

รายการอ้างอิง

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ภาคผนวก

ภาคผนวก ก

ตารางที่ ก-1 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน สنج. นโยบายและแผน
สิ่งแวดล้อม (BM26) ในพื้นที่ที่ 2

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-2.17	-1.33	-	-	-2.17	-1.33	-	-
2539	-2.84	-	-1.64	-	-5.01	-	-1.64	-
2541	-1.8	-2.23	-2.4	-	-6.81	-3.56	-4.04	-
2542	-1.28	-1.08	-1.03	-	-8.09	-4.64	-5.07	-
2543	0.38	-0.01	-0.02	-	-7.71	-4.65	-5.09	-
2544	-1.09	-1.11	-0.97	-	-8.8	-5.76	-6.06	-
2545	1.12	0.29	0.41	-	-7.68	-5.47	-5.65	-
2546	-1.39	-1.48	-1.37	-	-9.07	-6.95	-7.02	-
2547	-	-	-	-	-	-	-	-
2548	-	-	-	-	-	-	-	-

ตารางที่ ก-2 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน สถาบันเทคโนโลยี บางมด
(BM22) ในพื้นที่ที่ 3

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-0.12	-1.12	-0.81	-0.47	-0.12	-1.12	-0.81	-0.47
2539	-0.12	-1.37	-1.07	-0.60	-0.24	-2.49	-1.88	-1.07
2541	-0.05	-1.22	-0.82	-0.40	-0.29	-3.71	-2.70	-1.47
2542	0.63	-1.94	-0.40	0.17	0.34	-5.65	-3.10	-1.30
2543	-0.31	-1.04	-0.87	-0.49	0.03	-6.69	-3.97	-1.79
2544	0.75	-0.56	-0.07	0.47	0.78	-7.25	-4.04	-1.32
2545	0.80	-0.75	0.12	0.53	1.58	-8.00	-3.92	-0.79
2546	-1.16	-3.22	-1.74	-1.34	0.42	-11.22	-5.66	-2.13
2547	0.90	-0.11	0.23	0.65	1.32	-11.33	-5.43	-1.48
2548	0.11	-0.94	-0.46	-0.03	1.43	-12.27	-5.89	-1.51

ตารางที่ ก-3 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน รพ สมเด็จพระปิ่นเกล้า (BM11) ในพื้นที่ที่ 4

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-0.49	-0.81	-0.79	-0.73	-0.49	-0.81	-0.79	-0.73
2539	0.74	0.44	0.38	0.46	0.25	-0.37	-0.41	-0.27
2541	-0.13	-0.89	-0.58	-0.40	0.12	-1.26	-0.99	-0.67
2542	0.28	-0.20	-0.08	0.03	0.40	-1.46	-1.07	-0.64
2543	0.37	0.15	0.24	0.28	0.77	-1.31	-0.83	-0.36
2544	0.17	-0.34	-0.07	0.06	0.94	-1.65	-0.90	-0.30
2545	0.51	0.16	0.32	0.40	1.45	-1.49	-0.58	0.10
2546	-0.59	-0.96	-0.77	-0.66	0.86	-2.45	-1.35	-0.56
2547	0.39	-0.11	0.19	0.28	1.25	-2.56	-1.16	-0.28
2548	-0.68	-1.04	-0.80	-0.72	0.57	-3.60	-1.96	-1.00

ตารางที่ ก-4 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐานสถานีไทย ที.วี.สี ช่อง 3 (BM19) ในพื้นที่ที่ 5

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-0.17	3.83	-0.28	-0.28	-0.17	3.83	-0.28	-0.28
2539	0.4	0.41	0.27	0.05	0.23	4.24	-0.01	-0.23
2541	-0.18	-0.19	-0.29	-0.44	0.05	4.05	-0.3	-0.67
2542	0.07	0.03	-0.06	-0.36	0.12	4.08	-0.36	-1.03
2543	0.98	1.04	1.02	1.01	1.1	5.12	0.66	-0.02
2544	-0.04	-0.07	-0.11	-0.17	1.06	5.05	0.55	-0.19
2545	0.33	0.34	-	0.22	1.39	5.39	-	0.03
2546	-0.34	-0.34	-	-0.47	1.05	5.05	-	-0.44
2547	0.14	0.11	-	0.01	1.19	5.16	-	-0.43
2548	0.38	0.39	-	0.19	1.57	5.55	-	-0.24

ตารางที่ ก-5 ข้อมูลการเคลื่อนตัวในแนวดิ่งของดินที่หมุดหลักฐานพุทธมณฑล อ.นครชัยศรี (BM37) ในพื้นที่ที่ 5

ปี พ.ศ.	ปริมาณการเคลื่อนตัวในแนวดิ่งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวดิ่งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-0.6	-2.35	-	-	-0.6	-2.35	-	-
2539	2.2	-0.92	-	-	1.6	-3.27	-	-
2541	-	-	-	-	-	-	-	-
2542	-	-	-	-	-	-	-	-
2543	1.48	0.34	-	-	3.08	-2.93	-	-
2544	-0.62	-2.8	-	-	2.46	-5.73	-	-
2545	-0.09	-2.34	-	-	2.37	-8.07	-	-
2546	-0.42	-2.2	-	-	1.95	-10.27	-	-
2547	-0.55	-1.23	-	-	1.4	-11.5	-	-
2548	-0.01	-2.17	-	-	1.39	-13.67	-	-

ตารางที่ ก-6 ข้อมูลการเคลื่อนตัวในแนวดิ่งของดินที่หมุดหลักฐานชุมสายฯ เอกชัย เขตบางขุนเทียน (BM40) ในพื้นที่ที่ 5

ปี พ.ศ.	ปริมาณการเคลื่อนตัวในแนวดิ่งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวดิ่งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	0.03	-2.67	-	-	0.03	-2.67	-	-
2539	0.05	-3.34	-	-	0.08	-6.01	-	-
2541	-	-	-	-	-	-	-	-
2542	-	-	-	-	-	-	-	-
2543	-	-	-	-	-	-	-	-
2544	-	-	-	-	-	-	-	-
2545	-	-	-	-	-	-	-	-
2546	-	-	-	-	-	-	-	-
2547	-	-	-	-	-	-	-	-
2548	-0.11	-	-	-	-0.03	-	-	-

ตารางที่ ก-7 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หุดหลักฐาน สถานีกำจัดน้ำเสีย ดอนเมือง (BM15) ในพื้นที่ที่ 6

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2534	-	-1.50	-1.10	-0.72	-	-1.50	-1.10	-0.72
2535	-	-4.25	-2.72	-2.54	-	-5.75	-3.82	-3.26
2536	-	-2.76	-1.76	-1.24	-	-8.51	-5.58	-4.50
2537	-	-4.56	-4.71	-4.27	-	-13.07	-10.29	-8.77
2538	-	-1.26	-1.28	-1.04	-	-14.33	-11.57	-9.81
2539	-1.02	-4.20	-4.13	-3.78	-1.02	-18.53	-15.70	-13.59
2540	-	-	-	-	-	-	-	-
2541	-3.78	-	-	-	-4.80	-	-	-
2542	-1.77	-2.94	-2.75	-1.95	-6.57	-21.47	-18.45	-15.54
2543	-2.13	1.05	1.05	1.40	-8.70	-20.42	-17.40	-14.14
2544	-1.45	-4.98	-4.91	-4.79	-10.15	-25.40	-22.31	-18.93
2545	-0.06	-0.08	-0.57	-0.49	-10.21	-25.48	-22.88	-19.42
2546	-1.58	-2.50	-2.04	-1.86	-11.79	-27.98	-24.92	-21.28
2547	-0.42	-0.95	-0.79	-0.63	-12.21	-28.93	-25.71	-21.91
2548	-0.82	-1.41	-1.24	-1.13	-13.03	-30.34	-26.95	-23.04



ตารางที่ ก-9 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน วัดราชบรูณะฯ (วัดเลียบ)
(BM7) ในพื้นที่ที่ 6

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2534	-	-	-	-	-	-	-	-
2535	-	-	-	-	-	-	-	-
2536	-	-	-	-	-	-	-	-
2537	-	-	-	-	-	-	-	-
2538	-0.49	-0.69	-0.55	-0.50	-0.49	-0.69	-0.55	-0.50
2539	0.13	-	-	-	-	-	-	-
2540	-	-	-	-	-	-	-	-
2541	-0.89	-	-	-	-1.38	-	-	-
2542	0.15	-1.09	-0.56	-0.13	-1.23	-1.78	-1.11	-0.63
2543	0.11	-	0.06	0.10	-1.12	-	-1.05	-0.53
2544	-0.06	-	-0.12	-0.07	-1.18	-	-1.17	-0.60
2545	0.37	-	-	-	-0.81	-	-	-
2546	-0.03	-	-	-	-0.84	-	-	-
2547	-0.04	-0.22	0.03	-0.10	-0.88	-2.00	-1.14	-0.70
2548	-0.78	-0.88	-0.79	-0.76	-1.66	-2.88	-1.93	-1.46

ตารางที่ ก-10 ข้อมูลการเคลื่อนตัวในแนวดิ่งของดินที่หมุดหลักฐาน ม. รามคำแหง หัวหมาก (BM10) ในพื้นที่ที่ 6

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวดิ่งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวดิ่งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2534	-	-	-	-	-	-	-	-
2535	-	-	-	-	-	-	-	-
2536	-	-	-	-	-	-	-	-
2537	-	-	-	-	-	-	-	-
2538	-0.05	-2.09	-1.29	-0.58	-0.05	-2.09	-1.29	-0.58
2539	-1.47	-2.47	-2.30	-1.50	-1.52	-4.56	-3.59	-2.08
2540	-	-	-	-	-	-	-	-
2541	-0.77	-2.03	-1.35	-0.79	-2.29	-6.59	-4.94	-2.87
2542	-1.58	-2.59	-2.41	-1.57	-3.87	-9.18	-7.35	-4.44
2543	-0.15	-0.08	-0.62	-0.17	-4.02	-9.26	-7.97	-4.61
2544	0.17	-0.73	-0.57	0.15	-3.85	-9.99	-8.54	-4.46
2545	-0.01	-0.89	-0.67	-0.01	-3.86	-10.88	-9.21	-4.47
2546	-0.29	-1.05	-0.82	-0.29	-4.15	-11.93	-10.03	-4.76
2547	-0.18	-1.38	-0.87	-0.21	-4.33	-13.31	-10.90	-4.97
2548	-1.74	-2.76	-2.36	-1.71	-6.07	-16.07	-13.26	-6.68

ตารางที่ ก-11 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน คลังพัสดุการเคหะฯ คลอง
จั่น (BM18) ในพื้นที่ที่ 6

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2534	-	-	-	-	-	-	-	-
2535	-	-	-	-	-	-	-	-
2536	-	-	-	-	-	-	-	-
2537	-	-	-	-	-	-	-	-
2538	-0.37	-1.5	-0.59	-0.42	-0.37	-1.5	-0.59	-0.42
2539	-3.78	-2.45	-1.6	-1.3	-4.15	-3.95	-2.19	-1.72
2540	-	-	-	-	-	-	-	-
2541	-1.26	-2.41	-1.6	-1.34	-5.41	-6.36	-3.79	-3.06
2542	-0.37	-6.27	-0.7	-0.42	-5.78	-12.63	-4.49	-3.48
2543	0.41	-	0.25	0.4	-5.37	-	-4.24	-3.08
2544	-0.48	-	-0.73	-0.49	-5.85	-	-4.97	-3.57
2545	0.9	0.37	0.74	0.93	-4.95	-12.26	-4.23	-2.64
2546	-0.28	-1.1	-0.45	-0.29	-5.23	-13.36	-4.68	-2.93
2547	0.12	-0.42	-0.04	0.13	-5.11	-13.78	-4.72	-2.8
2548	-1.48	-2.03	-1.58	-1.42	-6.59	-15.81	-6.3	-4.22

ตารางที่ ก-12 ข้อมูลการเคลื่อนตัวในแนวดิ่งของดินที่หมุดหลักฐาน กองบินตำรวจรามอินทรา (BM16) ในพื้นที่ที่ 6

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวดิ่งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวดิ่งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2534	-	-	-	-	-	-	-	-
2535	-	-	-	-	-	-	-	-
2536	-	-	-	-	-	-	-	-
2537	-	-	-	-	-	-	-	-
2538	-0.06	-1.07	-0.94	-	-0.06	-1.07	-0.94	-
2539	-2.35	-2.88	-2.76	-	-2.41	-3.95	-3.70	-
2540	-	-	-	-	-	-	-	-
2541	-1.38	-2.70	-2.54	-2.17	-3.79	-6.65	-6.24	-2.17
2542	-0.07	-1.50	-1.28	-0.77	-3.86	-8.15	-7.52	-2.94
2543	-0.44	-0.86	-0.77	-0.44	-4.30	-9.01	-8.29	-3.38
2544	-0.99	-1.54	-1.43	-1.04	-5.29	-10.55	-9.72	-4.42
2545	1.04	0.52	0.63	0.97	-4.25	-10.03	-9.09	-3.45
2546	-0.72	-1.03	-1.02	-0.77	-4.97	-11.06	-10.11	-4.22
2547	-0.03	-0.47	-0.40	-0.01	-5.00	-11.53	-10.51	-4.23
2548	-1.11	-0.15	-0.15	-0.12	-6.11	-11.68	-10.66	-4.35

ตารางที่ ก-13 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน วัดกึ่งแก้ว (BM29) ในพื้นที่
ที่ 7

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-2.94	-3.85	-	-	-2.94	-3.85	-	-
2539	-1.35	-2.58	-	-	-4.29	-6.43	-	-
2541	-	-7.68	-	-	-	-14.11	-	-
2542	-	-	-	-	-	-	-	-
2543	-	-6.77	-	-	-	-20.88	-	-
2544	-0.17	-2.18	-	-	-4.46	-23.06	-	-
2545	1.02	-1.3	-	-	-3.44	-24.36	-	-
2546	-0.54	-2.38	-	-	-3.98	-26.74	-	-
2547	0.36	-1.29	-	-	-3.62	-28.03	-	-
2548	-0.71	-3.42	-	-	-4.33	-31.45	-	-

ตารางที่ ก-14 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน ร.ร. บางพลีราษฎร์บำรุง อ.
บางพลี (BM30) ในพื้นที่ที่ 7

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-5.25	-7.89	-	-	-5.25	-7.89	-	-
2539	-3.3	-6.78	-	-	-8.55	-14.67	-	-
2541	-2.2	-5.43	-	-	-10.75	-20.1	-	-
2542	-	-	-	-	-	-	-	-
2543	-	-	-	-	-	-	-	-
2544	-0.48	-0.99	-	-	-11.23	-21.09	-	-
2545	0.17	-1.92	-	-	-11.06	-23.01	-	-
2546	-0.72	-2.4	-	-	-11.78	-25.41	-	-
2547	0.51	-1.25	-	-	-11.27	-26.66	-	-
2548	-1.2	-2.54	-	-	-12.47	-29.2	-	-

ตารางที่ ก-19 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน สถาบันเทคโนโลยี ลาดกระบัง (BM20) ในพื้นที่ที่ 8

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-1.91	-2.85	-2.35	-1.91	-1.91	-2.85	-2.35	-1.91
2539	-1.03	-2.54	-1.8	-1.15	-2.94	-5.39	-4.15	-3.06
2541	-2.69	-3.92	-3.43	-2.85	-5.63	-9.31	-7.58	-5.91
2542	-	-	-	-	-	-	-	-
2543	-	-	-	-	-	-	-	-
2544	-0.36	-	-1.05	-0.5	-5.99	-	-8.63	-6.41
2545	1.67	-	1.23	1.59	-4.32	-	-7.4	-4.82
2546	-1.05	-2.39	-1.63	-1.12	-5.37	-11.7	-9.03	-5.94
2547	0.34	-	-0.13	0.32	-5.03	-	-9.16	-5.62
2548	-1.07	-	-1.45	-1.09	-6.1	-	-10.61	-6.71

ตารางที่ ก-20 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน วัดสี่ชมพู เขตหนองจอก (BM56) ในพื้นที่ที่ 9

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-	-	-	-	-	-	-	-
2539	-	-	-	-	-	-	-	-
2541	-	-	-	-	-	-	-	-
2542	-	-	-	-	-	-	-	-
2543	0.72	0.24	-	-	0.72	0.24	-	-
2544	-1.26	-2.63	-	-	-0.54	-2.39	-	-
2545	-0.1	-1.2	-	-	-0.64	-3.59	-	-
2546	-0.93	-2.72	-	-	-1.57	-6.31	-	-
2547	-0.79	-1.66	-	-	-2.36	-7.97	-	-
2548	-0.92	-2.57	-	-	-3.28	-10.54	-	-

ตารางที่ ก-21 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน วัดราษฎร์บำรุง เขตหนองจอก (BM57) ในพื้นที่ที่ 9

ปี พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-	-	-	-	-	-	-	-
2539	-	-	-	-	-	-	-	-
2541	-	-	-	-	-	-	-	-
2542	-	-	-	-	-	-	-	-
2543	1.82	-1.43	-	-	1.82	-1.43	-	-
2544	0.02	-1.96	-	-	1.84	-3.39	-	-
2545	0.69	-1.78	-	-	2.53	-5.17	-	-
2546	-0.01	-2.36	-	-	2.52	-7.53	-	-
2547	0.23	-2.49	-	-	2.75	-10.02	-	-
2548	-0.95	-5.62	-	-	1.8	-15.64	-	-

ตารางที่ ก-22 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน ศาลากลางจังหวัดนนทบุรี (BM33) ในพื้นที่ที่ 10

พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	0.63	-0.35	-	-	0.63	-0.35	-	-
2539	0.16	-0.66	-	-	0.79	-1.01	-	-
2541	-0.09	-1.11	-	-	0.7	-2.12	-	-
2542	1.23	0.16	-	-	1.93	-1.96	-	-
2543	0.91	0.39	-	-	2.84	-1.57	-	-
2544	0.13	-0.4	-	-	2.97	-1.97	-	-
2545	1.56	0.99	-	-	4.53	-0.98	-	-
2546	-0.81	-1.2	-	-	3.72	-2.18	-	-
2547	0.37	0	-	-	4.09	-2.18	-	-
2548	-0.77	-0.88	-	-	3.32	-3.06	-	-

ตารางที่ ก-23 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน วัดไทรน้อย อ.ไทรน้อย (BM33) ในพื้นที่ที่ 10

ปี พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	1.19	-	-	-	1.19	-	-	-
2539	1.35	1.27	-	-	2.54	1.27	-	-
2541	-	-	-	-	-	-	-	-
2542	-	-	-	-	-	-	-	-
2543	1.43	1.03	-	-	3.97	2.3	-	-
2544	-0.76	-2.19	-	-	3.21	0.11	-	-
2545	0.99	2.52	-	-	4.2	2.63	-	-
2546	-0.02	-0.25	-	-	4.18	2.38	-	-
2547	0.07	-0.65	-	-	4.25	1.73	-	-
2548	0.09	0.15	-	-	4.34	1.88	-	-

ตารางที่ ก-24 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน การไฟฟ้าบางกรวย (BM1) ใน พื้นที่ที่ 10

ปี พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	-0.34	-0.052	-0.47	-0.48	-0.34	-0.052	-0.47	-0.48
2539	-	-0.27	-0.18	-0.16	-	-0.322	-0.65	-0.64
2541	-1.33	-1.56	-1.52	-1.51	-1.67	-1.882	-2.17	-2.15
2542	0.05	-0.26	-0.09	-0.07	-1.62	-2.142	-2.26	-2.22
2543	0.49	0.4	0.45	0.44	-1.13	-1.742	-1.81	-1.78
2544	-0.45	-0.67	-0.56	-0.57	-1.58	-2.412	-2.37	-2.35
2545	-0.74	0.63	0.66	0.68	-2.32	-1.782	-1.71	-1.67
2546	-1.29	-1.31	-1.3	-1.29	-3.61	-3.092	-3.01	-2.96
2547	-0.04	-0.2	-0.11	-0.11	-3.65	-3.292	-3.12	-3.07
2548	-1.44	-1.59	-1.48	-1.49	-5.09	-4.882	-4.6	-4.56

ตารางที่ ก-25 ข้อมูลการเคลื่อนตัวในแนวตั้งของดินที่หมุดหลักฐาน กรมชลประทานปากเกร็ด (BM17) ในพื้นที่ที่ 10

ปี พ.ศ.	ปริมาณการเคลื่อนตัวในแนวตั้งที่ความลึกต่างๆ จากผิวดิน, ซม.				ปริมาณการเคลื่อนตัวในแนวตั้งสะสมที่ความลึก ต่างๆจากผิวดิน, ซม.			
	20 ม.(BM)	1 ม.	10-15 ม.	15-25 ม.	20 ม. (BM)	1 ม.	10-15 ม.	15-25 ม.
2538	1.27	0.56	1.1	1.18	1.27	0.56	1.1	1.18
2539	0.1	-0.95	-0.13	0.02	1.37	-0.39	0.97	1.2
2541	-0.18	-0.75	-0.39	-0.24	1.19	-1.14	0.58	0.96
2542	1.37	-0.11	1.16	1.32	2.56	-1.25	1.74	2.28
2543	0.87	0.13	0.77	0.82	3.43	-1.12	2.51	3.1
2544	-0.48	-1.36	-0.57	-0.48	2.95	-2.48	1.94	2.62
2545	1.54	0.52	0.63	0.97	4.49	-1.96	2.57	3.59
2546	-0.05	-1.03	-1.02	-0.77	4.44	-2.99	1.55	2.82
2547	0.27	-0.42	-0.21	0.26	4.71	-3.41	1.34	3.08
2548	-0.87	-1.48	-0.95	-0.93	3.84	-4.89	0.39	2.15

ภาคผนวก ข

ตารางที่ ข-1 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 2

พื้นที่ที่ 2

Pipe jacking			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
2.5	FEM	Total settlement [mm]	61.31	53.99	36.14	18.15
		Stage construction settlement [mm]	46.45	41.57	24.66	16.86
		Consolidation settlement [mm]	14.86	12.42	11.48	1.29
		Axial force [ton/m]	9.82	18.98	30.03	42.91
		Maximum shear force [ton/m]	1.79	2.12	2.43	6.50
		Maximum bending moment [ton-m]	3.55	6.35	9.77	15.78
	Hand calculation	Total settlement [mm]	12.73	11.87	11.29	8.49
		Immediate settlement [mm]	8.57	8.37	0.92	2.92
		Consolidation settlement [mm]	2.17	1.49	1.19	-0.66
	Design life	10 [years]	122.21	110.46	85.89	50.50
		30 [years]	249.09	223.28	184.64	127.58
		50 [years]	370.04	331.27	279.67	202.91
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
2	FEM	Total settlement [mm]	43.23	42.19	35.11	14.30
		Stage construction settlement [mm]	32.98	32.23	28.40	13.31
		Consolidation settlement [mm]	10.25	9.96	6.71	0.99
		Axial force [ton/m]	7.74	15.17	23.80	33.59
		Maximum shear force [ton/m]	1.39	1.64	2.07	4.99
		Maximum bending moment [ton-m]	2.61	4.72	7.45	11.49
	Hand calculation	Total settlement [mm]	10.18	9.55	9.11	7.25
		Immediate settlement [mm]	6.70	6.58	0.63	2.63
		Consolidation settlement [mm]	1.49	0.97	0.71	-0.49
	Design life	10 [years]	112.00	100.99	89.16	58.36
		30 [years]	229.06	212.96	187.07	135.44
		50 [years]	349.58	320.56	281.71	210.77
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
1.5	FEM	Total settlement [mm]	28.98	30.19	27.64	10.98
		Stage construction settlement [mm]	23.31	23.53	21.90	10.23
		Consolidation settlement [mm]	5.67	6.66	5.74	0.75
		Axial force [ton/m]	5.92	11.67	18.37	25.05
		Maximum shear force [ton/m]	1.00	1.31	1.62	3.64
		Maximum bending moment [ton-m]	1.85	3.52	5.54	7.96
	Hand calculation	Total settlement [mm]	8.57	8.03	7.58	6.23
		Immediate settlement [mm]	5.21	0.58	2.43	-0.08
		Consolidation settlement [mm]	1.36	0.90	0.60	-0.25
	Design life	10 [years]	93.49	87.49	82.24	55.10
		30 [years]	217.94	198.65	179.37	131.71
		50 [years]	337.77	305.88	273.64	206.82

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
1.2	FEM	Total settlement [mm]	24.01	23.56	22.51	8.91
		Stage construction settlement [mm]	18.29	18.76	18.26	8.42
		Consolidation settlement [mm]	5.72	4.80	4.25	0.49
		Axial force [ton/m]	4.58	9.65	15.05	20.20
		Maximum shear force [ton/m]	0.74	1.10	1.38	2.87
		Maximum bending moment [ton-m]	1.43	2.97	4.65	6.42
	Hand calculation	Total settlement [mm]	7.41	6.99	6.62	5.52
		Immediate settlement [mm]	4.23	0.50	2.39	-0.04
		Consolidation settlement [mm]	1.18	0.79	0.53	-0.13
	Design life	10 [years]	90.31	83.27	76.83	52.94
		30 [years]	213.15	193.68	173.48	129.08
		50 [years]	332.22	300.55	267.53	203.96
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
1	FEM	Total settlement [mm]	15.22	16.18	16.26	6.97
		Stage construction settlement [mm]	13.47	13.93	14.37	6.59
		Consolidation settlement [mm]	1.75	2.25	1.89	0.38
		Axial force [ton/m]	3.64	7.38	11.25	14.94
		Maximum shear force [ton/m]	0.58	2.36	1.05	2.01
		Maximum bending moment [ton-m]	1.16	2.38	3.62	4.84
	Hand calculation	Total settlement [mm]	6.57	6.23	5.94	5.02
		Immediate settlement [mm]	3.56	0.43	2.35	-0.03
		Consolidation settlement [mm]	1.01	0.68	0.47	-0.07
	Design life	10 [years]	82.35	77.31	69.44	50.84
		30 [years]	204.09	187.05	165.76	126.65
		50 [years]	322.66	293.62	259.67	201.38
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
0.8	FEM	Total settlement [mm]	12.58	12.65	13.89	3.08
		Stage construction settlement [mm]	11.10	11.36	12.02	2.80
		Consolidation settlement [mm]	1.48	1.29	1.87	0.28
		Axial force [ton/m]	2.99	6.07	9.26	14.29
		Maximum shear force [ton/m]	0.47	0.75	0.87	1.59
		Maximum bending moment [ton-m]	0.91	1.87	2.86	4.44
	Hand calculation	Total settlement [mm]	5.46	5.23	5.06	4.43
		Immediate settlement [mm]	2.78	2.77	2.74	2.48
		Consolidation settlement [mm]	0.68	0.45	0.32	-0.05
	Design life	10 [years]	80.20	74.27	67.94	46.65
		30 [years]	200.75	182.82	163.72	122.11
		50 [years]	318.76	288.83	257.37	196.68

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
0.6	FEM	Total settlement [mm]	9.38	7.68	9.65	4.94
		Stage construction settlement [mm]	8.44	6.44	8.91	4.72
		Consolidation settlement [mm]	0.94	1.24	0.74	0.22
		Axial force [ton/m]	2.34	5.06	7.22	9.47
		Maximum shear force [ton/m]	0.37	0.59	0.68	1.25
		Maximum bending moment [ton·m]	0.70	1.54	2.20	2.87
	Hand calculation	Total settlement [mm]	5.00	4.75	4.61	4.02
		Immediate settlement [mm]	2.28	2.27	2.26	2.01
		Consolidation settlement [mm]	0.72	0.47	0.35	0.01
	Design life	10 [years]	77.00	69.30	64.60	48.16
		30 [years]	196.60	176.90	159.93	123.35
		50 [years]	314.17	282.47	253.38	197.79

ตารางที่ ข-2 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 3

พื้นที่ที่ 3

Pipe jacking

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
2.5	FEM	Total settlement [mm]	56.89	53.06	41.55	16.30
		Stage construction settlement [mm]	44.20	40.18	33.56	14.97
		Consolidation settlement [mm]	12.69	12.88	7.99	1.33
		Axial force [ton/m]	9.68	18.93	29.82	39.73
		Maximum shear force [ton/m]	1.89	2.05	2.46	6.36
		Maximum bending moment [ton·m]	3.57	6.30	9.64	14.66
	Hand calculation	Total settlement [mm]	13.54	12.35	11.36	8.09
		Immediate settlement [mm]	8.71	8.48	1.03	3.03
		Consolidation settlement [mm]	2.83	1.87	1.22	-1.07
	Design life	10 [years]	152.00	127.00	98.48	21.22
		30 [years]	359.84	283.53	201.14	40.65
		50 [years]	564.56	435.26	299.60	58.67

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
2	FEM	Total settlement [mm]	41.19	39.77	33.64	12.93
		Stage construction settlement [mm]	31.85	31.25	27.72	12.00
		Consolidation settlement [mm]	9.34	8.52	5.92	0.93
		Axial force [ton/m]	7.78	15.21	23.89	30.99
		Maximum shear force [ton/m]	1.40	1.62	2.06	4.91
		Maximum bending moment [ton·m]	2.63	4.78	7.48	10.69
	Hand calculation	Total settlement [mm]	10.73	9.93	9.30	6.93
		Immediate settlement [mm]	6.79	6.65	0.70	2.70
		Consolidation settlement [mm]	1.94	1.28	0.86	-0.80
	Design life	10 [years]	142.00	112.00	86.14	27.71
		30 [years]	347.66	268.24	189.55	47.14
		50 [years]	551.70	419.43	288.36	65.16

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
1.5	FEM	Total settlement [mm]	28.90	28.60	26.68	9.81
		Stage construction settlement [mm]	22.35	22.53	21.10	9.26
		Consolidation settlement [mm]	6.55	6.07	5.58	0.55
		Axial force [ton/m]	5.96	11.63	18.32	23.18
		Maximum shear force [ton/m]	1.03	1.24	1.61	3.56
		Maximum bending moment [ton·m]	1.87	3.51	5.52	7.40
	Hand calculation	Total settlement [mm]	8.99	8.30	7.77	5.96
		Immediate settlement [mm]	5.28	0.62	2.45	-0.13
		Consolidation settlement [mm]	1.72	1.13	0.76	-0.47
	Design life	10 [years]	130.87	104.30	77.85	24.59
		30 [years]	339.47	259.21	178.86	44.02
		50 [years]	542.82	409.78	276.55	62.04

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
1.2	FEM	Total settlement [mm]	22.76	22.02	21.61	8.13
		Stage construction settlement [mm]	17.62	17.76	17.47	7.72
		Consolidation settlement [mm]	5.14	4.26	4.14	0.41
		Axial force [ton/m]	4.66	9.70	15.02	18.58
		Maximum shear force [ton/m]	0.77	1.09	1.38	2.76
		Maximum bending moment [ton·m]	1.39	2.85	4.41	5.64
	Hand calculation	Total settlement [mm]	7.74	7.20	6.76	5.32
		Immediate settlement [mm]	4.28	0.53	2.40	-0.08
		Consolidation settlement [mm]	1.46	0.97	0.66	-0.30
	Design life	10 [years]	127.62	100.49	73.19	22.91
		30 [years]	334.39	254.55	173.48	42.34
		50 [years]	536.89	404.72	270.83	60.36

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
1	FEM	Total settlement [mm]	14.57	14.09	13.99	13.28
		Stage construction settlement [mm]	11.29	10.63	11.17	11.16
		Consolidation settlement [mm]	3.28	3.46	2.82	2.12
		Axial force [ton/m]	3.58	7.39	11.25	11.22
		Maximum shear force [ton/m]	0.58	0.88	1.05	1.04
		Maximum bending moment [ton·m]	1.13	2.35	3.62	3.58
	Hand calculation	Total settlement [mm]	6.83	6.44	6.04	4.87
		Immediate settlement [mm]	3.59	0.48	2.35	-0.05
		Consolidation settlement [mm]	1.24	0.83	0.57	-0.20
	Design life	10 [years]	120.96	94.44	66.87	28.06
		30 [years]	326.49	247.91	166.58	47.49
		50 [years]	528.42	397.81	263.67	65.51
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
0.8	FEM	Total settlement [mm]	10.45	10.20	10.75	5.54
		Stage construction settlement [mm]	6.53	6.52	7.25	3.28
		Consolidation settlement [mm]	1.92	1.68	1.50	0.26
		Axial force [ton/m]	3.01	6.08	9.18	11.24
		Maximum shear force [ton/m]	0.49	0.75	0.88	1.56
		Maximum bending moment [ton·m]	0.91	1.87	2.83	3.46
	Hand calculation	Total settlement [mm]	5.64	5.35	5.13	4.33
		Immediate settlement [mm]	2.80	2.79	2.74	2.46
		Consolidation settlement [mm]	0.84	0.56	0.39	-0.14
	Design life	10 [years]	118.03	91.78	64.96	20.01
		30 [years]	322.22	243.97	164.04	39.09
		50 [years]	523.52	393.27	260.83	56.95
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
0.6	FEM	Total settlement [mm]	9.96	9.58	8.64	4.94
		Stage construction settlement [mm]	6.48	6.63	5.87	2.72
		Consolidation settlement [mm]	1.48	0.95	0.77	0.22
		Axial force [ton/m]	2.31	2.36	7.20	9.47
		Maximum shear force [ton/m]	0.37	0.58	0.67	1.25
		Maximum bending moment [ton·m]	0.69	0.67	2.20	2.87
	Hand calculation	Total settlement [mm]	5.15	4.85	4.67	3.96
		Immediate settlement [mm]	2.29	2.29	2.26	1.99
		Consolidation settlement [mm]	0.86	0.57	0.41	-0.03
	Design life	10 [years]	118.05	91.67	63.86	18.61
		30 [years]	321.16	242.78	162.43	37.39
		50 [years]	521.96	391.58	258.99	55.11

ตารางที่ ข-3 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 4

พื้นที่ที่ 4

Pipe jacking			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	6	8	13	18
2.5	FEM	Total settlement [mm]	208.56	93.00	31.34	12.15
		Stage construction settlement [mm]	131.86	61.62	22.88	11.70
		Consolidation settlement [mm]	76.70	31.38	8.46	0.45
		Axial force [ton/m]	11.46	20.53	28.08	27.60
		Maximum shear force [ton/m]	1.25	0.94	2.65	3.61
		Maximum bending moment [ton·m]	3.63	6.02	9.26	19.66
	Hand calculation	Total settlement [mm]	19.32	17.02	12.21	12.08
		Immediate settlement [mm]	10.87	9.96	2.51	4.51
		Consolidation settlement [mm]	6.45	5.06	2.43	2.37
	Design life	10 [years]	253.52	135.50	68.25	44.52
		30 [years]	343.60	219.25	132.22	87.06
		50 [years]	428.72	297.15	190.21	124.39
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	5	8	13	18
2	FEM	Total settlement [mm]	129.30	73.64	17.90	12.15
		Stage construction settlement [mm]	91.50	55.99	15.98	11.60
		Consolidation settlement [mm]	37.80	17.65	1.92	0.55
		Axial force [ton/m]	8.44	16.06	23.63	26.18
		Maximum shear force [ton/m]	0.75	0.78	4.16	2.43
		Maximum bending moment [ton·m]	2.50	4.66	8.33	7.46
	Hand calculation	Total settlement [mm]	15.59	13.22	9.59	9.82
		Immediate settlement [mm]	8.71	7.80	1.85	3.85
		Consolidation settlement [mm]	4.88	3.42	1.40	1.68
	Design life	10 [years]	178.27	117.05	52.94	44.52
		30 [years]	272.46	196.96	112.52	87.06
		50 [years]	361.63	273.07	168.48	124.39
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	13	18
1.5	FEM	Total settlement [mm]	80.10	51.97	13.52	9.55
		Stage construction settlement [mm]	56.14	41.91	12.13	9.20
		Consolidation settlement [mm]	23.96	10.06	1.39	0.35
		Axial force [ton/m]	6.12	12.13	17.34	19.67
		Maximum shear force [ton/m]	0.57	0.67	2.83	1.35
		Maximum bending moment [ton·m]	1.76	3.52	5.61	5.44
	Hand calculation	Total settlement [mm]	13.62	10.69	7.58	8.14
		Immediate settlement [mm]	6.76	1.47	2.17	0.43
		Consolidation settlement [mm]	4.86	2.67	0.85	1.16
	Design life	10 [years]	131.69	96.94	46.03	41.40
		30 [years]	230.07	175.97	101.68	82.96
		50 [years]	323.32	251.66	155.80	119.83

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	13	18
1.2	FEM	Total settlement [mm]	44.23	33.77	10.21	6.90
		Stage construction settlement [mm]	31.75	26.88	9.39	6.83
		Consolidation settlement [mm]	12.48	6.89	0.82	0.07
		Axial force [ton/m]	4.86	9.83	13.71	15.62
		Maximum shear force [ton/m]	0.60	0.63	2.23	2.23
		Maximum bending moment [ton·m]	2.83	2.69	4.20	4.28
	Hand calculation	Total settlement [mm]	11.38	9.08	6.51	6.71
		Immediate settlement [mm]	5.46	1.21	2.14	0.31
		Consolidation settlement [mm]	3.92	2.17	0.67	0.70
	Design life	10 [years]	96.47	79.41	42.93	35.87
		30 [years]	194.19	157.90	98.13	74.21
		50 [years]	287.13	233.35	152.05	109.58
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
1	FEM	Total settlement [mm]	36.35	31.21	8.04	5.55
		Stage construction settlement [mm]	26.19	25.13	7.39	5.45
		Consolidation settlement [mm]	10.16	6.08	0.65	0.10
		Axial force [ton/m]	3.62	7.31	10.07	11.60
		Maximum shear force [ton/m]	0.35	0.42	1.54	1.26
		Maximum bending moment [ton·m]	1.12	2.34	3.27	3.57
	Hand calculation	Total settlement [mm]	9.80	7.95	5.78	5.79
		Immediate settlement [mm]	4.56	1.02	2.11	0.24
		Consolidation settlement [mm]	3.24	1.81	0.54	0.43
	Design life	10 [years]	90.75	77.02	40.68	31.38
		30 [years]	187.90	155.14	95.52	67.53
		50 [years]	280.58	230.42	149.27	101.88
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
0.8	FEM	Total settlement [mm]	27.96	24.35	6.74	5.04
		Stage construction settlement [mm]	19.84	19.34	6.23	4.79
		Consolidation settlement [mm]	8.12	5.01	0.51	0.25
		Axial force [ton/m]	2.97	3.02	8.13	9.91
		Maximum shear force [ton/m]	0.30	0.39	1.21	1.06
		Maximum bending moment [ton·m]	0.89	0.91	2.51	2.97
	Hand calculation	Total settlement [mm]	7.66	6.51	4.96	4.89
		Immediate settlement [mm]	3.44	3.23	2.58	2.65
		Consolidation settlement [mm]	2.22	1.28	0.38	0.24
	Design life	10 [years]	86.05	69.53	39.54	27.59
		30 [years]	181.87	147.26	94.13	61.98
		50 [years]	273.93	222.35	147.76	95.51

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	13	18
0.6	FEM	Total settlement [mm]	20.47	17.54	5.57	4.17
		Stage construction settlement [mm]	14.86	15.86	5.17	4.11
		Consolidation settlement [mm]	5.61	1.68	0.40	0.06
		Axial force [ton/m]	2.35	4.73	7.54	7.40
		Maximum shear force [ton/m]	0.25	0.31	0.92	0.53
		Maximum bending moment [ton-m]	0.70	1.45	1.90	2.20
	Hand calculation	Total settlement [mm]	6.53	5.75	4.38	4.23
		Immediate settlement [mm]	2.79	2.67	2.07	2.04
		Consolidation settlement [mm]	1.74	1.08	0.31	0.19
	Design life	10 [years]	82.69	63.82	37.64	26.41
		30 [years]	177.11	141.05	91.75	60.47
		50 [years]	268.52	215.91	145.15	93.86

ตารางที่ ข-4 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 5
พื้นที่ที่ 5

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
2.5	FEM	Total settlement [mm]	49.35	43.06	38.80	16.25
		Stage construction settlement [mm]	37.52	33.27	30.34	15.59
		Consolidation settlement [mm]	11.83	9.79	8.46	0.66
		Axial force [ton/m]	9.63	18.45	28.08	38.94
		Maximum shear force [ton/m]	2.01	2.15	2.65	6.27
		Maximum bending moment [ton-m]	3.66	6.24	9.26	13.60
	Hand calculation	Total settlement [mm]	20.15	16.50	13.75	8.82
		Immediate settlement [mm]	9.65	9.24	1.79	3.79
		Consolidation settlement [mm]	8.50	5.25	3.07	-0.62
	Design life	10 [years]	134.00	113.98	94.94	41.20
		30 [years]	322.26	261.63	199.63	82.70
		50 [years]	504.52	403.37	300.84	123.72

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
2	FEM	Total settlement [mm]	34.12	32.07	31.03	12.95
		Stage construction settlement [mm]	28.61	25.22	24.57	12.61
		Consolidation settlement [mm]	5.51	6.85	6.46	0.34
		Axial force [ton/m]	7.49	14.85	22.55	30.68
		Maximum shear force [ton/m]	1.36	1.80	2.23	4.18
		Maximum bending moment [ton·m]	2.53	4.78	7.16	9.11
	Hand calculation	Total settlement [mm]	15.13	13.00	11.09	7.45
		Immediate settlement [mm]	7.46	7.21	1.26	3.26
		Consolidation settlement [mm]	5.67	3.79	2.25	-0.49
	Design life	10 [years]	122.00	102.99	87.17	37.90
		30 [years]	308.95	250.64	191.86	79.40
		50 [years]	491.00	392.38	293.07	120.42
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
1.5	FEM	Total settlement [mm]	24.96	23.85	23.54	10.12
		Stage construction settlement [mm]	20.99	18.80	18.86	9.95
		Consolidation settlement [mm]	3.97	5.05	4.68	0.17
		Axial force [ton/m]	5.68	11.37	17.38	22.81
		Maximum shear force [ton/m]	0.96	1.38	1.70	2.78
		Maximum bending moment [ton·m]	1.78	3.47	5.36	6.59
	Hand calculation	Total settlement [mm]	12.38	10.54	9.34	6.19
		Immediate settlement [mm]	5.66	0.97	2.96	-0.05
		Consolidation settlement [mm]	4.73	3.02	1.84	-0.30
	Design life	10 [years]	115.78	96.32	79.68	35.07
		30 [years]	304.29	243.62	184.37	76.57
		50 [years]	485.57	385.19	285.58	117.59
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
1.2	FEM	Total settlement [mm]	20.35	18.78	18.49	8.13
		Stage construction settlement [mm]	16.65	15.23	15.22	8.10
		Consolidation settlement [mm]	3.70	3.55	3.27	0.03
		Axial force [ton/m]	4.55	9.36	14.20	17.84
		Maximum shear force [ton/m]	0.75	1.16	1.48	1.29
		Maximum bending moment [ton·m]	1.35	2.77	4.19	4.84
	Hand calculation	Total settlement [mm]	10.23	8.92	7.83	5.46
		Immediate settlement [mm]	4.52	0.77	2.59	-0.04
		Consolidation settlement [mm]	3.72	2.45	1.54	-0.20
	Design life	10 [years]	115.06	94.22	74.63	33.08
		30 [years]	301.04	240.86	179.32	74.58
		50 [years]	481.15	382.13	280.53	115.60

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
1	FEM	Total settlement [mm]	14.09	13.25	14.35	6.28
		Stage construction settlement [mm]	12.60	11.94	12.17	6.23
		Consolidation settlement [mm]	1.49	1.31	2.18	0.05
		Axial force [ton/m]	3.47	7.08	10.65	12.68
		Maximum shear force [ton/m]	0.59	0.92	1.11	0.93
		Maximum bending moment [ton-m]	1.10	2.28	3.42	3.85
	Hand calculation	Total settlement [mm]	8.77	7.76	6.50	4.96
		Immediate settlement [mm]	3.75	0.62	2.07	-0.03
		Consolidation settlement [mm]	3.01	2.02	1.30	-0.14
	Design life	10 [years]	110.84	90.80	71.43	31.23
		30 [years]	295.12	236.68	175.96	72.73
		50 [years]	474.43	377.59	277.11	113.75
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
0.8	FEM	Total settlement [mm]	12.91	12.65	12.33	5.41
		Stage construction settlement [mm]	11.17	10.65	10.79	5.35
		Consolidation settlement [mm]	1.74	2.00	1.54	0.06
		Axial force [ton/m]	2.82	5.75	8.72	10.26
		Maximum shear force [ton/m]	0.47	0.72	0.89	1.46
		Maximum bending moment [ton-m]	1.06	2.23	3.40	3.88
	Hand calculation	Total settlement [mm]	6.94	6.24	5.85	4.38
		Immediate settlement [mm]	2.90	2.89	2.94	2.48
		Consolidation settlement [mm]	2.04	1.34	0.91	-0.10
	Design life	10 [years]	111.23	91.77	70.86	30.36
		30 [years]	293.65	235.79	174.80	71.86
		50 [years]	472.10	375.84	275.67	112.88
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
0.6	FEM	Total settlement [mm]	9.13	8.61	9.13	4.48
		Stage construction settlement [mm]	8.19	7.92	7.88	4.45
		Consolidation settlement [mm]	0.94	0.69	1.25	0.03
		Axial force [ton/m]	2.21	4.53	6.84	7.79
		Maximum shear force [ton/m]	0.37	0.57	0.71	0.51
		Maximum bending moment [ton-m]	0.66	1.37	2.08	2.30
	Hand calculation	Total settlement [mm]	6.04	5.47	4.87	3.96
		Immediate settlement [mm]	2.34	2.34	2.04	1.99
		Consolidation settlement [mm]	1.69	1.13	0.82	-0.03
	Design life	10 [years]	108.09	88.37	68.95	29.43
		30 [years]	289.03	230.91	172.49	70.93
		50 [years]	466.79	370.27	273.18	111.95

ตารางที่ ข-5 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 6

พื้นที่ที่ 6

Pipe jacking			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	6	8	13.5	18
2.5	FEM	Total settlement [mm]	103.17	82.83	20.55	15.53
		Stage construction settlement [mm]	73.62	61.43	18.15	14.55
		Consolidation settlement [mm]	29.55	21.40	2.40	0.98
		Axial force [ton/m]	13.26	18.23	31.24	37.91
		Maximum shear force [ton/m]	1.55	1.71	4.19	6.30
		Maximum bending moment [ton-m]	4.39	5.91	11.16	13.96
	Hand calculation	Total settlement [mm]	16.67	14.97	11.01	9.29
		Immediate settlement [mm]	9.82	9.32	1.87	3.87
		Consolidation settlement [mm]	4.85	3.65	1.15	-0.13
	Design life	10 [years]	205.92	178.89	93.88	69.17
		30 [years]	409.80	364.32	229.52	166.39
		50 [years]	608.71	545.88	363.80	263.06
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	13.5	18
2	FEM	Total settlement [mm]	88.71	76.04	18.91	12.45
		Stage construction settlement [mm]	66.09	57.72	16.32	11.71
		Consolidation settlement [mm]	22.62	18.32	2.59	0.74
		Axial force [ton/m]	7.05	16.80	26.91	29.59
		Maximum shear force [ton/m]	1.27	1.41	3.40	5.05
		Maximum bending moment [ton-m]	2.49	5.56	8.96	10.79
	Hand calculation	Total settlement [mm]	14.61	11.97	9.09	7.82
		Immediate settlement [mm]	7.87	7.31	1.36	3.36
		Consolidation settlement [mm]	4.73	2.65	0.84	-0.10
	Design life	10 [years]	197.90	172.10	92.24	66.09
		30 [years]	419.56	357.53	227.88	163.31
		50 [years]	635.52	539.09	362.16	259.98
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	13.5	18
1.5	FEM	Total settlement [mm]	55.58	48.87	14.26	9.53
		Stage construction settlement [mm]	41.43	37.50	12.51	9.04
		Consolidation settlement [mm]	14.15	11.37	1.75	0.49
		Axial force [ton/m]	5.51	11.12	18.82	22.61
		Maximum shear force [ton/m]	0.89	1.13	2.46	3.62
		Maximum bending moment [ton-m]	1.70	3.35	5.93	7.01
	Hand calculation	Total settlement [mm]	11.56	9.74	7.48	6.49
		Immediate settlement [mm]	6.02	1.08	2.25	-0.03
		Consolidation settlement [mm]	3.54	2.11	0.68	-0.03
	Design life	10 [years]	163.39	145.48	87.59	63.17
		30 [years]	384.10	330.32	223.23	160.39
		50 [years]	599.61	511.61	357.51	257.06

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	13.5	18
1.2	FEM	Total settlement [mm]	39.54	38.69	11.48	7.84
		Stage construction settlement [mm]	30.13	29.95	10.28	7.51
		Consolidation settlement [mm]	9.41	8.74	1.20	0.33
		Axial force [ton/m]	4.54	9.07	15.17	17.79
		Maximum shear force [ton/m]	0.73	0.95	1.97	2.76
		Maximum bending moment [ton-m]	1.34	2.66	4.57	5.30
	Hand calculation	Total settlement [mm]	9.72	8.31	6.47	5.71
		Immediate settlement [mm]	4.86	0.88	2.21	0.00
		Consolidation settlement [mm]	2.86	1.73	0.57	0.00
	Design life	10 [years]	150.75	134.92	84.68	61.48
		30 [years]	370.59	319.24	220.25	158.70
		50 [years]	585.70	500.29	354.49	255.37
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	13.5	18
1	FEM	Total settlement [mm]	28.55	28.70	9.11	6.21
		Stage construction settlement [mm]	22.31	23.56	8.18	5.95
		Consolidation settlement [mm]	6.24	5.14	0.93	0.26
		Axial force [ton/m]	3.40	6.79	11.28	13.21
		Maximum shear force [ton/m]	0.52	0.70	1.38	1.99
		Maximum bending moment [ton-m]	1.07	2.17	3.66	4.22
	Hand calculation	Total settlement [mm]	8.44	7.30	5.76	5.16
		Immediate settlement [mm]	4.07	0.73	2.17	0.02
		Consolidation settlement [mm]	2.37	1.44	0.46	0.02
	Design life	10 [years]	142.14	123.82	81.89	59.85
		30 [years]	361.40	307.73	217.10	157.07
		50 [years]	576.24	488.58	351.18	253.74
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	13.5	18
0.8	FEM	Total settlement [mm]	21.63	23.34	7.62	5.33
		Stage construction settlement [mm]	17.52	19.03	6.91	5.14
		Consolidation settlement [mm]	4.11	4.31	0.71	0.19
		Axial force [ton/m]	2.81	5.59	9.20	10.75
		Maximum shear force [ton/m]	0.42	0.58	1.11	1.61
		Maximum bending moment [ton-m]	0.84	1.71	2.85	3.27
	Hand calculation	Total settlement [mm]	6.70	6.01	4.95	4.53
		Immediate settlement [mm]	3.10	3.01	2.62	2.51
		Consolidation settlement [mm]	1.60	1.00	0.33	0.01
	Design life	10 [years]	136.76	120.12	80.76	58.97
		30 [years]	354.44	303.40	215.86	156.19
		50 [years]	568.54	483.96	349.88	252.86

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	13.5	18
0.6	FEM	Total settlement [mm]	15.66	15.41	6.23	4.51
		Stage construction settlement [mm]	13.12	13.47	5.70	4.36
		Consolidation settlement [mm]	2.54	1.94	0.53	0.15
		Axial force [ton/m]	2.21	4.44	7.18	8.49
		Maximum shear force [ton/m]	0.29	0.45	0.79	1.15
		Maximum bending moment [ton·m]	0.66	1.35	2.19	2.54
	Hand calculation	Total settlement [mm]	6.04	5.44	4.42	4.06
		Immediate settlement [mm]	2.52	2.47	2.11	2.01
		Consolidation settlement [mm]	1.52	0.97	0.31	0.05
	Design life	10 [years]	131.44	113.53	79.10	58.15
		30 [years]	347.78	296.30	213.89	155.37
		50 [years]	561.26	476.63	347.77	252.04

ตารางที่ ข-6 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 7

พื้นที่ที่ 7

Pipe jacking

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			6	8	11.5	18
2.5	FEM	Total settlement [mm]	267.83	121.59	63.59	19.30
		Stage construction settlement [mm]	179.62	92.24	48.59	17.20
		Consolidation settlement [mm]	88.21	29.35	15.00	2.10
		Axial force [ton/m]	11.36	19.70	27.84	40.78
		Maximum shear force [ton/m]	1.31	0.93	2.08	4.61
		Maximum bending moment [ton·m]	3.62	5.72	8.73	13.95
	Hand calculation	Total settlement [mm]	25.40	23.14	17.49	10.89
		Immediate settlement [mm]	12.90	12.02	4.57	6.57
		Consolidation settlement [mm]	10.50	9.12	6.34	1.20
	Design life	10 [years]	402.00	262.00	165.11	46.72
		30 [years]	780.24	568.41	371.12	101.40
		50 [years]	1122.91	863.29	567.92	148.86

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			6	8	11	18
2	FEM	Total settlement [mm]	143.04	87.92	55.17	15.61
		Stage construction settlement [mm]	109.61	69.53	42.96	13.94
		Consolidation settlement [mm]	33.43	18.39	12.21	1.67
		Axial force [ton/m]	8.18	15.45	21.72	32.40
		Maximum shear force [ton/m]	0.84	0.84	1.36	3.65
		Maximum bending moment [ton·m]	2.45	4.48	6.58	10.57
	Hand calculation	Total settlement [mm]	19.08	17.25	13.23	8.94
		Immediate settlement [mm]	9.77	9.22	3.27	5.27
		Consolidation settlement [mm]	7.32	6.03	3.98	0.80
	Design life	10 [years]	298.00	232.00	156.53	55.89
		30 [years]	654.08	528.55	357.31	110.57
		50 [years]	995.87	820.91	551.68	158.03
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	11	18
1.5	FEM	Total settlement [mm]	92.73	66.33	47.05	12.11
		Stage construction settlement [mm]	61.91	50.87	36.58	10.90
		Consolidation settlement [mm]	30.82	15.46	10.47	1.21
		Axial force [ton/m]	5.81	11.55	16.21	24.60
		Maximum shear force [ton/m]	0.57	0.63	0.88	2.73
		Maximum bending moment [ton·m]	1.67	3.34	4.78	7.60
	Hand calculation	Total settlement [mm]	16.41	13.33	10.14	7.46
		Immediate settlement [mm]	7.57	2.38	3.05	0.16
		Consolidation settlement [mm]	6.83	4.40	2.55	0.75
	Design life	10 [years]	282.00	212.00	146.09	51.04
		30 [years]	682.69	507.40	341.36	104.51
		50 [years]	1073.93	798.97	533.17	151.41
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	11	18
1.2	FEM	Total settlement [mm]	62.53	51.02	37.48	11.43
		Stage construction settlement [mm]	41.85	39.18	30.10	10.24
		Consolidation settlement [mm]	20.68	11.84	7.38	1.19
		Axial force [ton/m]	4.68	9.40	13.12	20.02
		Maximum shear force [ton/m]	0.48	0.55	0.71	2.24
		Maximum bending moment [ton·m]	1.32	2.68	3.79	5.95
	Hand calculation	Total settlement [mm]	13.32	10.94	8.52	6.39
		Immediate settlement [mm]	6.00	1.84	2.86	0.15
		Consolidation settlement [mm]	5.32	3.40	1.96	0.54
	Design life	10 [years]	258.60	198.53	135.73	46.37
		30 [years]	655.19	494.01	330.10	95.27
		50 [years]	1045.90	785.06	521.49	140.05

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	11	18
1	FEM	Total settlement [mm]	37.25	40.96	30.22	7.00
		Stage construction settlement [mm]	29.29	29.35	24.08	6.54
		Consolidation settlement [mm]	7.96	11.61	6.14	0.46
		Axial force [ton/m]	3.55	6.95	9.75	5.88
		Maximum shear force [ton/m]	0.35	0.39	0.52	1.59
		Maximum bending moment [ton·m]	1.10	2.20	3.14	1.85
	Hand calculation	Total settlement [mm]	11.13	9.34	7.39	5.65
		Immediate settlement [mm]	4.90	1.48	2.71	0.13
		Consolidation settlement [mm]	4.23	2.74	1.56	0.39
	Design life	10 [years]	235.94	190.42	129.68	37.87
		30 [years]	631.18	485.14	323.29	83.68
		50 [years]	1021.26	775.84	514.33	127.03
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
0.8	FEM	Total settlement [mm]	29.28	31.08	24.59	6.72
		Stage construction settlement [mm]	22.24	22.82	19.62	6.19
		Consolidation settlement [mm]	7.04	8.26	4.97	0.53
		Axial force [ton/m]	2.97	5.74	8.00	12.20
		Maximum shear force [ton/m]	0.32	0.35	0.44	1.29
		Maximum bending moment [ton·m]	0.89	1.76	2.49	3.77
	Hand calculation	Total settlement [mm]	8.48	7.41	6.07	4.83
		Immediate settlement [mm]	3.63	3.52	3.01	2.59
		Consolidation settlement [mm]	2.85	1.89	1.07	0.24
	Design life	10 [years]	230.33	182.55	125.11	35.19
		30 [years]	623.64	476.45	317.90	79.37
		50 [years]	1012.82	766.76	508.55	121.95
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
0.6	FEM	Total settlement [mm]	19.45	19.18	18.29	5.62
		Stage construction settlement [mm]	15.57	17.33	15.54	5.22
		Consolidation settlement [mm]	3.88	1.85	2.75	0.40
		Axial force [ton/m]	2.37	4.58	6.25	9.57
		Maximum shear force [ton/m]	0.27	0.33	0.34	0.99
		Maximum bending moment [ton·m]	0.70	1.40	1.94	2.92
	Hand calculation	Total settlement [mm]	7.28	6.50	5.36	4.36
		Immediate settlement [mm]	2.90	2.88	2.46	2.10
		Consolidation settlement [mm]	2.38	1.62	0.91	0.26
	Design life	10 [years]	221.75	172.19	119.45	33.23
		30 [years]	613.52	465.42	311.57	76.96
		50 [years]	1001.99	755.43	501.92	119.34

ตารางที่ ข-7 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 8

พื้นที่ที่ 8

Pipe jacking			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	6	8	11	16
2.5	FEM	Total settlement [mm]	152.89	80.25	48.79	18.50
		Stage construction settlement [mm]	136.40	71.97	39.98	16.15
		Consolidation settlement [mm]	16.49	8.28	8.81	2.35
		Axial force [ton/m]	9.62	17.86	26.07	30.50
		Maximum shear force [ton/m]	1.43	1.25	2.50	4.51
		Maximum bending moment [ton-m]	3.32	5.37	8.46	22.65
	Hand calculation	Total settlement [mm]	25.14	21.64	16.18	9.37
		Immediate settlement [mm]	12.23	11.41	3.96	5.96
		Consolidation settlement [mm]	10.91	8.23	4.55	-0.06
	Design life	10 [years]	254.69	177.77	137.18	88.82
		30 [years]	454.07	362.90	300.94	219.90
		50 [years]	647.36	543.36	462.15	350.40
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	6	8	11	16
2	FEM	Total settlement [mm]	86.39	71.22	49.23	14.18
		Stage construction settlement [mm]	62.48	55.35	36.41	13.33
		Consolidation settlement [mm]	23.91	15.87	12.82	0.85
		Axial force [ton/m]	11.11	15.06	21.21	11.92
		Maximum shear force [ton/m]	1.04	1.13	1.60	3.53
		Maximum bending moment [ton-m]	3.37	4.51	6.54	4.55
	Hand calculation	Total settlement [mm]	19.57	16.86	13.01	7.88
		Immediate settlement [mm]	9.34	8.81	2.86	4.86
		Consolidation settlement [mm]	8.22	6.06	3.39	-0.05
	Design life	10 [years]	188.19	168.74	137.62	84.50
		30 [years]	387.57	353.87	301.38	215.58
		50 [years]	580.85	534.33	462.59	346.08
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	11	16
1.5	FEM	Total settlement [mm]	64.66	53.80	37.44	11.67
		Stage construction settlement [mm]	46.69	41.03	30.84	10.74
		Consolidation settlement [mm]	17.97	12.77	6.60	0.93
		Axial force [ton/m]	5.64	11.37	15.47	21.83
		Maximum shear force [ton/m]	0.72	0.87	4.78	6.79
		Maximum bending moment [ton-m]	1.68	3.35	4.62	7.31
	Hand calculation	Total settlement [mm]	16.94	13.30	10.53	6.58
		Immediate settlement [mm]	7.28	2.13	3.33	0.01
		Consolidation settlement [mm]	7.66	4.62	2.65	0.02
	Design life	10 [years]	168.54	151.31	125.83	81.99
		30 [years]	381.03	336.21	289.59	213.07
		50 [years]	586.62	516.56	450.80	343.57

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	11	16
1.2	FEM	Total settlement [mm]	55.83	51.96	41.47	5.80
		Stage construction settlement [mm]	40.22	38.05	29.36	4.46
		Consolidation settlement [mm]	15.61	13.91	12.11	1.34
		Axial force [ton/m]	4.62	8.77	12.48	19.55
		Maximum shear force [ton/m]	0.56	0.78	0.89	0.24
		Maximum bending moment [ton·m]	1.32	2.55	3.63	5.53
	Hand calculation	Total settlement [mm]	13.78	11.06	8.94	5.77
		Immediate settlement [mm]	5.76	1.66	3.08	0.02
		Consolidation settlement [mm]	6.01	3.69	2.16	0.05
	Design life	10 [years]	164.17	147.07	129.96	76.12
30 [years]		375.90	331.66	293.60	207.20	
50 [years]		581.14	511.86	454.75	337.70	
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
1	FEM	Total settlement [mm]	45.75	41.15	25.06	7.57
		Stage construction settlement [mm]	34.25	32.57	20.43	7.01
		Consolidation settlement [mm]	11.50	8.58	4.63	0.56
		Axial force [ton/m]	4.69	9.32	9.66	13.18
		Maximum shear force [ton/m]	0.61	0.77	0.64	1.53
		Maximum bending moment [ton·m]	1.34	2.68	3.11	4.26
	Hand calculation	Total settlement [mm]	11.50	9.46	7.82	5.22
		Immediate settlement [mm]	4.71	1.33	2.90	0.03
		Consolidation settlement [mm]	4.79	3.01	1.79	0.06
	Design life	10 [years]	156.67	137.84	113.42	77.89
30 [years]		367.02	321.94	276.85	208.97	
50 [years]		571.62	501.91	437.90	339.47	
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
0.8	FEM	Total settlement [mm]	24.18	25.50	20.79	6.46
		Stage construction settlement [mm]	17.45	19.11	17.01	5.99
		Consolidation settlement [mm]	6.73	6.39	3.78	0.47
		Axial force [ton/m]	2.87	5.67	7.91	10.76
		Maximum shear force [ton/m]	0.38	0.47	0.55	1.23
		Maximum bending moment [ton·m]	0.86	1.73	2.45	3.32
	Hand calculation	Total settlement [mm]	8.73	7.53	5.97	4.57
		Immediate settlement [mm]	3.51	3.41	2.67	2.52
		Consolidation settlement [mm]	3.22	2.12	1.30	0.05
	Design life	10 [years]	136.77	124.63	107.52	76.78
30 [years]		344.97	308.17	270.72	207.86	
50 [years]		548.58	487.88	431.67	338.36	

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	11	16
0.6	FEM	Total settlement [mm]	16.62	17.67	16.40	5.40
		Stage construction settlement [mm]	12.85	14.75	13.62	5.03
		Consolidation settlement [mm]	3.77	2.92	2.78	0.37
		Axial force [ton/m]	0.33	4.50	6.17	8.42
		Maximum shear force [ton/m]	0.29	0.41	0.42	0.94
		Maximum bending moment [ton·m]	0.69	1.37	1.90	2.57
	Hand calculation	Total settlement [mm]	7.57	6.67	5.38	4.13
		Immediate settlement [mm]	2.80	2.77	2.22	2.04
		Consolidation settlement [mm]	2.78	1.89	1.16	0.09
	Design life	10 [years]	129.85	118.97	104.10	75.68
		30 [years]	336.33	302.06	266.85	206.72
		50 [years]	539.13	481.57	427.59	337.20

ตารางที่ ข-8 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 9
พื้นที่ที่ 9

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
2.5	FEM	Total settlement [mm]	90.13	80.65	63.21	20.44
		Stage construction settlement [mm]	65.44	55.99	47.54	18.31
		Consolidation settlement [mm]	24.69	24.66	15.67	2.13
		Axial force [ton/m]	9.55	17.42	26.95	40.09
		Maximum shear force [ton/m]	2.28	2.18	2.51	5.79
		Maximum bending moment [ton·m]	3.80	5.94	8.82	14.65
	Hand calculation	Total settlement [mm]	28.25	23.09	19.20	7.91
		Immediate settlement [mm]	12.77	11.82	4.37	6.37
		Consolidation settlement [mm]	13.48	9.27	6.73	-1.24
	Design life	10 [years]	292.00	249.23	194.11	69.36
		30 [years]	723.34	592.24	451.19	186.05
		50 [years]	1143.85	926.26	699.45	300.34

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
2	FEM	Total settlement [mm]	62.67	58.08	51.11	15.90
		Stage construction settlement [mm]	46.02	41.40	37.68	14.42
		Consolidation settlement [mm]	16.65	16.68	13.43	1.48
		Axial force [ton/m]	7.49	13.96	21.58	31.33
		Maximum shear force [ton/m]	1.62	1.71	2.16	4.36
		Maximum bending moment [ton·m]	2.65	4.38	6.85	10.65
	Hand calculation	Total settlement [mm]	21.15	17.40	14.58	6.73
		Immediate settlement [mm]	9.61	9.00	3.05	5.05
		Consolidation settlement [mm]	9.55	6.40	4.45	-0.92
	Design life	10 [years]	267.00	226.38	182.50	79.15
		30 [years]	693.63	566.32	435.03	195.54
		50 [years]	1113.50	898.92	681.18	309.69
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
1.5	FEM	Total settlement [mm]	42.18	37.79	38.15	11.49
		Stage construction settlement [mm]	32.26	29.15	28.50	10.60
		Consolidation settlement [mm]	9.92	8.64	9.65	0.89
		Axial force [ton/m]	5.70	11.07	16.60	23.42
		Maximum shear force [ton/m]	1.11	1.43	1.72	3.15
		Maximum bending moment [ton·m]	1.81	3.41	5.04	7.41
	Hand calculation	Total settlement [mm]	16.08	13.54	11.39	5.96
		Immediate settlement [mm]	7.12	2.23	3.65	-0.10
		Consolidation settlement [mm]	6.96	4.76	3.18	-0.49
	Design life	10 [years]	252.77	204.34	168.48	75.36
		30 [years]	679.34	543.12	417.90	191.05
		50 [years]	1098.01	875.16	662.60	304.87
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	8	12	18
1.2	FEM	Total settlement [mm]	32.71	29.13	29.05	9.81
		Stage construction settlement [mm]	24.89	22.76	22.94	9.03
		Consolidation settlement [mm]	7.82	6.37	6.11	0.78
		Axial force [ton/m]	4.65	9.12	13.63	18.81
		Maximum shear force [ton/m]	0.86	1.20	1.46	2.48
		Maximum bending moment [ton·m]	1.39	2.70	4.01	5.68
	Hand calculation	Total settlement [mm]	12.83	11.10	9.56	5.36
		Immediate settlement [mm]	5.54	1.73	3.32	-0.06
		Consolidation settlement [mm]	5.29	3.67	2.54	-0.28
	Design life	10 [years]	247.32	200.22	157.67	73.93
		30 [years]	671.13	537.70	406.66	189.19
		50 [years]	1088.52	869.14	651.16	302.81

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
1	FEM	Total settlement [mm]	28.66	30.34	22.52	7.52
		Stage construction settlement [mm]	24.20	22.59	17.46	7.01
		Consolidation settlement [mm]	4.46	7.75	5.06	0.51
		Axial force [ton/m]	4.03	6.61	10.19	13.91
		Maximum shear force [ton/m]	0.68	0.83	1.08	1.77
		Maximum bending moment [ton·m]	1.29	2.12	3.27	4.51
	Hand calculation	Total settlement [mm]	10.71	9.42	8.26	4.92
		Immediate settlement [mm]	4.52	1.36	3.08	-0.03
		Consolidation settlement [mm]	4.19	2.93	2.05	-0.17
	Design life	10 [years]	245.35	204.23	150.70	71.74
		30 [years]	667.29	540.57	399.05	186.70
		50 [years]	1083.81	871.49	643.26	300.19
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
0.8	FEM	Total settlement [mm]	16.28	16.91	16.70	6.52
		Stage construction settlement [mm]	14.33	13.60	13.91	5.94
		Consolidation settlement [mm]	1.95	3.31	2.79	0.58
		Axial force [ton/m]	2.86	5.61	8.44	11.33
		Maximum shear force [ton/m]	0.49	0.73	0.91	1.44
		Maximum bending moment [ton·m]	0.86	1.72	2.60	3.51
	Hand calculation	Total settlement [mm]	8.21	7.32	6.66	4.36
		Immediate settlement [mm]	3.39	3.37	3.25	2.48
		Consolidation settlement [mm]	2.82	1.95	1.41	-0.12
	Design life	10 [years]	234.51	192.34	147.15	70.74
		30 [years]	654.42	526.65	394.55	185.39
		50 [years]	1070.00	856.63	638.31	298.73
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	8	12	18
0.6	FEM	Total settlement [mm]	12.14	11.67	11.85	5.19
		Stage construction settlement [mm]	10.76	10.43	10.61	4.93
		Consolidation settlement [mm]	1.38	1.24	1.24	0.26
		Axial force [ton/m]	2.24	4.43	6.72	8.85
		Maximum shear force [ton/m]	0.38	0.58	0.71	1.07
		Maximum bending moment [ton·m]	0.66	1.34	2.05	2.70
	Hand calculation	Total settlement [mm]	7.10	6.33	5.87	4.01
		Immediate settlement [mm]	2.71	2.70	2.67	2.00
		Consolidation settlement [mm]	2.38	1.63	1.21	0.01
	Design life	10 [years]	230.94	187.67	144.09	69.29
		30 [years]	649.23	520.36	390.72	183.69
		50 [years]	1064.05	849.58	634.12	296.91

ตารางที่ ข-9 ค่าการทรุดตัวในแนวตั้งทั้งหมดของท่อ Pipe jacking ในพื้นที่ที่ 10

พื้นที่ที่ 10

Pipe jacking			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	9	15	18
2.5	FEM	Total settlement [mm]	30.49	21.25	15.33	13.04
		Stage construction settlement [mm]	24.74	18.78	14.60	12.78
		Consolidation settlement [mm]	5.75	2.47	0.73	0.26
		Axial force [ton/m]	9.24	19.39	28.62	31.94
		Maximum shear force [ton/m]	2.24	3.52	6.08	4.81
		Maximum bending moment [ton-m]	3.65	7.32	10.19	10.84
	Hand calculation	Total settlement [mm]	13.96	11.52	10.07	10.28
		Immediate settlement [mm]	8.49	7.90	0.45	2.45
		Consolidation settlement [mm]	3.47	1.62	0.62	0.66
	Design life	10 [years]	321.09	212.80	85.68	22.12
		30 [years]	904.02	588.90	215.60	29.47
		50 [years]	1482.28	962.38	344.28	35.99
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	9	15	18
2	FEM	Total settlement [mm]	24.00	17.04	12.33	10.36
		Stage construction settlement [mm]	19.72	15.13	11.83	10.27
		Consolidation settlement [mm]	4.28	1.91	0.50	0.09
		Axial force [ton/m]	7.23	15.32	22.32	26.64
		Maximum shear force [ton/m]	1.60	2.72	4.03	2.32
		Maximum bending moment [ton-m]	2.55	5.33	7.55	7.37
	Hand calculation	Total settlement [mm]	11.22	9.45	9.13	8.55
		Immediate settlement [mm]	6.67	6.28	0.33	2.33
		Consolidation settlement [mm]	2.55	1.16	0.44	0.47
	Design life	10 [years]	316.58	208.59	82.68	19.44
		30 [years]	898.50	584.69	212.60	26.79
		50 [years]	1476.29	958.17	341.28	33.31
			Depth [m]			
Diameter [m]	Method of analysis	Analysis results	4	9	15	18
1.5	FEM	Total settlement [mm]	18.09	12.85	9.23	8.15
		Stage construction settlement [mm]	15.08	11.71	9.19	8.06
		Consolidation settlement [mm]	3.01	1.14	0.04	0.09
		Axial force [ton/m]	5.46	11.59	17.50	20.17
		Maximum shear force [ton/m]	1.14	2.00	2.03	1.71
		Maximum bending moment [ton-m]	1.75	3.73	4.86	5.44
	Hand calculation	Total settlement [mm]	9.14	8.07	7.20	7.26
		Immediate settlement [mm]	5.13	0.37	2.28	0.33
		Consolidation settlement [mm]	2.01	1.14	0.37	0.38
	Design life	10 [years]	311.89	225.80	79.58	17.23
		30 [years]	892.87	642.22	209.50	24.58
		50 [years]	1470.23	1056.17	338.18	31.10

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	9	15	18
1.2	FEM	Total settlement [mm]	14.32	10.29	7.58	6.84
		Stage construction settlement [mm]	12.19	9.61	7.54	6.78
		Consolidation settlement [mm]	2.13	0.68	0.04	0.06
		Axial force [ton/m]	4.41	9.35	13.86	16.33
		Maximum shear force [ton/m]	0.89	1.59	1.43	1.34
		Maximum bending moment [ton·m]	1.33	2.85	3.68	4.28
	Hand calculation	Total settlement [mm]	7.86	6.74	6.25	6.35
		Immediate settlement [mm]	4.18	0.24	2.23	0.33
		Consolidation settlement [mm]	1.68	0.79	0.32	0.31
	Design life	10 [years]	308.02	203.03	77.93	15.92
		30 [years]	888.44	577.74	207.85	23.27
		50 [years]	1465.53	950.58	336.53	29.79
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	9	15	18
1	FEM	Total settlement [mm]	10.91	8.16	5.97	5.54
		Stage construction settlement [mm]	9.67	7.63	5.92	5.48
		Consolidation settlement [mm]	1.24	0.53	0.05	0.06
		Axial force [ton/m]	3.36	6.91	10.01	12.45
		Maximum shear force [ton/m]	0.65	1.16	0.98	0.99
		Maximum bending moment [ton·m]	1.06	2.23	3.01	3.74
	Hand calculation	Total settlement [mm]	6.93	6.01	5.58	5.61
		Immediate settlement [mm]	3.52	0.21	2.19	0.22
		Consolidation settlement [mm]	1.41	0.67	0.27	0.27
	Design life	10 [years]	305.79	201.02	76.27	14.62
		30 [years]	885.63	575.35	205.97	21.97
		50 [years]	1462.45	948.00	334.54	28.49
Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	9	15	18
0.8	FEM	Total settlement [mm]	9.10	6.90	5.21	4.85
		Stage construction settlement [mm]	8.08	6.46	5.18	4.80
		Consolidation settlement [mm]	1.02	0.44	0.03	0.05
		Axial force [ton/m]	2.76	5.65	8.15	10.16
		Maximum shear force [ton/m]	0.53	0.92	0.70	0.75
		Maximum bending moment [ton·m]	0.83	1.73	2.38	2.95
	Hand calculation	Total settlement [mm]	5.74	5.12	4.81	4.85
		Immediate settlement [mm]	2.76	2.65	2.64	2.66
		Consolidation settlement [mm]	0.97	0.47	0.18	0.19
	Design life	10 [years]	305.38	199.72	75.29	13.93
		30 [years]	884.57	573.62	204.57	21.28
		50 [years]	1461.09	946.08	332.95	27.80

Diameter [m]	Method of analysis	Analysis results	Depth [m]			
			4	9	15	18
0.6	FEM	Total settlement [mm]	7.41	5.71	4.40	4.18
		Stage construction settlement [mm]	6.59	5.36	4.38	4.13
		Consolidation settlement [mm]	0.82	0.35	0.02	0.05
		Axial force [ton/m]	2.14	4.39	6.34	7.98
		Maximum shear force [ton/m]	0.41	0.70	0.52	1.45
		Maximum bending moment [ton-m]	0.63	1.32	1.86	2.30
	Hand calculation	Total settlement [mm]	5.24	4.61	4.30	4.21
		Immediate settlement [mm]	2.24	2.15	2.13	2.04
		Consolidation settlement [mm]	0.99	0.45	0.17	0.17
	Design life	10 [years]	304.18	197.61	74.17	13.05
		30 [years]	882.54	570.88	203.11	20.19
		50 [years]	1458.67	943.05	331.34	26.62

ตารางที่ ข-10 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 2

พื้นที่ที่ 2

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-2.61	9.35	1.87
		Stage construction settlement [mm]	-2.66	8.88	1.54
		Consolidation settlement [mm]	0.05	0.47	0.33
		Maximum horizontal stress [ton/m ²]	4.45	9.34	13.42
		Maximum vertical stress [ton/m ²]	32.623	33.59	25.26
		Maximum shear stress [ton/m ²]	2.900	7.52	6.60
	Hand calculation	Total settlement [mm]	0.62	5.35	9.35
		Immediate settlement [mm]	0.15	1.33	2.87
		Consolidation settlement [mm]	0.46	4.02	6.48
	Design life	10 [years]	66.80	76.51	66.03
		30 [years]	194.29	199.50	183.02
		50 [years]	319.53	320.24	297.76
Type	Method of analysis	Analysis results	Depth [m]		
2	FEM	Total settlement [mm]	0.27	14.68	3.58
		Stage construction settlement [mm]	0.13	10.54	3.25
		Consolidation settlement [mm]	0.13	4.14	0.33
		Maximum horizontal stress [ton/m ²]	3.39	8.17	7.86
		Maximum vertical stress [ton/m ²]	21.888	17.92	14.34
		Maximum shear stress [ton/m ²]	3.463	2.53	2.14
	Hand calculation	Total settlement [mm]	2.29	7.78	12.27
		Immediate settlement [mm]	0.59	2.02	3.89
		Consolidation settlement [mm]	1.70	5.76	8.38
	Design life	10 [years]	69.55	81.71	67.61
		30 [years]	197.93	205.60	185.49
		50 [years]	323.60	326.76	300.66
Type	Method of analysis	Analysis results	Depth [m]		
3	FEM	Total settlement [mm]	0.75	5.38	4.17
		Stage construction settlement [mm]	0.69	4.98	3.83
		Consolidation settlement [mm]	0.07	0.40	0.34
		Maximum horizontal stress [ton/m ²]	3.90	5.20	10.04
		Maximum vertical stress [ton/m ²]	18.140	12.53	25.48
		Maximum shear stress [ton/m ²]	3.797	1.92	2.54
	Hand calculation	Total settlement [mm]	3.89	10.04	15.58
		Immediate settlement [mm]	1.02	2.71	5.44
		Consolidation settlement [mm]	2.87	7.33	10.15
	Design life	10 [years]	69.61	71.98	67.77
		30 [years]	198.90	196.77	186.56
		50 [years]	324.98	318.36	302.15

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	1.06	5.85	3.46
		Stage construction settlement [mm]	0.97	5.42	2.35
		Consolidation settlement [mm]	0.09	0.43	1.11
		Maximum horizontal stress [ton/m ²]	3.70	6.22	7.37
		Maximum vertical stress [ton/m ²]	13.346	12.32	18.96
		Maximum shear stress [ton/m ²]	3.287	1.18	2.92
	Hand calculation	Total settlement [mm]	4.73	11.55	17.59
		Immediate settlement [mm]	1.28	3.22	6.13
		Consolidation settlement [mm]	3.46	8.33	11.46
	Design life	10 [years]	69.24	71.78	66.38
		30 [years]	199.43	197.47	186.08
		50 [years]	325.94	319.48	302.08
Type	Method of analysis	Analysis results	Depth [m]		
5	FEM	Total settlement [mm]	0.75	3.64	3.46
		Stage construction settlement [mm]	0.75	3.47	3.27
		Consolidation settlement [mm]	-0.01	0.17	0.19
		Maximum horizontal stress [ton/m ²]	6.72	9.63	10.58
		Maximum vertical stress [ton/m ²]	12.534	15.03	18.40
		Maximum shear stress [ton/m ²]	4.138	2.42	1.88
	Hand calculation	Total settlement [mm]	3.07	10.70	17.44
		Immediate settlement [mm]	0.84	3.06	5.96
		Consolidation settlement [mm]	2.23	7.64	11.48
	Design life	10 [years]	67.76	68.68	65.49
		30 [years]	198.50	195.27	186.09
		50 [years]	325.25	317.70	302.52
Type	Method of analysis	Analysis results	Depth [m]		
6	FEM	Total settlement [mm]	-0.13	5.58	2.72
		Stage construction settlement [mm]	-0.29	5.16	2.46
		Consolidation settlement [mm]	0.16	0.42	0.26
		Maximum horizontal stress [ton/m ²]	11.70	10.70	13.30
		Maximum vertical stress [ton/m ²]	7.037	12.04	19.05
		Maximum shear stress [ton/m ²]	2.356	2.67	2.38
	Hand calculation	Total settlement [mm]	3.61	11.94	19.22
		Immediate settlement [mm]	1.04	3.51	6.69
		Consolidation settlement [mm]	2.57	8.43	12.54
	Design life	10 [years]	65.60	69.53	63.52
		30 [years]	196.70	197.03	184.87
		50 [years]	323.62	319.88	301.64

ตารางที่ ข-11 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 3

พื้นที่ที่ 3

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-2.16	-4.14	-5.38
		Stage construction settlement [mm]	-2.17	-5.31	-5.50
		Consolidation settlement [mm]	0.01	1.17	0.12
		Maximum horizontal stress [ton/m ²]	3.85	8.75	14.71
		Maximum vertical stress [ton/m ²]	33.965	25.83	16.31
		Maximum shear stress [ton/m ²]	4.725	3.16	2.26
	Hand calculation	Total settlement [mm]	0.62	5.67	10.08
		Immediate settlement [mm]	0.15	1.37	2.96
		Consolidation settlement [mm]	0.47	4.30	7.12
	Design life	10 [years]	120.03	108.30	94.06
		30 [years]	356.07	324.84	284.60
		50 [years]	589.57	538.84	472.60
Type	Method of analysis	Analysis results	Depth [m]		
2	FEM	Total settlement [mm]	0.08	-2.13	-5.09
		Stage construction settlement [mm]	0.04	-2.32	-5.23
		Consolidation settlement [mm]	0.04	0.19	0.14
		Maximum horizontal stress [ton/m ²]	3.13	6.25	7.92
		Maximum vertical stress [ton/m ²]	25.644	12.41	15.59
		Maximum shear stress [ton/m ²]	2.662	1.40	2.05
	Hand calculation	Total settlement [mm]	2.33	8.22	13.21
		Immediate settlement [mm]	0.59	2.07	4.00
		Consolidation settlement [mm]	1.75	6.15	9.20
	Design life	10 [years]	121.63	109.68	93.71
		30 [years]	358.70	327.24	285.28
		50 [years]	592.67	541.72	473.75
Type	Method of analysis	Analysis results	Depth [m]		
3	FEM	Total settlement [mm]	0.63	-1.67	-0.87
		Stage construction settlement [mm]	0.53	-1.88	-1.06
		Consolidation settlement [mm]	0.10	0.20	0.20
		Maximum horizontal stress [ton/m ²]	4.03	4.61	9.27
		Maximum vertical stress [ton/m ²]	14.428	9.78	24.45
		Maximum shear stress [ton/m ²]	3.776	1.08	2.30
	Hand calculation	Total settlement [mm]	3.98	10.61	16.20
		Immediate settlement [mm]	1.03	2.77	5.06
		Consolidation settlement [mm]	2.95	7.84	11.15
	Design life	10 [years]	121.22	109.16	96.97
		30 [years]	359.30	327.75	289.55
		50 [years]	593.75	542.70	478.51

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	0.32	1.15	-0.89
		Stage construction settlement [mm]	0.18	0.90	-1.09
		Consolidation settlement [mm]	0.14	0.25	0.20
		Maximum horizontal stress [ton/m ²]	6.59	15.38	7.59
		Maximum vertical stress [ton/m ²]	15.369	16.49	18.72
		Maximum shear stress [ton/m ²]	1.966	2.26	2.69
	Hand calculation	Total settlement [mm]	4.85	12.22	18.54
		Immediate settlement [mm]	1.28	3.29	5.93
		Consolidation settlement [mm]	3.57	8.93	12.60
	Design life	10 [years]	119.65	110.73	95.69
		30 [years]	358.76	330.34	289.30
		50 [years]	593.69	545.77	478.73
Type	Method of analysis	Analysis results	Depth [m]		
5	FEM	Total settlement [mm]	-0.87	-3.12	-2.65
		Stage construction settlement [mm]	-1.02	-3.52	-2.76
		Consolidation settlement [mm]	0.15	0.40	0.11
		Maximum horizontal stress [ton/m ²]	14.14	5.10	11.19
		Maximum vertical stress [ton/m ²]	8.666	8.21	18.43
		Maximum shear stress [ton/m ²]	2.610	1.42	1.98
	Hand calculation	Total settlement [mm]	3.26	11.37	18.81
		Immediate settlement [mm]	0.95	3.14	6.14
		Consolidation settlement [mm]	2.31	8.23	12.67
	Design life	10 [years]	116.97	104.97	92.43
		30 [years]	357.10	325.60	287.06
		50 [years]	592.50	541.50	476.97
Type	Method of analysis	Analysis results	Depth [m]		
6	FEM	Total settlement [mm]	-0.54	1.60	-3.50
		Stage construction settlement [mm]	-0.72	1.54	-4.06
		Consolidation settlement [mm]	0.18	0.06	0.56
		Maximum horizontal stress [ton/m ²]	14.32	17.37	13.38
		Maximum vertical stress [ton/m ²]	7.685	17.68	19.60
		Maximum shear stress [ton/m ²]	2.885	4.71	2.36
	Hand calculation	Total settlement [mm]	4.35	12.69	20.55
		Immediate settlement [mm]	1.04	3.60	6.77
		Consolidation settlement [mm]	3.31	9.09	13.78
	Design life	10 [years]	115.58	107.97	89.81
		30 [years]	356.74	329.63	285.07
		50 [years]	592.62	546.01	475.26

ตารางที่ ข-12 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 4

พื้นที่ที่ 4

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-4.57	-5.68	-10.00
		Stage construction settlement [mm]	-4.67	-6.15	-10.17
		Consolidation settlement [mm]	0.10	0.47	0.17
		Maximum horizontal stress [ton/m ²]	4.95	10.25	14.06
		Maximum vertical stress [ton/m ²]	28.436	27.52	24.82
		Maximum shear stress [ton/m ²]	3.062	5.77	2.21
	Hand calculation	Total settlement [mm]	1.32	11.67	20.90
		Immediate settlement [mm]	0.28	3.19	6.97
		Consolidation settlement [mm]	1.03	8.48	13.92
	Design life	10 [years]	54.70	50.59	42.27
		30 [years]	159.68	149.57	133.25
		50 [years]	261.35	245.24	220.92
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
2	FEM	Total settlement [mm]	-2.62	-3.61	-9.79
		Stage construction settlement [mm]	-2.88	-3.84	-10.07
		Consolidation settlement [mm]	0.26	0.24	0.27
		Maximum horizontal stress [ton/m ²]	3.72	6.30	10.14
		Maximum vertical stress [ton/m ²]	18.120	12.10	15.78
		Maximum shear stress [ton/m ²]	2.450	1.15	2.49
	Hand calculation	Total settlement [mm]	4.74	16.25	26.40
		Immediate settlement [mm]	1.09	4.62	9.03
		Consolidation settlement [mm]	3.66	11.62	17.37
	Design life	10 [years]	56.11	52.11	41.55
		30 [years]	162.42	152.43	133.54
		50 [years]	264.72	248.72	221.69
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
3	FEM	Total settlement [mm]	-1.94	-2.90	-9.47
		Stage construction settlement [mm]	-2.26	-3.19	-9.85
		Consolidation settlement [mm]	0.32	0.29	0.38
		Maximum horizontal stress [ton/m ²]	5.48	4.69	8.32
		Maximum vertical stress [ton/m ²]	11.175	9.53	12.95
		Maximum shear stress [ton/m ²]	2.316	0.78	1.22
	Hand calculation	Total settlement [mm]	7.88	20.54	30.75
		Immediate settlement [mm]	1.89	6.06	10.61
		Consolidation settlement [mm]	5.98	14.47	20.14
	Design life	10 [years]	55.81	51.84	40.20
		30 [years]	163.46	153.49	132.67
		50 [years]	266.37	250.41	221.04

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	-1.90	-3.66	-9.76
		Stage construction settlement [mm]	-2.30	-3.94	-10.22
		Consolidation settlement [mm]	0.41	0.29	0.46
		Maximum horizontal stress [ton/m ²]	5.40	4.97	10.85
		Maximum vertical stress [ton/m ²]	13.694	9.71	20.18
		Maximum shear stress [ton/m ²]	2.524	0.90	2.15
	Hand calculation	Total settlement [mm]	9.44	23.25	33.90
		Immediate settlement [mm]	2.36	6.92	11.76
		Consolidation settlement [mm]	7.07	16.33	22.14
	Design life	10 [years]	54.50	49.58	38.29
		30 [years]	163.49	152.31	131.24
		50 [years]	267.02	249.72	219.82
Type	Method of analysis	Analysis results	Depth [m]		
5	FEM	Total settlement [mm]	-3.82	-5.32	-10.30
		Stage construction settlement [mm]	-4.22	-5.69	-10.83
		Consolidation settlement [mm]	0.40	0.37	0.53
		Maximum horizontal stress [ton/m ²]	13.59	5.80	12.06
		Maximum vertical stress [ton/m ²]	7.602	11.95	16.36
		Maximum shear stress [ton/m ²]	2.423	1.30	1.62
	Hand calculation	Total settlement [mm]	6.01	21.53	33.84
		Immediate settlement [mm]	1.53	6.48	11.79
		Consolidation settlement [mm]	4.48	15.05	22.05
	Design life	10 [years]	50.72	45.76	38.23
		30 [years]	160.58	148.58	131.49
		50 [years]	264.52	246.03	220.22
Type	Method of analysis	Analysis results	Depth [m]		
6	FEM	Total settlement [mm]	-3.23	-7.03	-10.78
		Stage construction settlement [mm]	-3.77	-7.39	-11.45
		Consolidation settlement [mm]	0.54	0.36	0.67
		Maximum horizontal stress [ton/m ²]	8.39	6.86	14.68
		Maximum vertical stress [ton/m ²]	15.987	14.51	16.22
		Maximum shear stress [ton/m ²]	4.393	2.32	1.98
	Hand calculation	Total settlement [mm]	6.92	23.35	36.09
		Immediate settlement [mm]	1.80	7.09	12.59
		Consolidation settlement [mm]	5.12	16.26	23.50
	Design life	10 [years]	49.12	43.07	37.72
		30 [years]	158.98	146.30	131.28
		50 [years]	262.92	243.95	220.15

ตารางที่ ข-13 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 5

พื้นที่ที่ 5

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-2.01	-1.62	-3.32
		Stage construction settlement [mm]	-2.09	-1.75	-3.44
		Consolidation settlement [mm]	0.08	0.13	0.12
		Maximum horizontal stress [ton/m ²]	4.34	7.72	13.59
		Maximum vertical stress [ton/m ²]	31.490	31.71	16.34
		Maximum shear stress [ton/m ²]	2.534	3.79	1.96
	Hand calculation	Total settlement [mm]	1.16	9.57	16.56
		Immediate settlement [mm]	0.13	1.43	3.12
		Consolidation settlement [mm]	1.03	8.14	13.44
	Design life	10 [years]	106.77	99.96	88.66
		30 [years]	312.30	291.09	260.59
		50 [years]	514.33	478.72	429.02
2	FEM	Total settlement [mm]	-0.30	-1.01	0.23
		Stage construction settlement [mm]	-0.41	-1.18	0.19
		Consolidation settlement [mm]	0.11	0.17	0.05
		Maximum horizontal stress [ton/m ²]	4.15	6.94	10.06
		Maximum vertical stress [ton/m ²]	19.153	11.48	25.06
		Maximum shear stress [ton/m ²]	1.514	1.47	3.37
	Hand calculation	Total settlement [mm]	4.15	13.35	21.20
		Immediate settlement [mm]	0.51	2.09	4.15
		Consolidation settlement [mm]	3.64	11.26	17.05
	Design life	10 [years]	107.65	99.74	91.39
		30 [years]	314.59	292.28	264.73
		50 [years]	517.29	480.57	433.82
3	FEM	Total settlement [mm]	0.18	-0.71	1.16
		Stage construction settlement [mm]	0.08	-0.90	0.91
		Consolidation settlement [mm]	0.11	0.19	0.25
		Maximum horizontal stress [ton/m ²]	5.50	6.16	10.11
		Maximum vertical stress [ton/m ²]	12.930	15.27	23.75
		Maximum shear stress [ton/m ²]	1.272	1.37	2.24
	Hand calculation	Total settlement [mm]	6.85	16.84	25.60
		Immediate settlement [mm]	0.89	2.75	5.19
		Consolidation settlement [mm]	5.96	14.09	20.41
	Design life	10 [years]	106.86	98.77	91.03
		30 [years]	315.21	292.71	265.78
		50 [years]	518.55	481.66	435.53

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	0.44	2.27	1.45
		Stage construction settlement [mm]	0.29	2.06	1.23
		Consolidation settlement [mm]	0.15	0.21	0.22
		Maximum horizontal stress [ton/m ²]	6.44	6.04	8.29
		Maximum vertical stress [ton/m ²]	14.308	11.48	18.37
		Maximum shear stress [ton/m ²]	1.780	1.41	2.46
	Hand calculation	Total settlement [mm]	8.17	19.21	29.09
		Immediate settlement [mm]	1.11	3.26	6.07
		Consolidation settlement [mm]	7.06	15.96	23.01
	Design life	10 [years]	105.44	100.07	89.21
		30 [years]	315.20	295.43	265.37
50 [years]		519.20	485.04	435.78	
Type	Method of analysis	Analysis results	Depth [m]		
5	FEM	Total settlement [mm]	-1.44	1.04	1.05
		Stage construction settlement [mm]	-1.55	0.97	0.90
		Consolidation settlement [mm]	0.11	0.07	0.15
		Maximum horizontal stress [ton/m ²]	12.25	5.09	10.27
		Maximum vertical stress [ton/m ²]	7.328	13.66	17.59
		Maximum shear stress [ton/m ²]	2.417	1.85	1.86
	Hand calculation	Total settlement [mm]	5.24	18.24	29.86
		Immediate settlement [mm]	0.73	3.18	6.38
		Consolidation settlement [mm]	4.50	15.07	23.48
	Design life	10 [years]	101.56	96.84	87.25
		30 [years]	312.73	293.61	264.82
50 [years]		517.39	483.87	435.88	
Type	Method of analysis	Analysis results	Depth [m]		
6	FEM	Total settlement [mm]	0.17	2.46	1.68
		Stage construction settlement [mm]	0.04	2.40	1.51
		Consolidation settlement [mm]	0.13	0.06	0.17
		Maximum horizontal stress [ton/m ²]	12.31	10.79	12.98
		Maximum vertical stress [ton/m ²]	7.267	16.12	18.80
		Maximum shear stress [ton/m ²]	2.470	2.37	2.23
	Hand calculation	Total settlement [mm]	6.18	20.21	32.87
		Immediate settlement [mm]	0.90	3.63	7.18
		Consolidation settlement [mm]	5.28	16.58	25.69
	Design life	10 [years]	100.86	95.95	85.64
		30 [years]	313.44	294.13	264.62
50 [years]		518.75	485.05	436.34	

ตารางที่ ข-14 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 6

พื้นที่ที่ 6

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-4.46	-4.76	-7.14
		Stage construction settlement [mm]	-4.61	-5.19	-7.19
		Consolidation settlement [mm]	0.15	0.43	0.05
		Maximum horizontal stress [ton/m ²]	4.35	9.37	13.42
		Maximum vertical stress [ton/m ²]	33.457	33.29	31.02
		Maximum shear stress [ton/m ²]	3.270	2.65	2.49
	Hand calculation	Total settlement [mm]	0.95	8.42	15.46
		Immediate settlement [mm]	0.20	2.15	4.68
		Consolidation settlement [mm]	0.75	6.27	10.77
	Design life	10 [years]	119.38	112.93	102.35
		30 [years]	356.75	338.00	311.02
		50 [years]	590.98	559.93	516.55
Type	Method of analysis	Analysis results	Depth [m]		
2	FEM	Total settlement [mm]	-3.04	-2.53	-6.19
		Stage construction settlement [mm]	-3.17	-2.70	-7.10
		Consolidation settlement [mm]	0.13	0.17	0.91
		Maximum horizontal stress [ton/m ²]	2.43	5.84	7.41
		Maximum vertical stress [ton/m ²]	25.100	13.92	14.88
		Maximum shear stress [ton/m ²]	1.718	1.43	1.91
	Hand calculation	Total settlement [mm]	3.45	11.87	19.95
		Immediate settlement [mm]	0.77	3.14	6.23
		Consolidation settlement [mm]	2.68	8.73	13.72
	Design life	10 [years]	120.00	114.36	102.50
		30 [years]	358.64	340.70	312.44
		50 [years]	593.46	563.22	518.56
Type	Method of analysis	Analysis results	Depth [m]		
3	FEM	Total settlement [mm]	-2.22	-2.07	-10.27
		Stage construction settlement [mm]	-2.39	-2.26	-10.46
		Consolidation settlement [mm]	0.17	0.19	0.19
		Maximum horizontal stress [ton/m ²]	5.54	4.78	7.69
		Maximum vertical stress [ton/m ²]	16.125	10.65	11.94
		Maximum shear stress [ton/m ²]	1.747	1.25	1.46
	Hand calculation	Total settlement [mm]	5.76	15.11	23.47
		Immediate settlement [mm]	1.34	4.13	7.43
		Consolidation settlement [mm]	4.43	10.98	16.04
	Design life	10 [years]	119.61	113.46	96.59
		30 [years]	359.52	341.07	307.04
		50 [years]	594.93	564.18	513.40

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	-0.50	-3.26	-7.66
		Stage construction settlement [mm]	-0.72	-3.40	-9.28
		Consolidation settlement [mm]	0.22	0.14	1.62
		Maximum horizontal stress [ton/m ²]	6.58	4.88	7.46
		Maximum vertical stress [ton/m ²]	13.490	11.43	13.84
		Maximum shear stress [ton/m ²]	2.568	1.43	1.71
	Hand calculation	Total settlement [mm]	6.94	17.23	26.01
		Immediate settlement [mm]	1.67	4.82	8.32
		Consolidation settlement [mm]	5.27	12.41	17.69
	Design life	10 [years]	119.77	110.71	97.40
		30 [years]	360.95	339.31	308.33
		50 [years]	596.96	562.89	514.91
Type	Method of analysis	Analysis results	Depth [m]		
5	FEM	Total settlement [mm]	-1.88	-4.28	-10.16
		Stage construction settlement [mm]	-2.14	-4.48	-10.37
		Consolidation settlement [mm]	0.26	0.20	0.21
		Maximum horizontal stress [ton/m ²]	17.20	6.93	12.02
		Maximum vertical stress [ton/m ²]	9.086	14.54	18.27
		Maximum shear stress [ton/m ²]	2.767	1.80	2.03
	Hand calculation	Total settlement [mm]	4.46	16.06	26.09
		Immediate settlement [mm]	1.10	4.53	8.39
		Consolidation settlement [mm]	3.36	11.54	17.70
	Design life	10 [years]	116.50	107.62	93.14
		30 [years]	358.85	336.71	304.55
		50 [years]	595.39	560.51	511.35
Type	Method of analysis	Analysis results	Depth [m]		
6	FEM	Total settlement [mm]	-1.27	-4.60	-10.92
		Stage construction settlement [mm]	-1.49	-4.84	-11.19
		Consolidation settlement [mm]	0.22	0.24	0.27
		Maximum horizontal stress [ton/m ²]	14.64	9.36	14.46
		Maximum vertical stress [ton/m ²]	7.956	17.87	19.16
		Maximum shear stress [ton/m ²]	3.007	2.96	2.57
	Hand calculation	Total settlement [mm]	5.16	17.53	28.12
		Immediate settlement [mm]	1.30	5.00	9.10
		Consolidation settlement [mm]	3.86	12.53	19.01
	Design life	10 [years]	114.87	105.29	92.17
		30 [years]	357.22	334.85	304.00
		50 [years]	593.76	558.87	511.00

ตารางที่ ข-15 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 7

พื้นที่ที่ 7

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-6.88	29.19	19.46
		Stage construction settlement [mm]	-7.13	27.38	17.71
		Consolidation settlement [mm]	0.25	1.81	1.75
		Maximum horizontal stress [ton/m ²]	28.02	13.01	17.89
		Maximum vertical stress [ton/m ²]	12.848	20.56	16.76
		Maximum shear stress [ton/m ²]	7.519	2.99	3.33
	Hand calculation	Total settlement [mm]	1.24	12.99	24.01
		Immediate settlement [mm]	0.27	3.46	7.61
		Consolidation settlement [mm]	0.97	9.52	16.40
	Design life	10 [years]	223.75	241.37	207.04
		30 [years]	677.63	658.35	574.82
		50 [years]	1127.89	1071.71	938.98
Type	Method of analysis	Analysis results	Depth [m]		
2	FEM	Total settlement [mm]	-4.94	-6.20	28.43
		Stage construction settlement [mm]	-5.14	-6.35	25.24
		Consolidation settlement [mm]	0.20	0.15	3.19
		Maximum horizontal stress [ton/m ²]	3.69	5.69	8.58
		Maximum vertical stress [ton/m ²]	30.000	10.86	12.42
		Maximum shear stress [ton/m ²]	2.069	1.52	2.20
	Hand calculation	Total settlement [mm]	4.52	17.85	30.61
		Immediate settlement [mm]	1.05	4.93	10.00
		Consolidation settlement [mm]	3.48	12.92	20.61
	Design life	10 [years]	224.28	204.57	214.60
		30 [years]	679.63	623.02	583.85
		50 [years]	1130.57	1037.06	948.69
Type	Method of analysis	Analysis results	Depth [m]		
3	FEM	Total settlement [mm]	-2.65	21.29	19.68
		Stage construction settlement [mm]	-3.06	18.87	16.85
		Consolidation settlement [mm]	0.41	2.42	2.83
		Maximum horizontal stress [ton/m ²]	7.37	6.37	10.59
		Maximum vertical stress [ton/m ²]	22.420	12.11	16.49
		Maximum shear stress [ton/m ²]	2.975	2.47	2.38
	Hand calculation	Total settlement [mm]	7.56	22.43	36.79
		Immediate settlement [mm]	1.82	6.40	12.31
		Consolidation settlement [mm]	5.74	16.03	24.48
	Design life	10 [years]	224.68	230.17	203.98
		30 [years]	681.50	650.09	574.57
		50 [years]	1133.12	1064.81	940.02

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	-1.91	10.73	7.69
		Stage construction settlement [mm]	-2.25	7.81	5.07
		Consolidation settlement [mm]	0.35	2.92	2.62
		Maximum horizontal stress [ton/m ²]	6.49	8.86	10.55
		Maximum vertical stress [ton/m ²]	20.589	13.74	19.35
		Maximum shear stress [ton/m ²]	2.241	2.31	10.27
	Hand calculation	Total settlement [mm]	9.11	25.74	40.80
		Immediate settlement [mm]	2.28	7.56	13.74
		Consolidation settlement [mm]	6.83	18.18	27.06
	Design life	10 [years]	223.13	217.32	190.01
30 [years]		681.42	638.70	561.22	
50 [years]		1133.72	1054.10	926.97	
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
5	FEM	Total settlement [mm]	-0.93	7.14	-1.95
		Stage construction settlement [mm]	-1.16	5.50	-3.70
		Consolidation settlement [mm]	0.22	1.64	1.75
		Maximum horizontal stress [ton/m ²]	5.18	13.86	13.40
		Maximum vertical stress [ton/m ²]	12.726	13.03	13.33
		Maximum shear stress [ton/m ²]	3.976	2.95	2.08
	Hand calculation	Total settlement [mm]	5.88	24.77	41.49
		Immediate settlement [mm]	1.50	7.36	14.00
		Consolidation settlement [mm]	4.37	17.41	27.49
	Design life	10 [years]	222.00	212.00	178.00
30 [years]		681.22	633.76	550.20	
50 [years]		1134.20	1049.63	916.24	
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
6	FEM	Total settlement [mm]	-0.60	3.38	-4.54
		Stage construction settlement [mm]	-0.91	1.83	-7.63
		Consolidation settlement [mm]	0.31	1.55	3.09
		Maximum horizontal stress [ton/m ²]	9.73	8.62	15.85
		Maximum vertical stress [ton/m ²]	14.140	10.45	14.41
		Maximum shear stress [ton/m ²]	3.820	2.17	2.48
	Hand calculation	Total settlement [mm]	6.88	27.00	44.84
		Immediate settlement [mm]	1.83	8.09	15.22
		Consolidation settlement [mm]	5.05	18.91	29.62
	Design life	10 [years]	222.00	209.00	176.00
30 [years]		679.44	628.38	546.18	
50 [years]		1132.61	1044.55	912.51	

ตารางที่ ข-16 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 8

พื้นที่ที่ 8

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-5.53	-3.96	-1.82
		Stage construction settlement [mm]	-5.61	-4.48	-2.20
		Consolidation settlement [mm]	0.08	0.52	0.38
		Maximum horizontal stress [ton/m ²]	4.40	8.63	14.64
		Maximum vertical stress [ton/m ²]	33.979	27.04	29.69
		Maximum shear stress [ton/m ²]	4.002	3.38	2.86
	Hand calculation	Total settlement [mm]	1.26	0.81	24.98
		Immediate settlement [mm]	0.23	0.26	6.67
		Consolidation settlement [mm]	1.03	0.55	18.31
	Design life	10 [years]	112.78	110.00	106.33
		30 [years]	334.45	322.97	307.71
		50 [years]	552.07	531.89	505.03
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
2	FEM	Total settlement [mm]	-2.46	1.74	-2.44
		Stage construction settlement [mm]	-2.64	1.12	-3.06
		Consolidation settlement [mm]	0.18	0.62	0.62
		Maximum horizontal stress [ton/m ²]	4.28	4.95	7.55
		Maximum vertical stress [ton/m ²]	24.120	10.78	19.37
		Maximum shear stress [ton/m ²]	2.404	1.57	2.82
	Hand calculation	Total settlement [mm]	4.58	18.52	31.75
		Immediate settlement [mm]	0.89	4.30	8.75
		Consolidation settlement [mm]	3.69	14.22	23.00
	Design life	10 [years]	115.00	114.85	104.87
		30 [years]	338.31	329.46	307.88
		50 [years]	556.69	539.14	505.96
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
3	FEM	Total settlement [mm]	-1.25	2.28	-2.26
		Stage construction settlement [mm]	-1.49	1.84	-2.52
		Consolidation settlement [mm]	0.24	0.44	0.26
		Maximum horizontal stress [ton/m ²]	5.61	5.11	8.83
		Maximum vertical stress [ton/m ²]	16.605	18.84	17.56
		Maximum shear stress [ton/m ²]	1.783	1.95	1.94
	Hand calculation	Total settlement [mm]	7.66	23.21	38.03
		Immediate settlement [mm]	1.56	5.57	10.76
		Consolidation settlement [mm]	6.10	17.64	27.27
	Design life	10 [years]	114.83	114.01	103.52
		30 [years]	339.78	330.25	307.98
		50 [years]	558.92	540.70	506.73

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	-0.95	1.14	-4.86
		Stage construction settlement [mm]	-1.20	0.73	-5.35
		Consolidation settlement [mm]	0.25	0.41	0.49
		Maximum horizontal stress [ton/m ²]	6.10	4.24	8.84
		Maximum vertical stress [ton/m ²]	12.733	12.82	23.35
		Maximum shear stress [ton/m ²]	2.376	2.47	2.38
	Hand calculation	Total settlement [mm]	9.23	26.60	41.87
		Immediate settlement [mm]	1.94	6.57	12.04
		Consolidation settlement [mm]	7.28	20.02	29.83
	Design life	10 [years]	113.30	111.04	98.42
		30 [years]	339.88	328.92	303.30
		50 [years]	559.78	540.12	502.25
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
5	FEM	Total settlement [mm]	-2.20	-2.69	-8.18
		Stage construction settlement [mm]	-2.51	-3.03	-8.99
		Consolidation settlement [mm]	0.31	0.34	0.81
		Maximum horizontal stress [ton/m ²]	4.82	7.75	11.48
		Maximum vertical stress [ton/m ²]	14.362	10.71	16.51
		Maximum shear stress [ton/m ²]	4.903	2.00	1.72
	Hand calculation	Total settlement [mm]	5.95	25.59	42.38
		Immediate settlement [mm]	1.28	6.43	12.31
		Consolidation settlement [mm]	4.66	19.16	30.07
	Design life	10 [years]	109.83	104.76	92.76
		30 [years]	338.05	323.62	298.06
		50 [years]	558.71	535.28	497.21
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
6	FEM	Total settlement [mm]	-1.87	-0.95	-7.45
		Stage construction settlement [mm]	-2.12	-1.70	-8.46
		Consolidation settlement [mm]	0.25	0.74	1.01
		Maximum horizontal stress [ton/m ²]	13.54	14.00	14.19
		Maximum vertical stress [ton/m ²]	7.550	16.70	18.07
		Maximum shear stress [ton/m ²]	2.652	2.49	2.24
	Hand calculation	Total settlement [mm]	7.03	27.75	45.54
		Immediate settlement [mm]	1.56	7.08	13.41
		Consolidation settlement [mm]	5.47	20.67	32.13
	Design life	10 [years]	107.54	103.86	91.25
		30 [years]	337.00	323.15	296.98
		50 [years]	558.24	535.01	496.32

ตารางที่ ข-17 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 9

พื้นที่ที่ 9

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-0.84	5.43	-4.21
		Stage construction settlement [mm]	-2.41	4.87	-5.62
		Consolidation settlement [mm]	1.57	0.56	1.41
		Maximum horizontal stress [ton/m ²]	13.13	11.89	13.65
		Maximum vertical stress [ton/m ²]	7.261	12.86	17.82
		Maximum shear stress [ton/m ²]	2.514	2.56	2.19
	Hand calculation	Total settlement [mm]	1.24	0.90	22.70
		Immediate settlement [mm]	0.23	0.25	6.10
		Consolidation settlement [mm]	1.01	0.65	16.60
	Design life	10 [years]	242.56	232.78	201.74
		30 [years]	715.00	673.12	599.28
		50 [years]	1183.62	1109.64	993.00
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
2	FEM	Total settlement [mm]	-0.84	2.15	-3.85
		Stage construction settlement [mm]	-2.41	1.77	-4.59
		Consolidation settlement [mm]	1.57	0.38	0.74
		Maximum horizontal stress [ton/m ²]	13.13	7.30	10.89
		Maximum vertical stress [ton/m ²]	7.261	13.86	17.01
		Maximum shear stress [ton/m ²]	2.514	2.01	1.74
	Hand calculation	Total settlement [mm]	4.50	17.14	28.93
		Immediate settlement [mm]	0.86	3.97	8.03
		Consolidation settlement [mm]	3.63	13.17	20.90
	Design life	10 [years]	241.79	228.73	201.33
		30 [years]	715.77	670.61	600.41
		50 [years]	1185.11	1107.85	994.85
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
3	FEM	Total settlement [mm]	-1.93	4.75	-1.20
		Stage construction settlement [mm]	-2.44	4.26	-1.95
		Consolidation settlement [mm]	0.50	0.49	0.75
		Maximum horizontal stress [ton/m ²]	5.65	6.55	8.35
		Maximum vertical stress [ton/m ²]	13.599	11.58	18.05
		Maximum shear stress [ton/m ²]	2.190	1.64	3.39
	Hand calculation	Total settlement [mm]	7.50	21.53	34.90
		Immediate settlement [mm]	1.51	5.17	9.97
		Consolidation settlement [mm]	6.00	16.36	24.93
	Design life	10 [years]	239.43	230.06	202.71
		30 [years]	714.95	673.49	603.34
		50 [years]	1185.01	1111.44	998.49

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	-1.40	4.85	1.12
		Stage construction settlement [mm]	-1.59	4.26	0.42
		Consolidation settlement [mm]	0.19	0.59	0.71
		Maximum horizontal stress [ton/m ²]	5.80	6.56	7.69
		Maximum vertical stress [ton/m ²]	15.284	10.95	23.09
		Maximum shear stress [ton/m ²]	1.703	1.48	1.93
	Hand calculation	Total settlement [mm]	9.01	24.67	39.79
		Immediate settlement [mm]	1.88	6.10	11.65
		Consolidation settlement [mm]	7.13	18.56	28.14
	Design life	10 [years]	238.26	228.46	203.33
		30 [years]	715.33	673.43	605.50
		50 [years]	1186.10	1112.10	1001.37
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
5	FEM	Total settlement [mm]	-2.11	8.76	1.85
		Stage construction settlement [mm]	-2.28	4.94	1.22
		Consolidation settlement [mm]	0.17	3.82	0.63
		Maximum horizontal stress [ton/m ²]	2.98	8.48	8.11
		Maximum vertical stress [ton/m ²]	20.960	17.63	17.99
		Maximum shear stress [ton/m ²]	2.443	3.76	2.20
	Hand calculation	Total settlement [mm]	5.81	23.90	41.39
		Immediate settlement [mm]	1.24	6.05	12.35
		Consolidation settlement [mm]	4.56	17.86	29.04
	Design life	10 [years]	235.49	230.31	202.00
		30 [years]	714.10	676.82	605.71
		50 [years]	1185.59	1116.21	1002.30
			Depth [m]		
Type	Method of analysis	Analysis results	1.5	3	5
6	FEM	Total settlement [mm]	-5.45	8.91	3.41
		Stage construction settlement [mm]	-5.51	8.48	2.80
		Consolidation settlement [mm]	0.06	0.43	0.61
		Maximum horizontal stress [ton/m ²]	3.68	8.55	14.96
		Maximum vertical stress [ton/m ²]	33.990	33.66	19.06
		Maximum shear stress [ton/m ²]	3.866	4.43	3.04
	Hand calculation	Total settlement [mm]	7.02	31.41	51.12
		Immediate settlement [mm]	1.64	6.90	13.78
		Consolidation settlement [mm]	5.37	24.52	37.34
	Design life	10 [years]	229.76	260.17	201.01
		30 [years]	709.91	772.42	606.00
		50 [years]	1182.12	1276.73	1003.19

ตารางที่ ข-18 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ Duct bank ในพื้นที่ที่ 10

พื้นที่ที่ 10

Duct bank

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
1	FEM	Total settlement [mm]	-1.74	-3.07	-2.46
		Stage construction settlement [mm]	-1.79	-3.42	-2.58
		Consolidation settlement [mm]	0.05	0.35	0.12
		Maximum horizontal stress [ton/m ²]	2.85	10.04	10.97
		Maximum vertical stress [ton/m ²]	30.968	25.55	33.93
		Maximum shear stress [ton/m ²]	2.450	6.61	2.69
	Hand calculation	Total settlement [mm]	0.68	5.62	11.34
		Immediate settlement [mm]	0.11	1.25	2.26
		Consolidation settlement [mm]	0.57	4.37	9.08
	Design life	10 [years]	343.76	311.97	272.92
		30 [years]	1024.03	931.35	810.81
		50 [years]	1701.86	1548.27	1346.40
2	FEM	Total settlement [mm]	-0.34	-1.15	-1.42
		Stage construction settlement [mm]	-0.44	-1.25	-1.51
		Consolidation settlement [mm]	0.10	0.09	0.09
		Maximum horizontal stress [ton/m ²]	2.98	5.37	7.56
		Maximum vertical stress [ton/m ²]	22.155	15.72	15.04
		Maximum shear stress [ton/m ²]	1.078	1.68	1.91
	Hand calculation	Total settlement [mm]	3.53	9.82	14.43
		Immediate settlement [mm]	0.42	1.59	3.12
		Consolidation settlement [mm]	3.11	8.23	11.31
	Design life	10 [years]	344.83	313.57	274.64
		30 [years]	1026.09	933.93	813.01
		50 [years]	1704.37	1551.31	1348.83
3	FEM	Total settlement [mm]	-0.05	-0.67	-0.76
		Stage construction settlement [mm]	-0.16	-0.76	-0.90
		Consolidation settlement [mm]	0.11	0.08	0.14
		Maximum horizontal stress [ton/m ²]	4.64	5.41	7.74
		Maximum vertical stress [ton/m ²]	16.892	22.27	15.84
		Maximum shear stress [ton/m ²]	1.324	1.97	1.64
	Hand calculation	Total settlement [mm]	5.76	12.28	16.83
		Immediate settlement [mm]	0.73	2.11	3.51
		Consolidation settlement [mm]	5.03	10.17	13.32
	Design life	10 [years]	344.47	315.18	275.52
		30 [years]	1026.72	936.05	814.38
		50 [years]	1705.46	1553.67	1350.43

Type	Method of analysis	Analysis results	Depth [m]		
			1.5	3	5
4	FEM	Total settlement [mm]	-0.57	-0.08	-0.32
		Stage construction settlement [mm]	-1.42	-0.21	-0.49
		Consolidation settlement [mm]	0.85	0.13	0.17
		Maximum horizontal stress [ton/m ²]	7.37	4.36	9.55
		Maximum vertical stress [ton/m ²]	14.483	10.56	16.11
		Maximum shear stress [ton/m ²]	2.069	2.16	2.03
	Hand calculation	Total settlement [mm]	6.78	13.88	18.62
		Immediate settlement [mm]	0.92	2.35	3.97
		Consolidation settlement [mm]	5.87	11.53	14.65
	Design life	10 [years]	344.67	316.69	275.52
		30 [years]	1027.53	938.44	814.75
50 [years]		1706.56	1556.48	1350.96	
Type	Method of analysis	Analysis results	Depth [m]		
5	FEM	Total settlement [mm]	-2.20	-2.69	-8.18
		Stage construction settlement [mm]	-2.51	-3.03	-8.99
		Consolidation settlement [mm]	0.31	0.34	0.81
		Maximum horizontal stress [ton/m ²]	4.82	7.75	11.48
		Maximum vertical stress [ton/m ²]	14.362	10.71	16.51
		Maximum shear stress [ton/m ²]	4.903	2.00	1.72
	Hand calculation	Total settlement [mm]	5.95	25.59	42.38
		Immediate settlement [mm]	1.28	6.43	12.31
		Consolidation settlement [mm]	4.66	19.16	30.07
	Design life	10 [years]	109.83	104.76	92.76
		30 [years]	338.05	323.62	298.06
50 [years]		558.71	535.28	497.21	
Type	Method of analysis	Analysis results	Depth [m]		
6	FEM	Total settlement [mm]	-0.08	-0.82	-0.83
		Stage construction settlement [mm]	-0.24	-0.95	-0.92
		Consolidation settlement [mm]	0.16	0.14	0.09
		Maximum horizontal stress [ton/m ²]	13.64	8.20	12.78
		Maximum vertical stress [ton/m ²]	8.317	13.36	22.44
		Maximum shear stress [ton/m ²]	2.433	2.11	2.77
	Hand calculation	Total settlement [mm]	4.91	13.73	19.94
		Immediate settlement [mm]	0.69	2.45	4.42
		Consolidation settlement [mm]	4.22	11.28	15.51
	Design life	10 [years]	345.19	314.67	273.78
		30 [years]	1028.54	936.81	813.64
50 [years]		1707.80	1555.03	1350.15	

ตารางที่ ข-19 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 2
พื้นที่ที่ 2

HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 8	FEM	Total settlement [mm]	1.37	1.38	1.33	1.44	1.47
		Stage construction settlement [mm]	1.42	1.43	1.38	1.51	1.53
		Consolidation settlement [mm]	-0.05	-0.05	-0.04	-0.07	-0.06
		Axial force [ton/m]	0.08	0.14	0.21	0.30	0.39
		Maximum shear force [ton/m]	0.01	0.02	0.04	0.08	0.10
		Maximum bending moment [ton-m]	0.00	0.00	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.48	1.65	1.73	1.77	1.80
		Immediate settlement [mm]	1.91	1.91	1.91	1.91	1.91
		Consolidation settlement [mm]	-0.47	-0.31	-0.23	-0.18	-0.15
	Design life	10 [years]	66.05	63.05	60.01	57.11	54.14
		30 [years]	188.61	179.61	170.57	161.67	152.70
		50 [years]	310.76	295.77	280.72	265.82	250.86
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 10	FEM	Total settlement [mm]	1.39	1.45	1.35	1.46	1.27
		Stage construction settlement [mm]	1.44	1.51	1.40	1.53	1.31
		Consolidation settlement [mm]	-0.05	-0.06	-0.04	-0.07	-0.04
		Axial force [ton/m]	0.09	0.18	0.22	0.34	0.40
		Maximum shear force [ton/m]	0.01	0.04	0.04	0.09	0.11
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.50	1.66	1.74	1.78	1.81
		Immediate settlement [mm]	1.92	1.92	1.92	1.92	1.92
		Consolidation settlement [mm]	-0.45	-0.30	-0.22	-0.18	-0.15
	Design life	10 [years]	66.06	63.12	60.03	57.13	53.94
		30 [years]	188.62	179.68	170.59	161.69	152.50
		50 [years]	310.78	295.83	280.74	265.85	250.66
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 12.5	FEM	Total settlement [mm]	1.40	1.42	1.36	1.29	1.26
		Stage construction settlement [mm]	1.44	1.43	1.40	1.33	1.30
		Consolidation settlement [mm]	-0.04	-0.01	-0.04	-0.04	-0.04
		Axial force [ton/m]	0.09	0.31	0.23	0.33	0.41
		Maximum shear force [ton/m]	0.01	0.08	0.05	0.08	0.12
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.52	1.67	1.75	1.79	1.82
		Immediate settlement [mm]	1.92	1.92	1.92	1.92	1.92
		Consolidation settlement [mm]	-0.44	-0.29	-0.21	-0.17	-0.14
	Design life	10 [years]	66.07	63.09	60.03	56.96	53.94
		30 [years]	188.63	179.66	170.59	161.52	152.50
		50 [years]	310.79	295.81	280.75	265.68	250.65

ตารางที่ ข-20 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 3
พื้นที่ที่ 3

HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 8	FEM	Total settlement [mm]	1.71	1.77	1.82	1.84	1.94
		Stage construction settlement [mm]	1.79	1.79	1.70	1.89	1.93
		Consolidation settlement [mm]	-0.08	-0.02	0.12	-0.06	0.01
		Axial force [ton/m]	0.12	0.16	0.24	0.27	0.34
		Maximum shear force [ton/m]	0.02	0.03	0.05	0.05	0.07
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.49	1.64	1.71	1.76	1.79
		Immediate settlement [mm]	1.91	1.91	1.91	1.91	1.91
		Consolidation settlement [mm]	-0.46	-0.32	-0.24	-0.19	-0.16
	Design life	10 [years]	117.97	104.92	91.98	78.83	65.85
		30 [years]	343.63	304.58	265.64	226.49	187.51
		50 [years]	568.83	503.78	438.84	373.69	308.71
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 10	FEM	Total settlement [mm]	1.64	1.64	1.62	1.74	1.77
		Stage construction settlement [mm]	1.76	1.71	1.73	1.76	1.74
		Consolidation settlement [mm]	-0.12	-0.08	-0.11	-0.03	0.03
		Axial force [ton/m]	0.14	0.21	0.28	0.36	0.46
		Maximum shear force [ton/m]	0.03	0.05	0.07	0.08	0.10
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.51	1.65	1.72	1.77	1.80
		Immediate settlement [mm]	1.92	1.92	1.92	1.92	1.92
		Consolidation settlement [mm]	-0.45	-0.31	-0.23	-0.19	-0.16
	Design life	10 [years]	117.90	104.90	91.89	79.00	66.03
		30 [years]	343.56	304.56	265.55	226.66	187.70
		50 [years]	568.77	503.76	438.75	373.86	308.90
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 12.5	FEM	Total settlement [mm]	1.70	1.67	1.62	1.87	1.73
		Stage construction settlement [mm]	1.72	1.67	1.71	1.70	1.73
		Consolidation settlement [mm]	-0.02	0.01	-0.08	0.17	-0.01
		Axial force [ton/m]	0.15	0.22	0.30	0.37	0.48
		Maximum shear force [ton/m]	0.03	0.05	0.07	0.09	0.11
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.53	1.67	1.74	1.78	1.81
		Immediate settlement [mm]	1.92	1.92	1.92	1.92	1.92
		Consolidation settlement [mm]	-0.43	-0.29	-0.22	-0.18	-0.15
	Design life	10 [years]	117.96	104.93	91.88	79.13	65.99
		30 [years]	343.62	304.60	265.55	226.80	187.65
		50 [years]	568.82	503.80	438.75	374.00	308.85

ตารางที่ ข-21 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 4
พื้นที่ที่ 4

HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 8	FEM	Total settlement [mm]	1.21	1.29	1.37	1.60	1.83
		Stage construction settlement [mm]	1.21	1.36	1.43	1.69	2.03
		Consolidation settlement [mm]	0.00	-0.06	-0.06	-0.09	-0.20
		Axial force [ton/m]	0.13	0.24	0.32	0.42	0.45
		Maximum shear force [ton/m]	0.03	0.07	0.09	0.07	0.11
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.18	1.42	1.54	1.61	1.65
		Immediate settlement [mm]	1.85	1.85	1.85	1.85	1.85
		Consolidation settlement [mm]	-0.71	-0.47	-0.35	-0.28	-0.24
	Design life	10 [years]	54.89	50.98	47.05	43.28	39.51
		30 [years]	152.81	140.90	128.98	117.20	105.43
		50 [years]	250.13	230.22	210.30	190.53	170.76
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 10	FEM	Total settlement [mm]	1.25	1.30	1.38	1.60	1.85
		Stage construction settlement [mm]	1.25	1.38	1.45	1.68	1.99
		Consolidation settlement [mm]	0.00	-0.08	-0.07	-0.08	-0.14
		Axial force [ton/m]	0.14	0.25	0.35	0.44	0.44
		Maximum shear force [ton/m]	0.04	0.07	0.09	0.08	0.11
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.21	1.44	1.55	1.62	1.67
		Immediate settlement [mm]	1.86	1.86	1.86	1.86	1.86
		Consolidation settlement [mm]	-0.69	-0.46	-0.34	-0.27	-0.23
	Design life	10 [years]	54.93	50.99	47.06	43.28	39.54
		30 [years]	152.86	140.91	128.98	117.20	105.46
		50 [years]	250.18	230.23	210.30	190.52	170.78
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 12.5	FEM	Total settlement [mm]	1.28	1.32	1.39	1.58	1.89
		Stage construction settlement [mm]	1.28	1.39	1.45	1.66	1.98
		Consolidation settlement [mm]	0.00	-0.06	-0.06	-0.09	-0.08
		Axial force [ton/m]	0.14	0.26	0.34	0.44	0.45
		Maximum shear force [ton/m]	0.04	0.06	0.09	0.08	0.10
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.24	1.46	1.57	1.64	1.68
		Immediate settlement [mm]	1.86	1.86	1.86	1.86	1.86
		Consolidation settlement [mm]	-0.66	-0.44	-0.33	-0.26	-0.22
	Design life	10 [years]	54.96	51.00	47.07	43.26	39.57
		30 [years]	152.88	140.93	128.99	117.18	105.50
		50 [years]	250.21	230.25	210.32	190.50	170.82

ตารางที่ ข-22 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 5
พื้นที่ที่ 5

HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 8	FEM	Total settlement [mm]	1.48	1.54	1.69	1.69	1.66
		Stage construction settlement [mm]	1.51	1.57	1.72	1.68	1.69
		Consolidation settlement [mm]	-0.04	-0.03	-0.04	0.01	-0.02
		Axial force [ton/m]	0.10	0.15	0.18	0.25	0.31
		Maximum shear force [ton/m]	0.01	0.10	0.03	0.05	0.06
		Maximum bending moment [ton-m]	0.00	0.00	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.26	1.49	1.61	1.68	1.73
		Immediate settlement [mm]	1.93	1.93	1.93	1.93	1.93
		Consolidation settlement [mm]	-0.71	-0.48	-0.36	-0.29	-0.24
	Design life	10 [years]	103.95	94.41	84.96	75.36	65.73
		30 [years]	299.34	270.59	241.94	213.14	184.32
		50 [years]	494.09	446.15	398.30	350.30	302.27
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 10	FEM	Total settlement [mm]	1.50	1.57	1.71	1.70	1.69
		Stage construction settlement [mm]	1.53	1.59	1.74	1.70	1.69
		Consolidation settlement [mm]	-0.03	-0.03	-0.04	0.01	0.00
		Axial force [ton/m]	0.10	0.15	0.19	0.26	0.36
		Maximum shear force [ton/m]	0.01	0.09	0.03	0.05	0.08
		Maximum bending moment [ton-m]	0.00	0.00	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.28	1.51	1.62	1.69	1.74
		Immediate settlement [mm]	1.93	1.93	1.93	1.93	1.93
		Consolidation settlement [mm]	-0.69	-0.46	-0.35	-0.28	-0.23
	Design life	10 [years]	103.97	94.44	84.98	75.37	65.76
		30 [years]	299.36	270.62	241.97	213.16	184.34
		50 [years]	494.11	446.18	398.32	350.31	302.30
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 12.5	FEM	Total settlement [mm]	1.53	1.59	1.72	1.71	1.71
		Stage construction settlement [mm]	1.57	1.62	1.75	1.76	1.70
		Consolidation settlement [mm]	-0.03	-0.03	-0.04	-0.05	0.01
		Axial force [ton/m]	0.10	0.15	0.20	0.34	0.27
		Maximum shear force [ton/m]	0.10	0.01	0.04	0.08	0.06
		Maximum bending moment [ton-m]	0.00	0.00	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.31	1.53	1.64	1.70	1.75
		Immediate settlement [mm]	1.93	1.93	1.93	1.93	1.93
		Consolidation settlement [mm]	-0.66	-0.44	-0.34	-0.27	-0.23
	Design life	10 [years]	104.00	94.46	84.99	75.38	65.78
		30 [years]	299.39	270.65	241.97	213.17	184.37
		50 [years]	494.14	446.20	398.33	350.32	302.32

ตารางที่ ข-23 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 6
พื้นที่ที่ 6

HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 8	FEM	Total settlement [mm]	1.37	1.53	1.52	1.55	1.64
		Stage construction settlement [mm]	1.39	1.57	1.58	1.59	1.75
		Consolidation settlement [mm]	-0.02	-0.04	-0.06	-0.04	-0.11
		Axial force [ton/m]	0.10	0.17	0.26	0.35	0.41
		Maximum shear force [ton/m]	0.02	0.03	0.07	0.09	0.13
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.43	1.57	1.65	1.70	1.73
		Immediate settlement [mm]	1.89	1.89	1.89	1.89	1.89
		Consolidation settlement [mm]	-0.50	-0.36	-0.29	-0.23	-0.20
	Design life	10 [years]	119.86	111.81	103.60	95.44	87.33
		30 [years]	348.32	323.88	299.27	274.70	250.20
		50 [years]	576.22	535.38	494.36	453.40	412.49
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 10	FEM	Total settlement [mm]	1.41	1.55	1.54	1.56	1.66
		Stage construction settlement [mm]	1.42	1.59	1.60	1.60	1.77
		Consolidation settlement [mm]	-0.02	-0.04	-0.06	-0.04	-0.11
		Axial force [ton/m]	0.11	0.17	0.28	0.37	0.43
		Maximum shear force [ton/m]	0.02	0.04	0.07	0.10	0.14
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.45	1.58	1.66	1.71	1.74
		Immediate settlement [mm]	1.90	1.90	1.90	1.90	1.90
		Consolidation settlement [mm]	-0.49	-0.35	-0.28	-0.23	-0.19
	Design life	10 [years]	119.89	111.83	103.62	95.44	87.34
		30 [years]	348.36	323.90	299.29	274.71	250.21
		50 [years]	576.25	535.40	494.38	453.41	412.51
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 12.5	FEM	Total settlement [mm]	1.43	1.61	1.56	1.56	1.66
		Stage construction settlement [mm]	1.45	1.66	1.61	1.60	1.77
		Consolidation settlement [mm]	-0.02	-0.05	-0.05	-0.04	-0.11
		Axial force [ton/m]	0.11	0.23	0.29	0.38	0.44
		Maximum shear force [ton/m]	0.02	0.05	0.08	0.10	0.15
		Maximum bending moment [ton-m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.47	1.60	1.68	1.72	1.76
		Immediate settlement [mm]	1.90	1.90	1.90	1.90	1.90
		Consolidation settlement [mm]	-0.47	-0.34	-0.27	-0.22	-0.19
	Design life	10 [years]	119.92	111.89	103.64	95.45	87.35
		30 [years]	348.39	323.96	299.31	274.71	250.22
		50 [years]	576.28	535.46	494.40	453.41	412.51

ตารางที่ ข-24 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 7
พื้นที่ที่ 7

HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 8	FEM	Total settlement [mm]	1.38	1.32	1.37	1.48	1.74
		Stage construction settlement [mm]	1.29	1.34	1.38	1.58	1.84
		Consolidation settlement [mm]	0.09	-0.02	-0.01	-0.10	-0.10
		Axial force [ton/m]	0.15	0.16	0.31	0.38	0.45
		Maximum shear force [ton/m]	0.03	0.04	0.08	0.08	0.07
		Maximum bending moment [ton·m]	0.01	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.28	1.45	1.55	1.61	1.66
		Immediate settlement [mm]	1.86	1.86	1.86	1.86	1.86
		Consolidation settlement [mm]	-0.62	-0.45	-0.35	-0.29	-0.25
	Design life	10 [years]	223.90	199.24	174.68	150.20	125.86
		30 [years]	659.93	586.07	512.32	438.63	365.09
		50 [years]	1095.30	972.25	849.29	726.41	603.67
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 10	FEM	Total settlement [mm]	1.33	1.34	1.49	1.61	1.73
		Stage construction settlement [mm]	1.33	1.36	1.59	1.56	1.82
		Consolidation settlement [mm]	0.00	-0.02	-0.09	0.05	-0.09
		Axial force [ton/m]	0.13	0.17	0.40	0.41	0.46
		Maximum shear force [ton/m]	0.03	0.04	0.09	0.08	0.08
		Maximum bending moment [ton·m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.31	1.47	1.57	1.63	1.67
		Immediate settlement [mm]	1.87	1.87	1.87	1.87	1.87
		Consolidation settlement [mm]	-0.60	-0.43	-0.34	-0.28	-0.24
	Design life	10 [years]	223.85	199.26	174.81	150.33	125.84
		30 [years]	659.88	586.09	512.44	438.76	365.08
		50 [years]	1095.25	972.26	849.42	726.54	603.65
HDD			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 12.5	FEM	Total settlement [mm]	1.35	1.35	1.32	1.50	1.72
		Stage construction settlement [mm]	1.35	1.37	1.36	1.59	1.80
		Consolidation settlement [mm]	0.00	-0.02	-0.05	-0.09	-0.08
		Axial force [ton/m]	0.14	0.18	0.65	0.40	0.47
		Maximum shear force [ton/m]	0.32	0.04	0.09	0.09	0.08
		Maximum bending moment [ton·m]	0.00	0.01	0.02	0.01	0.02
	Hand calculation	Total settlement [mm]	1.34	1.50	1.59	1.64	1.68
		Immediate settlement [mm]	1.87	1.87	1.87	1.87	1.87
		Consolidation settlement [mm]	-0.57	-0.42	-0.33	-0.27	-0.23
	Design life	10 [years]	223.87	199.27	174.64	150.22	125.84
		30 [years]	659.90	586.10	512.27	438.65	365.07
		50 [years]	1095.28	972.28	849.24	726.42	603.64

ตารางที่ ข-25 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 8

พื้นที่ที่ 8

HDD

Type	Method of analysis	Analysis results	Depth [m]				
			2	4	6	8	10
PN 8	FEM	Total settlement [mm]	1.38	1.49	1.47	1.42	1.78
		Stage construction settlement [mm]	1.39	1.54	1.54	1.53	1.82
		Consolidation settlement [mm]	-0.01	-0.05	-0.07	-0.11	-0.04
		Axial force [ton/m]	0.12	0.18	0.27	0.38	0.45
		Maximum shear force [ton/m]	0.02	0.04	0.08	0.09	0.07
		Maximum bending moment [ton·m]	0.00	0.01	0.01	0.01	0.02
	Hand calculation	Total settlement [mm]	1.28	1.45	1.54	1.61	1.65
		Immediate settlement [mm]	1.88	1.88	1.88	1.88	1.88
		Consolidation settlement [mm]	-0.64	-0.48	-0.38	-0.32	-0.27
	Design life	10 [years]	113.30	107.61	101.79	95.94	90.50
		30 [years]	325.88	308.58	291.17	273.72	256.68
		50 [years]	537.72	508.82	479.81	450.76	422.12
			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 10	FEM	Total settlement [mm]	1.41	1.51	1.49	1.50	1.78
		Stage construction settlement [mm]	1.42	1.55	1.55	1.54	1.82
		Consolidation settlement [mm]	0.00	-0.05	-0.07	-0.04	-0.04
		Axial force [ton/m]	0.12	0.19	0.28	0.38	0.43
		Maximum shear force [ton/m]	0.03	0.05	0.08	0.09	0.10
		Maximum bending moment [ton·m]	0.00	0.01	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.31	1.47	1.56	1.62	1.67
		Immediate settlement [mm]	1.89	1.89	1.89	1.89	1.89
		Consolidation settlement [mm]	-0.62	-0.46	-0.37	-0.30	-0.26
	Design life	10 [years]	113.33	107.63	101.81	96.02	90.50
		30 [years]	325.91	308.60	291.18	273.80	256.68
		50 [years]	537.75	508.84	479.82	450.84	422.12
			Depth [m]				
Type	Method of analysis	Analysis results	2	4	6	8	10
PN 12.5	FEM	Total settlement [mm]	1.43	1.51	1.66	1.49	1.43
		Stage construction settlement [mm]	1.44	1.56	1.62	1.55	1.54
		Consolidation settlement [mm]	0.00	-0.05	0.04	-0.06	-0.11
		Axial force [ton/m]	0.13	0.20	0.31	0.29	0.40
		Maximum shear force [ton/m]	0.03	0.05	0.07	0.08	0.10
		Maximum bending moment [ton·m]	0.00	0.01	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.34	1.49	1.58	1.64	1.68
		Immediate settlement [mm]	1.89	1.89	1.89	1.89	1.89
		Consolidation settlement [mm]	-0.59	-0.44	-0.35	-0.29	-0.25
	Design life	10 [years]	113.35	107.63	101.98	96.01	90.15
		30 [years]	325.93	308.61	291.35	273.79	256.32
		50 [years]	537.77	508.85	479.99	450.83	421.76

ตารางที่ ข-26 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 9
พื้นที่ที่ 9

HDD

Type	Method of analysis	Analysis results	Depth [m]				
			2	4	6	8	10
PN 8	FEM	Total settlement [mm]	1.39	1.62	1.69	1.66	1.66
		Stage construction settlement [mm]	1.43	1.67	1.67	1.68	1.69
		Consolidation settlement [mm]	-0.03	-0.05	0.02	-0.03	-0.03
		Axial force [ton/m]	0.11	0.15	0.19	0.24	0.30
		Maximum shear force [ton/m]	0.01	0.01	0.05	0.04	0.07
		Maximum bending moment [ton·m]	0.00	0.00	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.27	1.45	1.55	1.62	1.67
		Immediate settlement [mm]	1.88	1.89	1.89	1.89	1.89
		Consolidation settlement [mm]	-0.65	-0.47	-0.37	-0.30	-0.26
	Design life	10 [years]	234.68	213.50	192.17	170.74	149.34
		30 [years]	690.58	626.60	562.47	498.24	434.04
		50 [years]	1145.78	1039.00	932.08	825.05	718.05
PN 10	FEM	Total settlement [mm]	1.44	1.63	1.70	1.68	1.68
		Stage construction settlement [mm]	1.47	1.68	1.69	1.70	1.71
		Consolidation settlement [mm]	-0.03	-0.05	0.01	-0.02	-0.03
		Axial force [ton/m]	0.11	0.15	0.26	0.25	0.32
		Maximum shear force [ton/m]	0.01	0.02	0.06	0.05	0.08
		Maximum bending moment [ton·m]	0.00	0.00	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.30	1.47	1.57	1.63	1.68
		Immediate settlement [mm]	1.89	1.89	1.89	1.89	1.89
		Consolidation settlement [mm]	-0.63	-0.46	-0.36	-0.29	-0.25
	Design life	10 [years]	234.72	213.51	192.18	170.76	149.36
		30 [years]	690.62	626.61	562.48	498.26	434.06
		50 [years]	1145.82	1039.02	932.09	825.06	718.06
PN 12.5	FEM	Total settlement [mm]	1.46	1.64	1.69	1.60	1.69
		Stage construction settlement [mm]	1.49	1.69	1.69	1.71	1.73
		Consolidation settlement [mm]	-0.03	-0.05	0.01	-0.11	-0.04
		Axial force [ton/m]	0.11	0.16	0.253.32	0.34	0.40
		Maximum shear force [ton/m]	0.01	0.02	0.07	0.08	0.10
		Maximum bending moment [ton·m]	0.00	0.00	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	1.33	1.50	1.59	1.65	1.69
		Immediate settlement [mm]	1.89	1.89	1.89	1.89	1.89
		Consolidation settlement [mm]	-0.61	-0.44	-0.34	-0.28	-0.24
	Design life	10 [years]	234.74	213.52	192.18	170.68	149.37
		30 [years]	690.64	626.62	562.48	498.18	434.07
		50 [years]	1145.84	1039.03	932.08	824.98	718.07

ตารางที่ ข-27 ค่าการทรุดตัวในแนวตั้งทั้งหมดของ HDD ในพื้นที่ที่ 10
พื้นที่ที่ 10

HDD

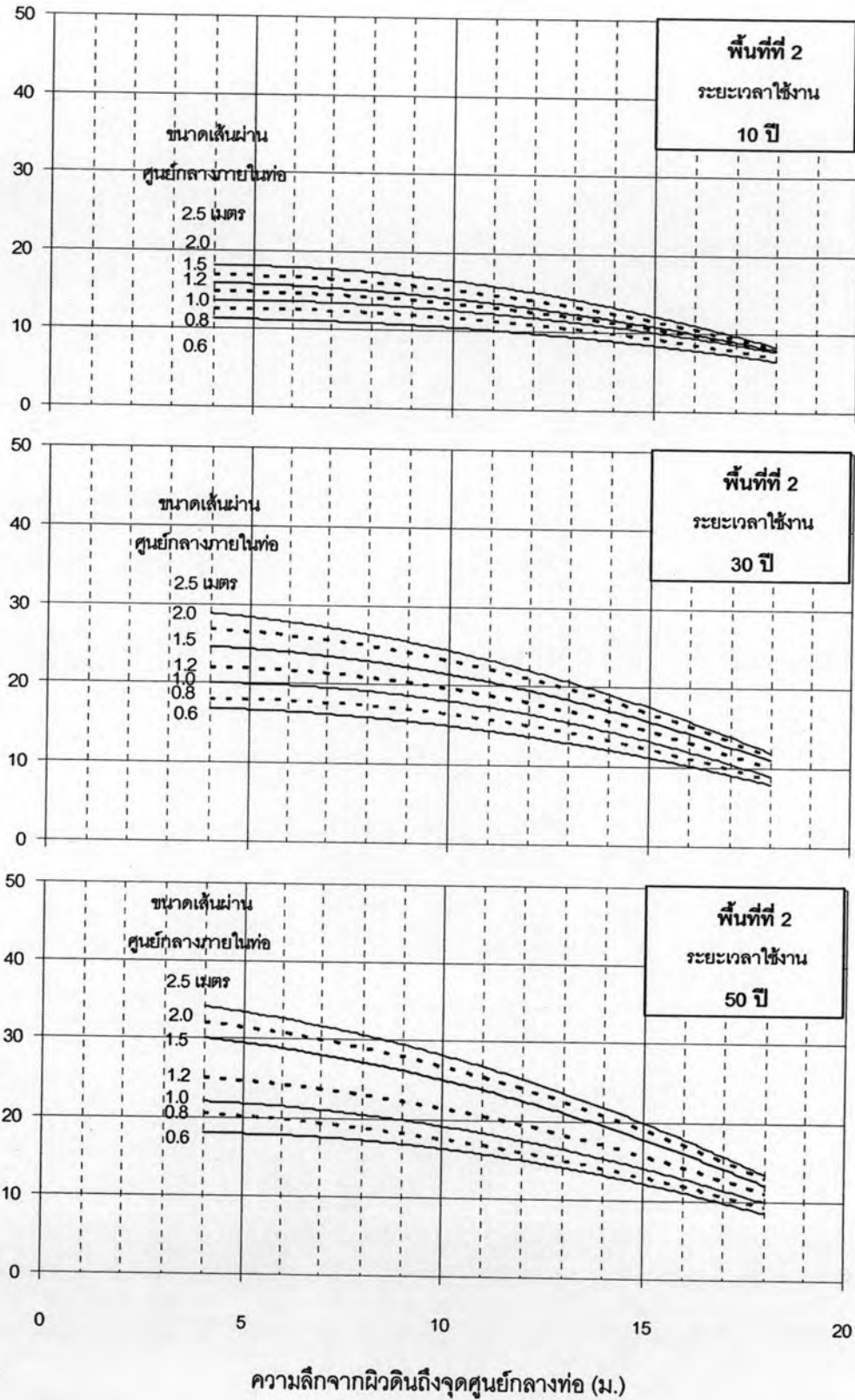
Type	Method of analysis	Analysis results	Depth [m]				
			2	4	6	8	10
PN 8	FEM	Total settlement [mm]	-0.53	-0.35	-0.19	-0.27	-0.14
		Stage construction settlement [mm]	-0.55	-0.30	-0.22	-0.26	0.00
		Consolidation settlement [mm]	0.01	-0.05	0.03	-0.01	-0.14
		Axial force [ton/m]	0.12	0.16	0.19	0.23	0.24
		Maximum shear force [ton/m]	0.03	0.02	0.01	0.01	0.07
		Maximum bending moment [ton-m]	0.00	0.00	0.00	0.01	0.01
	Hand calculation	Total settlement [mm]	-0.46	-0.34	-0.28	-0.24	-0.12
		Immediate settlement [mm]	-0.06	-0.06	-0.06	-0.06	-0.03
		Consolidation settlement [mm]	-0.40	-0.28	-0.22	-0.18	-0.10
	Design life	10 [years]	333.14	292.72	252.28	211.60	169.13
		30 [years]	989.37	867.75	746.11	624.23	500.15
		50 [years]	1645.16	1442.34	1239.50	1036.42	830.94

Type	Method of analysis	Analysis results	Depth [m]				
			2	4	6	8	10
PN 10	FEM	Total settlement [mm]	-0.47	0.00	-0.20	-0.27	0.00
		Stage construction settlement [mm]	-0.49	0.00	0.00	-0.26	0.00
		Consolidation settlement [mm]	0.01	0.00	-0.19	0.00	0.00
		Axial force [ton/m]	0.12	0.20	0.19	0.23	0.25
		Maximum shear force [ton/m]	0.03	0.04	0.01	0.02	0.06
		Maximum bending moment [ton-m]	0.00	0.01	0.00	0.01	0.01
	Hand calculation	Total settlement [mm]	-0.44	-0.33	-0.27	-0.23	-0.12
		Immediate settlement [mm]	-0.06	-0.06	-0.06	-0.06	-0.03
		Consolidation settlement [mm]	-0.39	-0.28	-0.21	-0.18	-0.09
	Design life	10 [years]	333.20	291.07	252.27	211.60	169.27
		30 [years]	989.43	866.10	746.11	624.23	500.28
		50 [years]	1645.22	1440.69	1239.49	1036.42	831.07

Type	Method of analysis	Analysis results	Depth [m]				
			2	4	6	8	10
PN 12.5	FEM	Total settlement [mm]	-0.43	-0.29	-0.19	-0.30	-0.04
		Stage construction settlement [mm]	-0.44	-0.26	0.00	-0.28	-0.05
		Consolidation settlement [mm]	0.01	-0.03	-0.19	-0.02	0.00
		Axial force [ton/m]	0.12	0.16	0.28	0.22	0.26
		Maximum shear force [ton/m]	0.03	0.02	0.07	0.02	0.06
		Maximum bending moment [ton-m]	0.00	0.00	0.01	0.01	0.01
	Hand calculation	Total settlement [mm]	-0.43	-0.32	-0.26	-0.22	-0.12
		Immediate settlement [mm]	-0.06	-0.06	-0.06	-0.06	-0.02
		Consolidation settlement [mm]	-0.37	-0.26	-0.21	-0.17	-0.09
	Design life	10 [years]	333.24	292.78	252.28	211.57	169.23
		30 [years]	989.47	867.81	746.11	624.20	500.24
		50 [years]	1645.26	1442.40	1239.50	1036.39	831.03

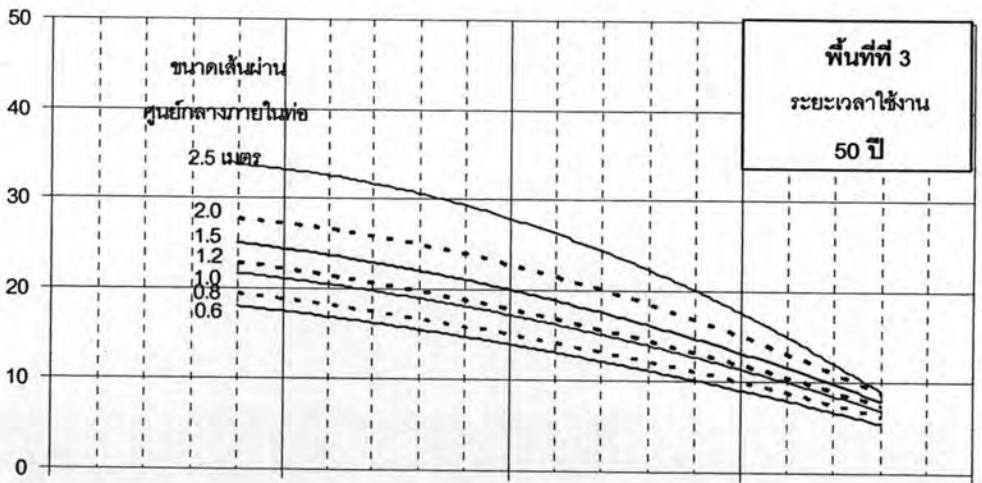
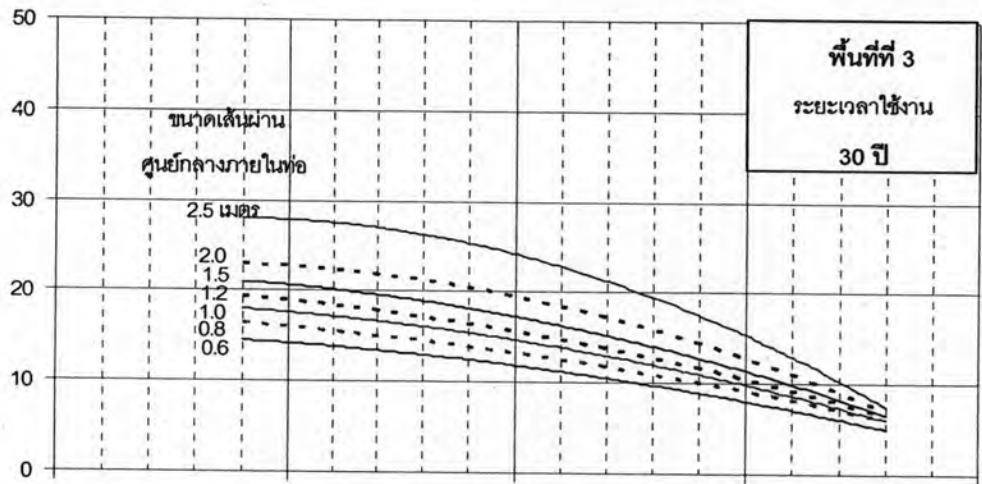
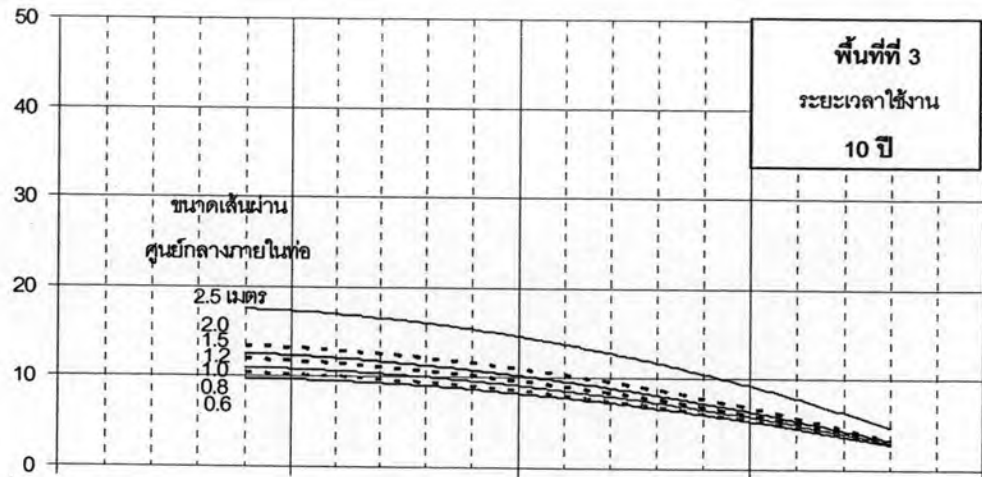
ภาคผนวก ค

ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)



รูปที่ ค-1 ความแตกต่างของการเคลื่อนตัวในแนวตั้งระหว่างท่อ Pipe jacking กับบ่อพักในพื้นที่ที่ 2

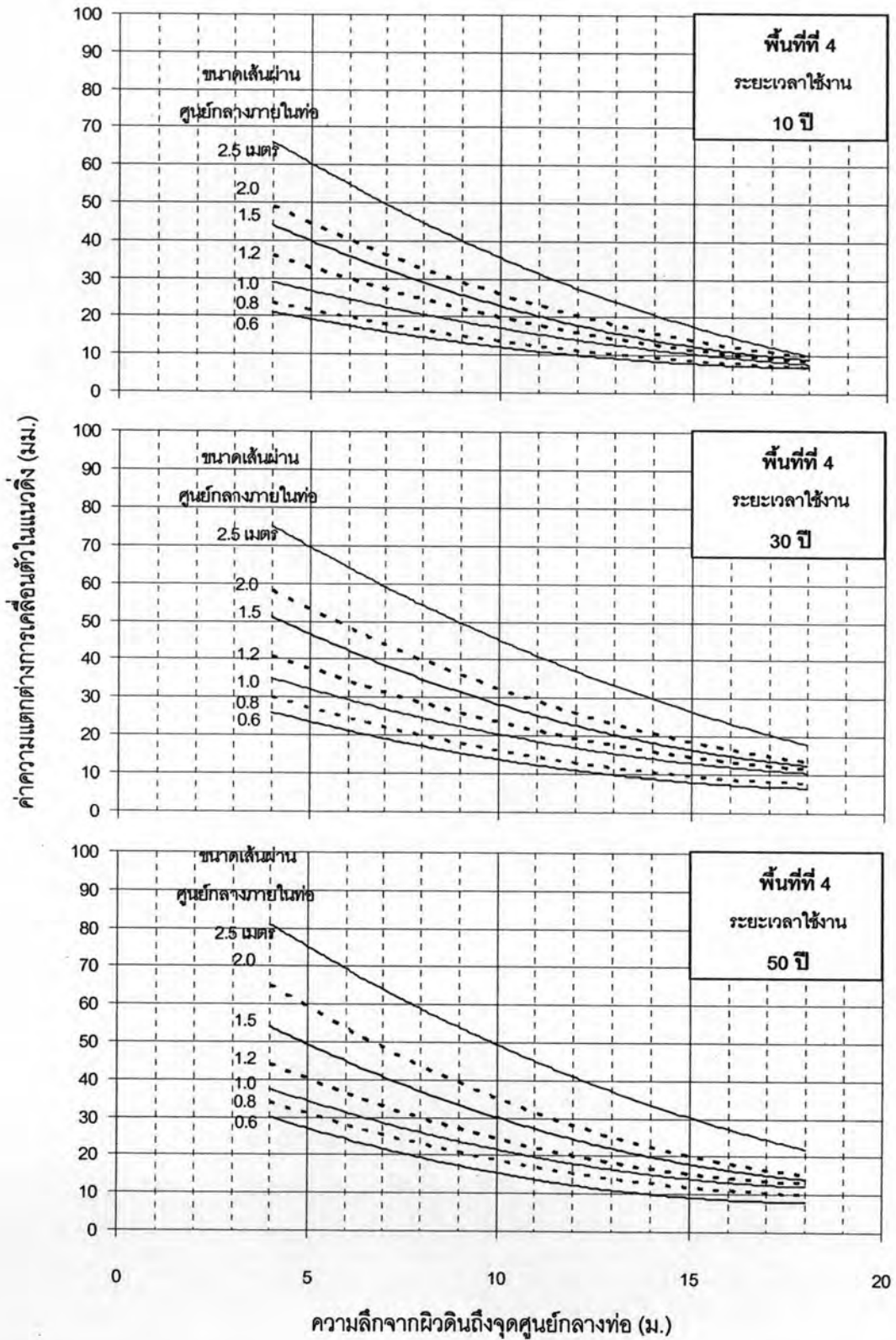
ค่าความแตกต่างทางการเคลื่อนตัวในแนวตั้ง (มม.)



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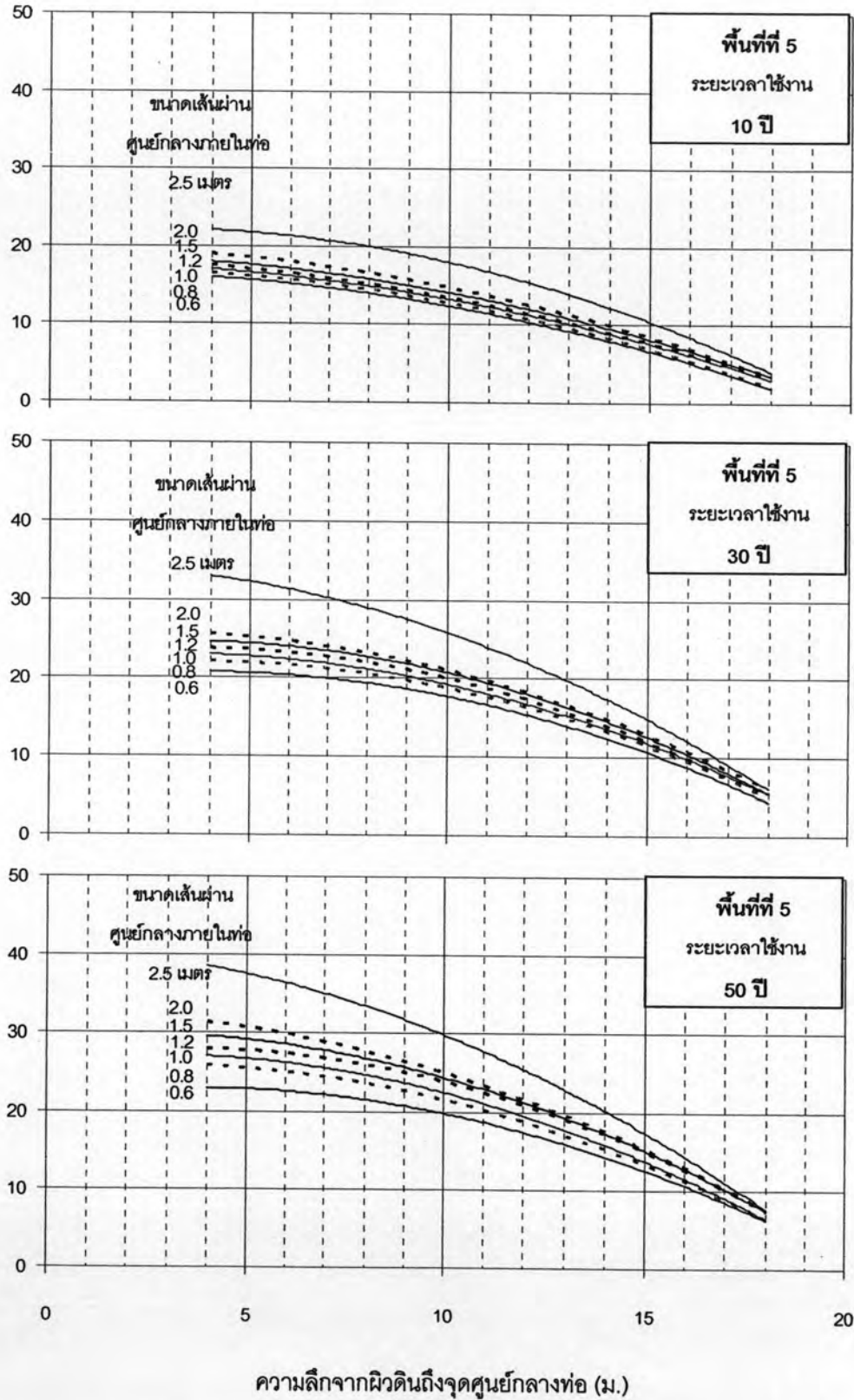
ความลึกจากผิวดินถึงจุดศูนย์กลางท่อ (ม.)

รูปที่ ค-2 ความแตกต่างของการเคลื่อนตัวในแนวตั้งระหว่างท่อ Pipe jacking กับบ่อพักในพื้นที่ที่ 3



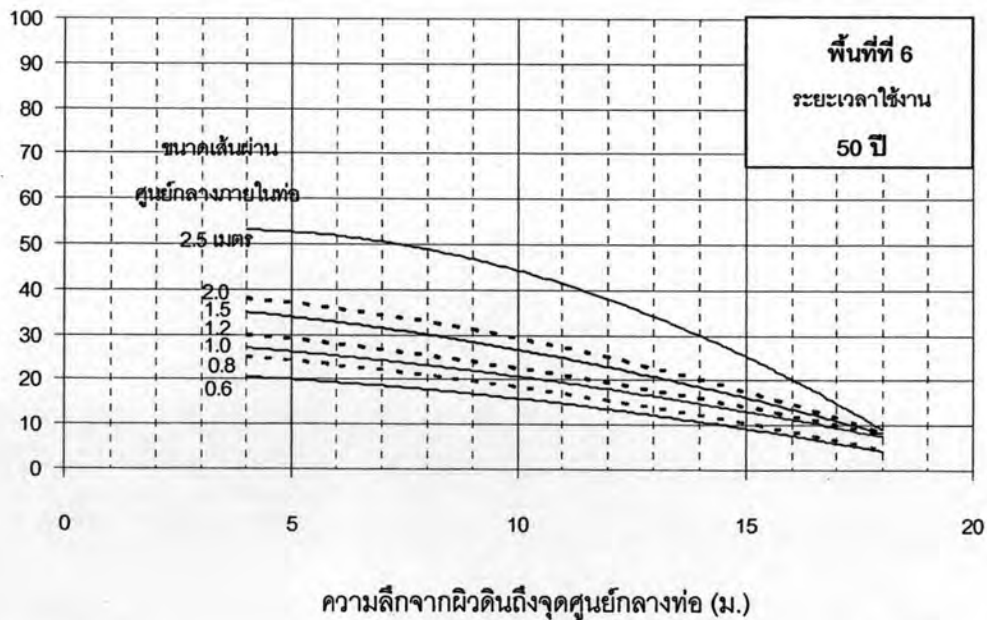
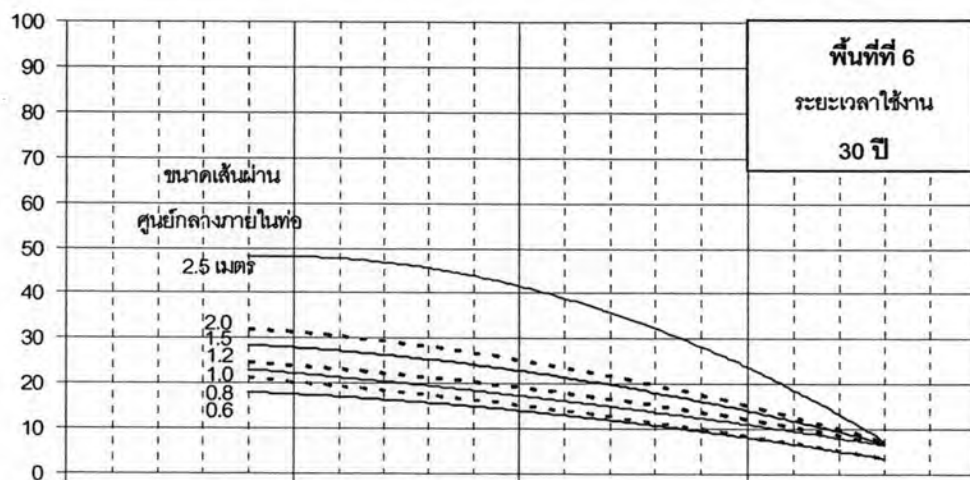
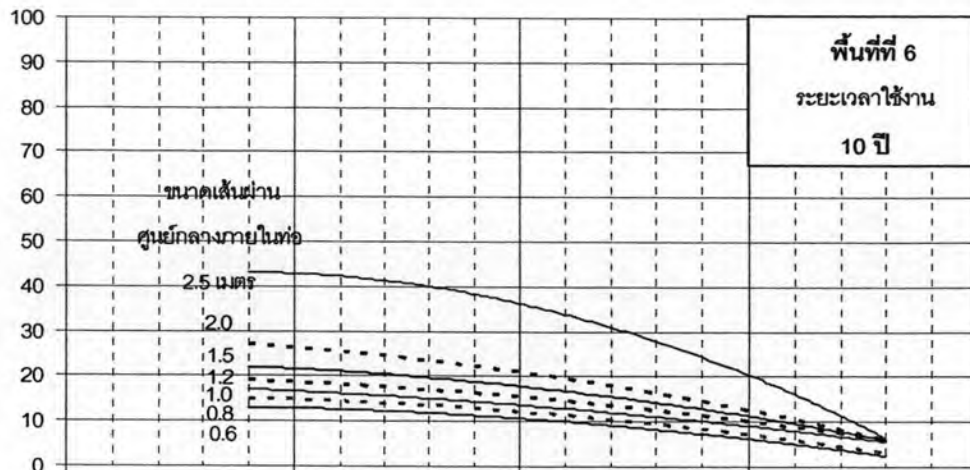
รูปที่ ค-3 ความแตกต่างของการเคลื่อนตัวในแนวตั้งระหว่างท่อ Pipe jacking กับบ่อพักในพื้นที่ที่ 4

ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)



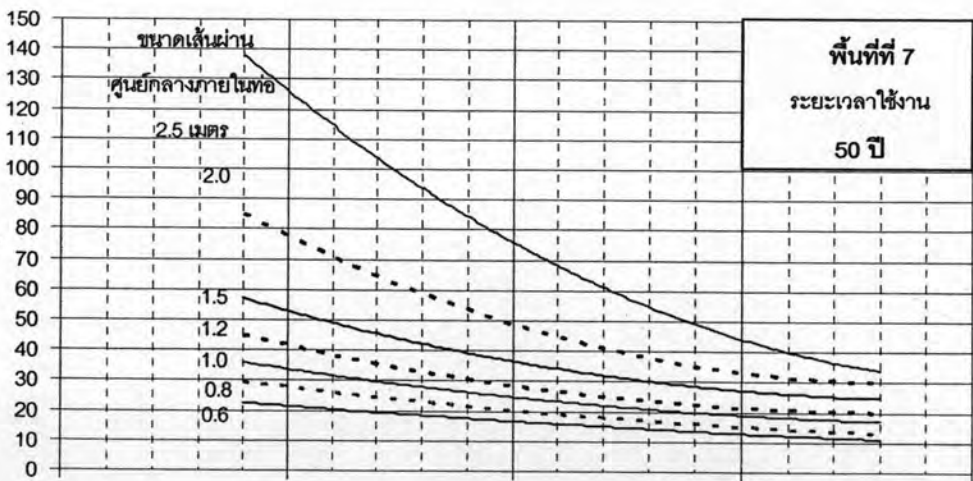
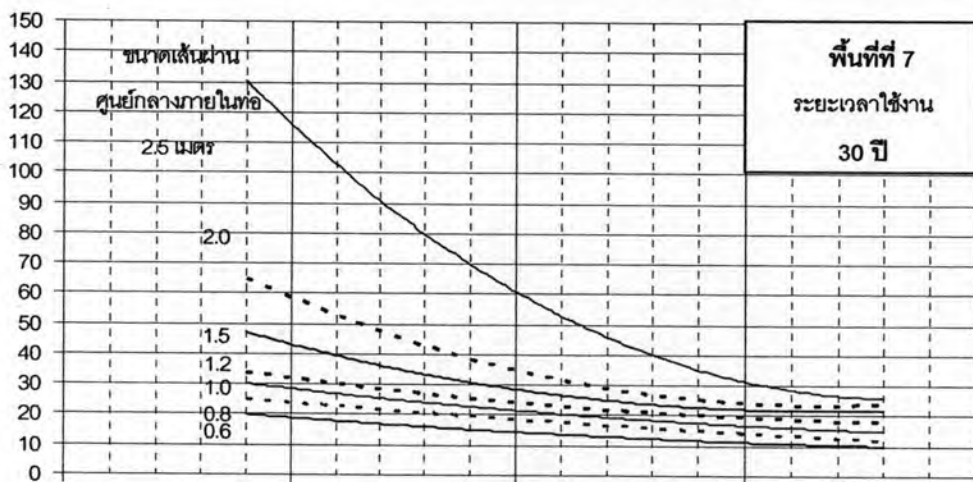
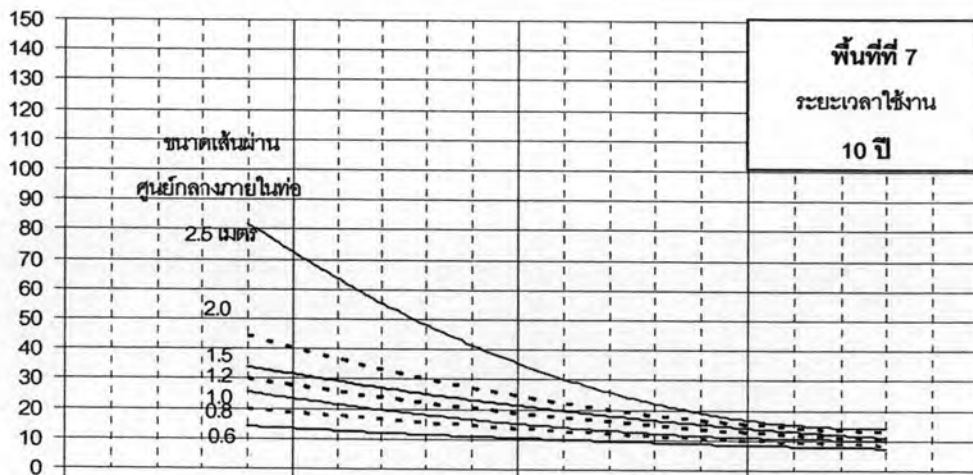
รูปที่ ค-4 ความแตกต่างของการเคลื่อนตัวในแนวตั้งระหว่างท่อ Pipe jacking กับบ่อพักในพื้นที่ที่ 5

ค่าความแตกต่างทางการเคลื่อนตัวในแนวดิ่ง (มม.)



รูปที่ ค-5 ความแตกต่างของการเคลื่อนตัวในแนวดิ่งระหว่างท่อ Pipe jacking กับบ่อพักในพื้นที่ที่ 6

ค่าความแตกต่างทางการเคลื่อนตัวในแนวตั้ง (มม.)

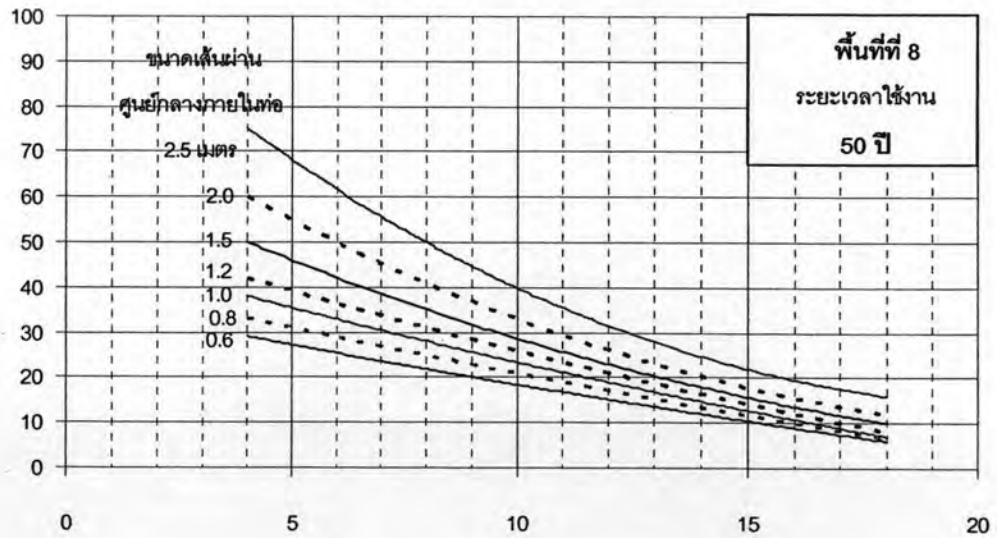
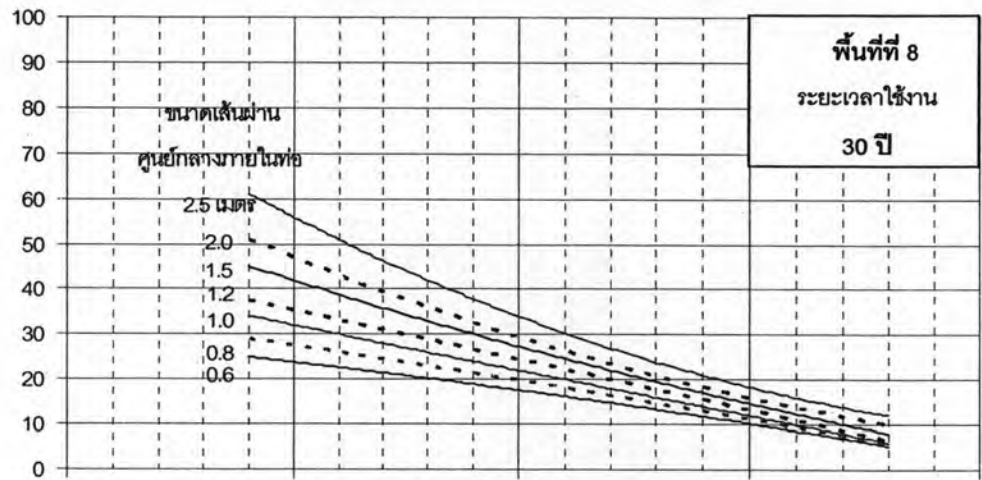
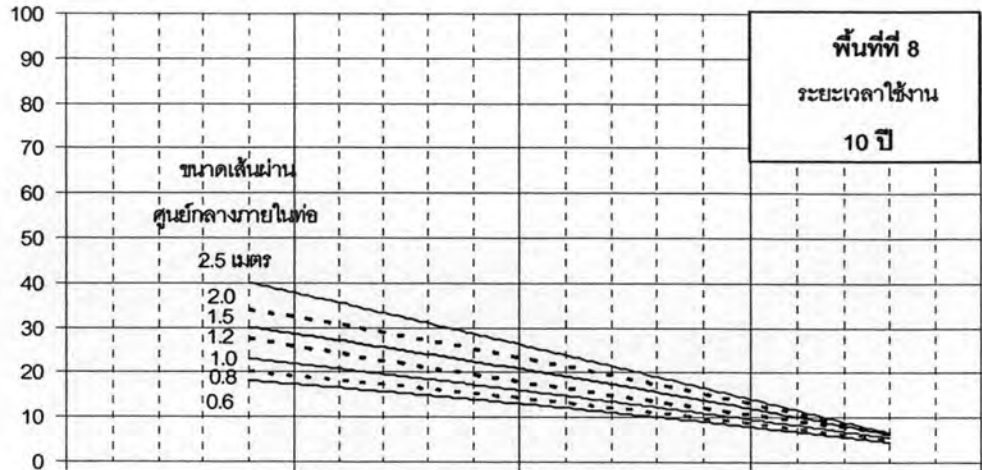


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ความลึกจากผิวดินถึงจุดศูนย์กลางท่อ (ม.)

รูปที่ ค-6 ความแตกต่างของการเคลื่อนตัวในแนวตั้งระหว่างท่อ Pipe jacking กับบ่อพักในพื้นที่ที่ 7

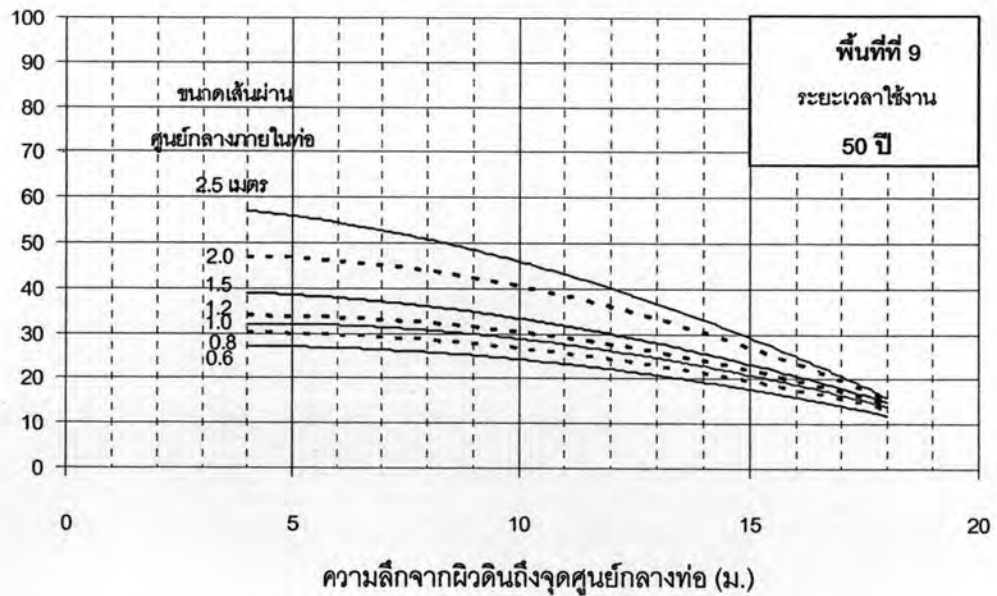
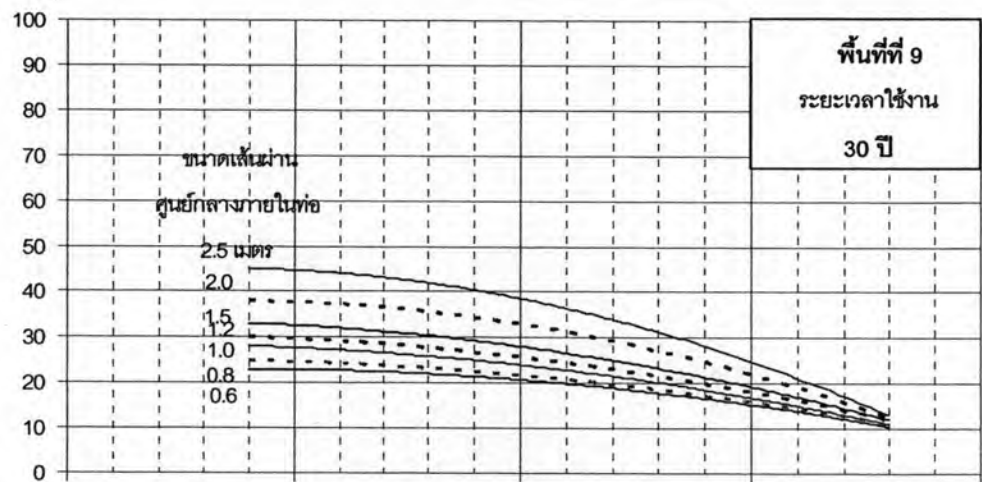
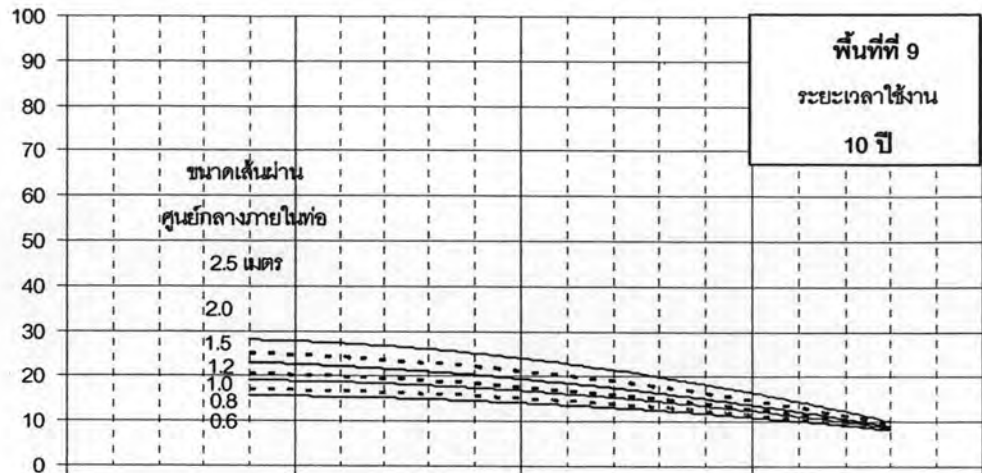
ค่าความแตกต่างของการเคลื่อนตัวในแนวตั้ง (มม.)



ความลึกจากผิวดินถึงจุดศูนย์กลางท่อ (ม.)

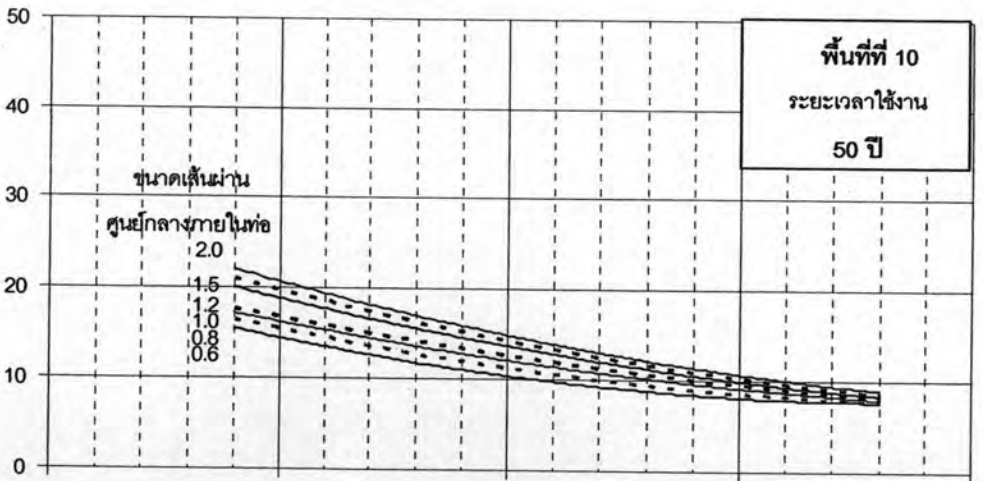
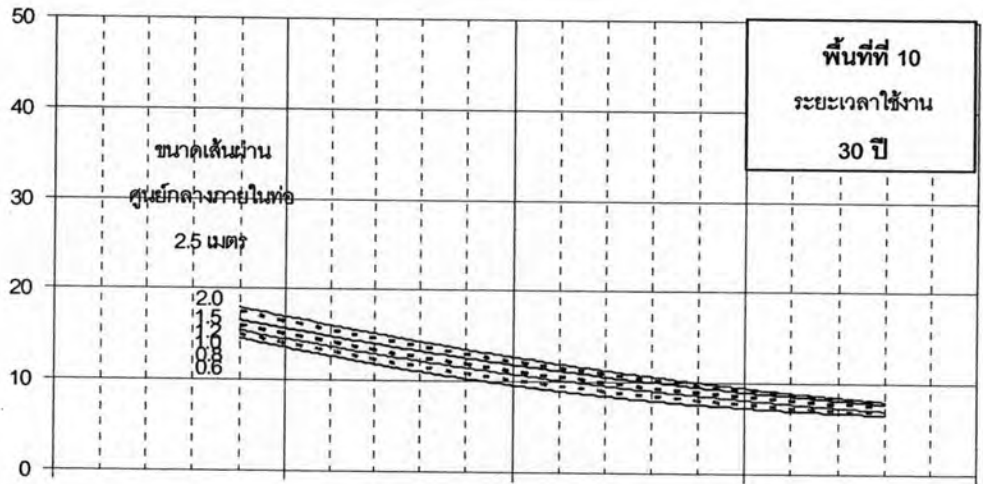
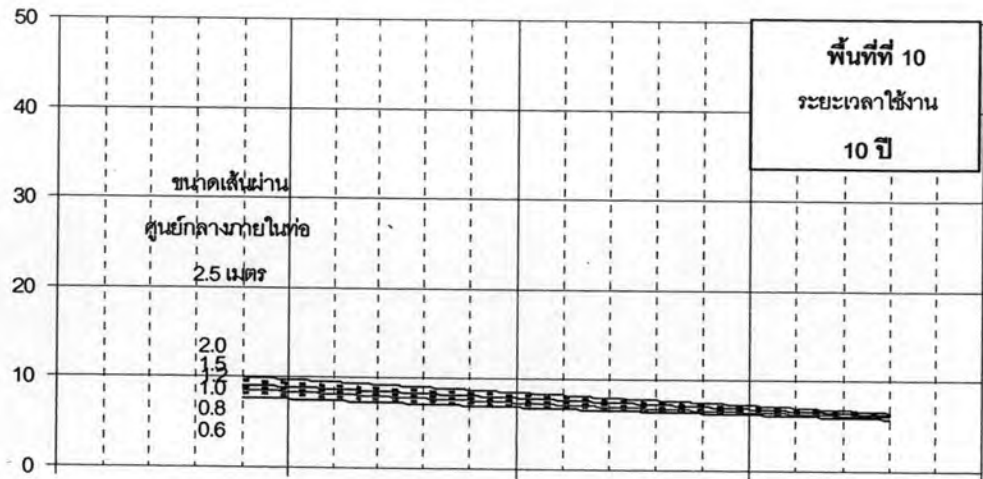
รูปที่ ค-7 ความแตกต่างของการเคลื่อนตัวในแนวตั้งระหว่างท่อ Pipe jackingกับบ่อพักในพื้นที่ที่ 8

ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)



รูปที่ ค-8 ความแตกต่างของการเคลื่อนตัวในแนวตั้งระหว่างท่อ Pipe jacking กับบ่อพักในพื้นที่ที่ 9


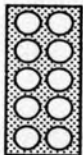
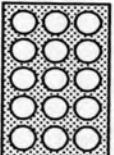
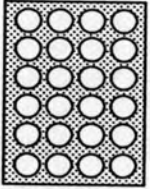
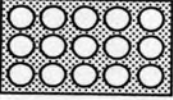
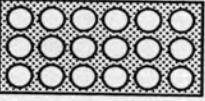
ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)




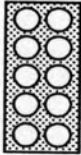
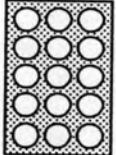
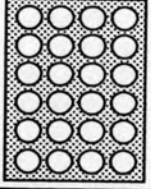
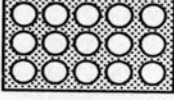
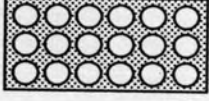
0 5 10 15 20
 ความลึกจากผิวดินถึงจุดศูนย์กลางท่อ (ม.)

รูปที่ ค-9 ความแตกต่างของการเคลื่อนตัวในแนวตั้งระหว่างท่อ Pipe jacking กับบ่อพักในพื้นที่ที่


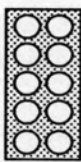
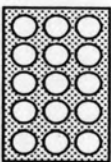
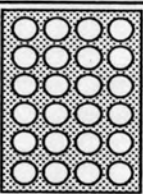
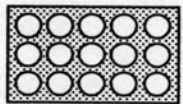
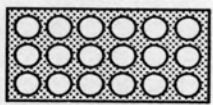
ตารางที่ ค-1 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 2

ชนิด Duct Bank	ระยะเวลาการใช้งาน	
	(ปี)	(มม.)
	10	20
	30	24
	50	26
	10	22
	30	27
	50	29
	10	22
	30	28
	50	30
	10	21
	30	27
	50	33
	10	22
	30	29
	50	33
	10	20
	30	28
	50	31


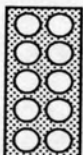
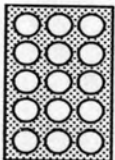
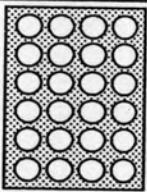
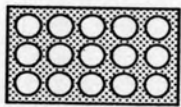
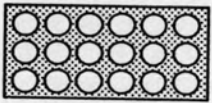
ตารางที่ ค-2 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 3

ชนิด Duct Bank	ระยะเวลาการใช้งาน	
	(ปี)	(มม.)
	10	21
	30	25
	50	28
	10	21
	30	27
	50	29
	10	19
	30	26
	50	29
	10	18
	30	26
	50	32
	10	19
	30	28
	50	32
	10	18
	30	28
	50	32


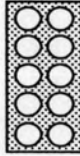
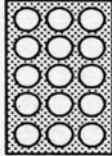
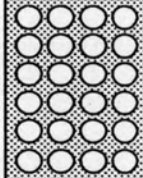
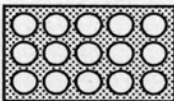
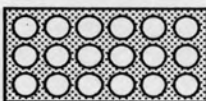
ตารางที่ ค-3 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 4

ชนิด Duct Bank	ระยะเวลาการใช้งาน		ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่ง (มม.)
	(ปี)	(มม.)	
	10	27	
	30	34	
	50	36	
	10	27	
	30	35	
	50	38	
	10	25	
	30	34	
	50	38	
	10	28	
	30	38	
	50	46	
	10	30	
	30	41	
	50	46	
	10	29	
	30	40	
	50	45	


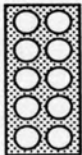
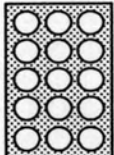
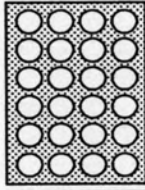
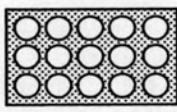
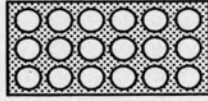
ตารางที่ ค-4 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 5

ชนิด Duct Bank	ระยะเวลาการใช้งาน		ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)
	(ปี)		
	1	10	20
		30	26
		50	29
	2	10	20
		30	28
		50	31
	3	10	18
		30	27
		50	31
	4	10	18
		30	29
		50	33
	5	10	15
		30	27
		50	33
	6	10	15
		30	28
		50	35


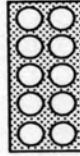
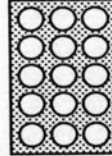
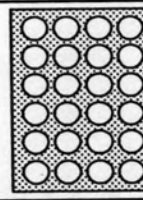
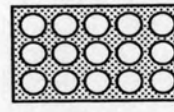
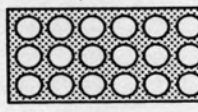
ตารางที่ ค-5 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 6

ชนิด Duct Bank	ระยะเวลาการใช้งาน		
	(ปี)	(มม.)	
	1	10	25
		30	31
		50	34
	2	10	24
		30	31
		50	34
	3	10	21
		30	30
		50	34
	4	10	22
		30	32
		50	39
	5	10	23
		30	34
		50	39
	6	10	21
		30	32
		50	37


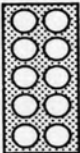
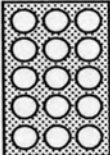
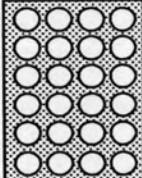
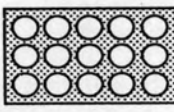
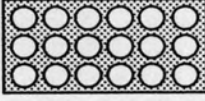
ตารางที่ ค-6 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 7

ชนิด Duct Bank	ระยะเวลาการใช้งาน		ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)
	(ปี)		
	1	10	29
		30	35
		50	39
	2	10	25
		30	34
		50	37
	3	10	24
		30	34
		50	38
	4	10	25
		30	36
		50	43
	5	10	26
		30	37
		50	43
	6	10	27
		30	37
		50	43


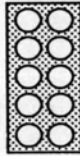
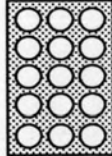
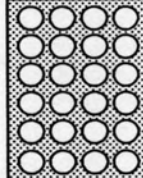
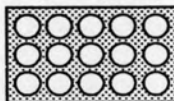
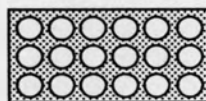
ตารางที่ ค-7 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 8

ชนิด Duct Bank	ระยะเวลาการใช้งาน		ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)
	(ปี)		
	1	10	30
		30	38
		50	41
	2	10	31
		30	40
		50	44
	3	10	27
		30	38
		50	43
	4	10	27
		30	40
		50	49
	5	10	28
		30	43
		50	49
	6	10	27
		30	42
		50	49

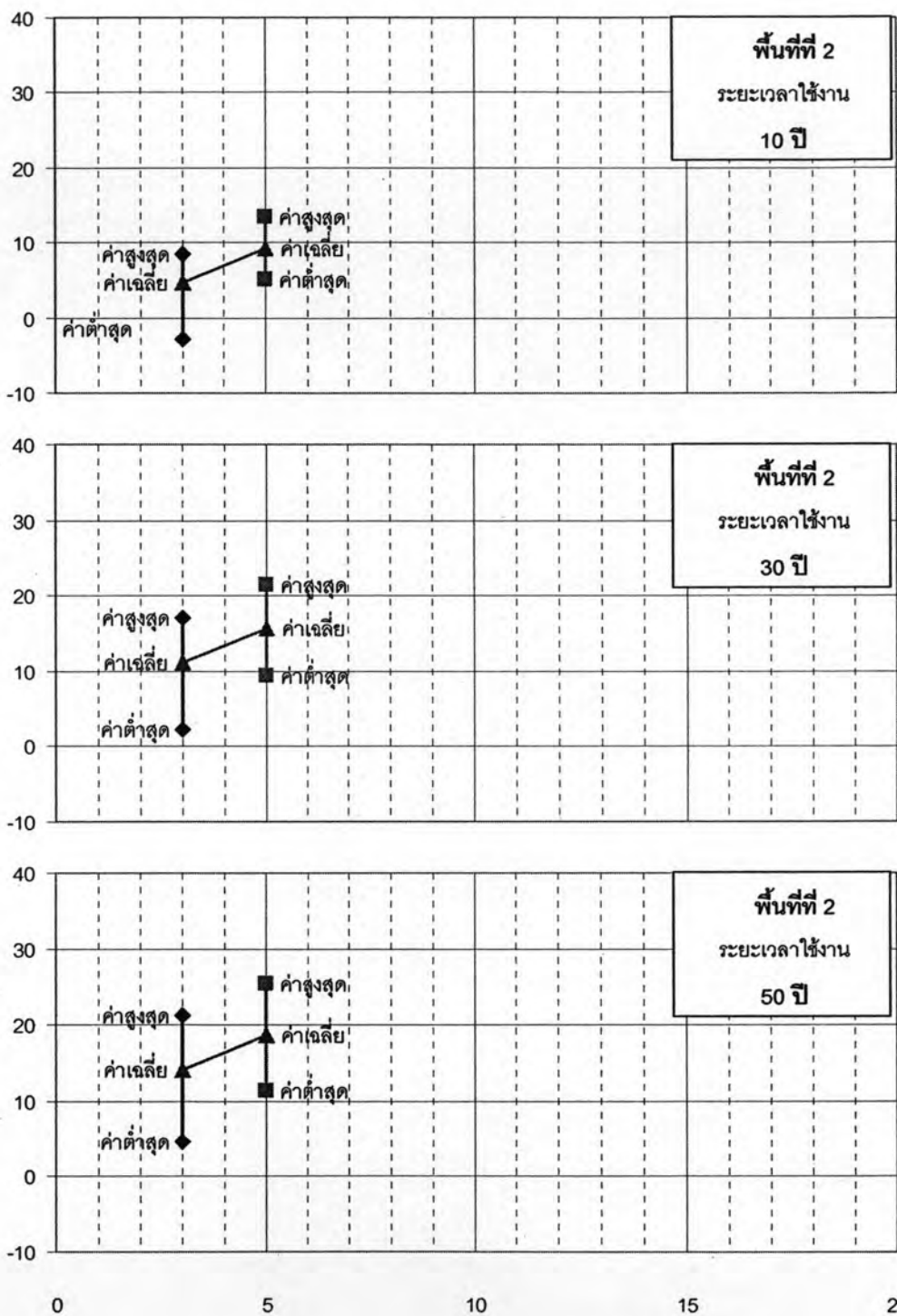
ตารางที่ ค-8 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 9

ชนิด Duct Bank	ระยะเวลาการใช้งาน		ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)
	(ปี)		
	1	10	35
		30	42
		50	45
	2	10	32
		30	41
		50	45
	3	10	27
		30	37
		50	42
	4	10	38
		30	50
		50	48
	5	10	28
		30	42
		50	48
	6	10	25
		30	40
		50	47

ตารางที่ ค-9 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งระหว่างโครงสร้าง Duct Bank กับบ่อพักที่
ความลึก 1.5 เมตรจากผิวดินถึงพื้น Duct bank ในพื้นที่ที่ 10

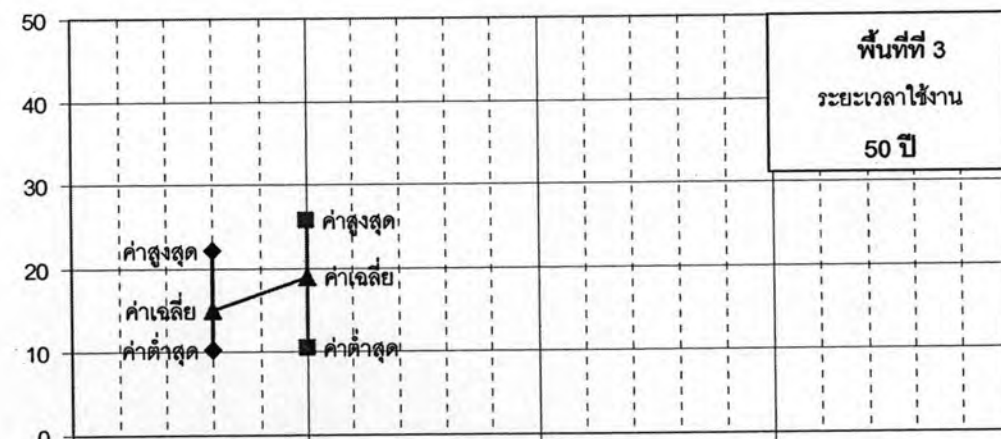
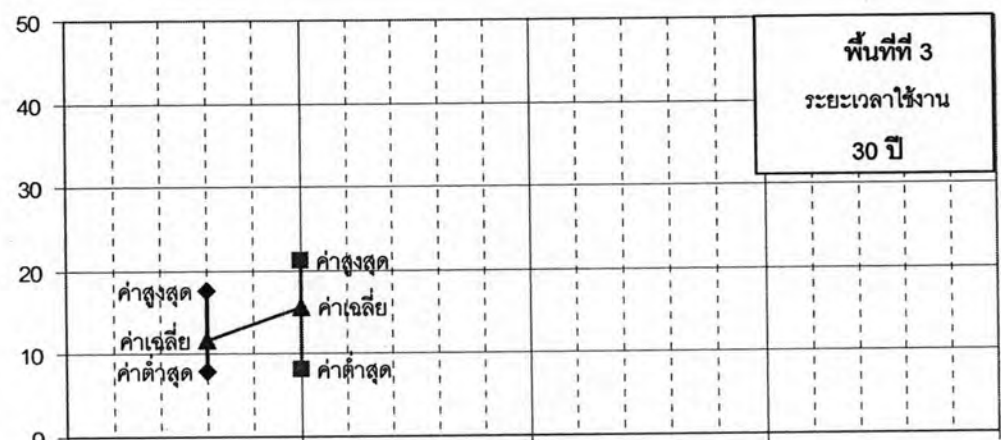
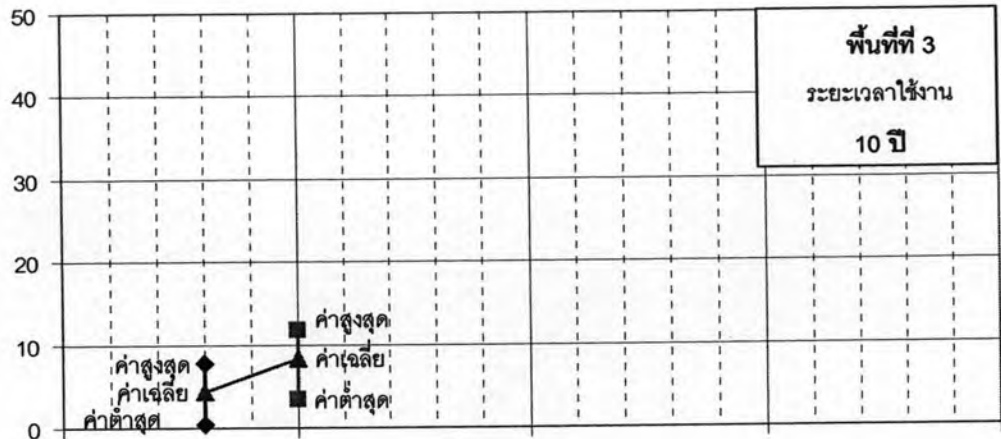
ชนิด Duct Bank	ระยะเวลาการใช้งาน		ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่ง (มม.)
	(ปี)		
	1	10	15
		30	20
		50	22
	2	10	16
		30	21
		50	24
	3	10	14
		30	21
		50	24
	4	10	18
		30	25
		50	28
	5	10	17
		30	25
		50	28
	6	10	17
		30	25
		50	28

ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)



รูปที่ ค-10 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 2

ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่ง (มม.)

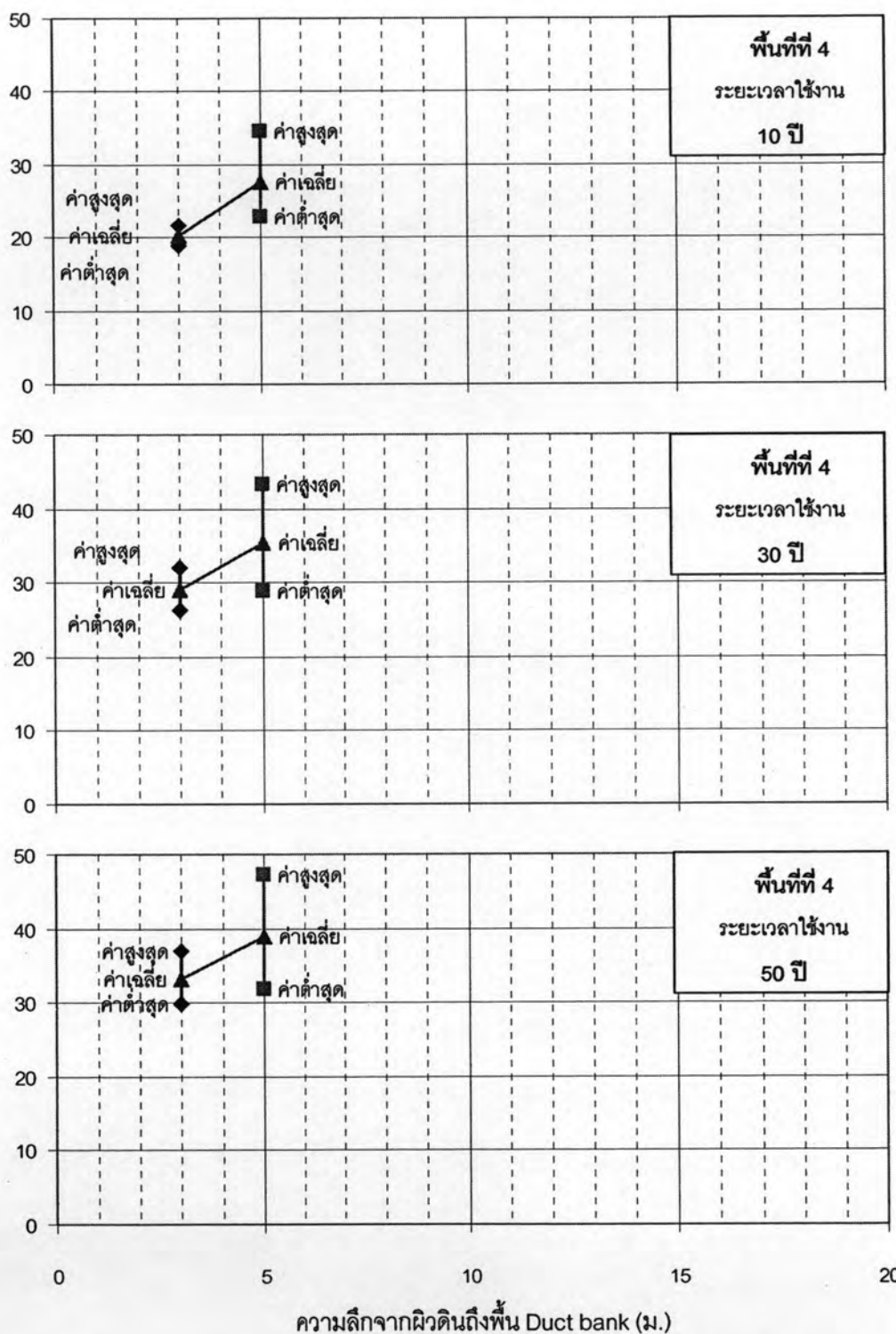


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ความลึกจากผิวดินถึงพื้น Duct bank (ม.)

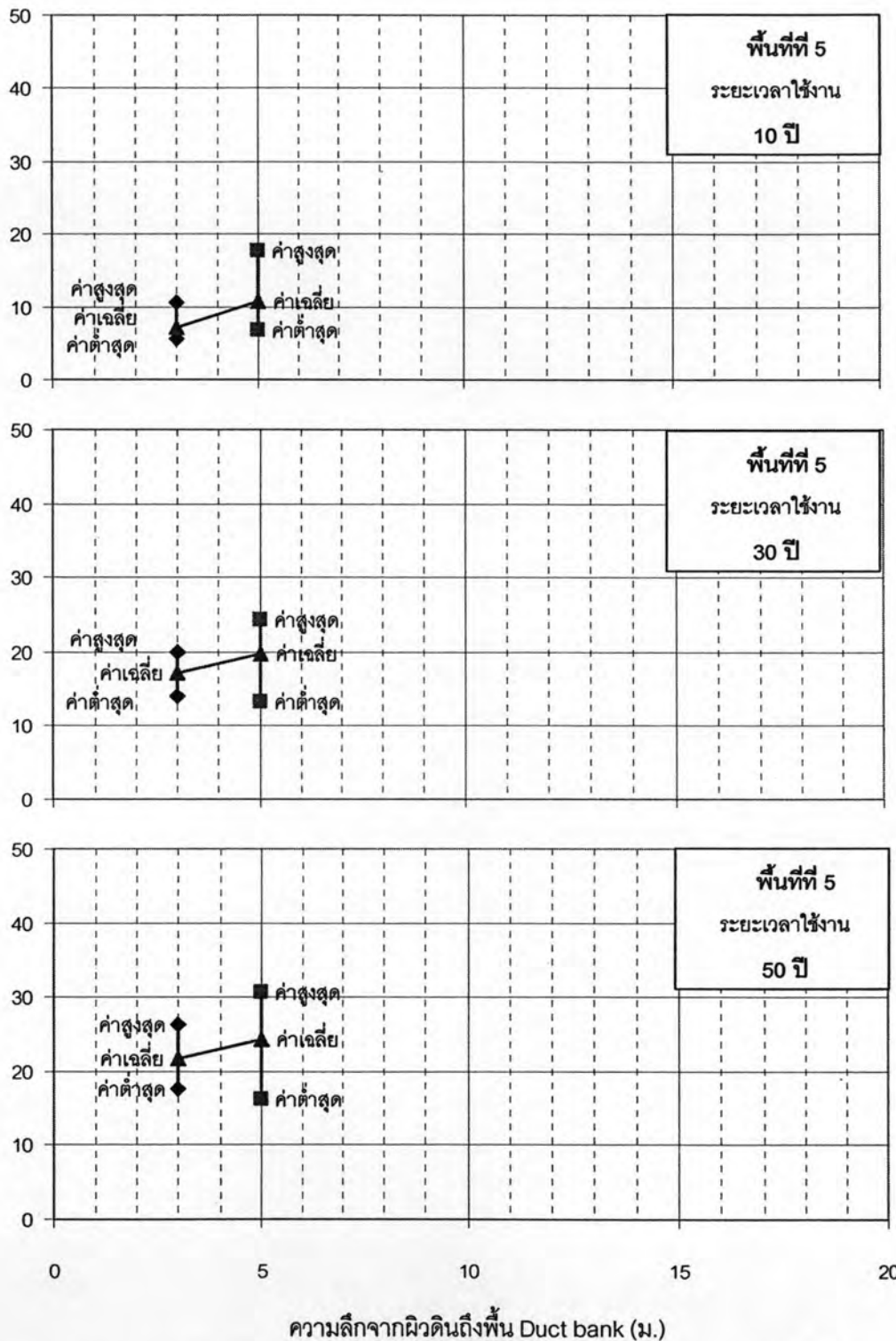
รูปที่ ค-11 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 3

ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่ง (มม.)



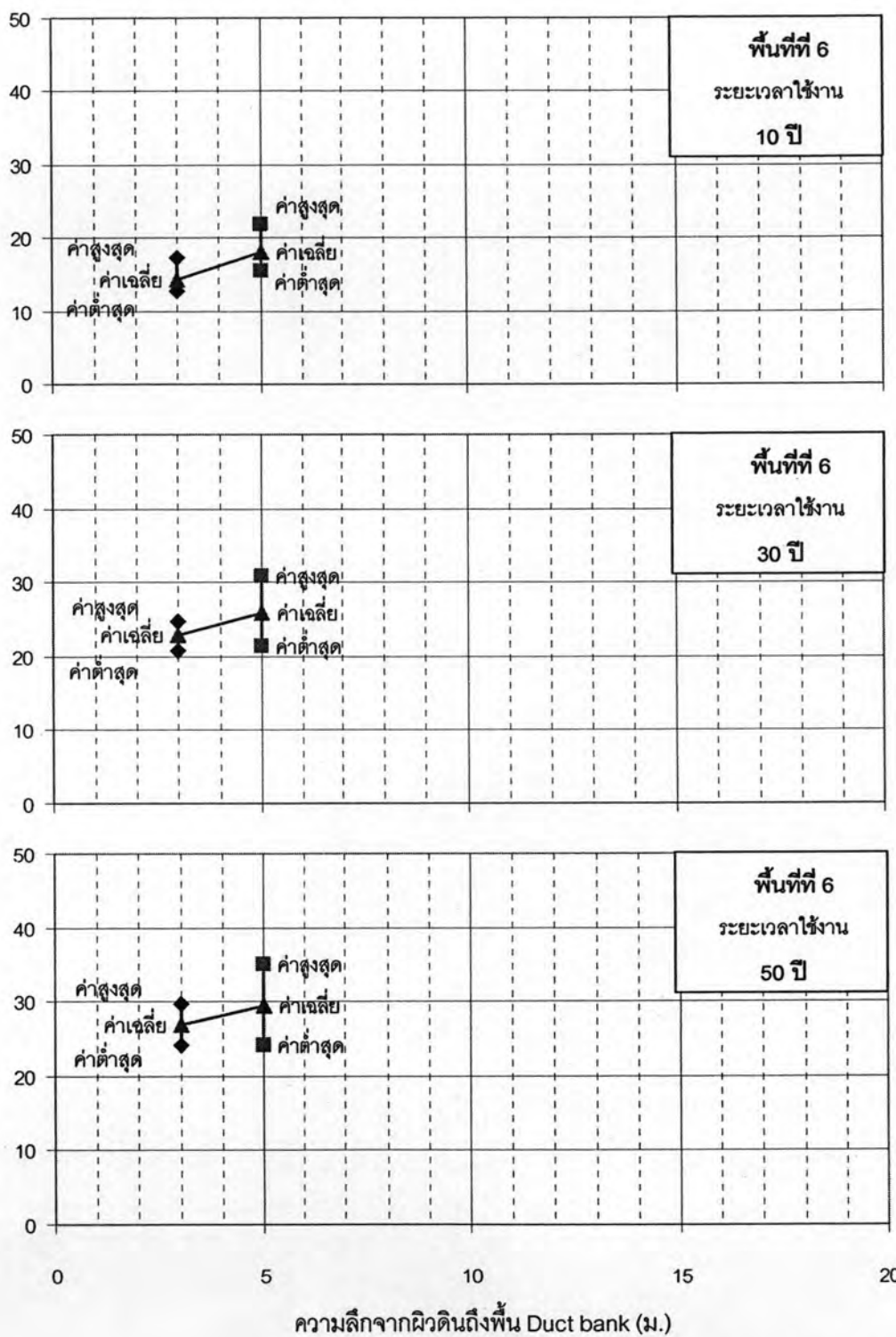
รูปที่ ค-12 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 4

ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่ง (มม.)



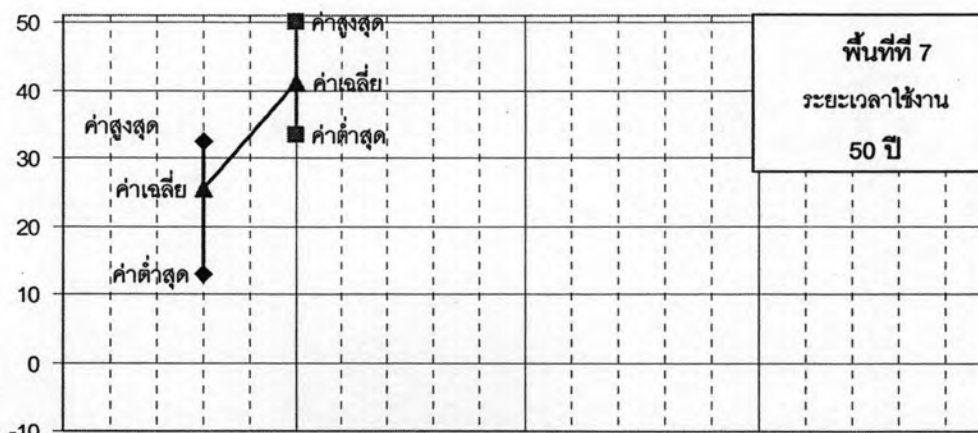
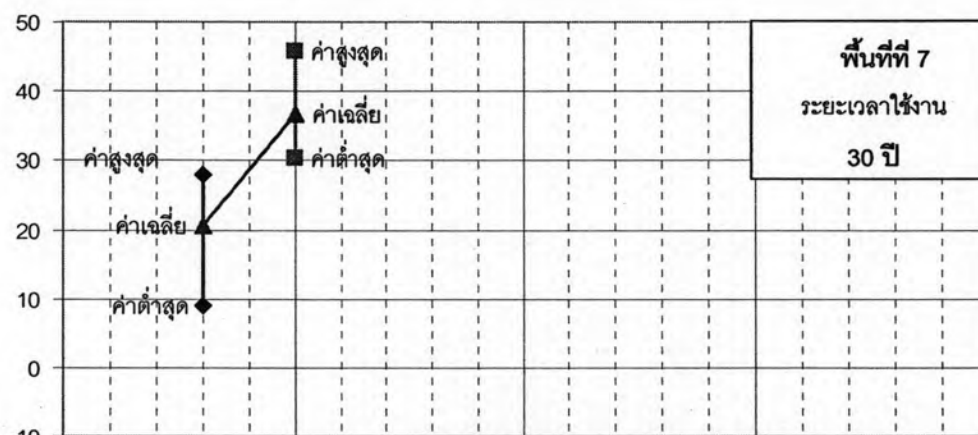
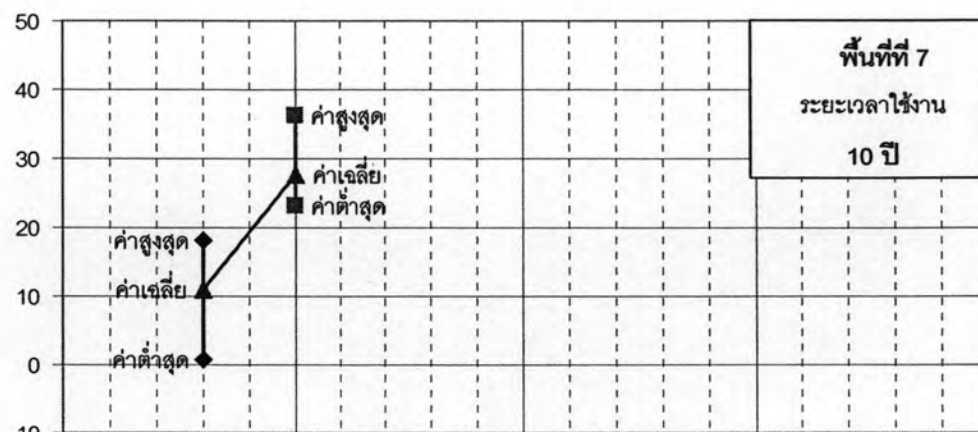
รูปที่ ค-13 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 5

ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่ง (มม.)



รูปที่ ค-14 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 6

ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่ง (มม.)

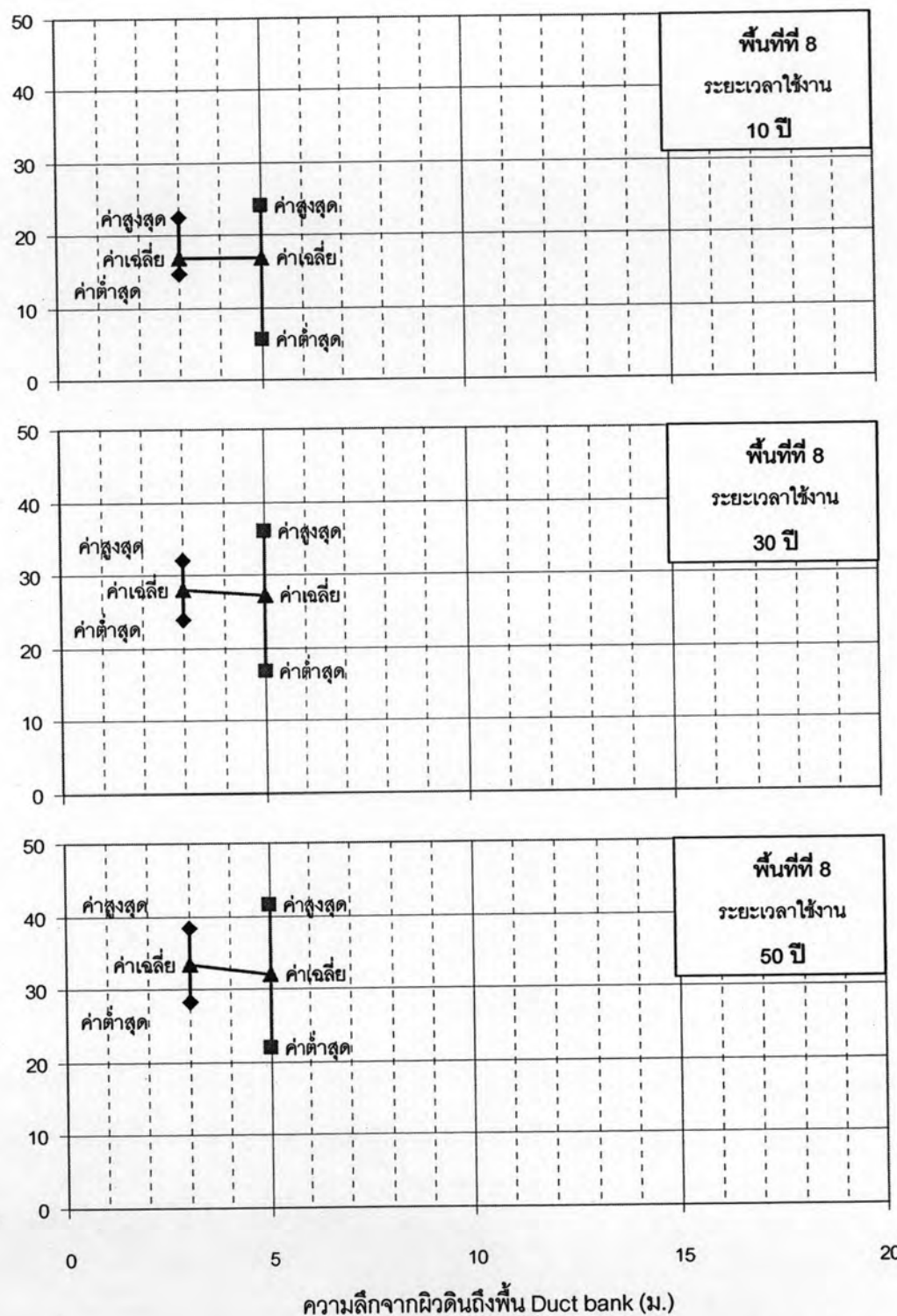


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ความลึกจากผิวดินถึงพื้น Duct bank (ม.)

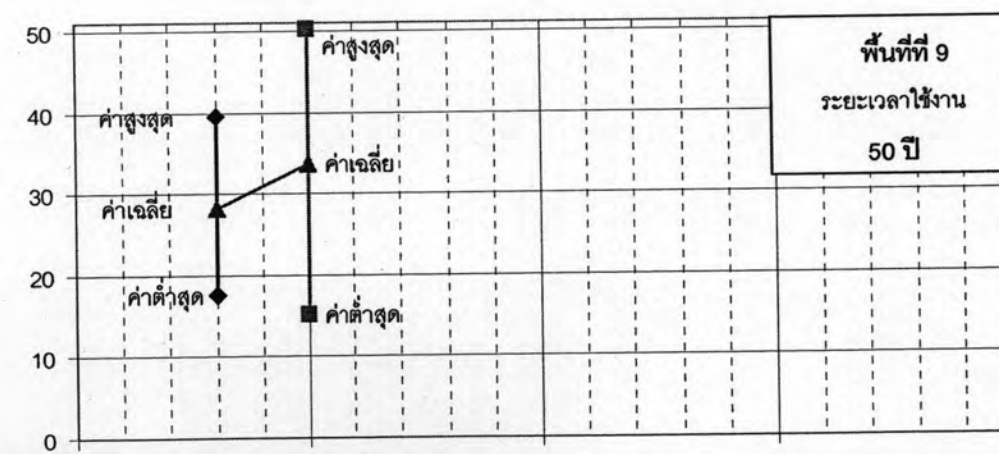
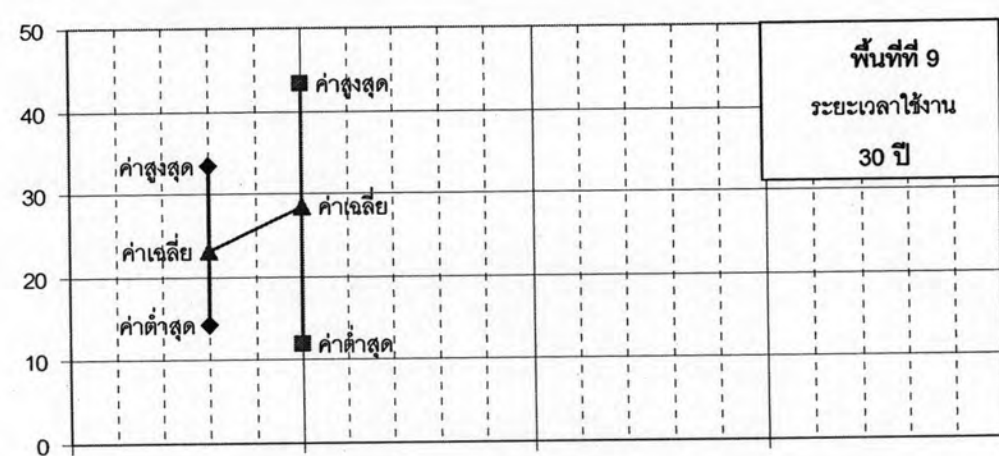
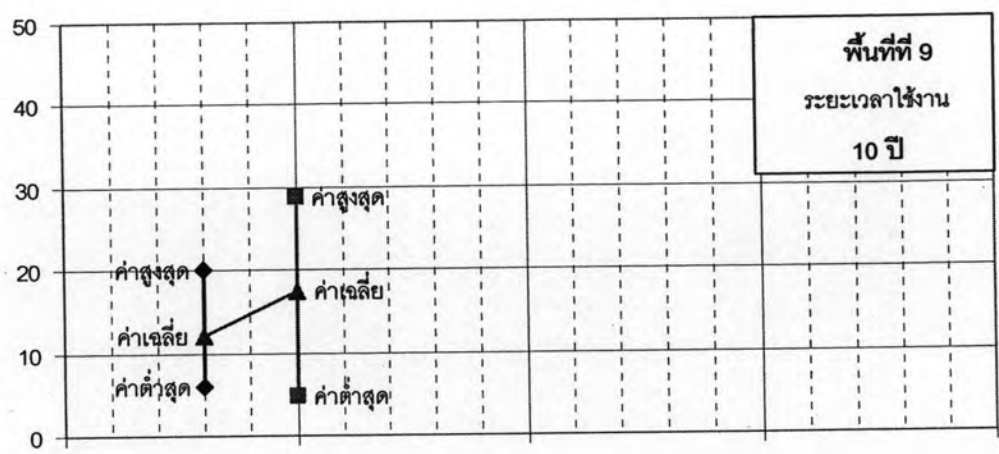
รูปที่ ค-15 ค่าความแตกต่างการเคลื่อนตัวในแนวดิ่งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 7

ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)



รูปที่ ค-16 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 8

ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)

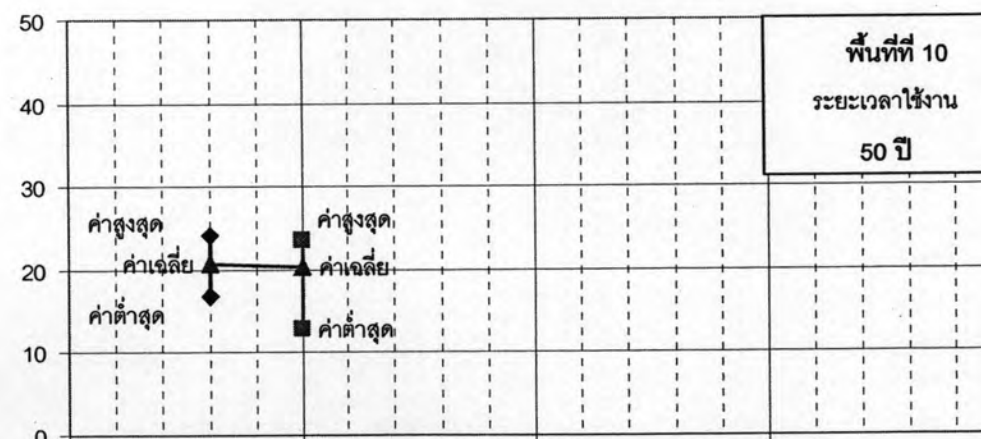
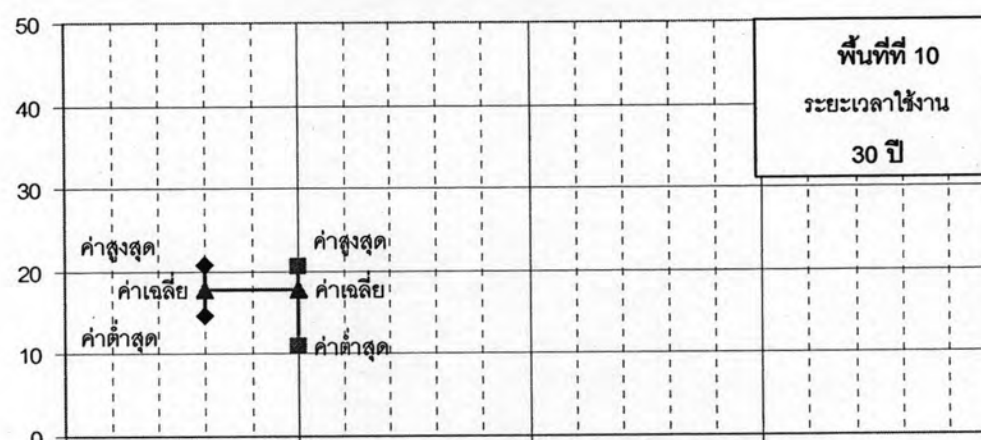
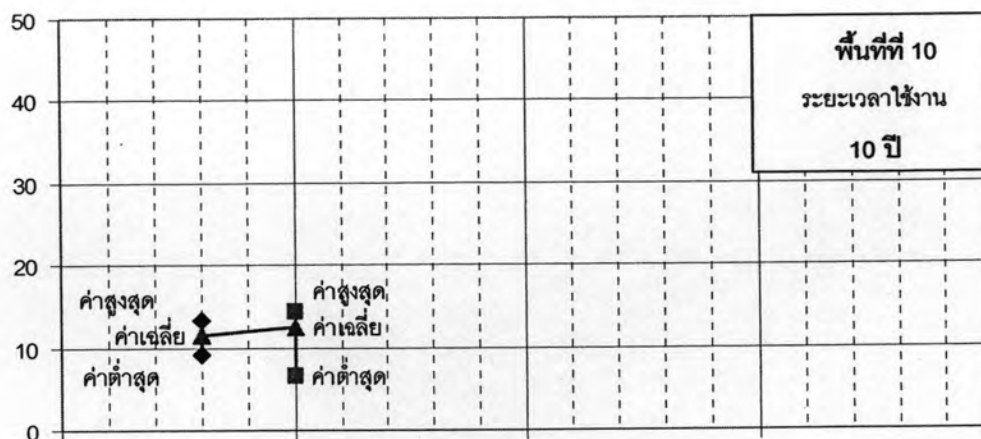


0 5 10 15 20

ความลึกจากผิวดินถึงพื้น Duct bank (ม.)

รูปที่ ค-17 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 9

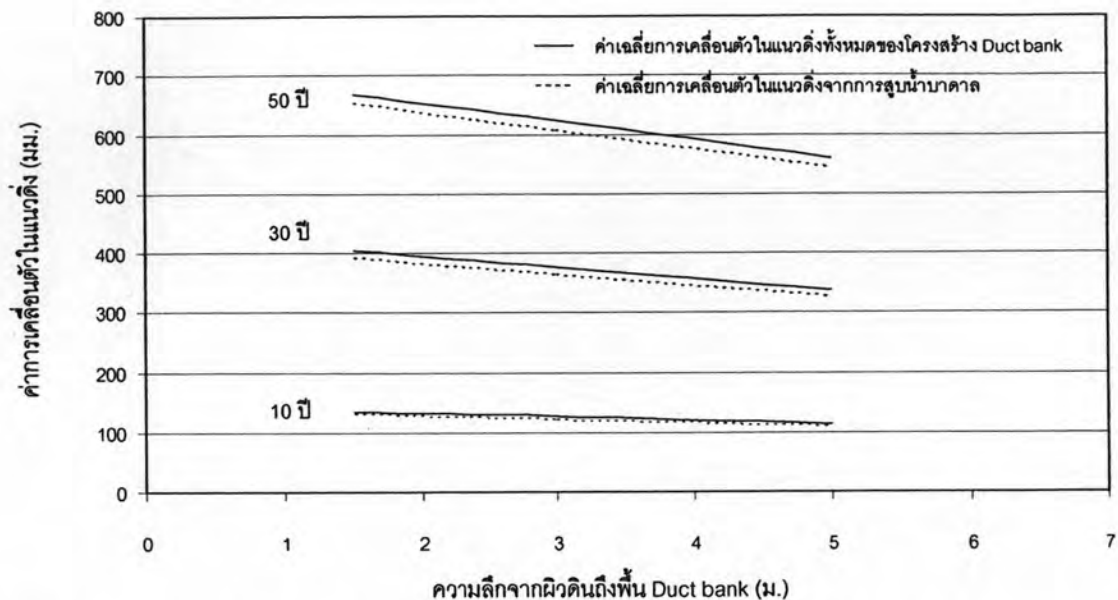
ค่าความแตกต่างการเคลื่อนตัวในแนวตั้ง (มม.)



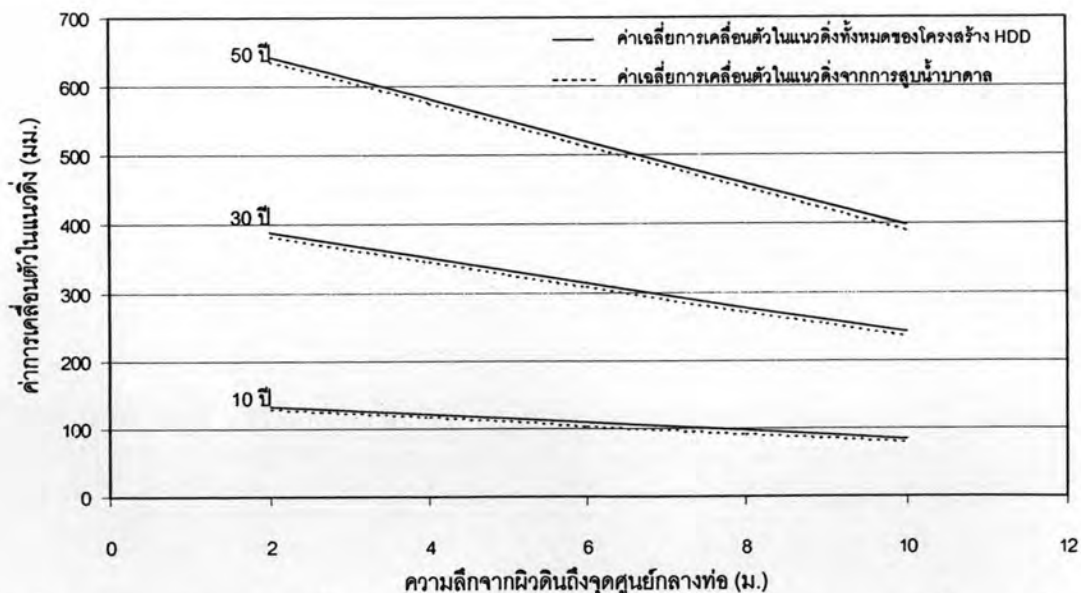
0 5 10 15 20

ความลึกจากผิวดินถึงพื้น Duct bank (ม.)

รูปที่ ค-18 ค่าความแตกต่างการเคลื่อนตัวในแนวตั้งของ Duct Bank กับบ่อพัก ในพื้นที่ที่ 10



รูปที่ ค-19 การเปรียบเทียบที่เวลา 10, 30 และ 50 ปีหลังการก่อสร้าง ระหว่างค่าเฉลี่ยการเคลื่อนตัวในแนวตั้งทั้งหมดของโครงสร้าง Duct bank และค่าเฉลี่ยการเคลื่อนตัวในแนวตั้งจากการสูบน้ำบาดาลในพื้นที่กรุงเทพฯและปริมณฑล



รูปที่ ค-20 การเปรียบเทียบที่เวลา 10, 30 และ 50 ปีหลังการก่อสร้าง ระหว่างค่าเฉลี่ยการเคลื่อนตัวในแนวตั้งทั้งหมดของโครงสร้าง HDD และค่าเฉลี่ยการเคลื่อนตัวในแนวตั้งจากการสูบน้ำบาดาลในพื้นที่กรุงเทพฯและปริมณฑล

ประวัติผู้เขียนวิทยานิพนธ์

นายรัฐวุฒิ เหมะธุลิน เป็นบุตรของ นายธัญญพร และนางพัทธาภรณ์ เหมะธุลิน เกิดวันที่ 28 มกราคม 2523 ที่อำเภอวาริชภูมิ จังหวัดสกลนคร สำเร็จการศึกษาปริญญาวิศวกรรมศาสตรบัณฑิต ภาควิชาวิศวกรรมโยธา คณะวิศวกรรมศาสตร์ มหาวิทยาลัยขอนแก่น จังหวัดสกลนคร ในปีการศึกษา 2546 และเข้าศึกษาต่อในหลักสูตรวิศวกรรมศาสตรมหาบัณฑิตที่จุฬาลงกรณ์มหาวิทยาลัย เมื่อปีการศึกษา 2547

