

รายการอ้างอิง

ภาษาไทย

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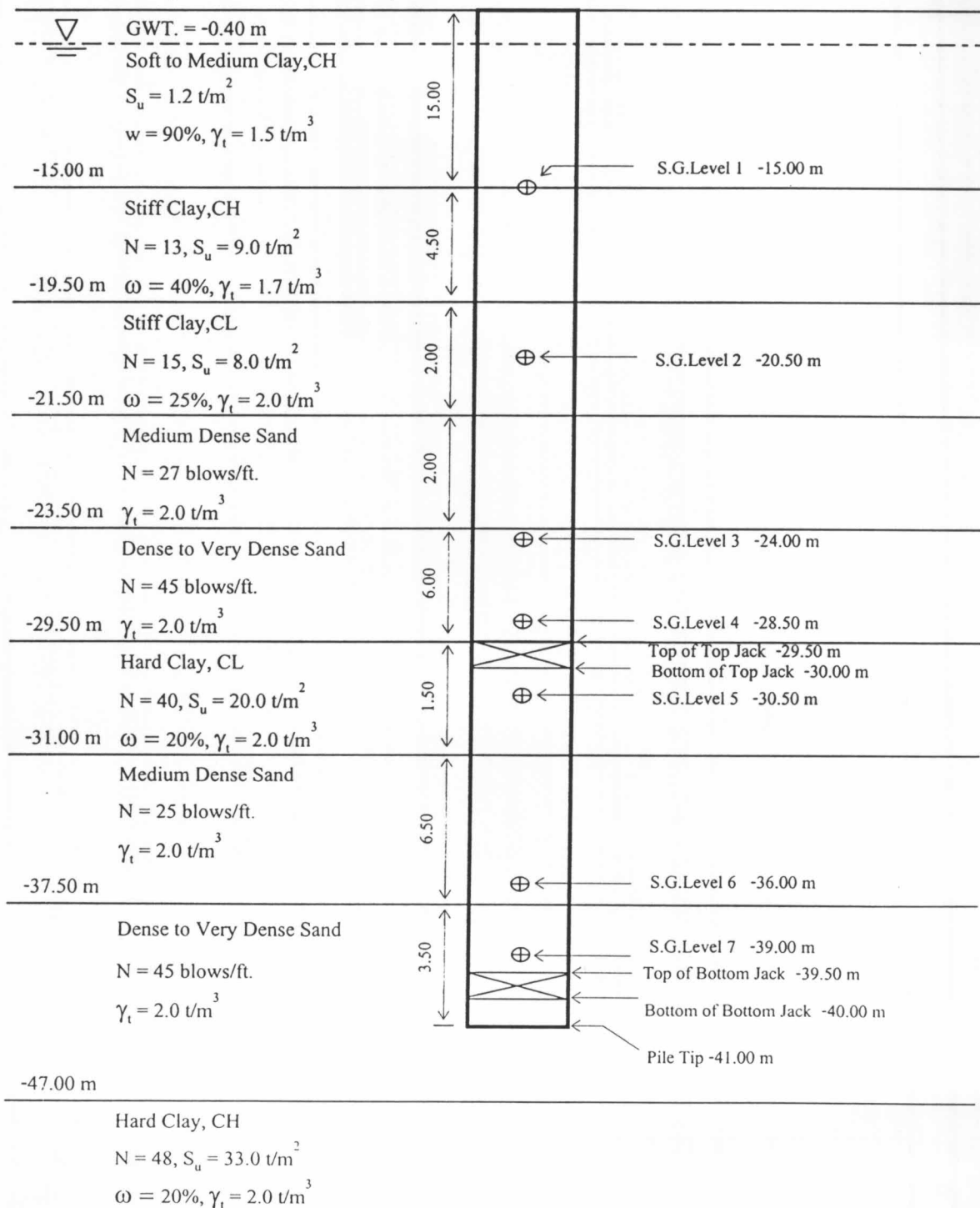
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ภาคผนวก

Typical Soil Profile of BH-1, TP-15 The 1st Bi-Directional Test Pile

Boring Started 29/11/1996
 Boring Finished 10/12/1996 Diameter of Pile = 1000 mm
 Date of Casting 03/02/2002
 Date of Testing 01/03/2002

Ground Level Depth 0.00 m Ground Level = +0.07 m. MSL



Typical Soil Profile of B-6,TP-19 The 2nd Bi-Directional Test Pile

Boring Started 04/11/2001

Boring Finished 10/11/2001

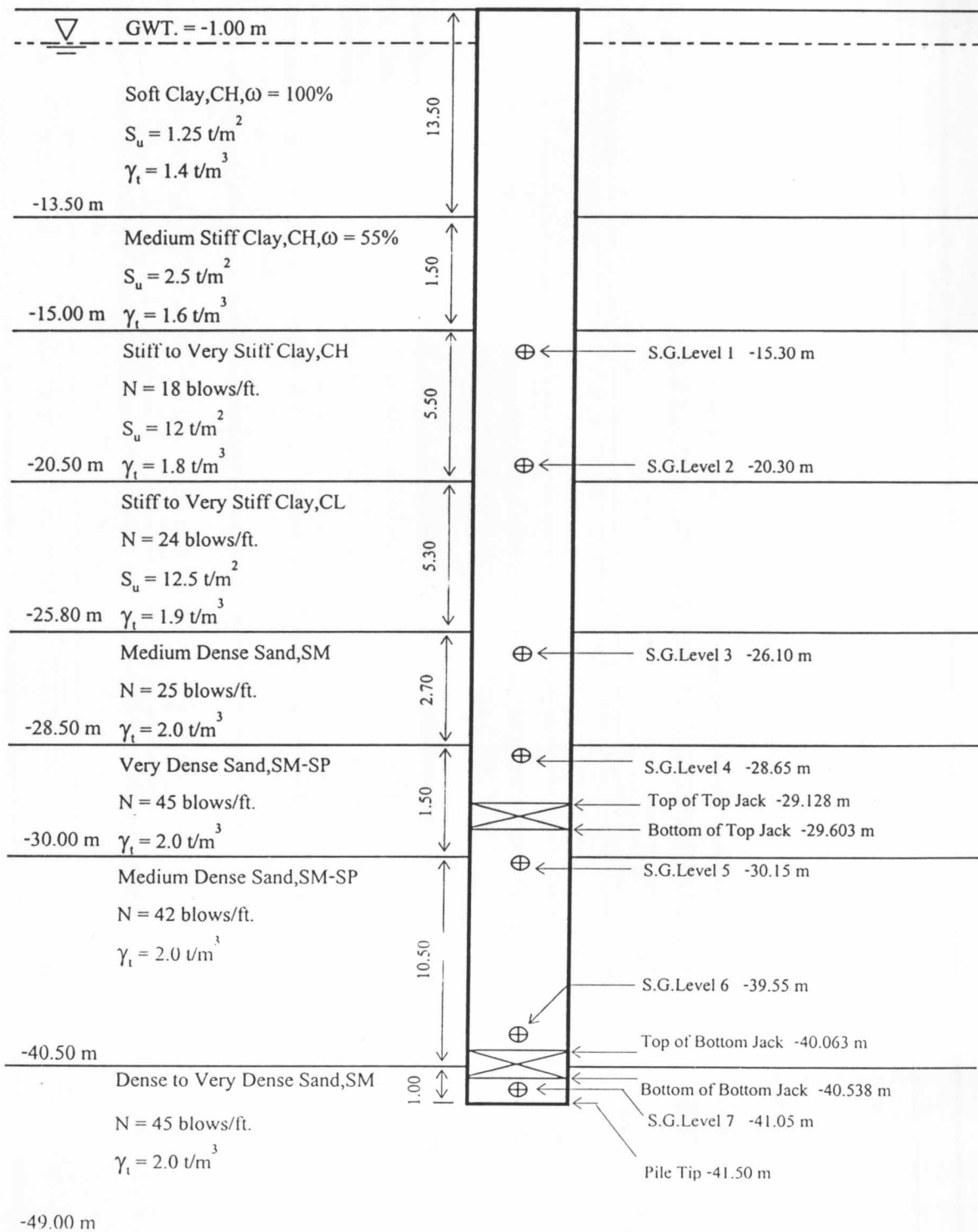
Diameter of Pile = 1200 mm

Date of Casting 24/01/2003

Date of Testing 21/02/2003

Ground Level Depth 0.00 m

Ground Level = +0.30 m. MSL



Typical Soil Profile of BH-1,TP-13/1

Boring Started 29/11/1996

Boring Finished 10/12/1996

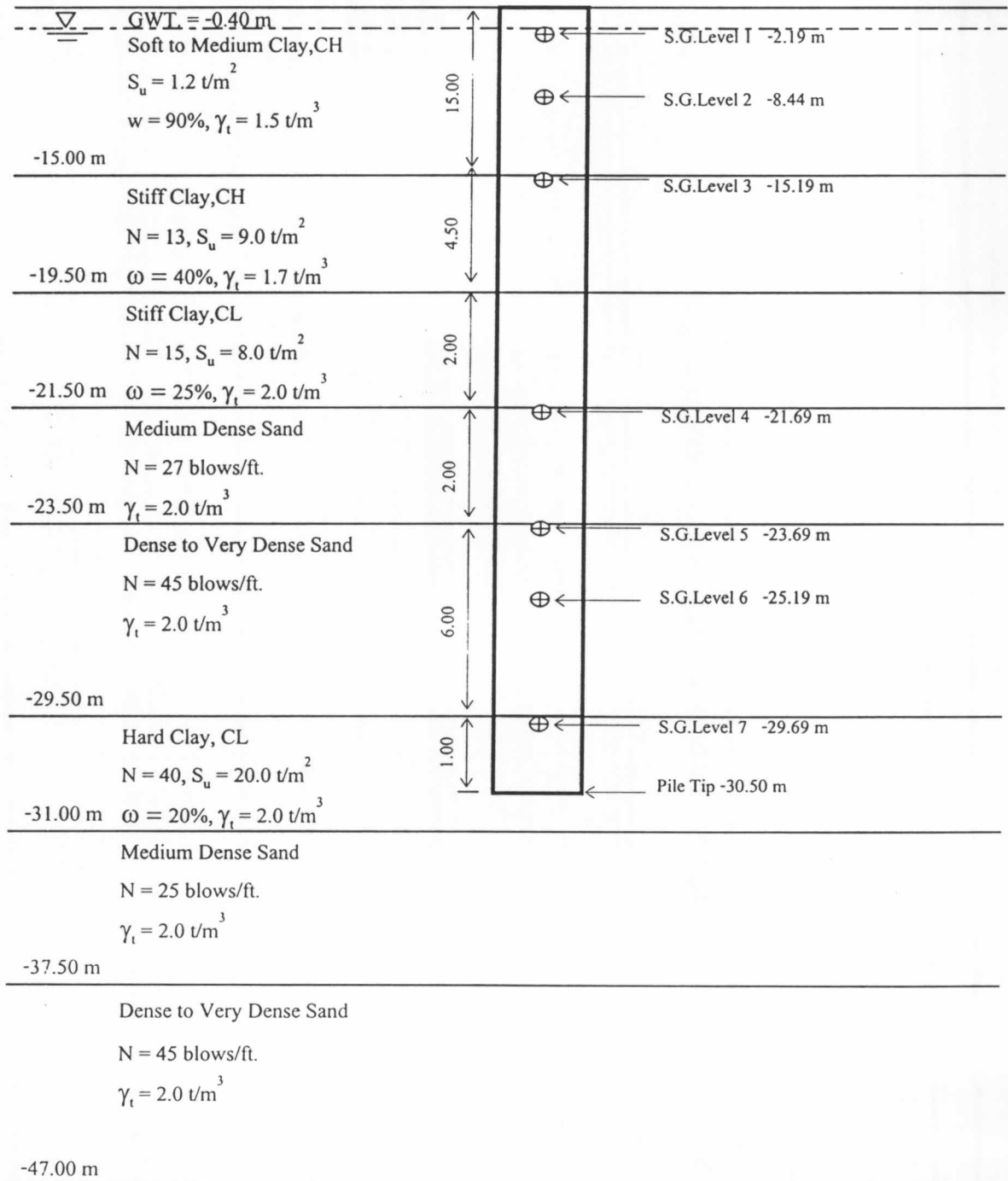
Diameter of Pile = 600 mm

Date of Casting 12/12/2001

Date of Testing 16/01/2002

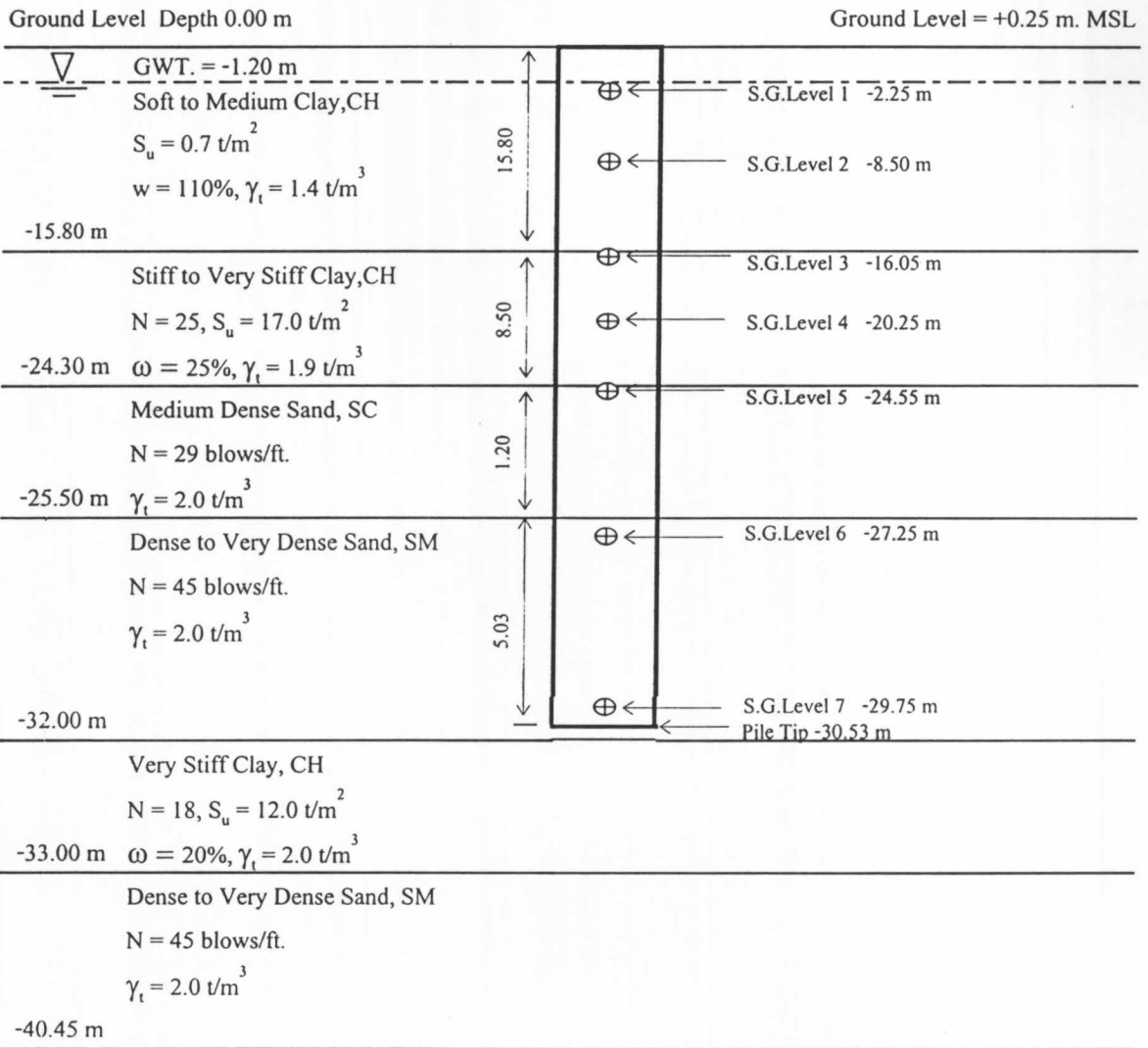
Ground Level Depth 0.00 m

Ground Level = +0.19 m. MSL



Typical Soil Profile of BH-12,TP-14

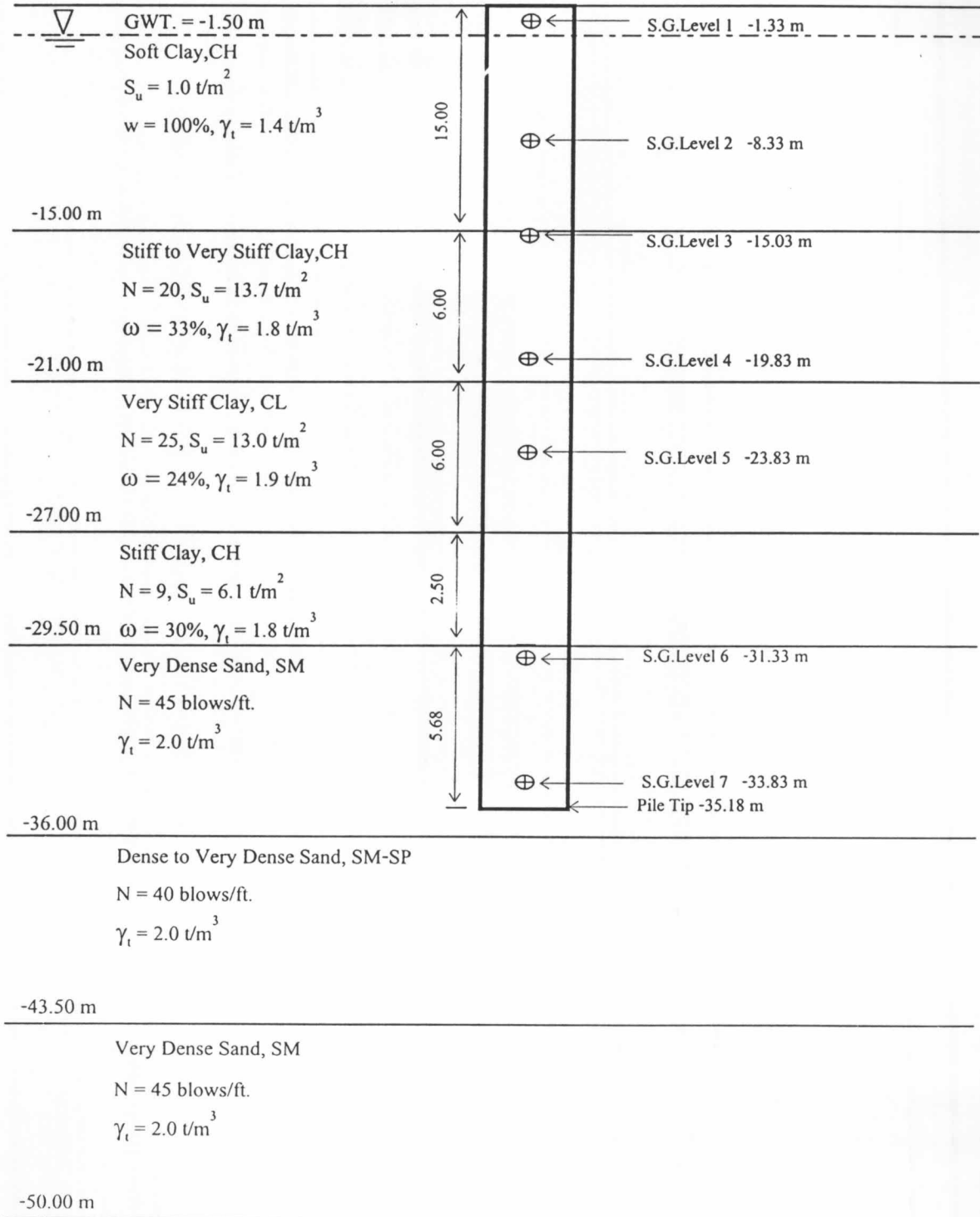
Boring Started 24/12/1996
 Boring Finished 25/12/1996 Diameter of Pile = 600 mm
 Date of Casting 14/12/2001
 Date of Testing 21/01/2002



Typical Soil Profile of BN-5,TP-16

Boring Started 28/10/2001
 Boring Finished 31/10/2001 Diameter of Pile = 600 mm
 Date of Casting 14/05/2002
 Date of Testing 21/06/2002

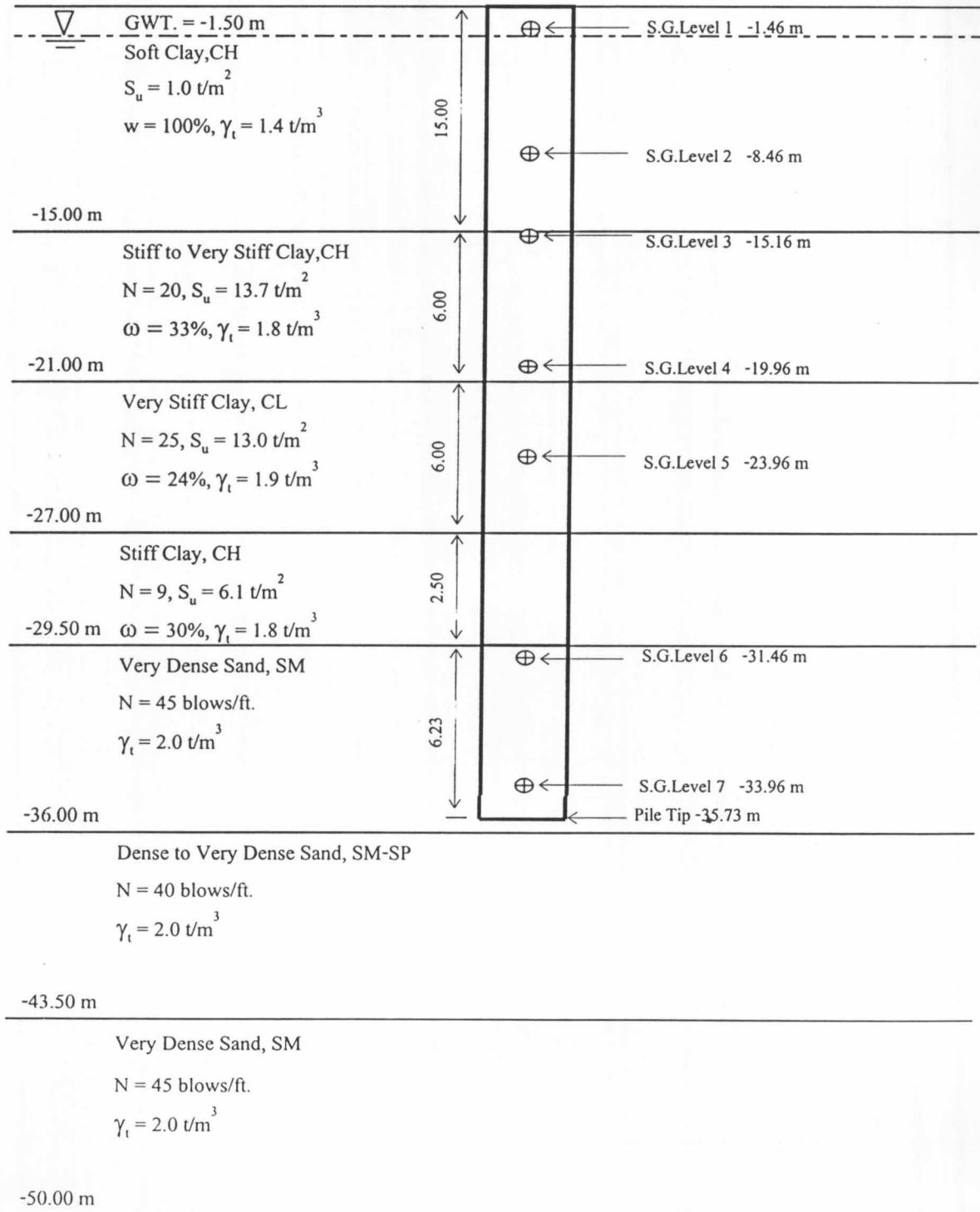
Ground Level Depth 0.00 m Ground Level = +0.083 m. MSL



Typical Soil Profile of BN-5,TP-17

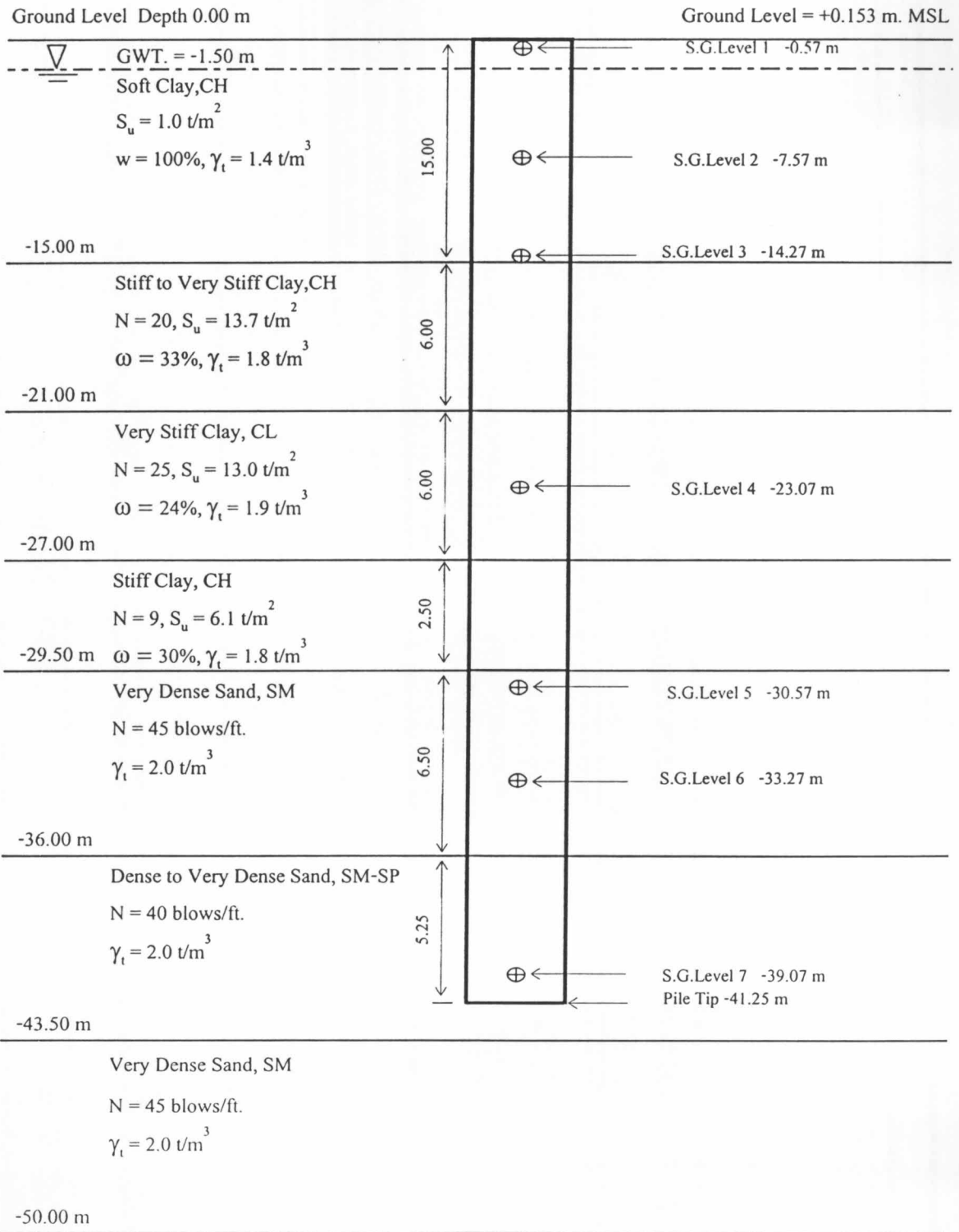
Boring Started 28/10/2001
 Boring Finished 31/10/2001 Diameter of Pile = 600 mm
 Date of Casting 16/05/2002
 Date of Testing 26/06/2002

Ground Level Depth 0.00 m Ground Level = +0.073 m. MSL



Typical Soil Profile of BN-5, TP-18

Boring Started 28/10/2001
 Boring Finished 31/10/2001 Diameter of Pile = 1000 mm
 Date of Casting 18/05/2002
 Date of Testing 18/06/2002



Detail of Soil Parameter in Each Layer from Bi-Directional Static Load Test, TP-15, BH-1 (Stage2)

Depth of Ground Water Table = -0.40 m

Additional Effective Stress from Drawdown Effect = 12.6 t/m^2

Stage 2 ----> Failed, f_s = stress at failure

| Depth (m) | Length (m) | Soil Type | f_s (t/m^2) | Pile Movement at Failure (mm) | N Blow/ft | S_u (t/m^2) | σ'_{vi} (t/m^2) | C_N | N' | ϕ' | σ'_{vi}^* (t/m^2) | α | β |
|--------------|---------------|--------------------------|-----------------------------|----------------------------------|--------------|-----------------------------|--------------------------------------|-------|------|---------|--|----------|---------|
| 30.00-31.00 | 1.00 | Hard Clay, CL | 11.93 | 11.54 | 40 | 20.0 | - | - | - | - | - | 0.597 | - |
| 31.00-37.50 | 6.50 | Medium Dense Sand | 12.24 | 45.36 | 25 | - | 25.80 | 0.68 | 17.0 | 32.4 | 38.40 | - | 0.319 |
| 37.50-39.50 | 2.00 | Dense to Very Dense Sand | 13.42 | 45.36 | 45 | - | 30.05 | 0.62 | 27.9 | 35.6 | 42.65 | - | 0.315 |

Note:

- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง, มนัสพล และฉัฐพล (2540)
- ค่า f_s ได้จากกราฟระหว่าง Vertical Stress-Pile Movement ใน Stage 2
- σ'_{vi}^* = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Detail of Soil Parameter in Each Layer from Bi-Directional Static Load Test,TP-15,BH-1 (Stage3)

Depth of Ground Water Table = -0.40 m

Additional Effective Stress from Drawdown Effect = 12.6 t/m²

Stage 3 ----> Not Failed , f'_s = Maximum stress occurred

| Depth (m) | Length (m) | Soil Type | f'_s (t/m ²) | Pile Movement Occurred (mm) | N Blow/ft | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N' | ϕ' | σ^*_{vi} (t/m ²) | α | β |
|--------------|---------------|--------------------------|-------------------------------|--------------------------------|--------------|------------------------------|---------------------------------------|-------|------|---------|--|----------|---------|
| 0.0-15.0 | 15.00 | Soft to Medium Clay,CH | 0.14 | 3.66 | - | 1.2 | - | - | - | - | - | 0.117 | - |
| 15.0-19.5 | 4.50 | Stiff Clay,CH | 4.83 | 3.66 | 13 | 9.0 | - | - | - | - | - | 0.537 | - |
| 19.5-21.5 | 2.00 | Stiff Clay,CL | 8.25 | 3.66 | 15 | 8.0 | - | - | - | - | - | 1.032 | - |
| 21.5-23.5 | 2.00 | Medium Dense Sand | 11.67 | 3.66 | 27 | - | 14.05 | 0.90 | 24.3 | 34.6 | 26.65 | - | 0.438 |
| 23.5-29.5 | 6.00 | Dense to Very Dense Sand | 18.34 | 3.66 | 45 | - | 18.05 | 0.80 | 36.0 | 37.5 | 30.65 | - | 0.598 |

Note:

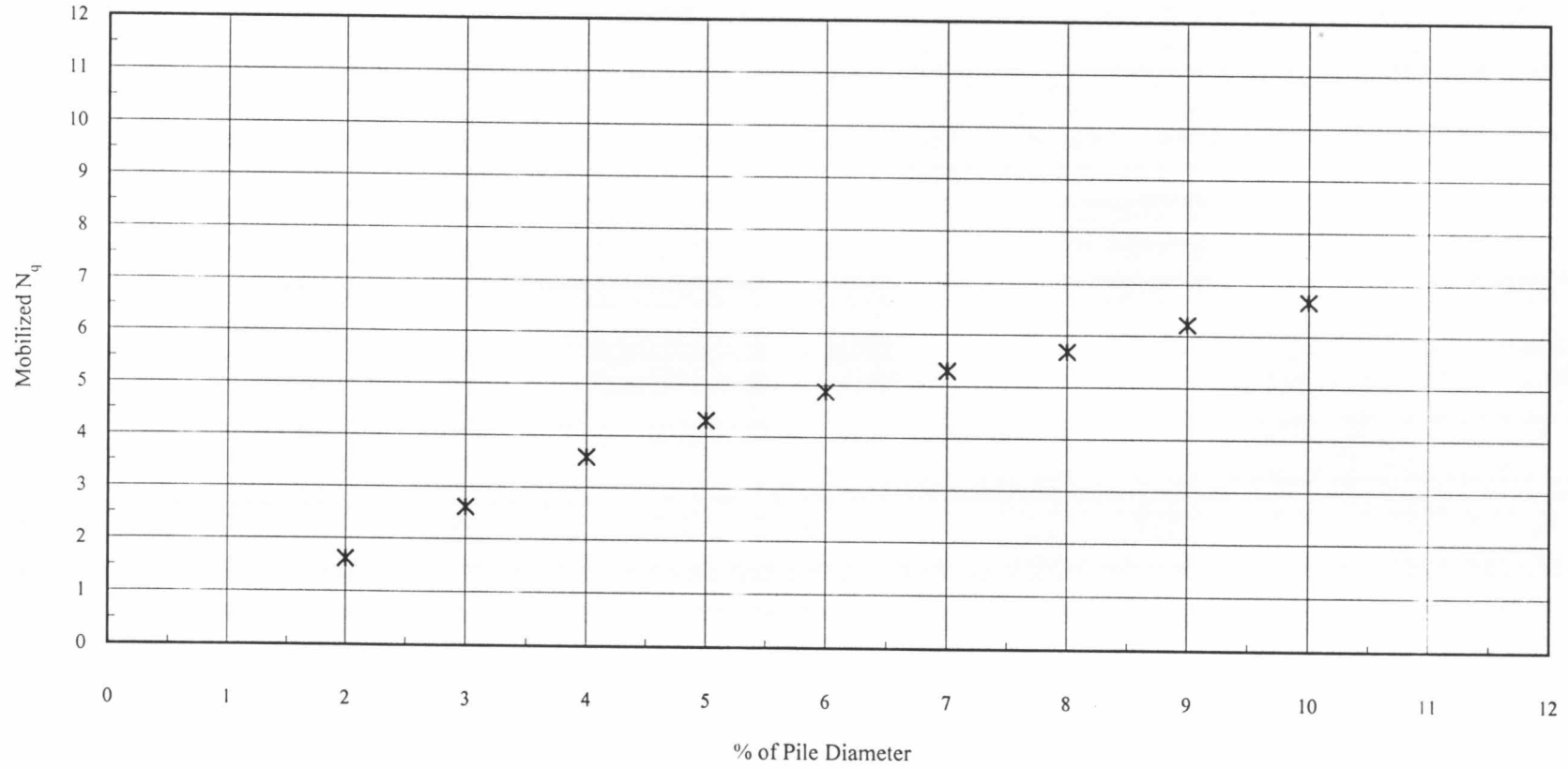
- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง,มนัสพล และณัฐพล (2540)
- ค่า f'_s ได้จากกราฟระหว่าง Vertical Stress-Pile Movement ใน Stage 3
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Table of Mobilized N_q of TP-15,BH-1

| | | |
|---|-------|---------|
| Diameter of Pile | 1.000 | m |
| Cross Section Area of Pile | 0.785 | m^2 |
| Effective Stress with Drawdown Effect at Pile Tip (σ'_v) | 45.15 | t/m^2 |

| % of Pile Diameter | Soil Movement at Pile Tip (m) | q_c at Pile Tip Movement (t/m^2) | Mobilized $N_q = q_c / \sigma'_v$ |
|--------------------|-------------------------------|--|-----------------------------------|
| 2 | 0.020 | 72.7 | 1.61 |
| 3 | 0.030 | 118.1 | 2.61 |
| 4 | 0.040 | 161.7 | 3.58 |
| 5 | 0.050 | 194.5 | 4.31 |
| 6 | 0.060 | 220.3 | 4.88 |
| 7 | 0.070 | 239.4 | 5.30 |
| 8 | 0.080 | 256.5 | 5.68 |
| 9 | 0.090 | 280.6 | 6.21 |
| 10 | 0.100 | 300.8 | 6.66 |

Bi-Directional Static Load Test, TP-15, BH-1



Detail of Soil Parameter in Each Layer from Bi-Directional Static Load Test, TP-19, B-6 (Stage 2)

Case 1

Depth of Ground Water Table = -1.00 m

Additional Effective Stress from Drawdown Effect = 12.0 t/m²

Stage 2 ----> Not Failed, f'_s = Maximum stress occurred

| Depth (m) | Length (m) | Soil Type | f'_s (t/m ²) | Pile Movement Occurred (mm) | N (Blows/ft) | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N | ϕ | σ^*_{vi} (t/m ²) | α | β |
|-------------|------------|-------------------|----------------------------|-----------------------------|--------------|---------------------------|------------------------------------|-------|------|--------|-------------------------------------|----------|---------|
| 29.60-30.00 | 0.40 | Very Dense Sand | 330.80 | 15.30 | 45 | - | 20.47 | 0.76 | 34.2 | 37.2 | 32.47 | - | 10.187 |
| 30.00-40.06 | 10.06 | Medium Dense Sand | 12.18 | 15.30 | 42 | - | 25.70 | 0.69 | 28.8 | 35.8 | 37.70 | - | 0.323 |

Note:

- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง, มนัสพล และฉัฐพล (2540)
- ค่า f'_s ได้จากกราฟระหว่าง Vertical Stress-Pile Movement ใน Stage 2
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Detail of Soil Parameter in Each Layer from Bi-Directional Static Load Test, TP-19, B-6 (Stage 3)

Case 1

Depth of Ground Water Table = -1.00 m

Additional Effective Stress from Drawdown Effect = 12.0 t/m²

Stage 3 ----> f_s = Stress at failure, f'_s = Maximum stress occurred

| Depth (m) | Length (m) | Soil Type | f_s (t/m ²) | f'_s (t/m ²) | Pile Movement at Failure (mm) | Pile Movement Occurred (mm) | N (Blows/ft) | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N' | ϕ' | σ^*_{vi} (t/m ²) | α | β |
|-------------|------------|------------------------------|---------------------------|----------------------------|-------------------------------|-----------------------------|--------------|---------------------------|------------------------------------|-------|------|---------|-------------------------------------|----------|---------|
| 0.00-13.50 | 13.50 | Soft Clay, CH | - | 0.00 | - | 4.60 | - | 1.3 | - | - | - | - | - | 0.000 | - |
| 13.50-15.00 | 1.50 | Medium Stiff Clay, CH | - | 0.00 | - | 4.60 | - | 2.5 | - | - | - | - | - | 0.000 | - |
| 15.00-20.50 | 5.50 | Stiff to Very Stiff Clay, CH | - | 6.58 | - | 4.60 | 18 | 12.0 | - | - | - | - | - | 0.548 | - |
| 20.50-25.80 | 5.30 | Stiff to Very Stiff Clay, CL | - | 18.06 | - | 4.60 | 13 | 12.5 | - | - | - | - | - | 1.445 | - |
| 25.80-28.50 | 2.70 | Medium Dense Sand | 17.66 | - | 3.50 | - | 25 | - | 17.82 | 0.81 | 20.3 | 33.3 | 29.82 | - | 0.592 |
| 28.50-29.13 | 0.63 | Very Dense Sand | 115.66 | - | 2.70 | - | 45 | - | 19.48 | 0.77 | 34.7 | 37.0 | 31.48 | - | 3.674 |

Note:

- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง, มนัสพล และณัฐพล (2540)
- ค่า f_s , f'_s ได้จากกราฟระหว่าง Vertical Stress-Pile Movement ใน Stage 3
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Detail of Soil Parameter in Each Layer from Bi-Directional Static Load Test, TP-19, B-6 (Stage 2)

Case 2

Depth of Ground Water Table = -1.00 m

Additional Effective Stress from Drawdown Effect = 12.0 t/m²

Stage 2 ----> Not Failed, f'_s = Maximum stress occurred

| Depth (m) | Length (m) | Soil Type | f'_s (t/m ²) | Pile Movement Occurred (mm) | N (Blows/ft) | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N' | ϕ' | σ^*_{vi} (t/m ²) | α | β |
|--------------|---------------|-------------------|-------------------------------|--------------------------------|-----------------|------------------------------|---------------------------------------|-------|------|---------|--|----------|---------|
| 29.60-30.00 | 0.40 | Very Dense Sand | 12.18 | 15.30 | 45 | - | 20.47 | 0.76 | 34.2 | 37.2 | 32.47 | - | 0.375 |
| 30.00-40.06 | 10.06 | Medium Dense Sand | 12.18 | 15.30 | 42 | - | 25.70 | 0.69 | 28.8 | 35.8 | 37.70 | - | 0.323 |

Note:

- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง, มนัสพล และณัฐพล (2540)
- ค่า f'_s ได้จากกราฟระหว่าง Vertical Stress-Pile Movement ใน Stage 2
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Detail of Soil Parameter in Each Layer from Bi-Directional Static Load Test, TP-19, B-6 (Stage 3)

Case 2

Depth of Ground Water Table = -1.00 m

Additional Effective Stress from Drawdown Effect = 12.0 t/m²

Stage 3 ----> f_s = Stress at failure, f'_s = Maximum stress occurred

| Depth (m) | Length (m) | Soil Type | f_s (t/m ²) | f'_s (t/m ²) | Pile Movement at Failure (mm) | Pile Movement Occurred (mm) | N (Blows/ft) | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N' | ϕ' | σ^*_{vi} (t/m ²) | α | β |
|-------------|------------|------------------------------|---------------------------|----------------------------|-------------------------------|-----------------------------|--------------|---------------------------|------------------------------------|-------|------|---------|-------------------------------------|----------|---------|
| 0.00-13.50 | 13.50 | Soft Clay, CH | - | 0.00 | - | 4.60 | - | 1.3 | - | - | - | - | - | 0.000 | - |
| 13.50-15.00 | 1.50 | Medium Stiff Clay, CH | - | 0.00 | - | 4.60 | - | 2.5 | - | - | - | - | - | 0.000 | - |
| 15.00-20.50 | 5.50 | Stiff to Very Stiff Clay, CH | - | 6.58 | - | 4.60 | 18 | 12.0 | - | - | - | - | - | 0.548 | - |
| 20.50-25.80 | 5.30 | Stiff to Very Stiff Clay, CL | - | 18.06 | - | 4.60 | 13 | 12.5 | - | - | - | - | - | 1.445 | - |
| 25.80-28.50 | 2.70 | Medium Dense Sand | 17.66 | - | 3.50 | - | 25 | - | 17.82 | 0.81 | 20.3 | 33.3 | 29.82 | - | 0.592 |
| 28.50-29.13 | 0.63 | Very Dense Sand | - | 12.18 | - | 2.70 | 45 | - | 19.48 | 0.77 | 34.7 | 37.0 | 31.48 | - | 0.387 |

Note:

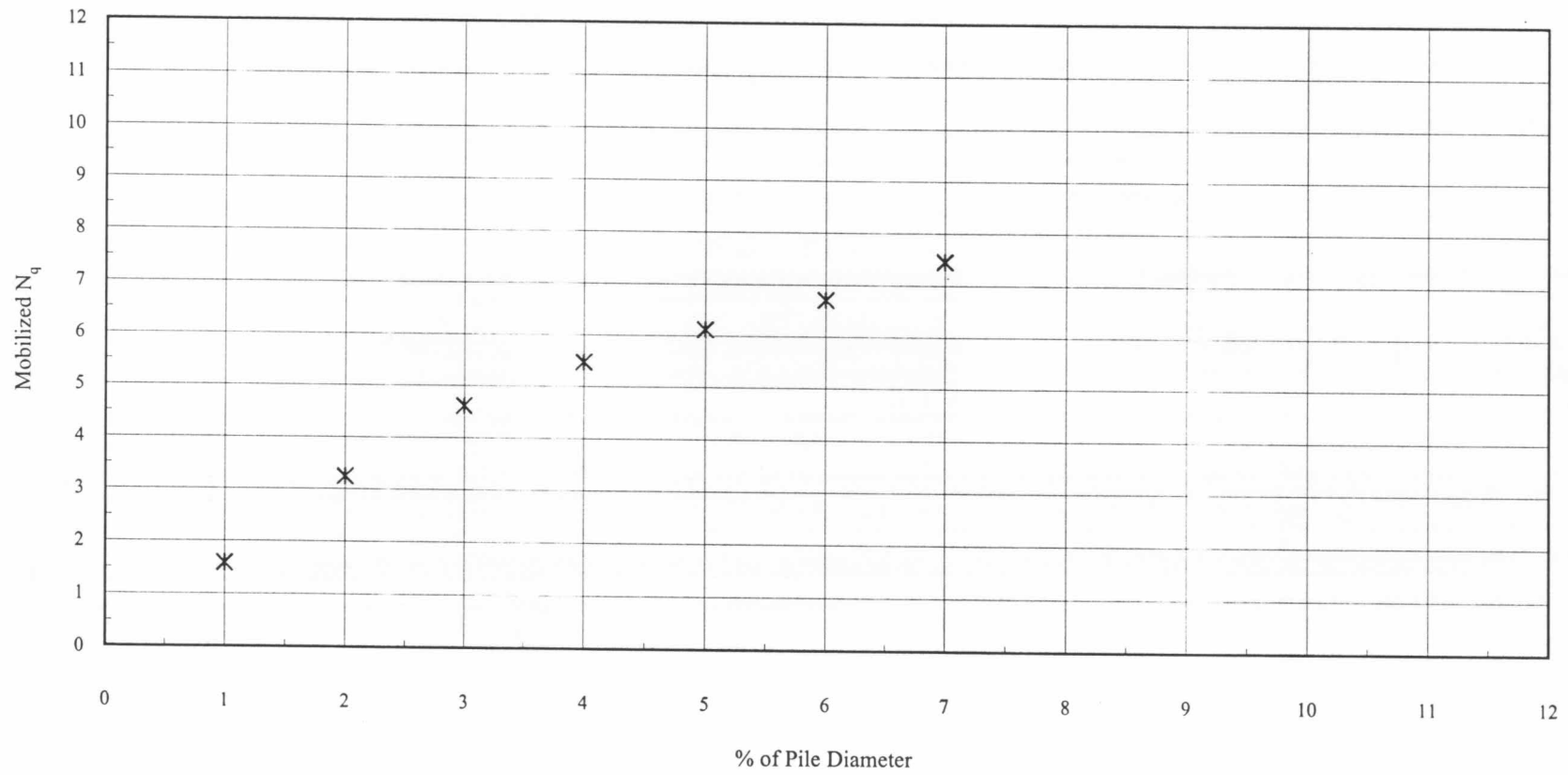
- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง, มนัสพล และณัฐพล (2540)
- ค่า f_s , f'_s ได้จากกราฟระหว่าง Vertical Stress-Pile Movement ใน Stage 3
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Table of Mobilized N_q of TP-19,B-6 (Case 2)

| | | |
|---|-------|------------------|
| Diameter of Pile | 1.200 | m |
| Cross Section Area of Pile | 1.131 | m ² |
| Effective Stress with Drawdown Effect at Pile Tip (σ'_v) | 44.17 | t/m ² |

| % of Pile Diameter | Soil Movement at Pile Tip (m) | q_c at Pile Tip Movement (t/m ²) | Mobilized $N_q = q_c / \sigma'_v$ |
|--------------------|-------------------------------|--|-----------------------------------|
| 1 | 0.012 | 69.8 | 1.58 |
| 2 | 0.024 | 143.3 | 3.24 |
| 3 | 0.036 | 203.8 | 4.61 |
| 4 | 0.048 | 241.7 | 5.47 |
| 5 | 0.060 | 270.2 | 6.12 |
| 6 | 0.072 | 296.5 | 6.71 |
| 7 | 0.084 | 329.4 | 7.46 |

Bi-Directional Static Load Test, TP-19, B-6 (Case 2)



Detail of Soil Parameter in Each Layer from TP-13/1,BH-1

Depth of Ground Water Table = -0.40 m

Additional Effective Stress from Drawdown Effect = 12.6 t/m²

| Depth (m) | Length (m) | Soil Type | f_s (t/m ²) | f_s' (t/m ²) | Pile Head Movement (mm) | N (Blows/ft) | S_u (t/m ²) | σ_{vi}' (t/m ²) | C_N | N' | ϕ' (Degree) | σ_{vi}^* (t/m ²) | α | β |
|--------------|---------------|--------------------------|------------------------------|-------------------------------|----------------------------|-----------------|------------------------------|---------------------------------------|-------|------|---------------------|--|----------|---------|
| 0.00-15.00 | 15.00 | Soft to Medium Clay,CH | 0.68 | - | 5.56 | - | 1.2 | - | - | - | - | - | 0.570 | - |
| 15.00-19.50 | 4.50 | Stiff Clay,CH | - | 8.92 | 9.09 | 13 | 9.0 | - | - | - | - | - | 0.991 | - |
| 19.50-21.50 | 2.00 | Stiff Clay,CL | - | 9.31 | 9.09 | 15 | 8.0 | - | - | - | - | - | 1.164 | - |
| 21.50-23.50 | 2.00 | Medium Dense Sand | - | 4.55 | 9.09 | 27 | - | 14.05 | 0.89 | 24.0 | 34.5 | 26.65 | - | 0.171 |
| 23.50-29.50 | 6.00 | Dense to Very Dense Sand | - | 13.05 | 9.09 | 45 | - | 18.05 | 0.8 | 36.0 | 37.5 | 30.65 | - | 0.426 |
| 29.50-30.50 | 1.00 | Hard Clay,CL | - | 2.40 | 9.09 | 40 | 20.0 | - | - | - | - | - | 0.120 | - |

Note:

- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง,มนัสพล และณัฐพล (2540)
- f_s = Stress at failure
- f_s' = Maximum stress occurred
- σ_{vi}^* = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Detail of Soil Parameter in Each Layer from TP-14,BH-12

Depth of Ground Water Table = -1.20 m

Additional Effective Stress from Drawdown Effect = 11.8 t/m²

| Depth (m) | Length (m) | Soil Type | f_s (t/m ²) | f'_s (t/m ²) | Pile Head Movement (mm) | N (Blows/ft) | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N' | ϕ' (Degree) | σ^*_{vi} (t/m ²) | α | β |
|--------------|---------------|-----------------------------|------------------------------|-------------------------------|----------------------------|-----------------|------------------------------|---------------------------------------|-------|------|---------------------|--|----------|---------|
| 0.00-15.80 | 15.80 | Soft to Medium Clay,CH | - | 3.99 | 7.97 | - | 0.7 | - | - | - | - | - | 5.703 | - |
| 15.80-24.30 | 8.50 | Stiff to Very Stiff Clay,CH | - | 8.75 | 7.97 | 25 | 17.0 | - | - | - | - | - | 0.515 | - |
| 24.30-25.50 | 1.20 | Medium Dense Sand | - | 8.36 | 7.97 | 29 | - | 15.77 | 0.86 | 24.9 | 34.8 | 27.57 | - | 0.303 |
| 25.50-30.53 | 5.03 | Dense to Very Dense Sand | - | 8.77 | 7.97 | 45 | - | 18.89 | 0.80 | 36.0 | 37.5 | 30.69 | - | 0.286 |

Note:

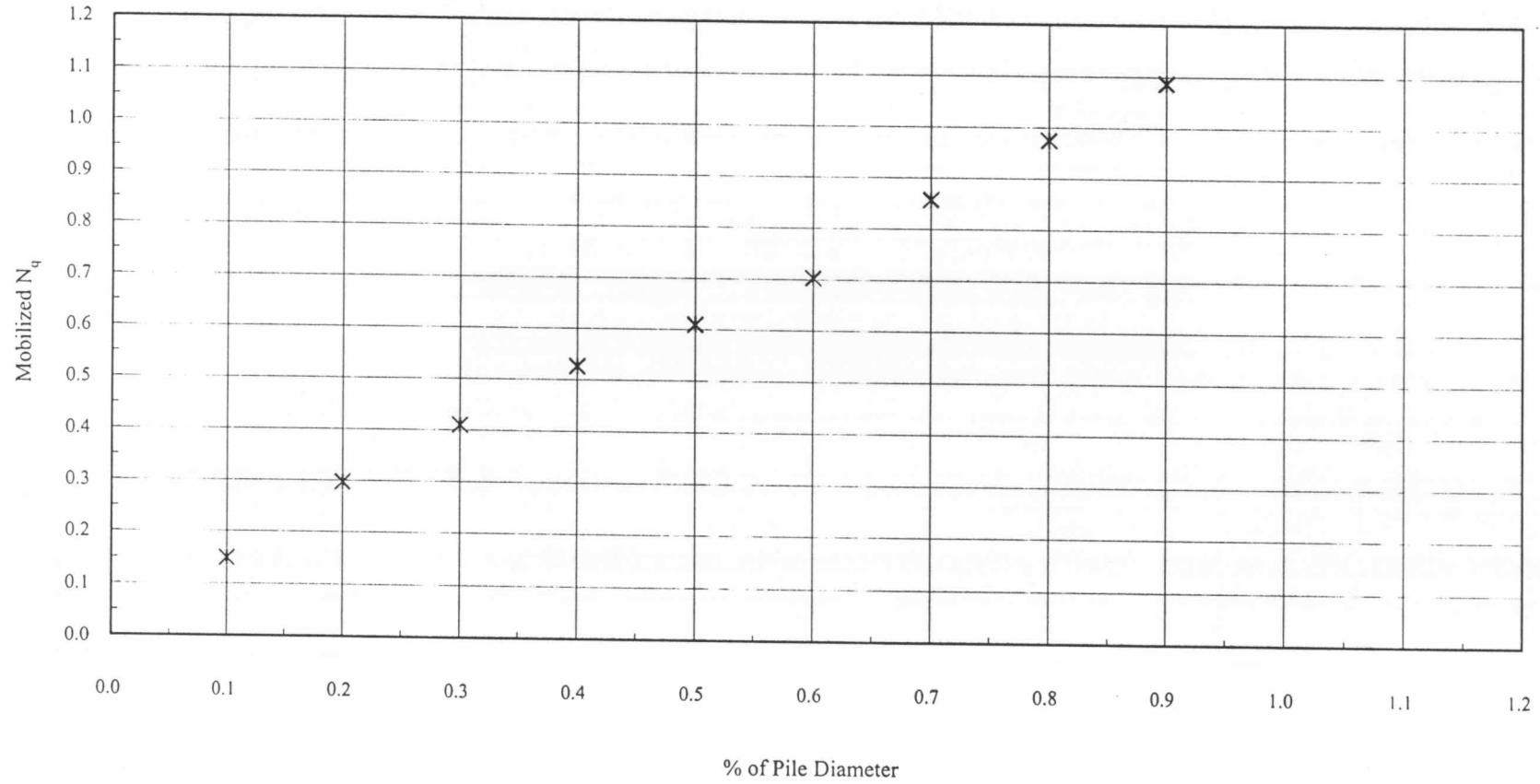
- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง,มนัสพล และณัฐพล (2540)
- f_s = Stress at failure
- f'_s = Maximum stress occurred
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Table of Mobilized N_q of TP-14,BH-12

| | | |
|--|-------|---------|
| Diameter of Pile | 0.600 | m |
| Cross Section Area of Pile | 0.283 | m^2 |
| Effective Stress with Drawdown Effect at Pile Tip (σ_v^*) | 33.21 | t/m^2 |

| % of Pile Diameter | Soil Movement at Pile Tip (m) | q_e from curve (t/m^2) | Mobilized $N_q = q_e / \sigma_v^*$ |
|--------------------|-------------------------------|------------------------------|------------------------------------|
| 0.1 | 0.0006 | 4.941 | 0.149 |
| 0.2 | 0.0012 | 9.862 | 0.297 |
| 0.3 | 0.0018 | 13.604 | 0.410 |
| 0.4 | 0.0024 | 17.472 | 0.526 |
| 0.5 | 0.0030 | 20.232 | 0.609 |
| 0.6 | 0.0036 | 23.331 | 0.703 |
| 0.7 | 0.0042 | 28.459 | 0.857 |
| 0.8 | 0.0048 | 32.371 | 0.975 |
| 0.9 | 0.0054 | 36.082 | 1.087 |
| 1.0 | 0.0060 | 40.265 | 1.213 |

TP-14,BH-12



Detail of Soil Parameter in Each Layer from TP-16,BN-5

Depth of Ground Water Table = -1.50 m

Additional Effective Stress from Drawdown Effect = 11.5 t/m²

| Depth (m) | Length (m) | Soil Type | f_s (t/m ²) | f'_s (t/m ²) | Pile Head Movement (mm) | N (Blows/ft) | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N | ϕ (Degree) | σ^*_{vi} (t/m ²) | α | β |
|--------------|---------------|-----------------------------|------------------------------|-------------------------------|----------------------------|-----------------|------------------------------|---------------------------------------|-------|------|--------------------|--|----------|---------|
| 0.00-15.00 | 15.00 | Soft Clay,CH | 2.14 | - | 8.24 | - | 1.0 | - | - | - | - | - | 2.142 | - |
| 15.00-21.00 | 6.00 | Stiff to Very Stiff Clay,CH | 4.47 | - | 6.63 | 20 | 13.7 | - | - | - | - | - | 0.326 | - |
| 21.00-27.00 | 6.00 | Very Stiff Clay,CL | 12.37 | - | 10.5 | 25 | 13.0 | - | - | - | - | - | 0.951 | - |
| 27.00-29.50 | 2.50 | Stiff Clay,CH | 7.05 | - | 10.5 | 9 | 6.1 | - | - | - | - | - | 1.156 | - |
| 29.50-35.18 | 5.68 | Very Dense Sand | - | 7.11 | 13.40 | 45 | - | 22.54 | 0.72 | 32.4 | 36.9 | 34.04 | - | 0.209 |

Note:

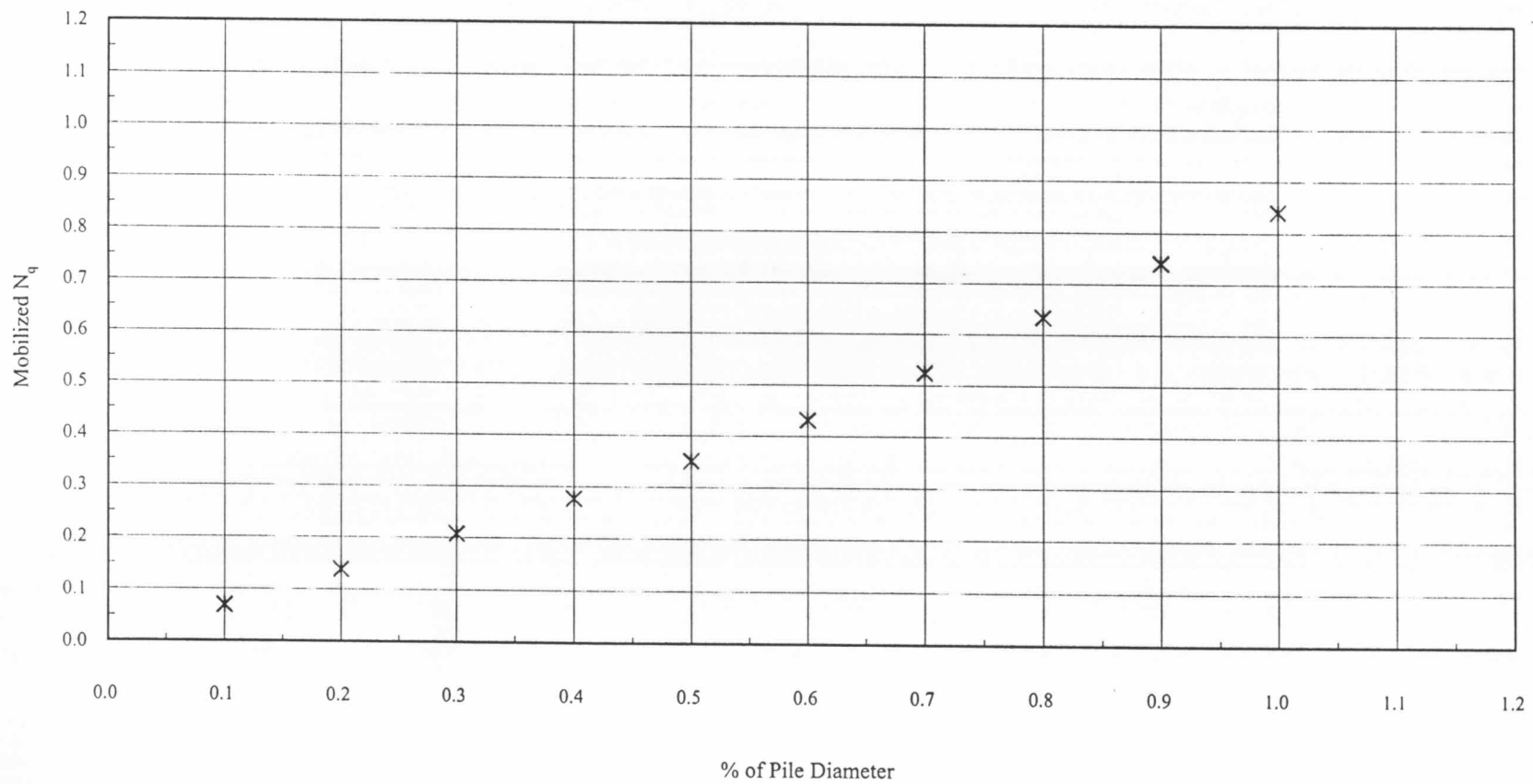
- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง,มนัสพล และณัฐพล (2540)
- f_s = Stress at failure
- f'_s = Maximum stress occurred
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Table of Mobilized N_q of TP-16,BN-5

| | | |
|--|-------|------------------|
| Diameter of Pile | 0.600 | m |
| Cross Section Area of Pile | 0.283 | m ² |
| Effective Stress with Drawdown Effect at Pile Tip (σ_v^*) | 36.88 | t/m ² |

| % of Pile Diameter | Soil Movement at Pile Tip (m) | q_e from curve (t/m ²) | Mobilized $N_q = q_e / \sigma_v^*$ |
|-----------------------|----------------------------------|---|------------------------------------|
| 0.1 | 0.0006 | 2.552 | 0.069 |
| 0.2 | 0.0012 | 5.104 | 0.138 |
| 0.3 | 0.0018 | 7.656 | 0.208 |
| 0.4 | 0.0024 | 10.208 | 0.277 |
| 0.5 | 0.0030 | 12.918 | 0.350 |
| 0.6 | 0.0036 | 15.901 | 0.431 |
| 0.7 | 0.0042 | 19.341 | 0.524 |
| 0.8 | 0.0048 | 23.380 | 0.634 |
| 0.9 | 0.0054 | 27.309 | 0.740 |
| 1.0 | 0.0060 | 31.002 | 0.841 |

TP-16,BN-5



Detail of Soil Parameter in Each Layer from TP-17,BN-5

Depth of Ground Water Table = -1.50 m

Additional Effective Stress from Drawdown Effect = 11.5 t/m²

| Depth (m) | Length (m) | Soil Type | f_s (t/m ²) | f'_s (t/m ²) | Pile Head Movement (mm) | N (Blows/ft) | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N | ϕ' (Degree) | σ^*_{vi} (t/m ²) | α | β |
|--------------|---------------|-----------------------------|------------------------------|-------------------------------|----------------------------|-----------------|------------------------------|---------------------------------------|-------|------|---------------------|--|----------|---------|
| 0.00-15.00 | 15.00 | Soft Clay,CH | 4.25 | - | 14.9 | - | 1.0 | - | - | - | - | - | 4.250 | - |
| 15.00-21.00 | 6.00 | Stiff to Very Stiff Clay,CH | 4.93 | - | 7.1 | 20 | 13.7 | - | - | - | - | - | 0.360 | - |
| 21.00-27.00 | 6.00 | Very Stiff Clay,CL | - | 8.86 | 19.07 | 25 | 13.0 | - | - | - | - | - | 0.682 | - |
| 27.00-29.50 | 2.50 | Stiff Clay,CH | - | 13.30 | 19.07 | 9 | 6.1 | - | - | - | - | - | 2.181 | - |
| 29.50-35.73 | 6.23 | Very Dense Sand | - | 11.09 | 19.07 | 45 | - | 22.82 | 0.71 | 32.0 | 36.6 | 34.32 | - | 0.323 |

Note:

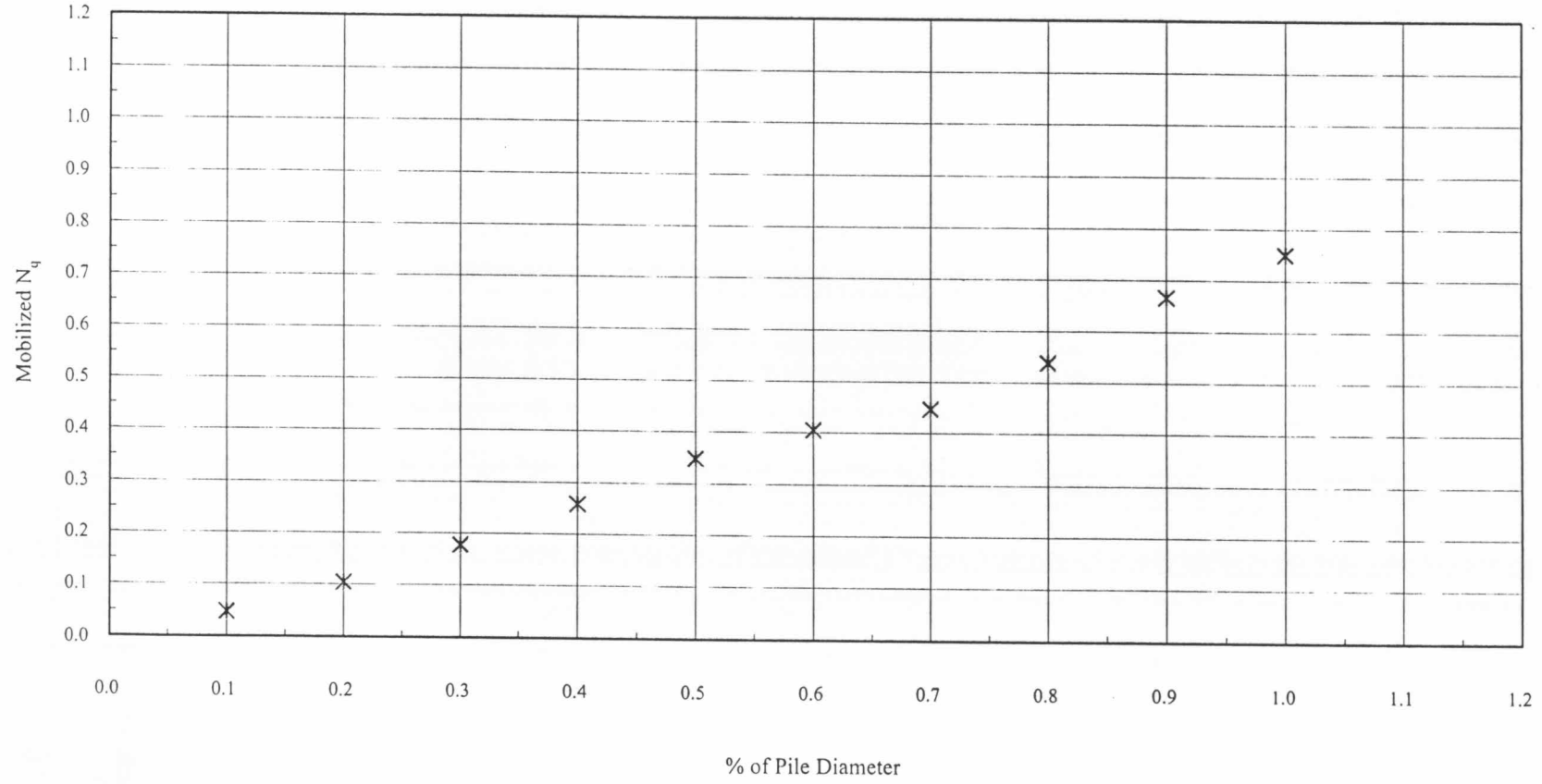
- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง,มนัสพล และณัฐพล (2540)
- f_s = Stress at failure
- f'_s = Maximum stress occurred
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งคิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Table of Mobilized N_q of TP-17,BN-5

| | | |
|---|-------|------------------|
| Diameter of Pile | 0.600 | m |
| Cross Section Area of Pile | 0.283 | m ² |
| Effective Stress with Drawdown Effect at Pile Tip (σ'_v) | 37.43 | t/m ² |

| % of Pile Diameter | Soil Movement at Pile Tip (m) | q_c from curve (t/m ²) | Mobilized $N_q = q_c / \sigma'_v$ |
|--------------------|-------------------------------|--------------------------------------|-----------------------------------|
| 0.1 | 0.0006 | 1.759 | 0.047 |
| 0.2 | 0.0012 | 3.882 | 0.104 |
| 0.3 | 0.0018 | 6.634 | 0.177 |
| 0.4 | 0.0024 | 9.669 | 0.258 |
| 0.5 | 0.0030 | 13.006 | 0.347 |
| 0.6 | 0.0036 | 15.144 | 0.405 |
| 0.7 | 0.0042 | 16.726 | 0.447 |
| 0.8 | 0.0048 | 20.163 | 0.539 |
| 0.9 | 0.0054 | 24.924 | 0.666 |
| 1.0 | 0.0060 | 28.074 | 0.750 |

TP-17,BN-5



Detail of Soil Parameter in Each Layer from TP-18,BN-5

Depth of Ground Water Table = -1.50 m

Additional Effective Stress from Drawdown Effect = 11.5 t/m²

| Depth (m) | Length (m) | Soil Type | f_s (t/m ²) | f'_s (t/m ²) | Pile Head Movement (mm) | N (Blows/ft) | S_u (t/m ²) | σ'_{vi} (t/m ²) | C_N | N' | ϕ' (Degree) | σ^*_{vi} (t/m ²) | α | β |
|--------------|---------------|-----------------------------|------------------------------|-------------------------------|----------------------------|-----------------|------------------------------|---------------------------------------|-------|------|---------------------|--|----------|---------|
| 0.00-15.00 | 15.00 | Soft Clay,CH | - | 9.40 | 93.72 | - | 1.0 | - | - | - | - | - | 9.405 | - |
| 15.00-21.00 | 6.00 | Stiff to Very Stiff Clay,CH | 6.76 | - | 39.05 | 20 | 13.7 | - | - | - | - | - | 0.494 | - |
| 21.00-27.00 | 6.00 | Very Stiff Clay,CL | 7.72 | - | 39.05 | 25 | 13.0 | - | - | - | - | - | 0.594 | - |
| 27.00-29.50 | 2.50 | Stiff Clay,CH | 8.22 | - | 39.05 | 9 | 6.1 | - | - | - | - | - | 1.348 | - |
| 29.50-36.00 | 6.50 | Very Dense Sand | - | 10.69 | 93.72 | 45 | - | 22.95 | 0.72 | 32.4 | 36.9 | 34.45 | - | 0.310 |
| 36.00-41.25 | 5.25 | Dense to Very Dense Sand | - | 5.91 | 93.72 | 40 | - | 28.83 | 0.61 | 24.4 | 34.6 | 40.33 | - | 0.147 |

Note:

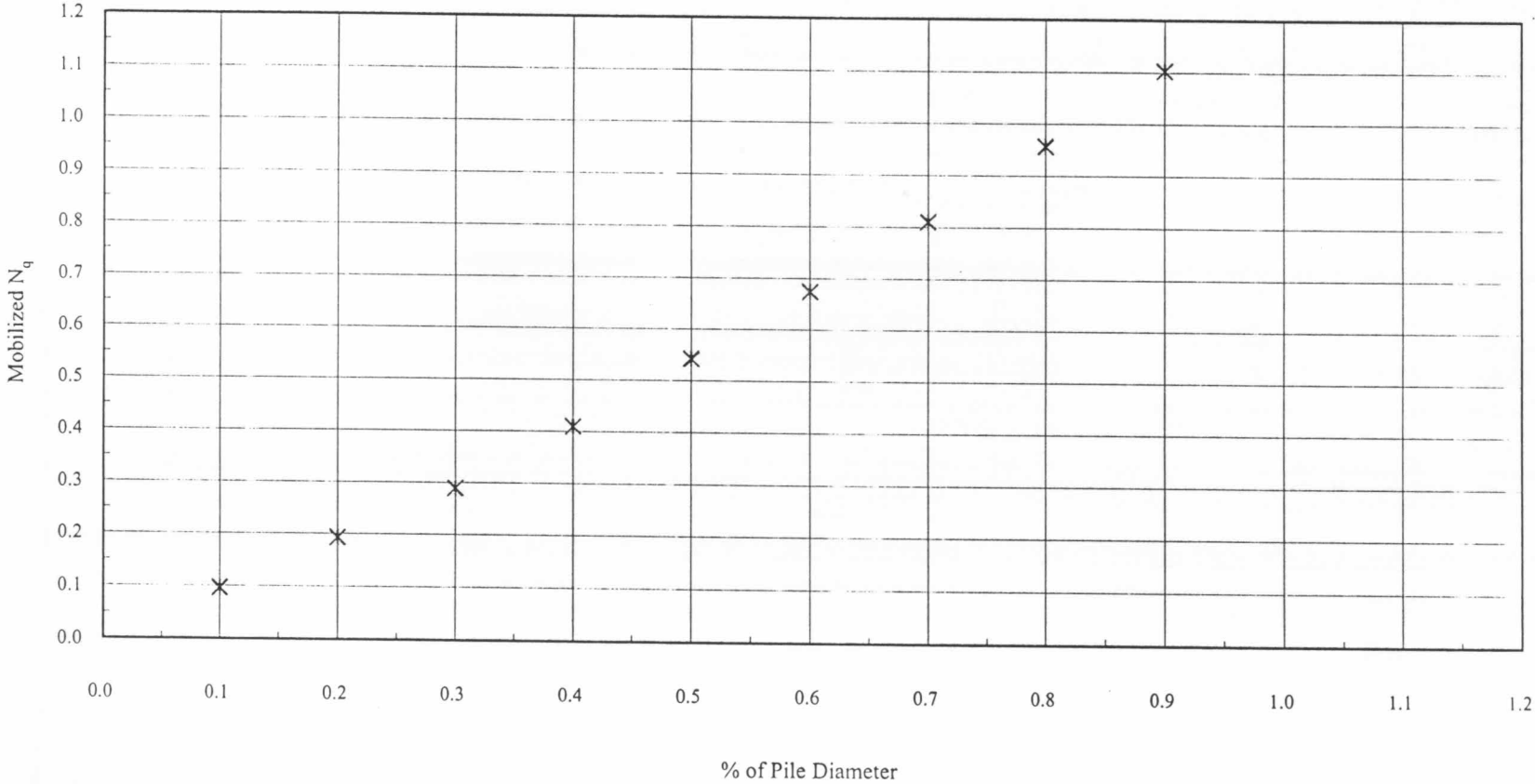
- ค่า S_u สำหรับ Stiff clay ได้จากกราฟ N- S_u ของวีระนันท์ (2526) ซึ่งสอดคล้องกับแมนสรวง,มนัสพล และณัฐพล (2540)
- f_s = Stress at failure
- f'_s = Maximum stress occurred
- σ^*_{vi} = Effective Stress ที่กึ่งกลางชั้นดินที่พิจารณาซึ่งเกิดผลจาก Drawdown ในชั้นดินกรุงเทพฯ

Table of Mobilized N_q of TP-18,BN-5

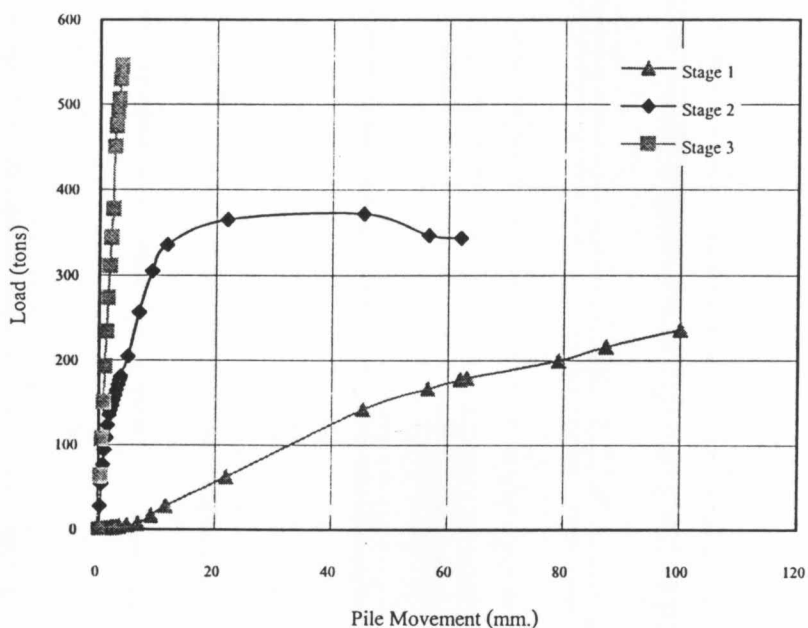
| | | |
|--|-------|---------|
| Diameter of Pile | 1.000 | m |
| Cross Section Area of Pile | 0.785 | m^2 |
| Effective Stress with Drawdown Effect at Pile Tip (σ_v^*) | 42.95 | t/m^2 |

| % of Pile Diameter | Soil Movement at Pile Tip (m) | q_c from curve (t/m^2) | Mobilized $N_q = q_c / \sigma_v^*$ |
|--------------------|-------------------------------|------------------------------|------------------------------------|
| 0.1 | 0.0010 | 4.135 | 0.096 |
| 0.2 | 0.0020 | 8.271 | 0.193 |
| 0.3 | 0.0030 | 12.406 | 0.289 |
| 0.4 | 0.0040 | 17.603 | 0.410 |
| 0.5 | 0.0050 | 23.276 | 0.542 |
| 0.6 | 0.0060 | 28.950 | 0.674 |
| 0.7 | 0.0070 | 34.795 | 0.810 |
| 0.8 | 0.0080 | 41.080 | 0.956 |
| 0.9 | 0.0090 | 47.366 | 1.103 |
| 1.0 | 0.0100 | 53.651 | 1.249 |

TP-18,BN-5

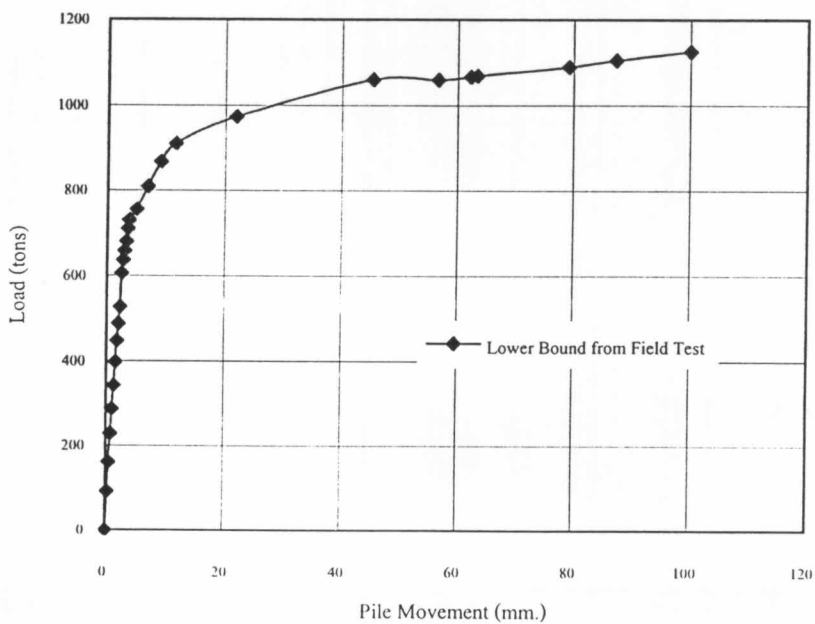


Load-Movement Curve from 3 stages of TP-15



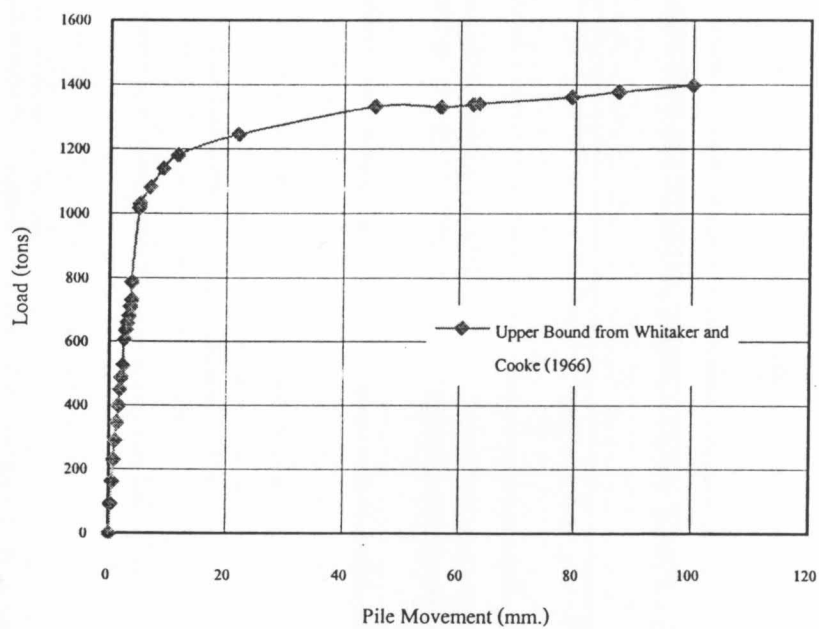
Load-Movement Curve from 3 stages of TP-15

(Summation load at same movement)



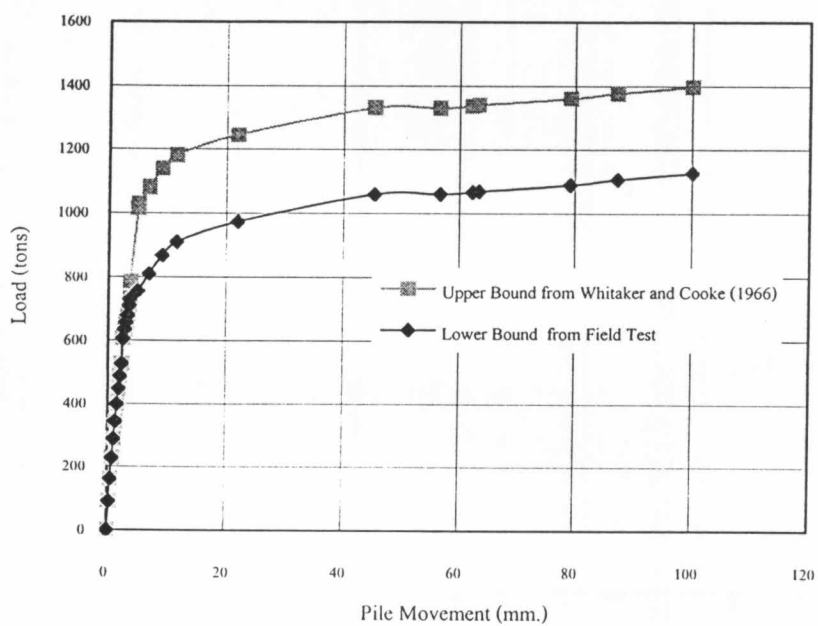
Load-Movement Curve from 3 stages of TP-15

(Summation load at same movement)

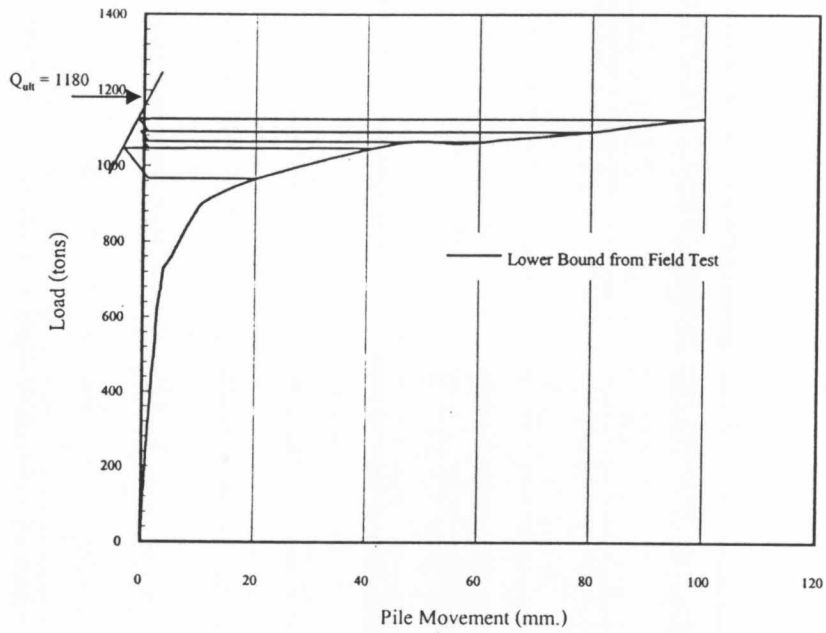


Load-Movement Curve from 3 stages of TP-15

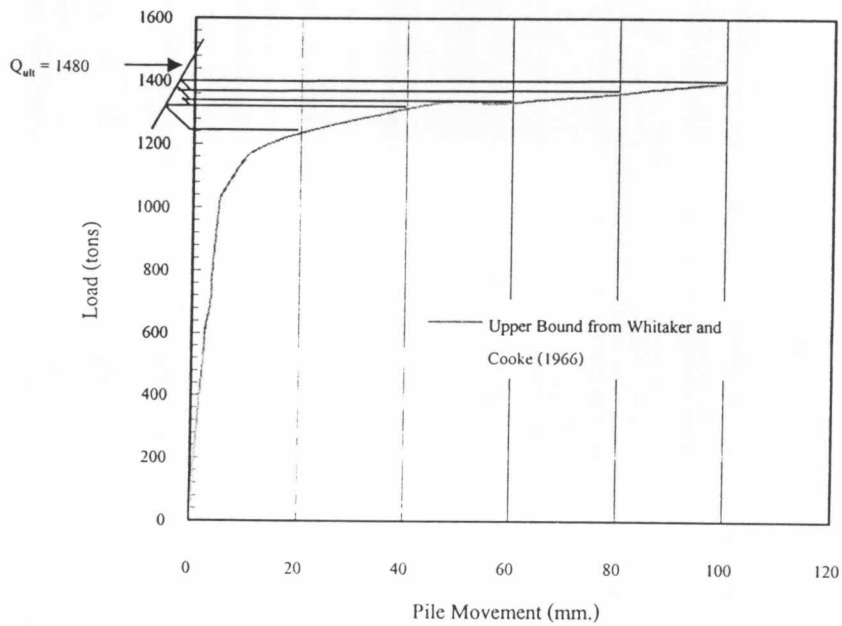
(Summation load at same movement)



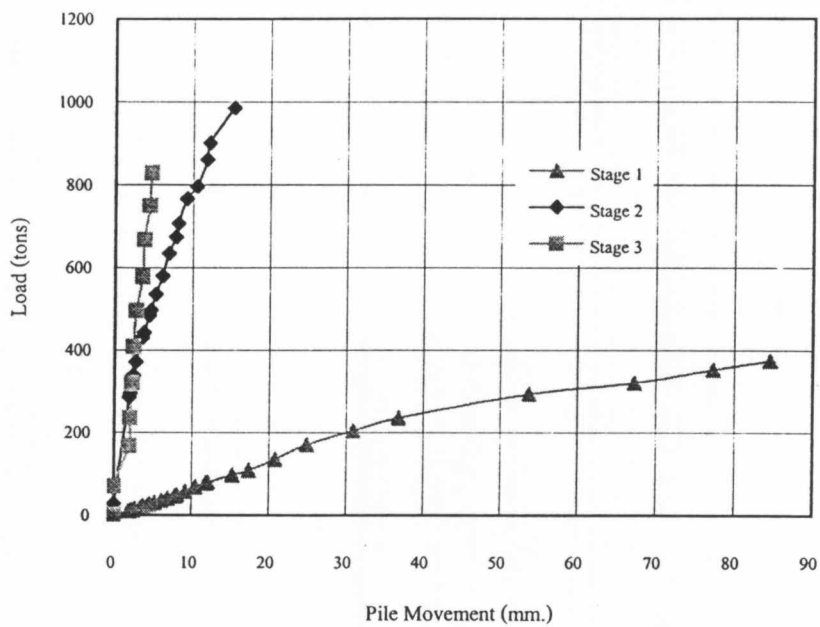
Ultimate Pile Capacity of TP-15,BH-1 from Mazurkiewicz Method
(Lower Bound Curve)



Ultimate Pile Capacity of TP-15,BH-1 from Mazurkiewicz Method
(Upper Bound Curve)

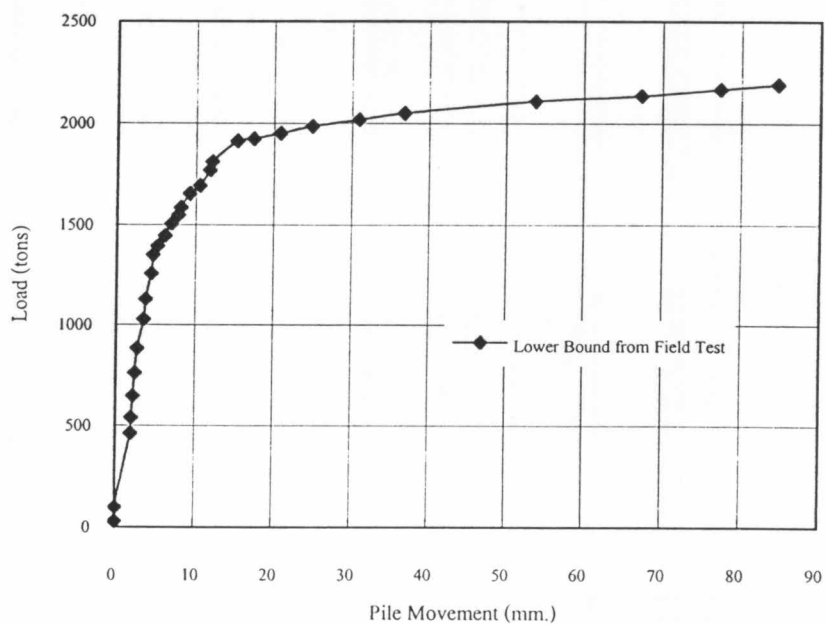


Load-Movement Curve from 3 stages of TP-19 (case1)



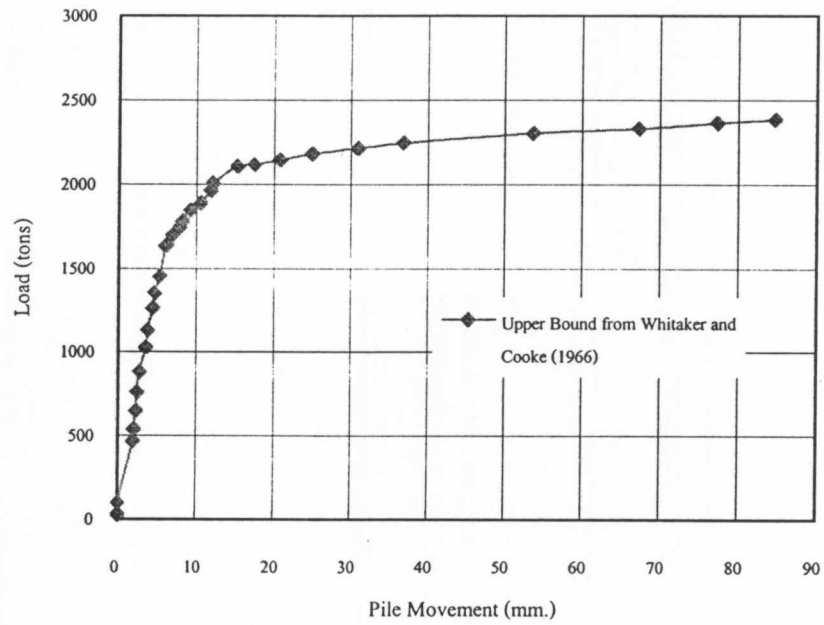
Load-Movement Curve from 3 stages of TP-19 (case1)

(Summation load at same movement)



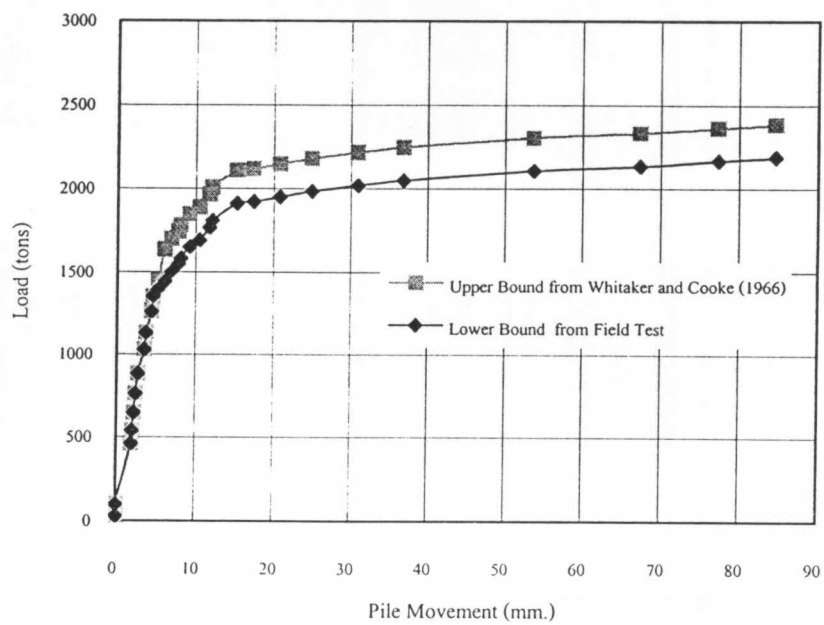
Load-Movement Curve from 3 stages of TP-19 (case1)

(Summation load at same movement)

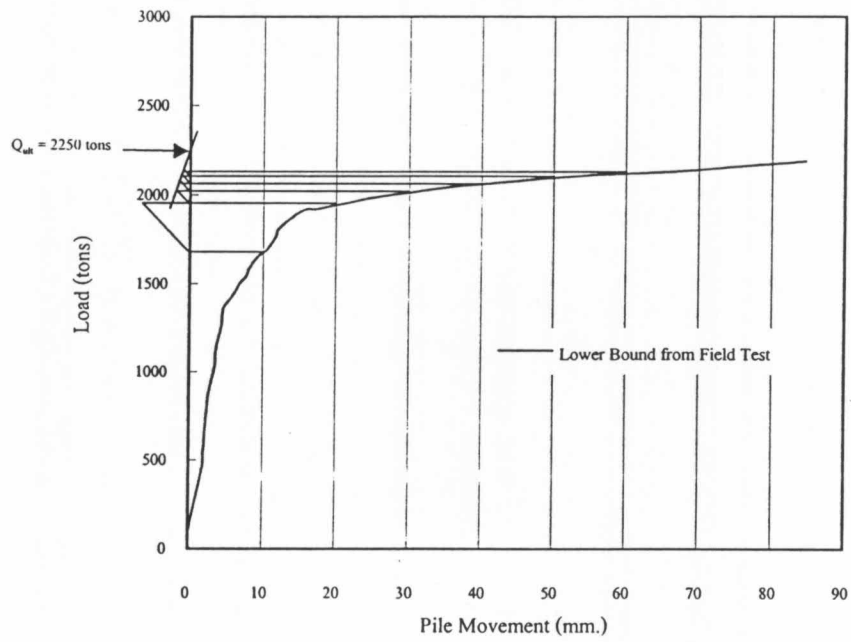


Load-Movement Curve from 3 stages of TP-19 (case1)

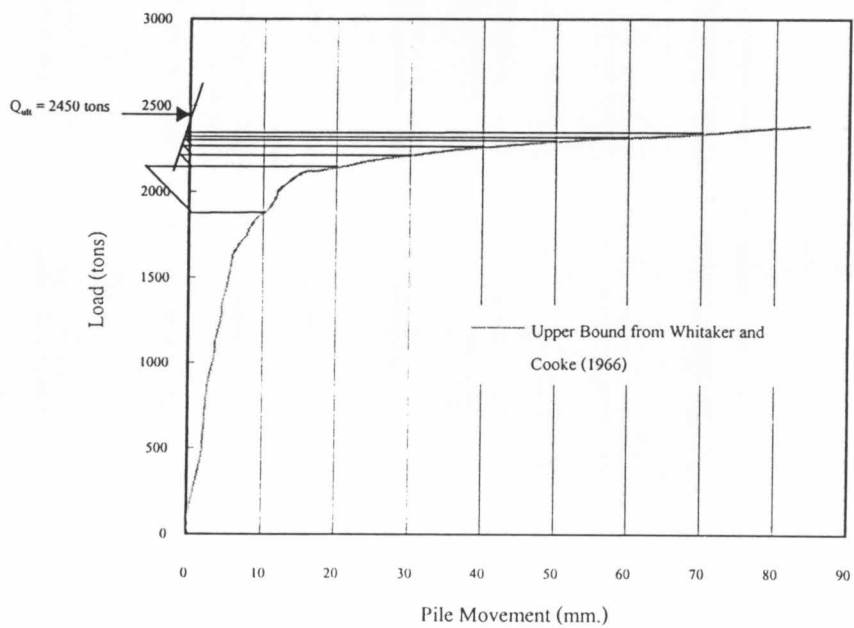
(Summation load at same movement)



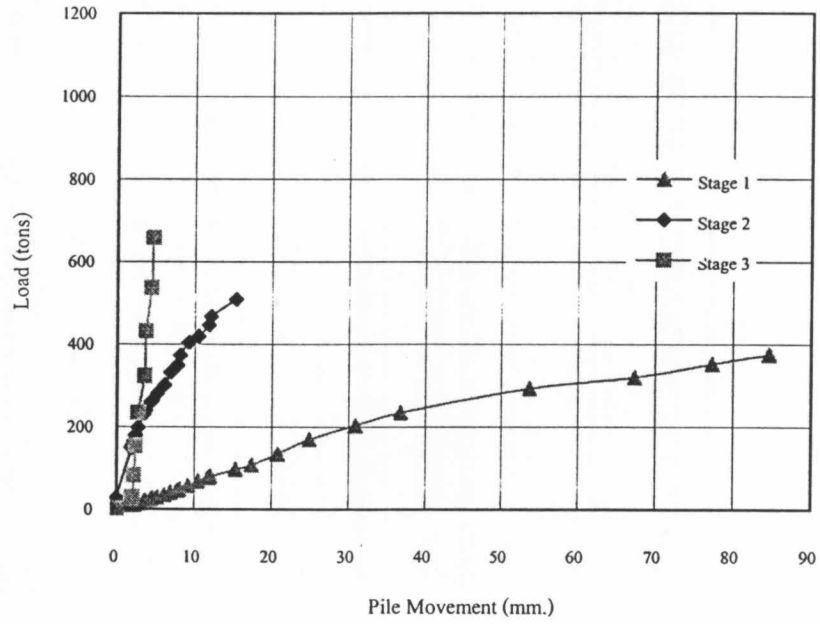
Ultimate Pile Capacity of TP-19,B-6 from Mazurkiewicz Method
 (Lower Bound Curve Case1)



Ultimate Pile Capacity of TP-19,B-6 from Mazurkiewicz Method
 (Upper Bound Curve Case1)

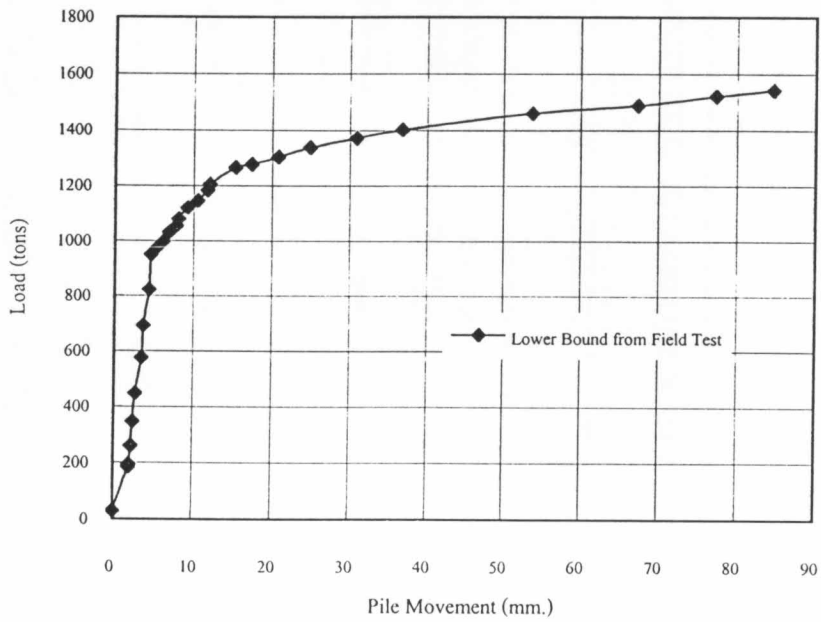


Load-Movement Curve from 3 stages of TP-19 (case2)



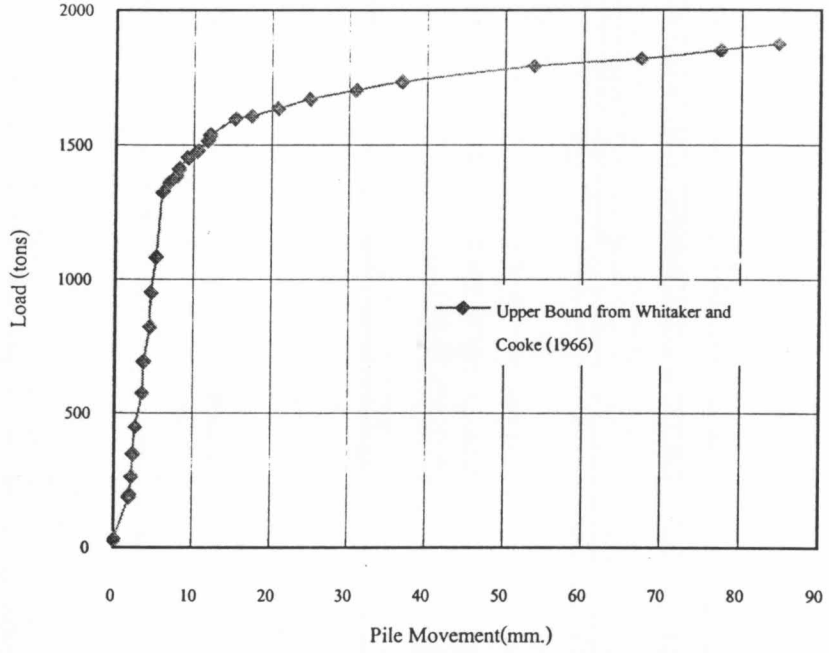
Load-Movement Curve from 3 stages of TP-19 (case2)

(Summation load at same movement)



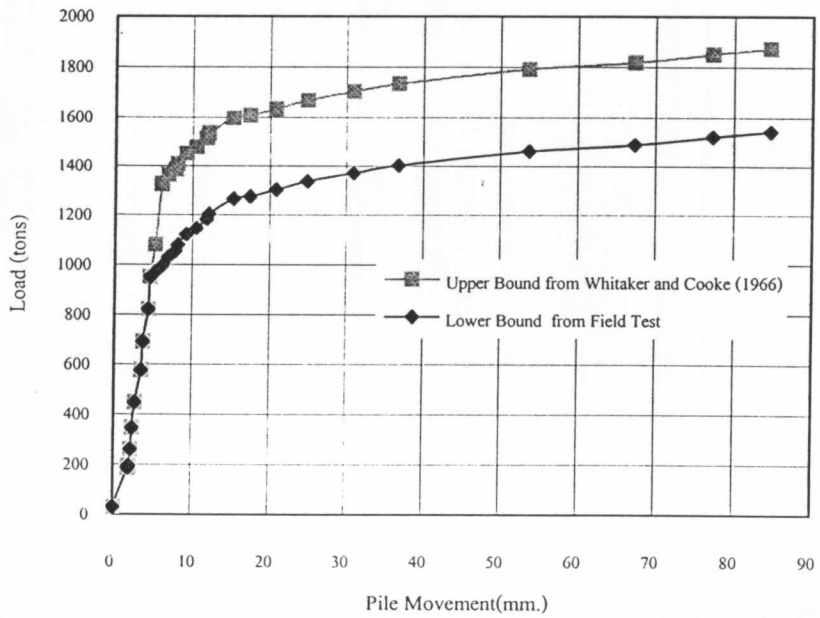
Load-Movement Curve from 3 stages of TP-19 (case2)

(Summation load at same movement)

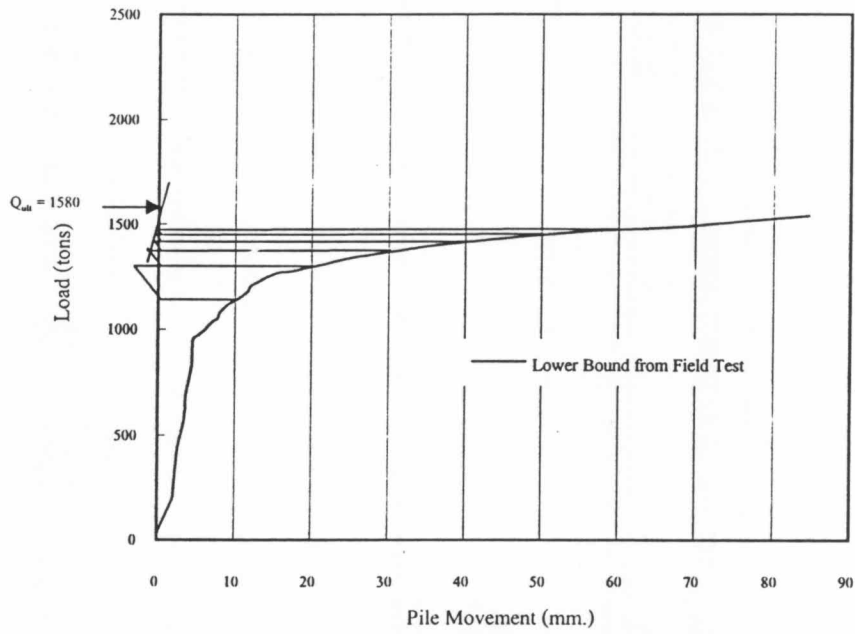


Load-Movement Curve from 3 stages of TP-19 (case2)

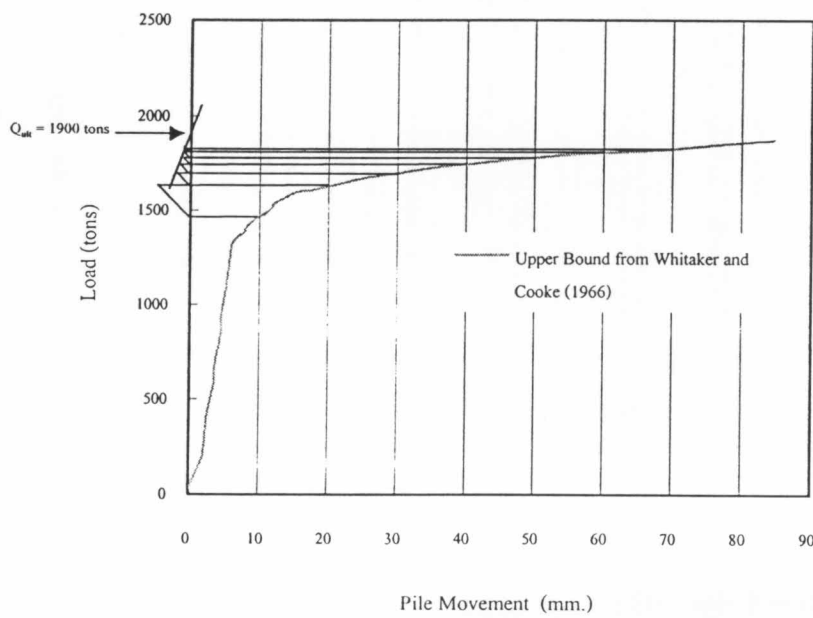
(Summation load at same movement)



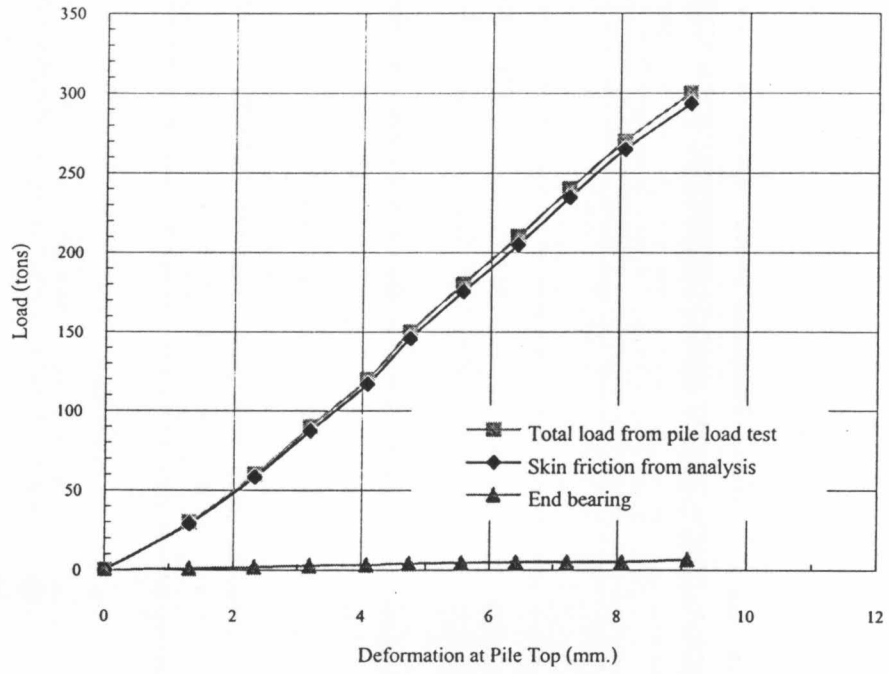
Ultimate Pile Capacity of TP-19,B-6 from Mazurkiewicz Method
(Lower Bound Curve Case2)



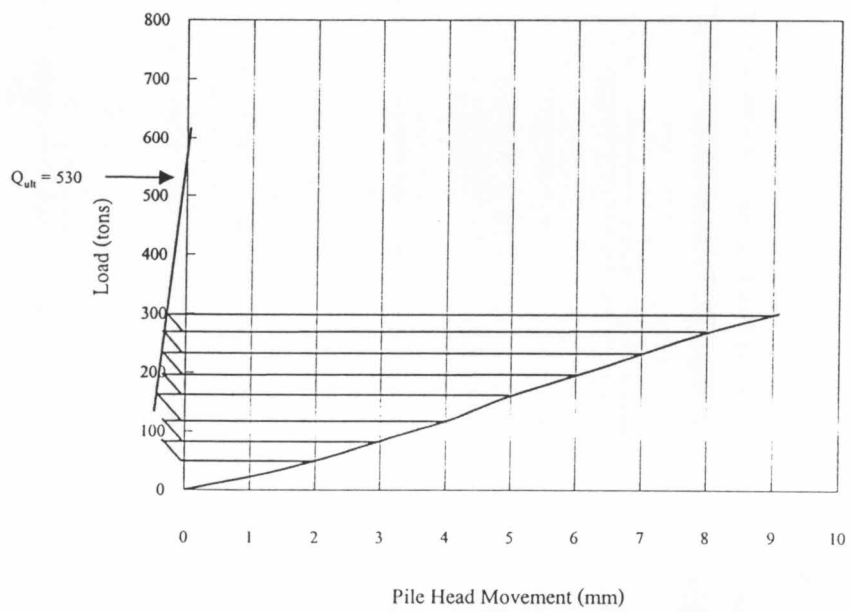
Ultimate Pile Capacity of TP-19,B-6 from Mazurkiewicz Method
(Upper Bound Curve Case2)



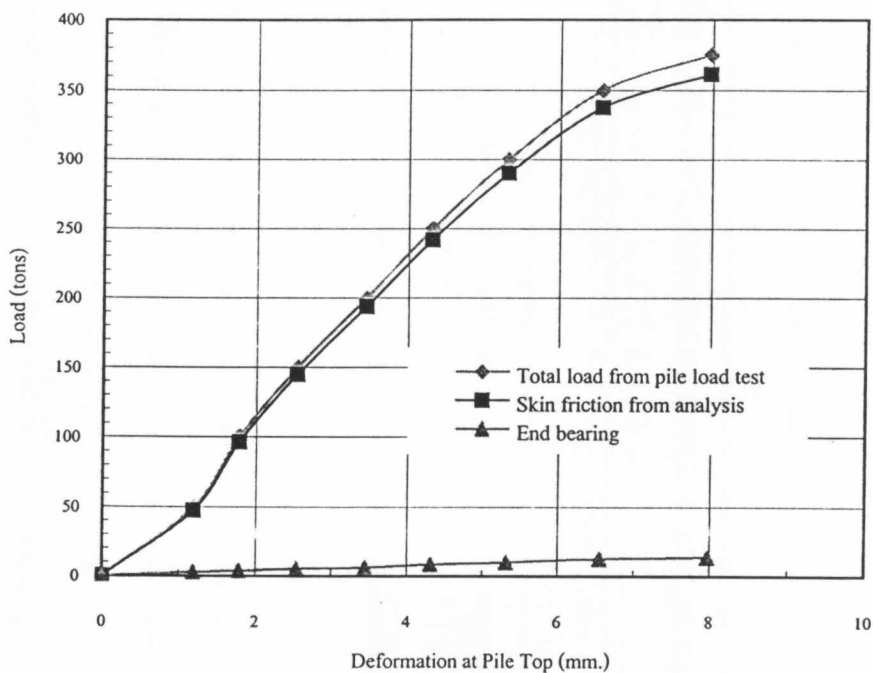
Load - Settlement Curve (TP-13/1,BH-1)



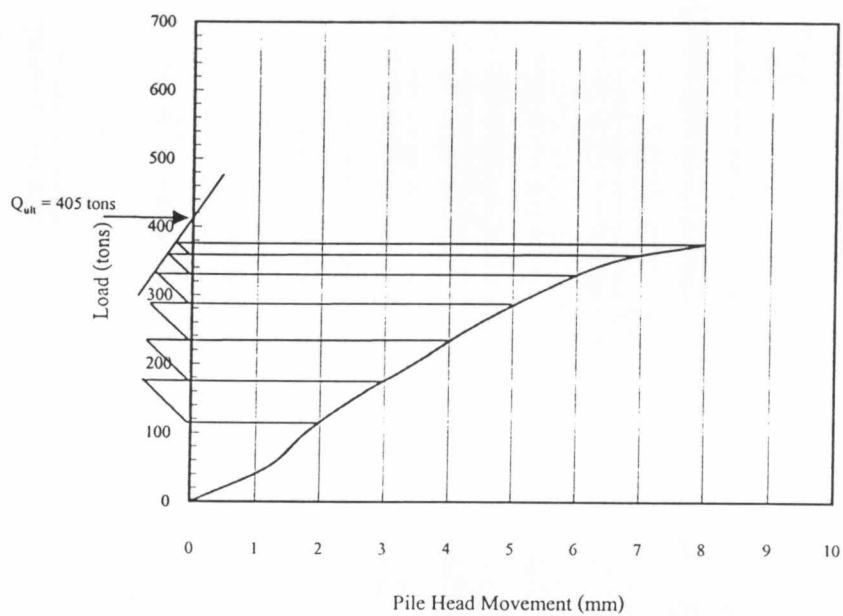
Ultimate Capacity of TP-13/1,BH-1 from Mazurkiewicz Method



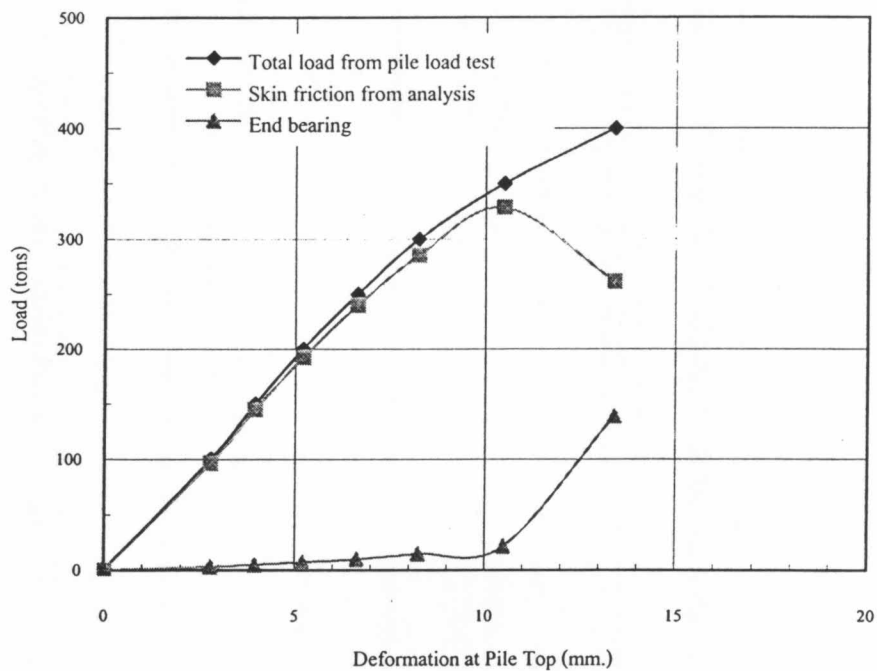
Load - Settlement Curve (TP-14,BH-12)



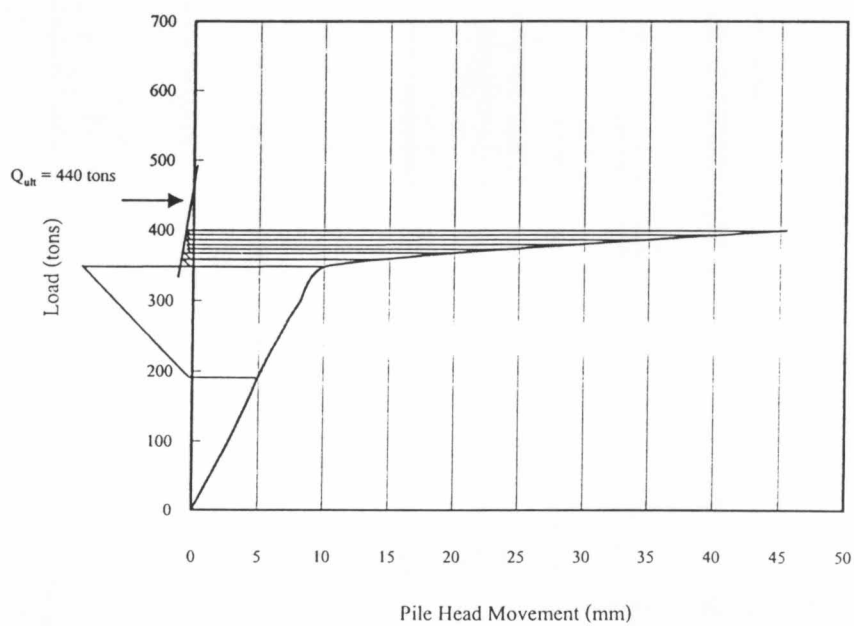
Ultimate Capacity of TP-14,BH-12 from Mazurkiewicz Method



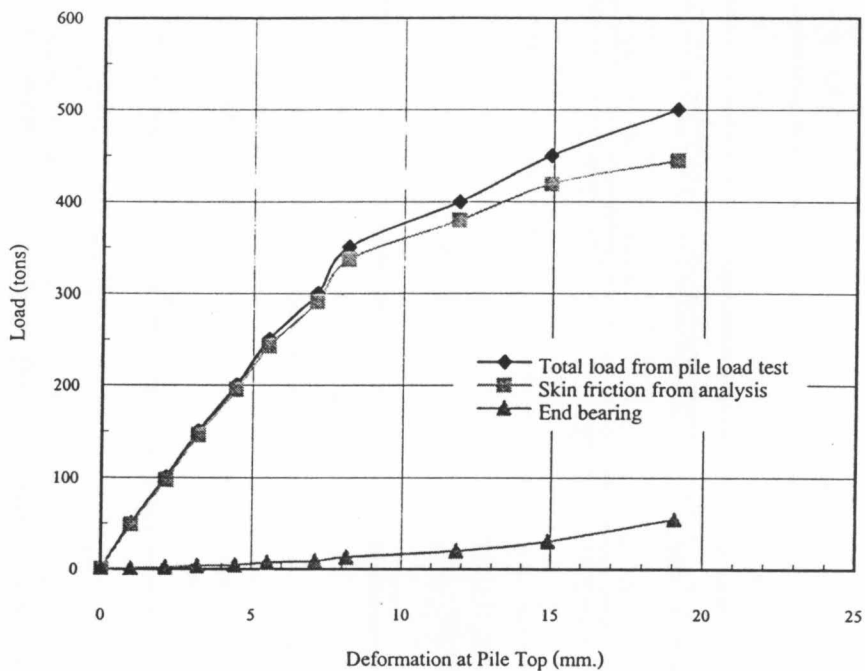
Load - Settlement Curve (TP-16,BN-5)



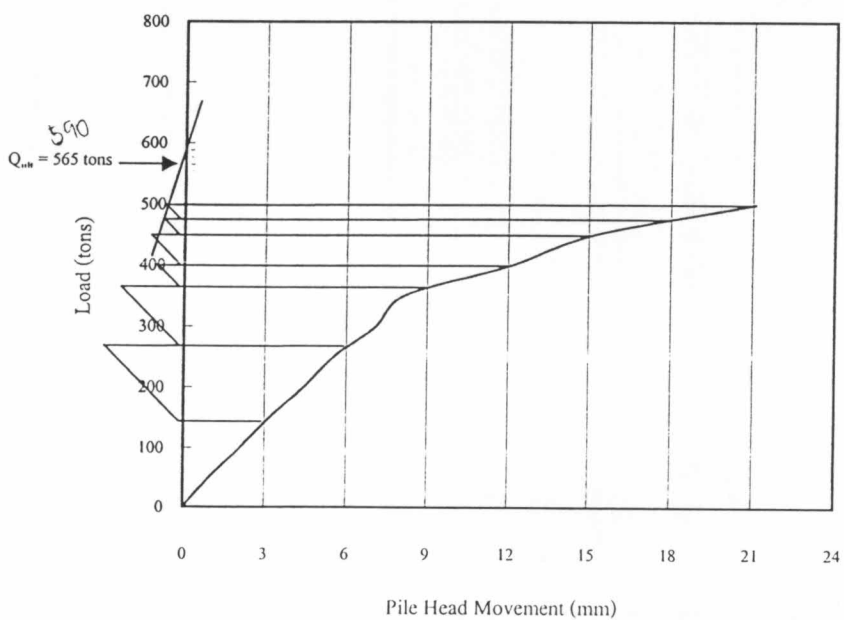
Ultimate Capacity of TP-16,BN-5 from Mazurkiewicz Method



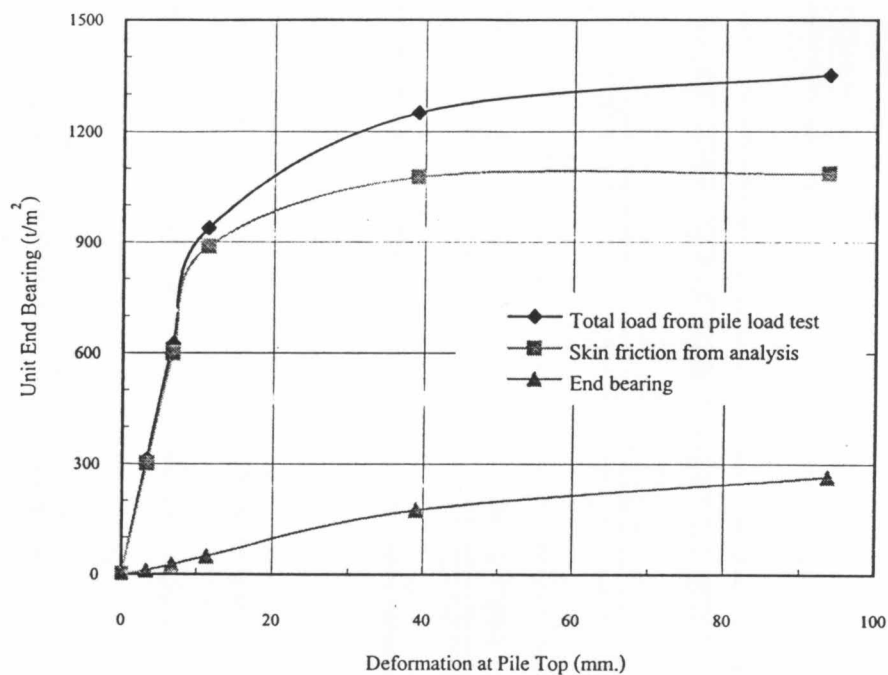
Load - Settlement Curve (TP-17,BN-5)



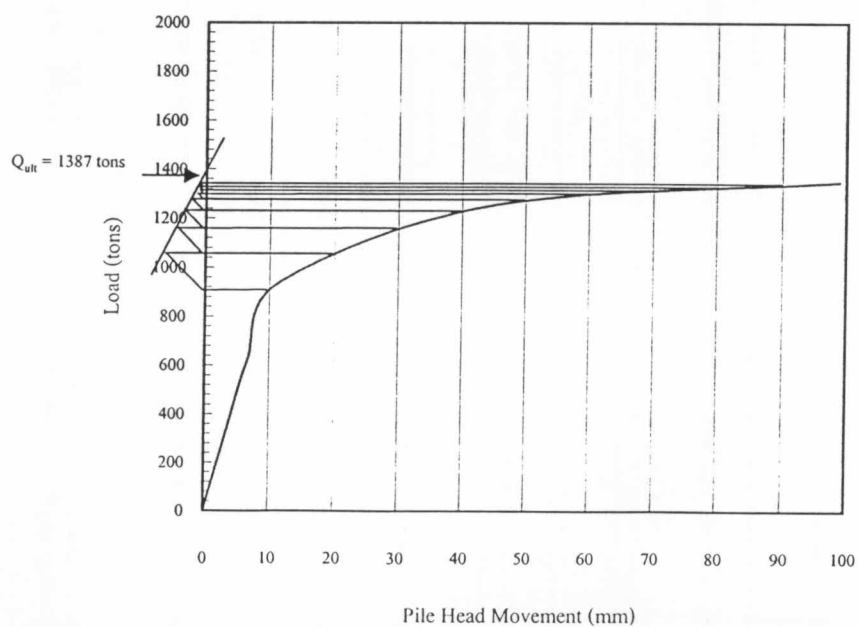
Ultimate Capacity of TP-17,BN-5 from Mazurkiewicz Method



Unit End Bearing-Deformation at Pile Top (TP-18,BN-5)



Ultimate Capacity of TP-18,BN-5 from Mazurkiewicz Method



ประวัติผู้เขียนวิทยานิพนธ์

นายสาครเรศ นาคะ เกิดวันที่ 17 มกราคม พ.ศ. 2523 ที่จังหวัดนครศรีธรรมราช สำเร็จการศึกษาระดับปริญญาตรีวิศวกรรมศาสตรบัณฑิต ภาควิชาวิศวกรรมโยธา คณะวิศวกรรมศาสตร์ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี เมื่อปีการศึกษา 2543 จากนั้นเข้าศึกษาต่อในหลักสูตรวิศวกรรมศาสตรมหาบัณฑิต สาขาวิชาวิศวกรรมโยธา ภาควิชาวิศวกรรมโยธา คณะวิศวกรรมศาสตร์ ที่จุฬาลงกรณ์มหาวิทยาลัย เมื่อปีการศึกษา 2544