 05/4/04 | × 06/4/04 | ✱ 07/4/04 (ST3) | ● 08/4/04 (ST4) |
| ⊕ 9/4/04 (ST4-ST5) | ■ 10/4/04 (ST4-ST5) | ○ 17/4/04 (ST4-ST5) | × 19/4/04 (ST5) | ✱ 20/4/04 (ST5-ST6) | ● 21/4/04 (ST6) |
| ⊕ 22/4/04 (ST7) | ■ 23/4/04 (ST7-ST8) | ○ 24/4/04 (ST7-ST8) | × 26/4/04 (ST7-ST8) | ✱ 27/4/04 (ST7-ST8) | ● 28/4/04 (ST7-ST8) |
| ⊕ 29/4/04 (ST7-ST8) | ■ 30/4/04 (ST8) | ○ 04/5/04 (ST8-ST9) | × 11/5/04 (ST8-ST9) | ✱ 19/5/04 (ST8-ST9) | ● 21/5/04 (ST9) |
| ⊕ 03/6/04 (ST9-ST10) | ■ 21/6/04 (ST10) | ○ 25/6/04 (ST10-ST11) | × 02/7/04 (ST11-ST12) | ✱ 08/7/04 (ST12-ST13) | ● 13/7/04 (ST12-ST13) |
| ⊕ 23/7/04 (ST13-ST14) | ■ 28/7/04 (ST13-ST14) | ○ 05/8/04 (ST14-ST15) | | | |

INCLINOMETER MONITORING RESULT

(Perpendicular to Excavation Line)

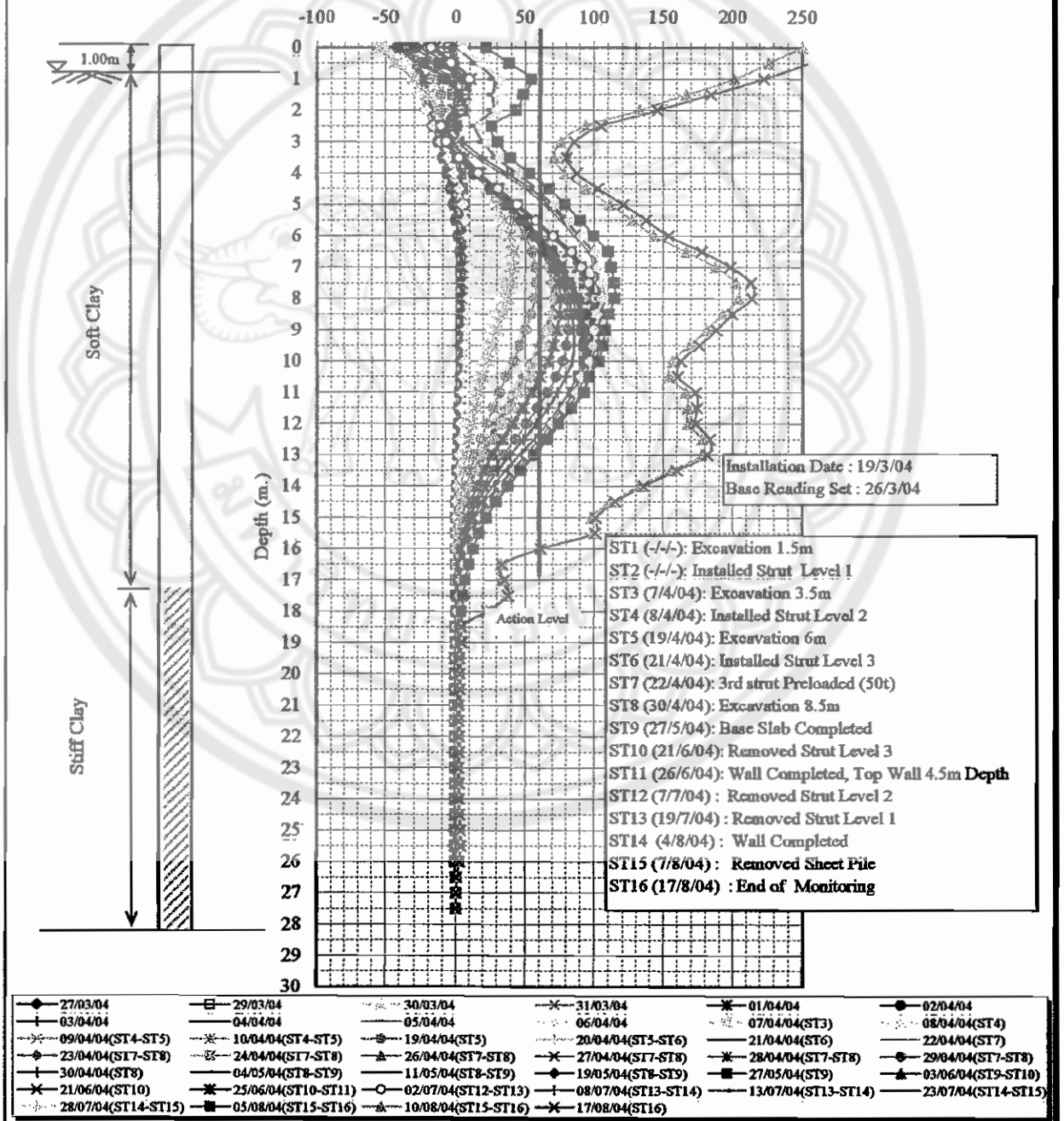
SUARNABHUMI AIRPORT PROJECT

Landside Road System Project

Section C

Inclinometer No. : IN-C2 (North)

Net Lateral Displacement : A-axis (mm.)



INCLINOMETER MONITORING RESULT

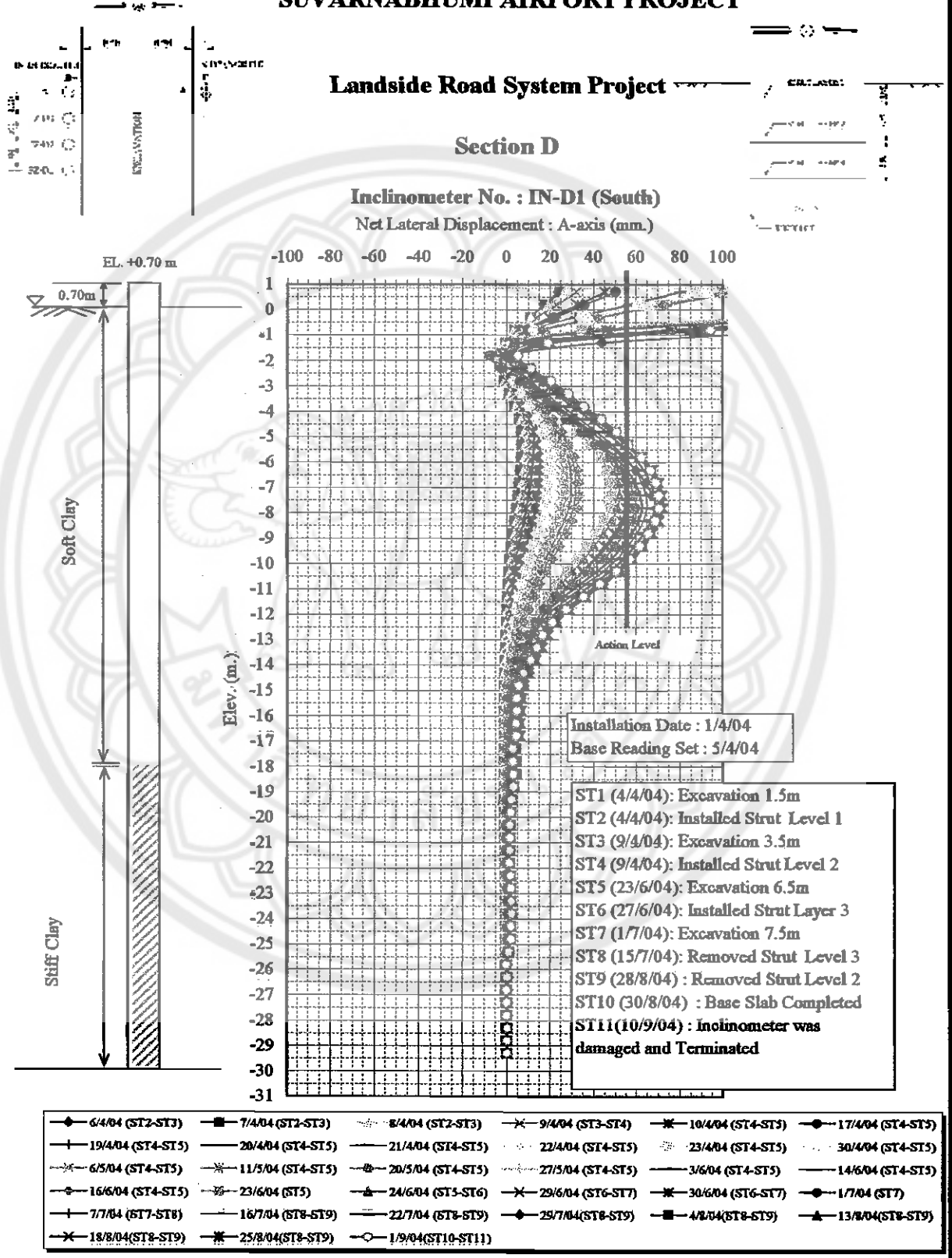
SUARNABHUMI AIRPORT PROJECT

Landside Road System Project

Section D

Inclinometer No. : IN-D1 (South)

Net Lateral Displacement : A-axis (mm.)



INCLINOMETER MONITORING RESULT

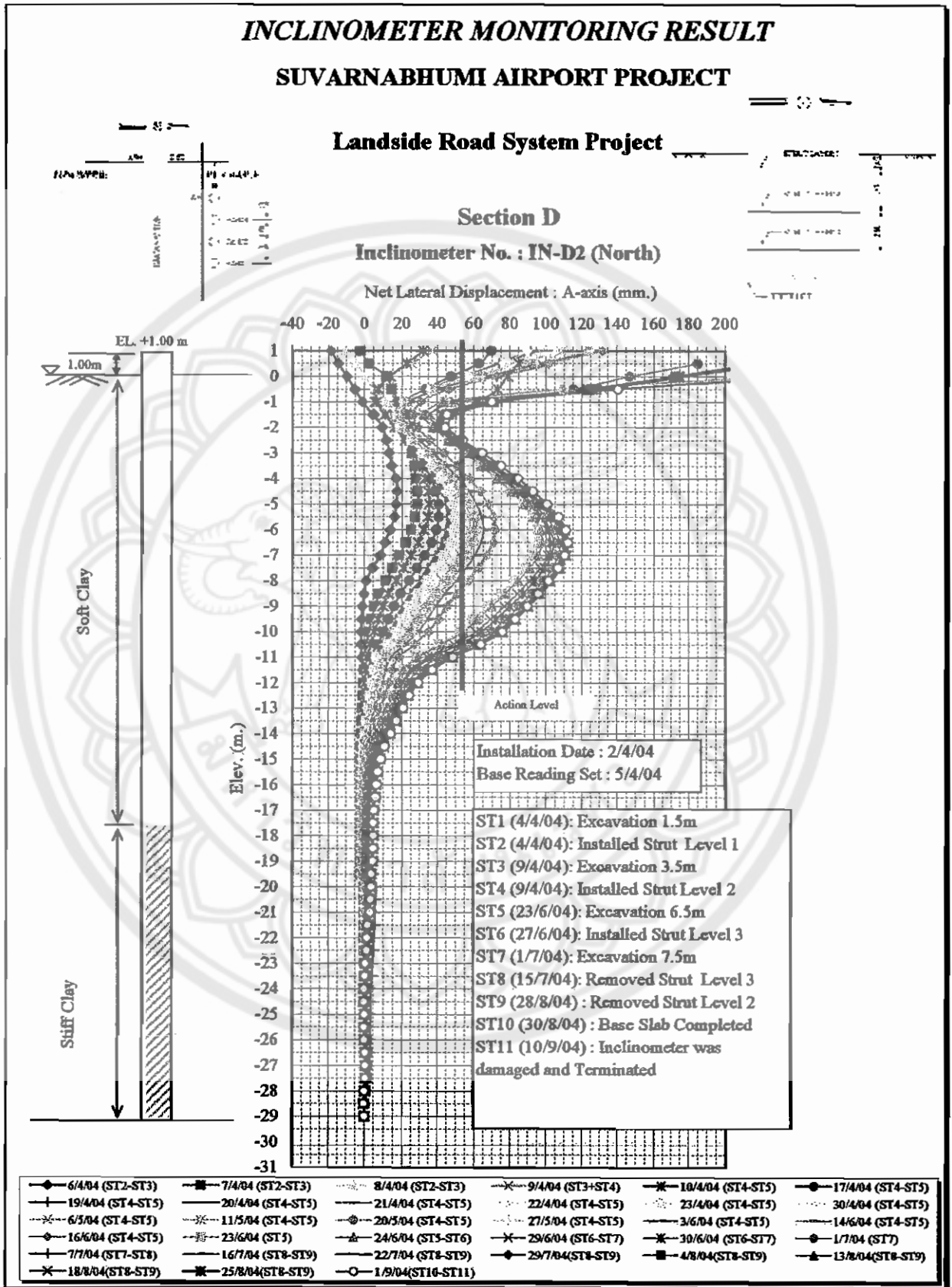
SUARNABHUMI AIRPORT PROJECT

Landside Road System Project

Section D

Inclinometer No. : IN-D2 (North)

Net Lateral Displacement : A-axis (mm.)



INCLINOMETER MONITORING RESULT

SUARNABHUMI AIRPORT PROJECT

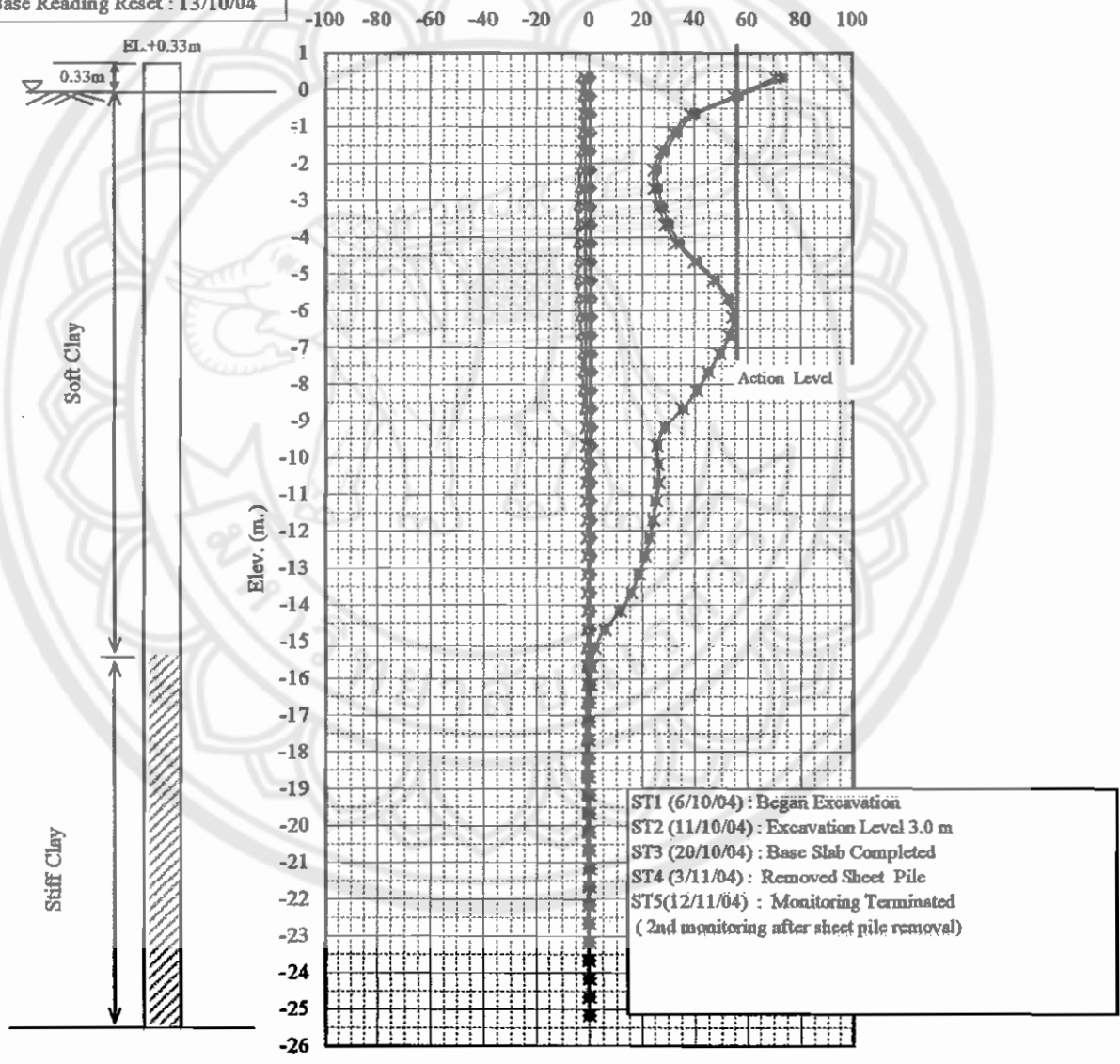
Landside Road System Project

Section E

Inclinometer No. : IN-E1 (East)

Net Latcral Displacement : A-axis (mm.)

Installation Date : 11/5/04
 Base Reading Set : 17/5/04
 Base Reading Rcsct : 13/10/04



| | | |
|----------------------|---------------------|---------------------|
| ✕ Base Reading Rcsct | ◆ 15/10/04(ST2-ST3) | ■ 21/10/04(ST3-ST4) |
| ◊ 28/10/04(ST3-ST4) | * 5/11/04(ST4-ST5) | ■ 12/11/04(ST5) |

INCLINOMETER MONITORING RESULT

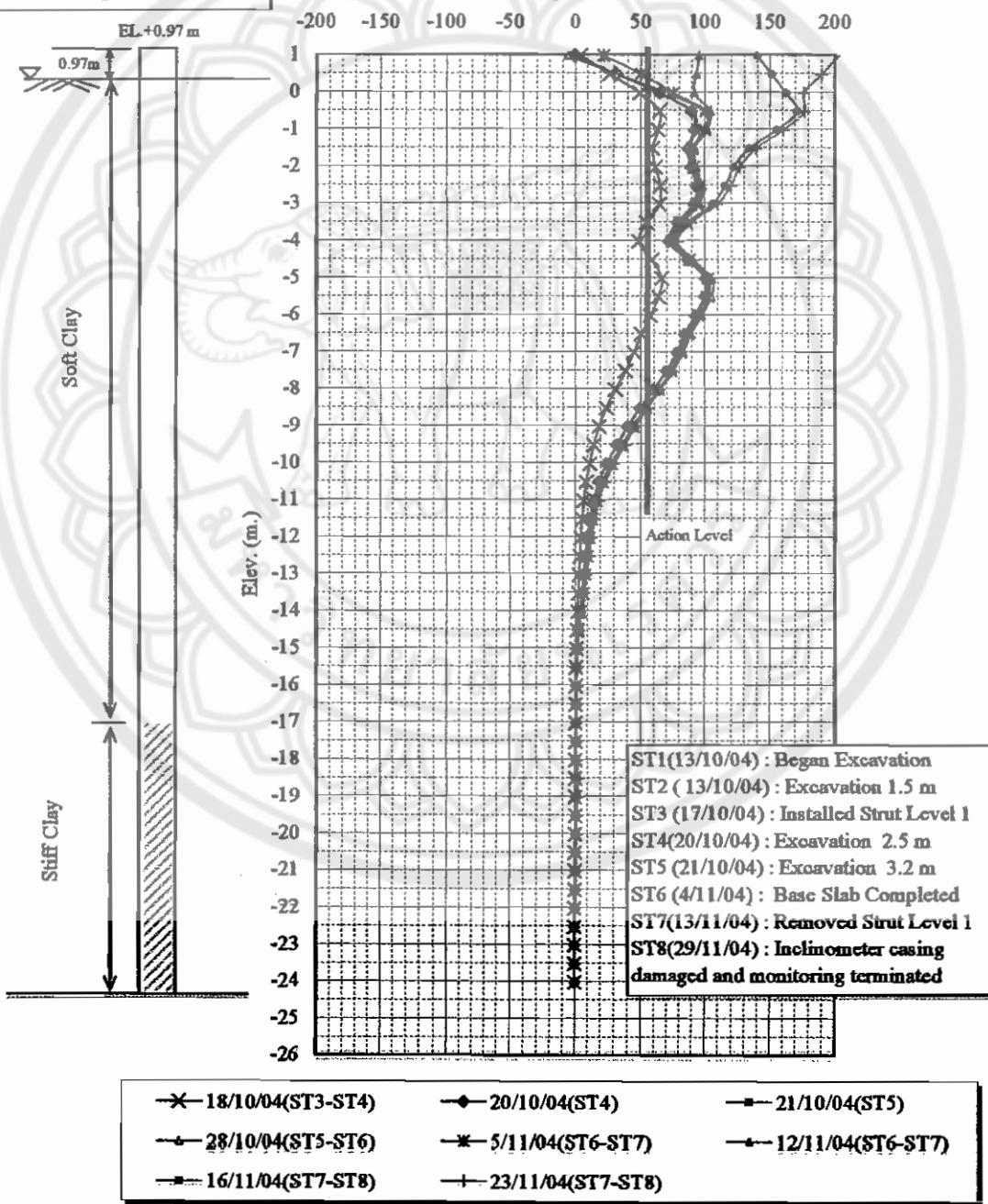
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Landside Road System Project

Section F

Installation Date : 13/10/04
 Base Reading Set : 15/10/04

Inclinometer No. : IN-F1 (East)
 Net Lateral Displacement : A-axis (mm.)



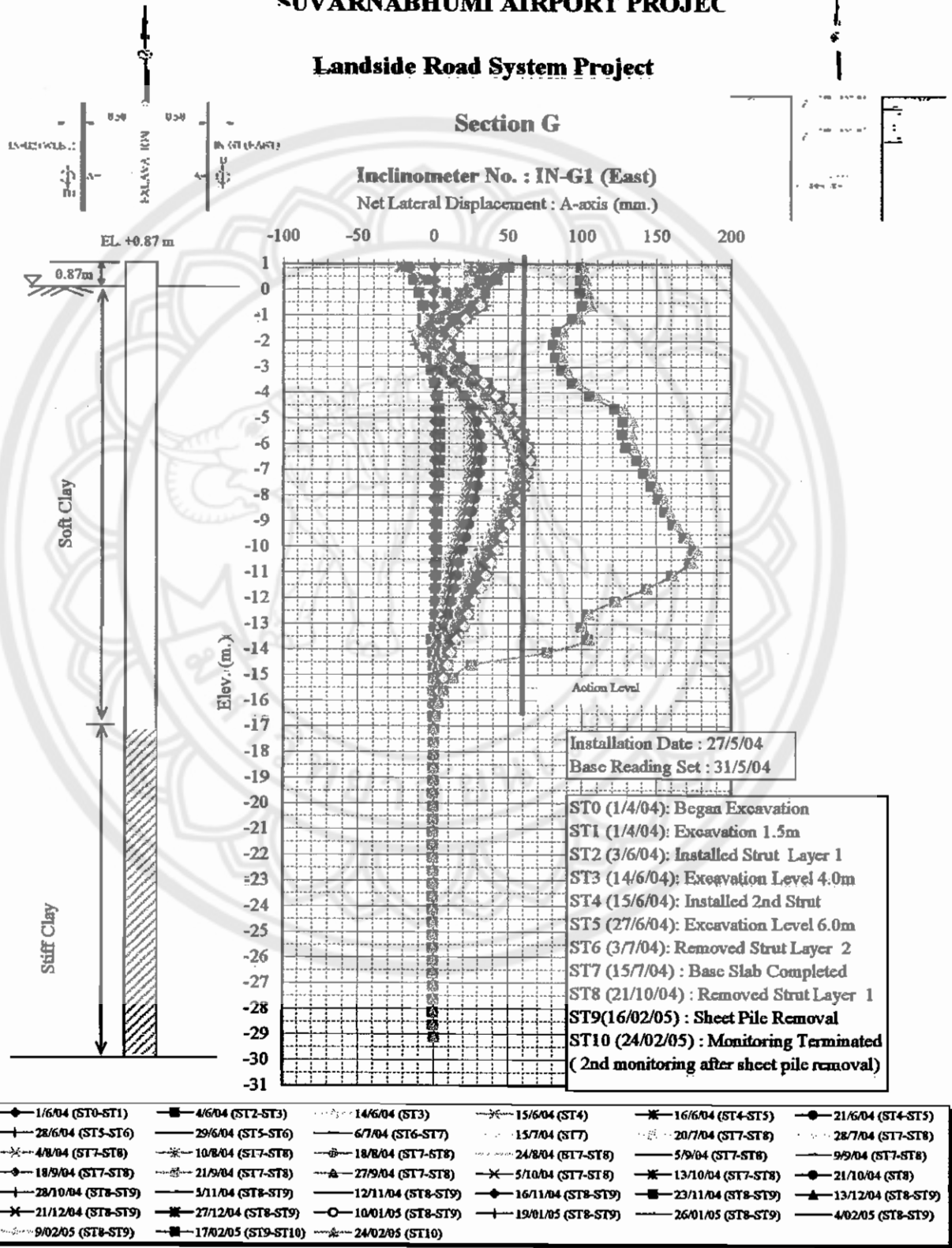
INCLINOMETER MONITORING RESULT

SUARNABHUMI AIRPORT PROJEC

Landside Road System Project

Section G

Inclinometer No. : IN-G1 (East)
Net Lateral Displacement : A-axis (mm.)



INCLINOMETER MONITORING RESULT

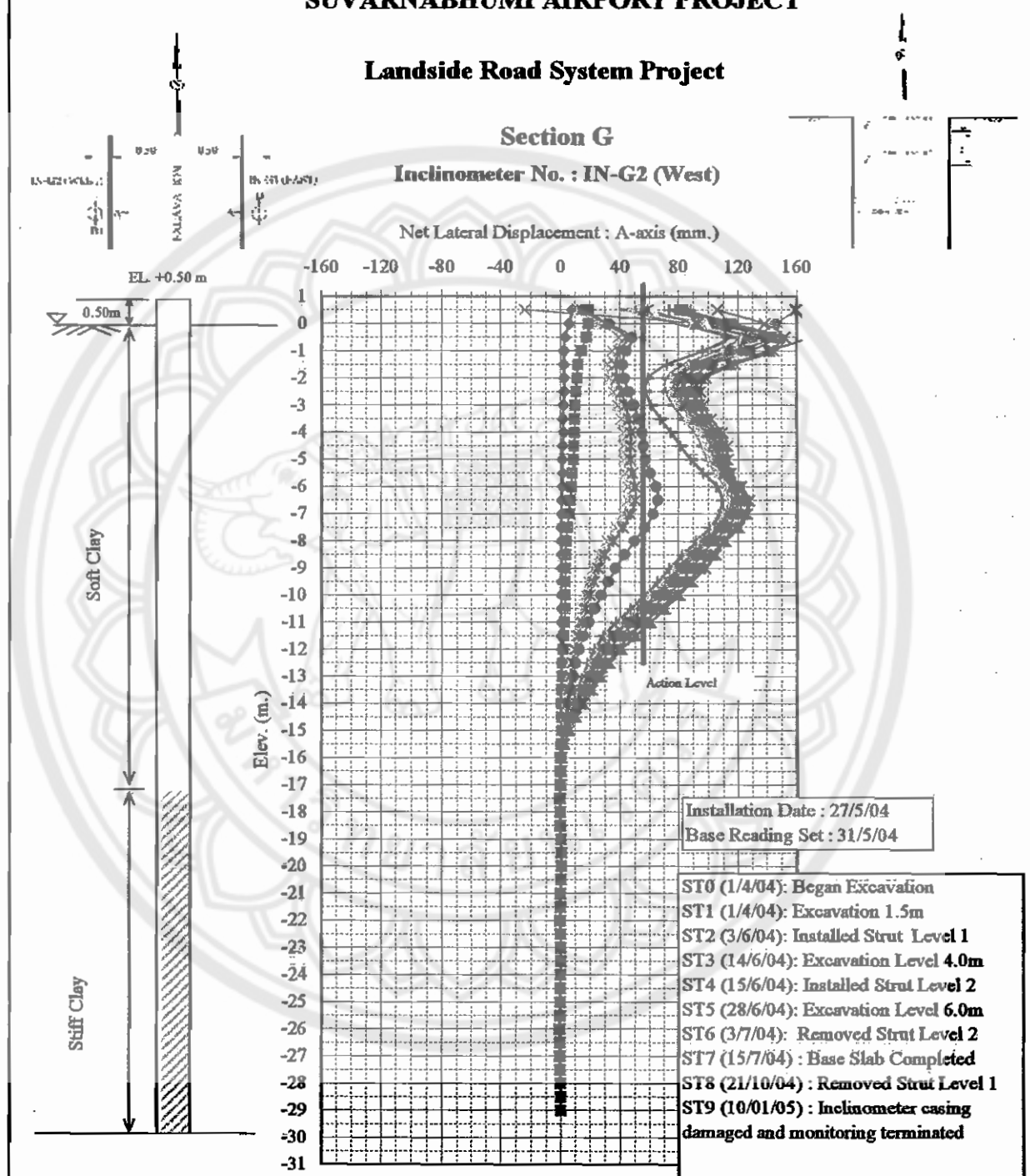
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Landside Road System Project

Section G

Inclinometer No. : IN-G2 (West)

Net Lateral Displacement : A-axis (mm.)



Installation Date : 27/5/04
Base Reading Set : 31/5/04

- ST0 (1/4/04): Began Excavation
- ST1 (1/4/04): Excavation 1.5m
- ST2 (3/6/04): Installed Strut Level 1
- ST3 (14/6/04): Excavation Level 4.0m
- ST4 (15/6/04): Installed Strut Level 2
- ST5 (28/6/04): Excavation Level 6.0m
- ST6 (3/7/04): Removed Strut Level 2
- ST7 (15/7/04): Base Slab Completed
- ST8 (21/10/04): Removed Strut Level 1
- ST9 (10/01/05): Inclinometer casing damaged and monitoring terminated

| | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| ◆ 1/6/04 (ST0-ST1) | ■ 4/6/04 (ST2-ST3) | ○ 14/6/04 (ST3) | ✱ 15/6/04 (ST4) | ✱ 16/6/04 (ST4-ST5) | ● 21/6/04 (ST4-ST5) |
| ⊕ 28/6/04 (ST5-ST6) | — 29/6/04 (ST5-ST6) | — 6/7/04 (ST6-ST7) | ○ 15/7/04 (ST7) | ○ 20/7/04 (ST7-ST8) | ○ 28/7/04 (ST7-ST8) |
| ✱ 4/8/04 (ST7-ST8) | ✱ 10/8/04 (ST7-ST8) | ○ 18/8/04 (ST7-ST8) | ○ 24/8/04 (ST7-ST8) | — 5/9/04 (ST7-ST8) | — 9/9/04 (ST7-ST8) |
| ● 18/9/04 (ST7-ST8) | ○ 21/9/04 (ST7-ST8) | ▲ 27/9/04 (ST7-ST8) | ✱ 5/10/04 (ST7-ST8) | ✱ 13/10/04 (ST7-ST8) | ● 21/10/04 (ST8) |
| ⊕ 28/10/04 (ST8-ST9) | — 5/11/04 (ST8-ST9) | — 12/11/04 (ST8-ST9) | ● 16/11/04 (ST8-ST9) | ■ 23/11/04 (ST8-ST9) | ▲ 13/12/04 (ST8-ST9) |
| ✱ 21/12/04 (ST8-ST9) | ■ 27/12/04 (ST8-ST9) | | | | |

INCLINOMETER MONITORING RESULT

SUARNABHUMI AIRPORT PROJECT

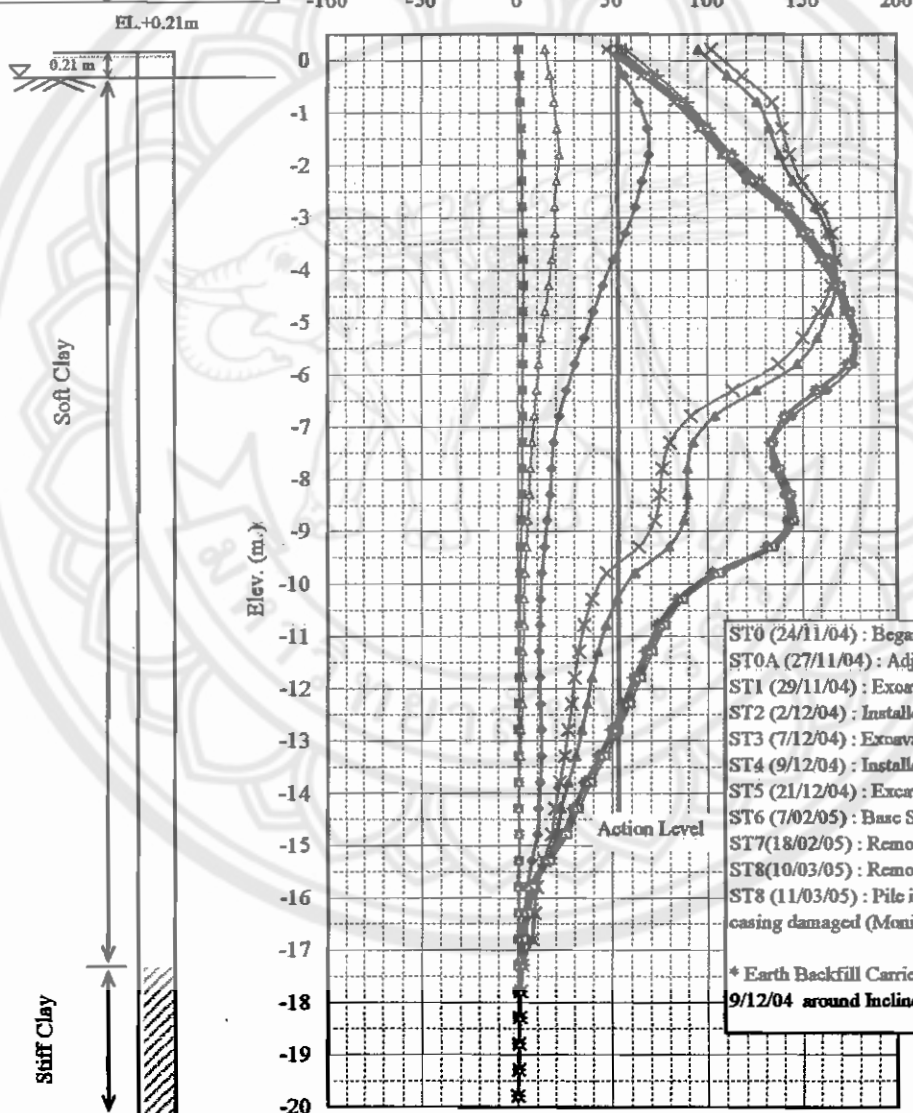
Landside Road System Project

Section H

Inclinometer No. : IN-H1 (West)

Net Lateral Displacement : A-axis (mm.)

Installation Date : 17/11/04
Base Reading Set : 23/11/04



ST0 (24/11/04) : Began Excavation
 ST0A (27/11/04) : Adjust Sheet Pile Level
 ST1 (29/11/04) : Excavation Level 1.0 m
 ST2 (2/12/04) : Installed Strut Layer 1
 ST3 (7/12/04) : Excavation Level 4.0 m
 ST4 (9/12/04) : Installed Strut Layer 2
 ST5 (21/12/04) : Excavation Level 6.5 m
 ST6 (7/02/05) : Base Slab Completed
 ST7(18/02/05) : Removed Strut layer 2
 ST8(10/03/05) : Removed Strut layer 1
 ST8 (11/03/05) : Pile installation, inclinometer casing damaged (Monitoring Terminated)

* Earth Backfill Carried out During 29/11/04 to 9/12/04 around Inclinometer Casing

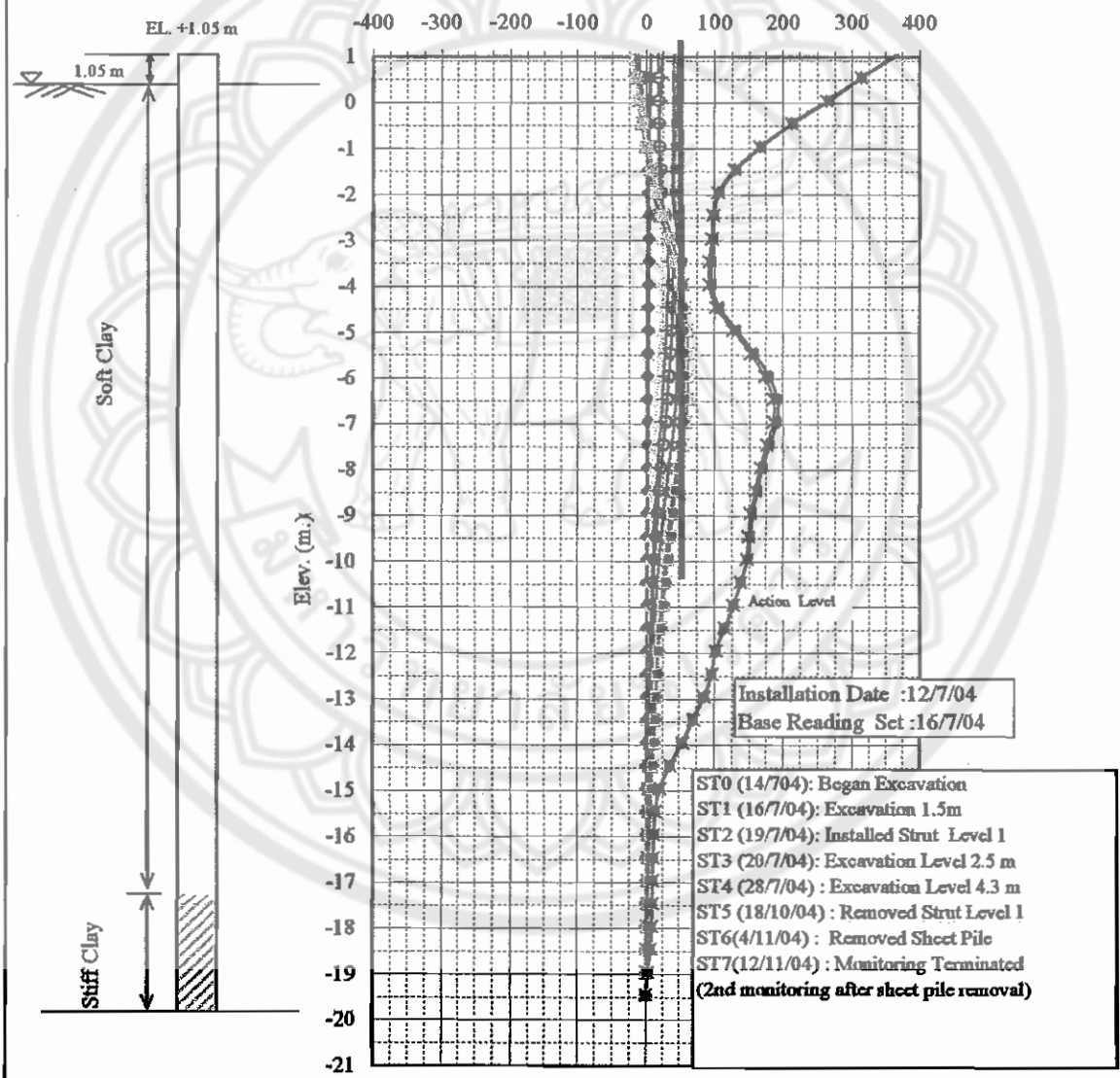
- 24/11/04 (ST0) —▲— 26/11/04 (ST0-ST1) —◆— 29/11/04 (ST1) —×— 9/12/04 (ST4)
- ▲— 13/12/04 (ST4-ST5) —◆— 27/12/04 (ST5-ST6) —+— 5/1/05 (ST5-ST6) —●— 10/1/05 (ST5-ST6)
- ×— 4/02/05 (ST5-ST6) —◆— 9/02/05 (ST6-ST7) —□— 17/02/05 (ST6-ST7) —▲— 24/02/05 (ST7-ST8)

INCLINOMETER MONITORING RESULT SUVARNABHUMI AIRPORT PROJECT

Landside Road System Project

Section I

Inclinometer No. : IN-I1 (East)
Net Lateral Displacement : A-axis (mm.)



| | | | |
|----------------------|----------------------|---------------------|----------------------|
| ◆ 16/7/04 (ST1) | ▲ 20/7/04 (ST3) | + 21/7/04 (ST3-ST4) | ○ 22/7/04 (ST3-ST4) |
| * 28/7/04 (ST4) | △ 4/8/04 (ST4-ST5) | — 10/8/04 (ST4-ST5) | ⋯ 17/8/04 (ST4-ST5) |
| * 24/8/04 (ST4-ST5) | ■ 3/9/04 (ST4-ST5) | × 9/9/04 (ST4-ST5) | → 15/9/04 (ST4-ST5) |
| ⊕ 21/9/04 (ST4-ST5) | * 28/9/04 (ST4-ST5) | ⋯ 5/10/04 (ST4-ST5) | ↔ 13/10/04 (ST4-ST5) |
| — 21/10/04 (ST5-ST6) | ■ 28/10/04 (ST5-ST6) | * 5/11/04 (ST6-ST7) | ■ 12/11/04 (ST7) |

INCLINOMETER MONITORING RESULT

SUARNABHUMI AIRPORT PROJECT

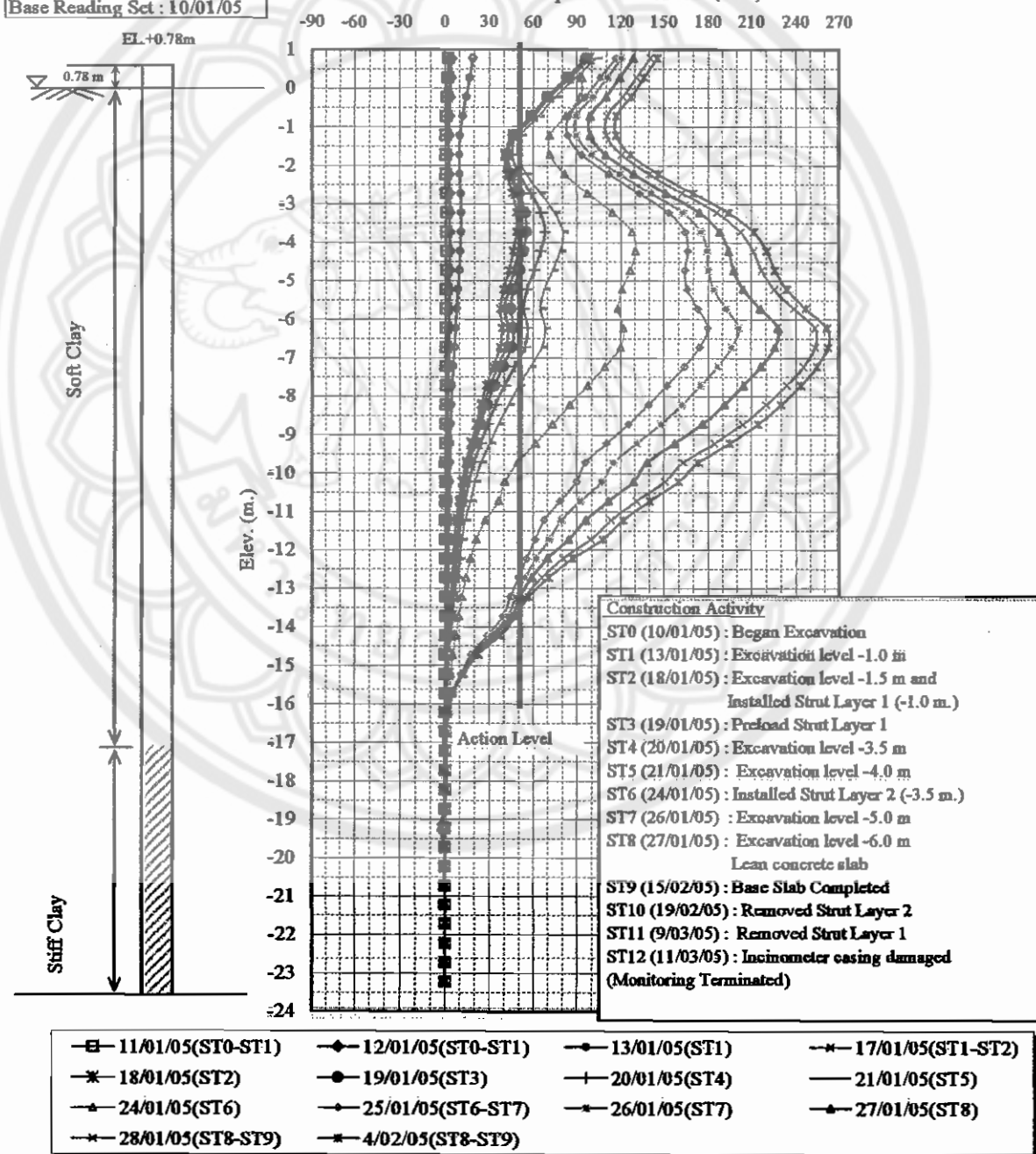
Landside Road System Project

Section J

Inclinometer No. : IN-J1 (East)

Net Lateral Displacement : A-axis (mm.)

Installation Date : 6/01/05
Base Reading Sct : 10/01/05



INCLINOMETER MONITORING RESULT

SUVARNABHUMI AIRPORT

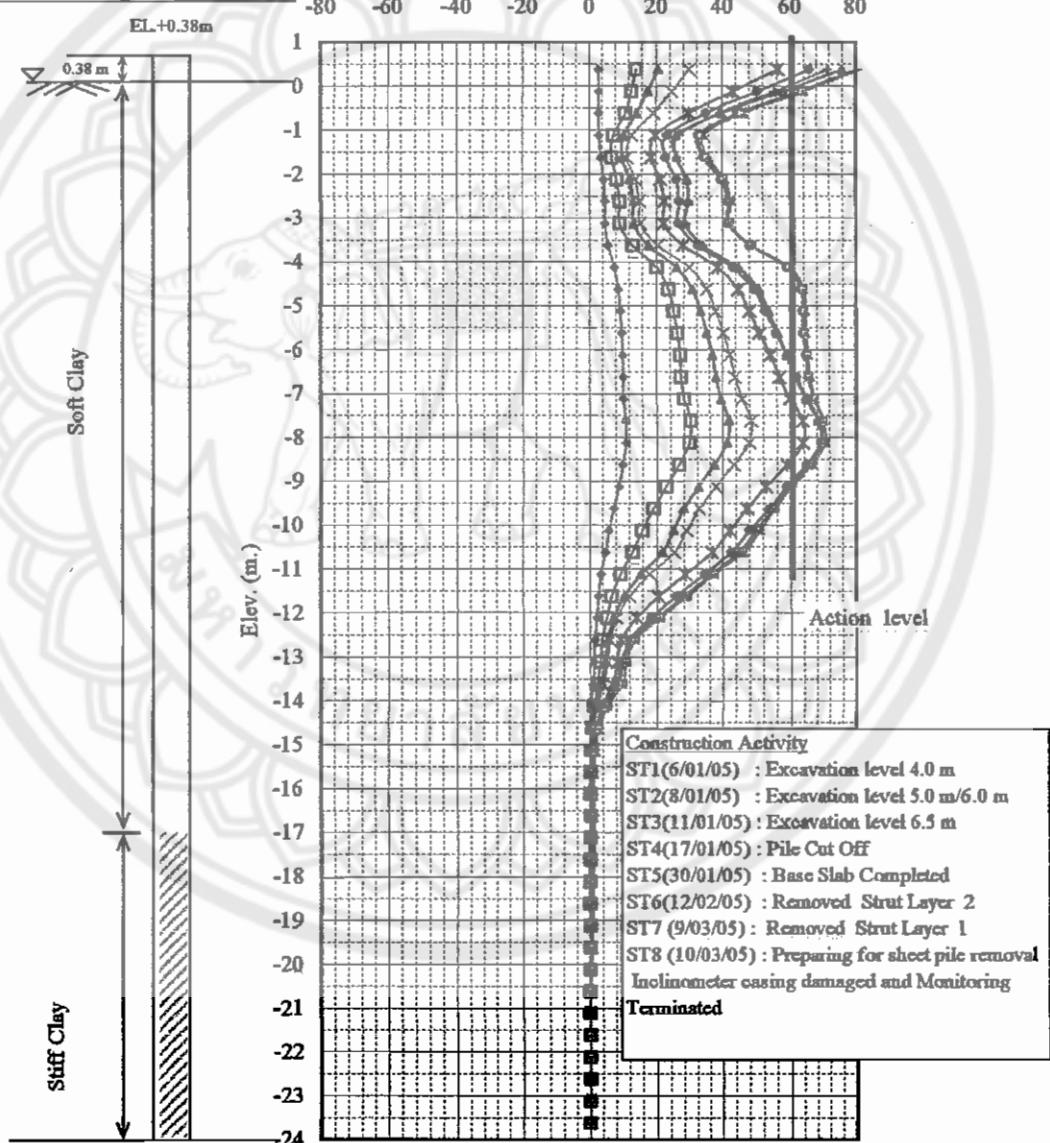
Landside Road System Project

Section K

Inclinometer No. : IN-K1 (East)

Installation Date : 7/01/05
Base Reading Set : 8/01/05

Net Lateral Displacement : A-axis (mm.)



- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| —●— 10/01/05(ST2-ST3) | —■— 11/01/05(ST3) | —▲— 12/01/05(ST3-ST4) | —×— 13/01/05(ST3-ST4) |
| —*— 17/01/05(ST4) | —◆— 26/01/05(ST4-ST5) | —+— 4/02/05(ST5-ST6) | —◀— 9/02/05(ST5-ST6) |
| —●— 17/02/05(ST6-ST7) | —◻— 24/02/05(ST6-ST7) | —◆— 02/03/05(ST6-ST7) | |

INCLINOMETER MONITORING RESULT

SUARNABHUMI AIRPORT PROJECT

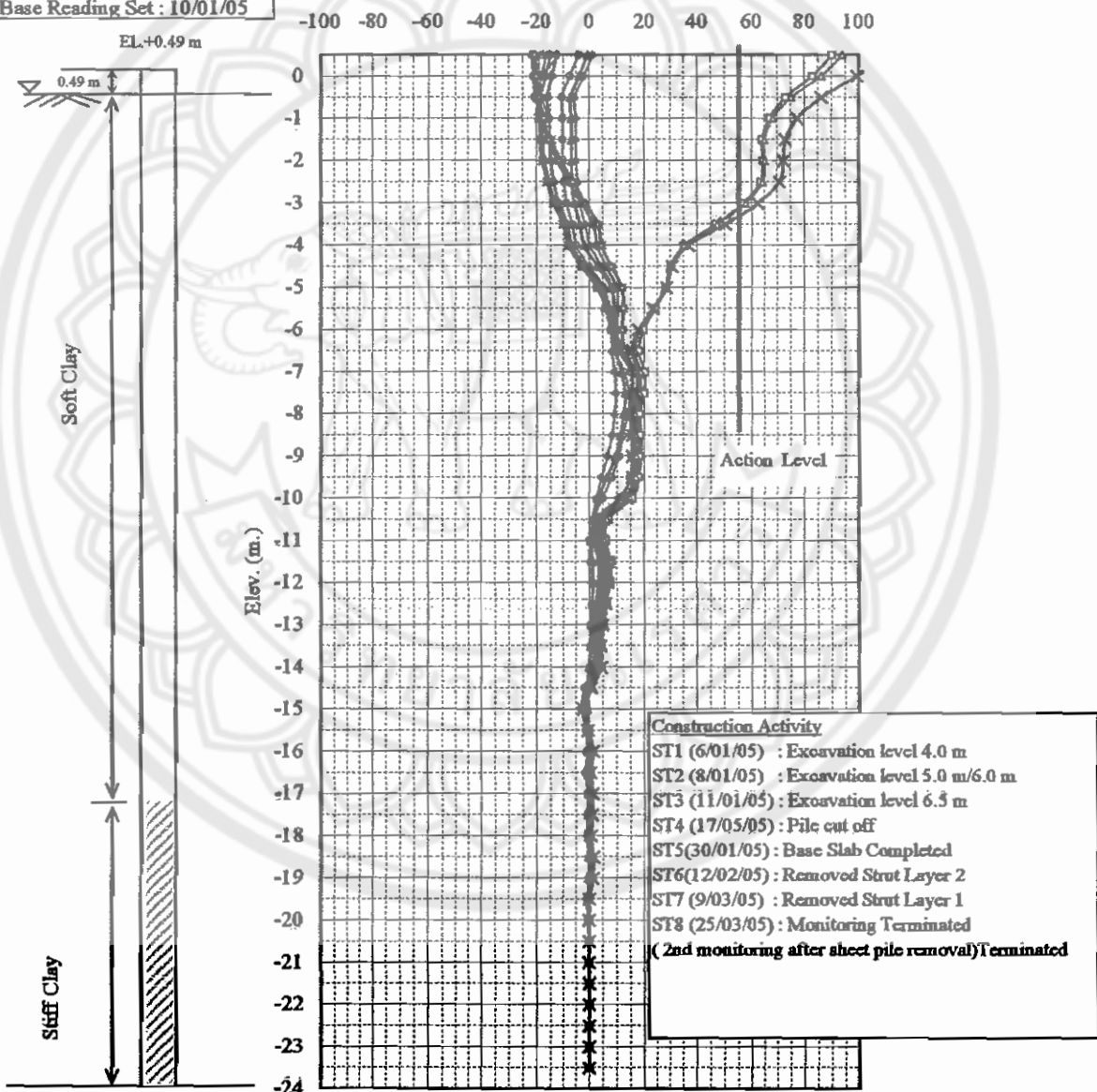
Landside Road System Project

Section K

Inclinometer No. : IN-K2 (West)

Installation Date : 5/01/05
Base Reading Set : 10/01/05

Net Lateral Displacement : A-axis (mm.)



- 11/01/05(ST3)
- 12/01/05(ST3-ST4)
- 13/01/05(ST3-ST4)
- 17/01/05(ST4)
- 26/01/05(ST4-ST5)
- 4/02/05(ST5-ST6)
- 9/02/05(ST5-ST6)
- 17/02/05(ST6-ST7)
- 24/02/05(ST6-ST7)
- 02/03/05(ST6-ST7)
- 11/03/05(ST7-ST8)
- 18/03/05(ST7-ST8)
- 25/03/05(ST8)

INCLINOMETER MONITORING RESULT

SUARNABHUMI AIRPORT

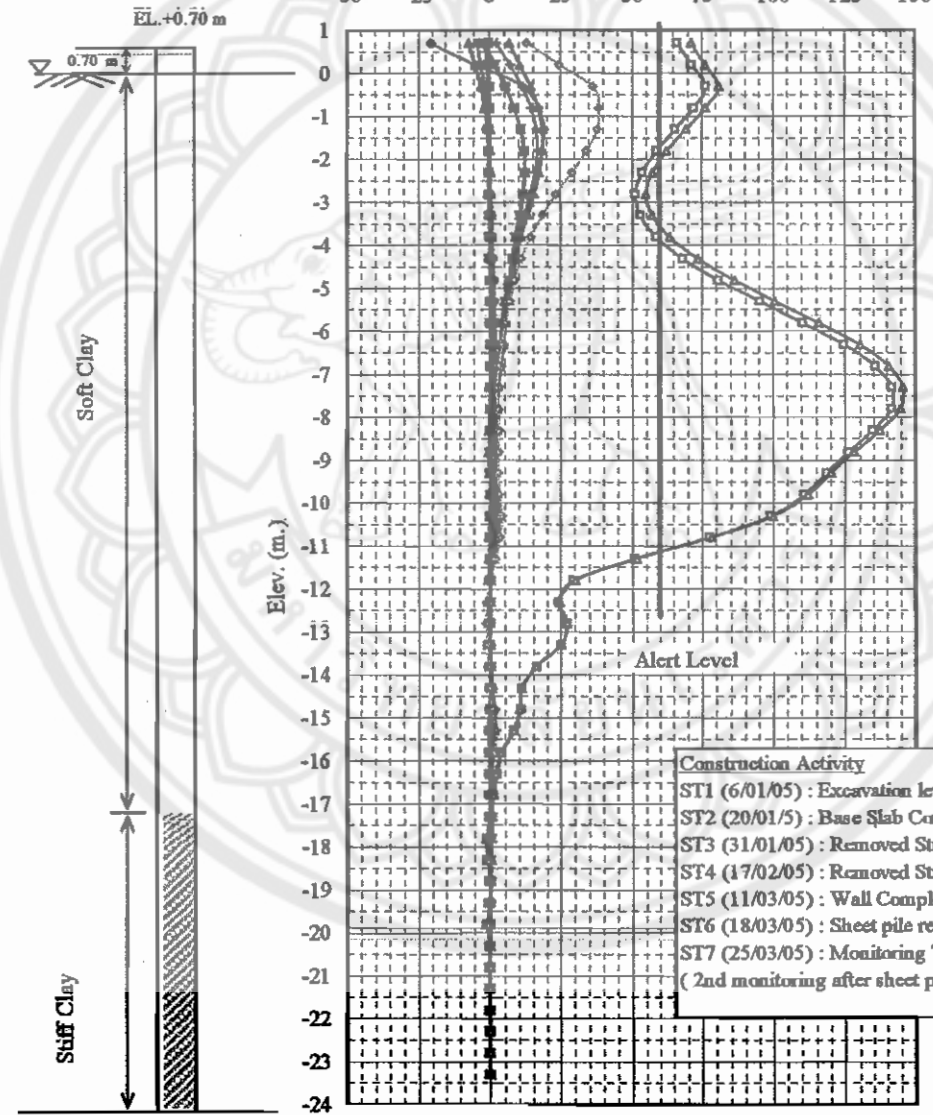
Landside Road System Project

Section L

Inclinometer No. : IN-L1 (West)

Net Lateral Displacement : A-axis (mm.)

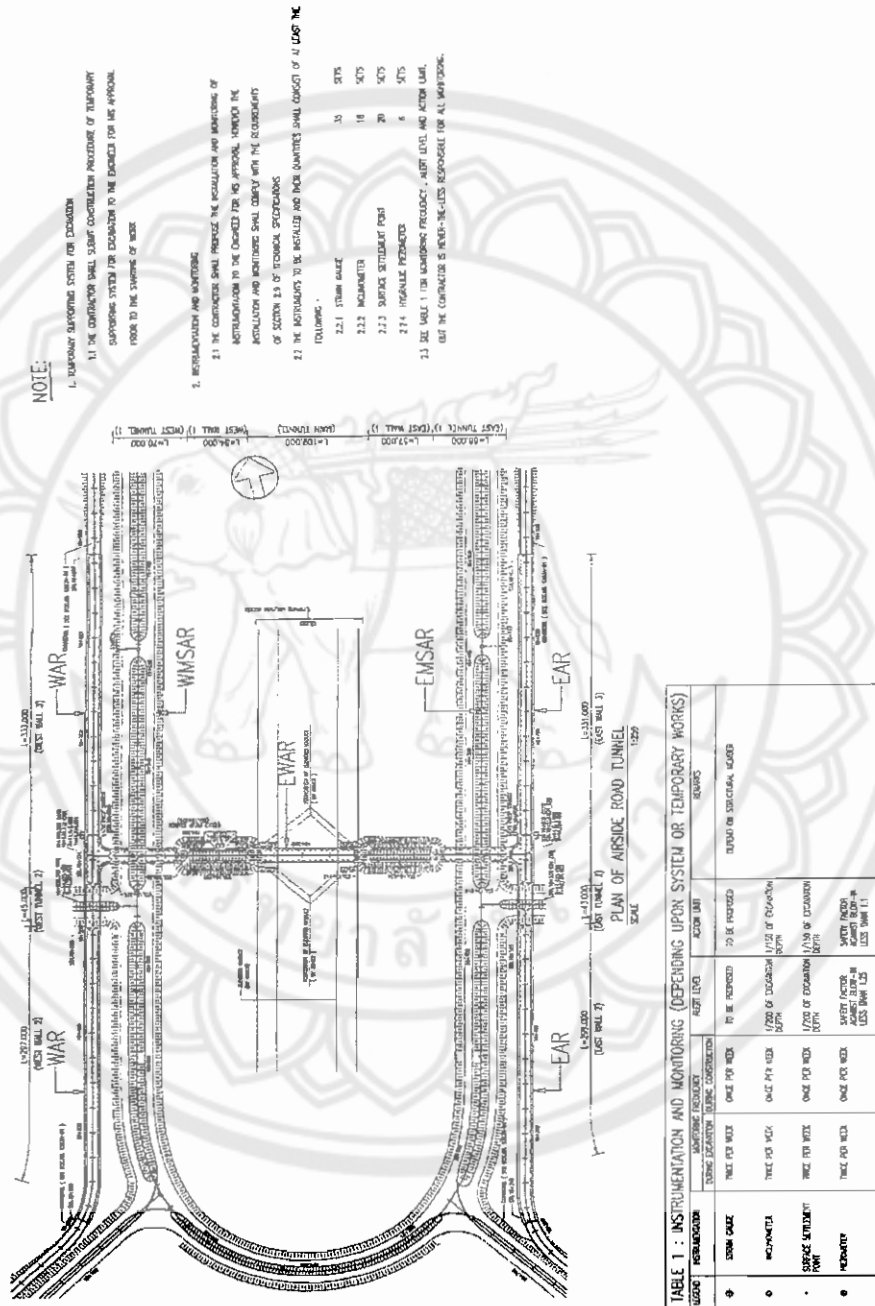
Installation Date : 7/01/05
Base Reading Set : 10/01/05



- | | | |
|-----------------------|-----------------------|-----------------------|
| —■— 11/01/05(ST1-ST2) | —▲— 12/01/05(ST1-ST2) | —●— 17/01/05(ST1-ST2) |
| —◆— 26/01/05(ST2-ST3) | —■— 4/02/05(ST3-ST4) | —●— 9/02/05(ST3-ST4) |
| —+— 17/02/05(ST4) | —◆— 24/02/05(ST4-ST5) | —●— 02/03/05(ST4-ST5) |
| —○— 11/03/05(ST5) | —□— 18/03/05(ST6) | —▲— 25/03/05(ST7) |

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รูป PLAN OF AIRSIDE ROAD TUNNEL



NOTE:

1. TEMPORARY SUPPORTING SYSTEM FOR EXCAVATION

2.1 THE CONTRACTOR SHALL SUBMIT COMPLETION PROCEDURE OF TEMPORARY SUPPORTING SYSTEM FOR EXCAVATION TO THE ENGINEER FOR HIS APPROVAL PRIOR TO THE STARTING OF WORK

3. INSTRUMENTATION AND MONITORING

3.1 THE CONTRACTOR SHALL PROVIDE THE INSTALLATION AND MONITORING OF INSTRUMENTATION TO THE ENGINEER FOR HIS APPROVAL. THROUGH THE INSTALLATION AND MONITORING SHALL COMPLY WITH THE REQUIREMENT OF SECTION 2.5 OF TECHNICAL SPECIFICATIONS

3.2 THE INSTRUMENTS TO BE INSTALLED AND THEIR QUANTITIES SHALL CONSIST OF AT LEAST THE FOLLOWING:

| | | |
|--------------------------------|----|------|
| 2.2.1 STATION GAUGE | 30 | STPS |
| 2.2.2 INCLINOMETER | 18 | SC75 |
| 2.2.3 SURFACE SETTLEMENT POINT | 20 | SC75 |
| 2.2.4 PERMEABLE PRESSUREMETER | 6 | STPS |

3.3 SEE TABLE 1 FOR MONITORING FREQUENCY, ALERT LEVEL AND ACTION LEVEL. BUT THE CONTRACTOR IS ALWAYS BE RESPONSIBLE FOR ALL MONITORING.

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

| SYSTEM | INSTRUMENTATION | MONITORING FREQUENCY | ALERT LEVEL | ACTIONS |
|--------------------------|-----------------|----------------------|---|--------------------------------|
| STATION GAUGE | THREE PER WEEK | ONCE PER WEEK | TO BE EXCEEDED | REPORT TO SUPERVISOR, ENGINEER |
| INCLINOMETER | THREE PER WEEK | ONCE PER WEEK | 1/200 OF DEFORMATION DEPTH | TO BE MONITORED |
| SURFACE SETTLEMENT POINT | THREE PER WEEK | ONCE PER WEEK | 1/200 OF DEFORMATION DEPTH | TO BE EXCEEDED |
| PERMEABILITY | THREE PER WEEK | ONCE PER WEEK | REPORT MONITORING RESULTS TO THE CONTRACTOR | TO BE EXCEEDED |