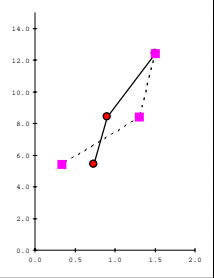
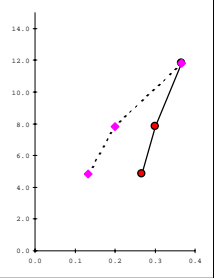
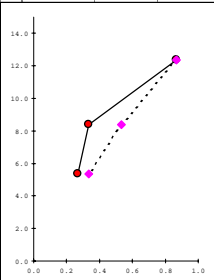
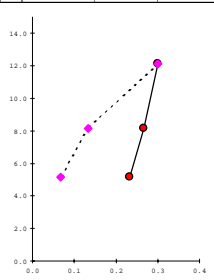
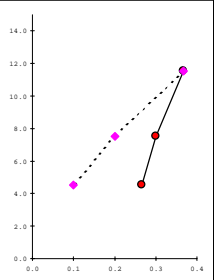
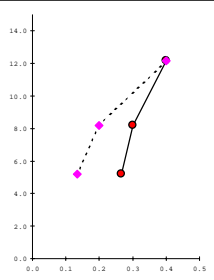
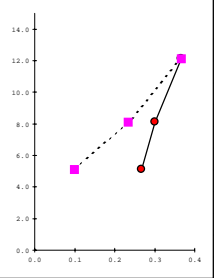
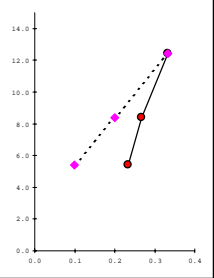
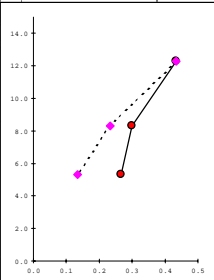
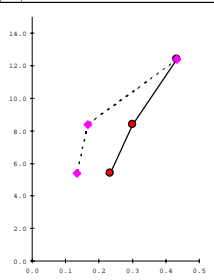
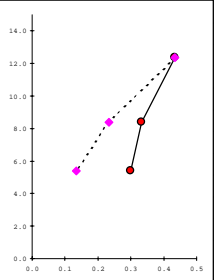
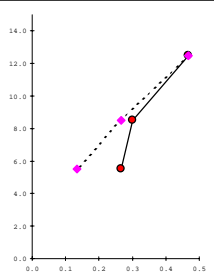
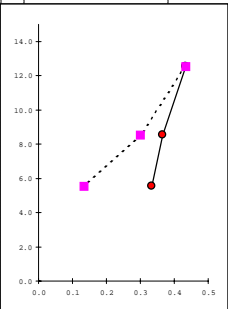
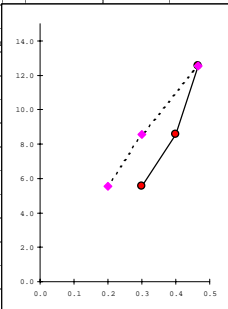
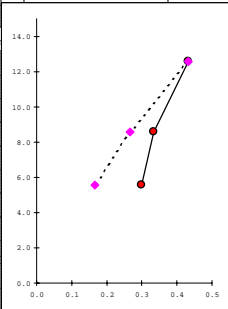
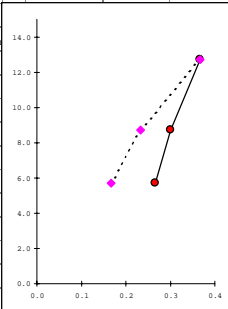
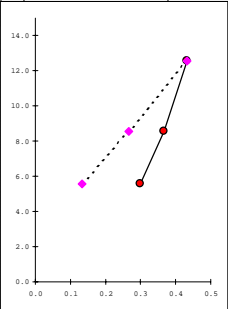
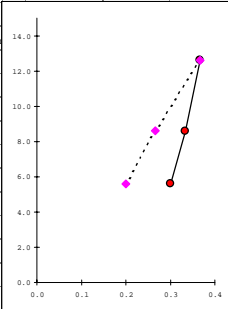


Location SD2				Location SD2			
Injecting Section		21 ~ 24 m		Injecting Section		30 ~ 33 m	
Ground Water Level		23.0 m		Ground Water Level		17.2	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		22.00 m		Pipe Length of Injecting Pa		31.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	2.2	5.4	0.7	3.0	0.8	4.8	0.3
6.0	2.7	8.4	0.9	6.0	0.9	7.8	0.3
10.0	4.5	12.4	1.5	10.0	1.1	11.8	0.4
6.0	3.9	8.4	1.3	6.0	0.6	7.8	0.2
3.0	1.0	5.4	0.3	3.0	0.4	4.8	0.1
							
Lu' = 1.1				Lu = 0.3			
Pc = 10.0 kgf/cm ²				Pc = - kgf/cm ²			
Location SD2				Location SD2			
Injecting Section		24 ~ 27 m		Injecting Section		33 ~ 36 m	
Ground Water Level		22.7 m		Ground Water Level		20.4	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		25.00 m		Pipe Length of Injecting Pa		34.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.8	5.4	0.3	3.0	0.7	5.1	0.2
6.0	1.0	8.4	0.3	6.0	0.8	8.1	0.3
10.0	2.6	12.4	0.9	10.0	0.9	12.1	0.3
6.0	1.6	8.4	0.5	6.0	0.4	8.1	0.1
3.0	1.0	5.4	0.3	3.0	0.2	5.1	0.1
							
Lu' = 0.4				Lu = 0.3			
Pc = 8.4 kgf/cm ²				Pc = - kgf/cm ²			
Location SD2				Location SD2			
Injecting Section		27 ~ 30 m		Injecting Section		36 ~ 39 m	
Ground Water Level		14.3 m		Ground Water Level		20.8	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		28.00 m		Pipe Length of Injecting Pa		37.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.8	4.5	0.3	3.0	0.8	5.2	0.3
6.0	0.9	7.5	0.3	6.0	0.9	8.2	0.3
10.0	1.1	11.5	0.4	10.0	1.2	12.2	0.4
6.0	0.6	7.5	0.2	6.0	0.6	8.2	0.2
3.0	0.3	4.5	0.1	3.0	0.4	5.2	0.1
							
Lu = 0.3				Lu = 0.3			
Pc = - kgf/cm ²				Pc = - kgf/cm ²			

Result of Lugeon Test at Borehole SD2(2)

Location SD2				Location SD2			
Injecting Section		39 ~ 42 m		Injecting Section		48 ~ 51 m	
Ground Water Leve		20.2 m		Ground Water Leve		23.0 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$		kgf/cm ²		Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$		kgf/cm ²	
Pipe Length of Injecting		40.00 m		Pipe Length of Injecting		49.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.8	5.1	0.3	3.0	0.7	5.4	0.2
6.0	0.9	8.1	0.3	6.0	0.8	8.4	0.3
10.0	1.1	12.1	0.4	10.0	1.0	12.4	0.3
6.0	0.7	8.1	0.2	6.0	0.6	8.4	0.2
3.0	0.3	5.1	0.1	3.0	0.3	5.4	0.1
Lu= 0.3				Lu= 0.3			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
							
Location SD2				Location SD2			
Injecting Section		42 ~ 45 m		Injecting Section		51 ~ 54 m	
Ground Water Leve		22.0 m		Ground Water Leve		23.0 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$		kgf/cm ²		Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$		kgf/cm ²	
Pipe Length of Injecting		43.00 m		Pipe Length of Injecting		52.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.8	5.3	0.3	3.0	0.7	5.4	0.2
6.0	0.9	8.3	0.3	6.0	0.9	8.4	0.3
10.0	1.3	12.3	0.4	10.0	1.3	12.4	0.4
6.0	0.7	8.3	0.2	6.0	0.5	8.4	0.2
3.0	0.4	5.3	0.1	3.0	0.4	5.4	0.1
Lu= 0.4				Lu= 0.4			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
							
Location SD2				Location SD2			
Injecting Section		45 ~ 48 m		Injecting Section		54 ~ 57 m	
Ground Water Leve		22.8 m		Ground Water Leve		24.0 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$		kgf/cm ²		Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$		kgf/cm ²	
Pipe Length of Injecting		46.00 m		Pipe Length of Injecting		55.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.9	5.4	0.3	3.0	0.8	5.5	0.3
6.0	1.0	8.4	0.3	6.0	0.9	8.5	0.3
10.0	1.3	12.4	0.4	10.0	1.4	12.5	0.5
6.0	0.7	8.4	0.2	6.0	0.8	8.5	0.3
3.0	0.4	5.4	0.1	3.0	0.4	5.5	0.1
Lu= 0.4				Lu= 0.4			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
							

Result of Lugeon Test at Borehole SD2(3)

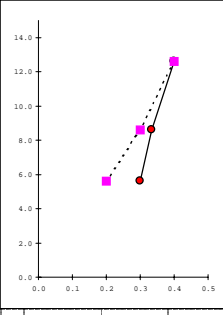
Location SD2				Location SD2			
Injecting Section		57 ~ 60 m		Injecting Section		66 ~ 69 m	
Ground Water Level		24.2 m		Ground Water Level		24.6 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		58.00 m		Pipe Length of Injecting Pa		67.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.0	5.5	0.3	3.0	0.9	5.6	0.3
6.0	1.1	8.5	0.4	6.0	1.2	8.6	0.4
10.0	1.3	12.5	0.4	10.0	1.4	12.6	0.5
6.0	0.9	8.5	0.3	6.0	0.9	8.6	0.3
3.0	0.4	5.5	0.1	3.0	0.6	5.6	0.2
Lu= 0.4				Lu= 0.4			
Pc= - kgf/cm²				Pc= - kgf/cm²			
							
Location SD2				Location SD2			
Injecting Section		60 ~ 63 m		Injecting Section		69 ~ 72 m	
Ground Water Level		24.6 m		Ground Water Level		26.0 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		61.00 m		Pipe Length of Injecting Pa		70.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.9	5.6	0.3	3.0	0.8	5.7	0.3
6.0	1.0	8.6	0.3	6.0	0.9	8.7	0.3
10.0	1.3	12.6	0.4	10.0	1.1	12.7	0.4
6.0	0.8	8.6	0.3	6.0	0.7	8.7	0.2
3.0	0.5	5.6	0.2	3.0	0.5	5.7	0.2
Lu= 0.4				Lu= 0.3			
Pc= - kgf/cm²				Pc= - kgf/cm²			
							
Location SD2				Location SD2			
Injecting Section		63 ~ 66 m		Injecting Section		72 ~ 75 m	
Ground Water Level		24.6 m		Ground Water Level		24.9 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		64.00 m		Pipe Length of Injecting Pa		73.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.9	5.6	0.3	3.0	0.9	5.6	0.3
6.0	1.1	8.6	0.4	6.0	1.0	8.6	0.3
10.0	1.3	12.6	0.4	10.0	1.1	12.6	0.4
6.0	0.8	8.6	0.3	6.0	0.8	8.6	0.3
3.0	0.4	5.6	0.1	3.0	0.6	5.6	0.2
Lu= 0.4				Lu= 0.3			
Pc= - kgf/cm²				Pc= - kgf/cm²			
							

Result of Lugeon Test at Borehole SD2(4)

Location	SD2
Injecting Section	75 ~ 78 m
Ground Water Level	25.0 m
Height of Pressure Gauge	100.0 cm
Length of Test Section	3.0 m
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm
Pipe Length of Injecting Pa	76.00 m

P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	g (l/min/m)
3.0	0.9	5.6	0.3
6.0	1.0	8.6	0.3
10.0	1.2	12.6	0.4
6.0	0.9	8.6	0.3
3.0	0.6	5.6	0.2

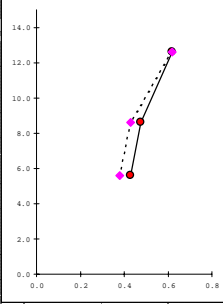
Lu= 0.4
Pc= - kgf/cm²



Location	SD2
Injecting Section	78 ~ 80.1 m
Ground Water Level	25.0 m
Height of Pressure Gauge	100.0 cm
Length of Test Section	2.1 m
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm
Pipe Length of Injecting Pa	79.00 m

P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	g (l/min/m)
3.0	0.9	5.6	0.4
6.0	1.0	8.6	0.5
10.0	1.3	12.6	0.6
6.0	0.9	8.6	0.4
3.0	0.8	5.6	0.4

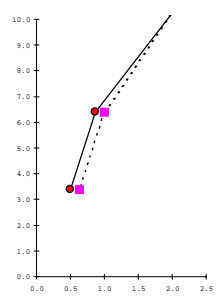
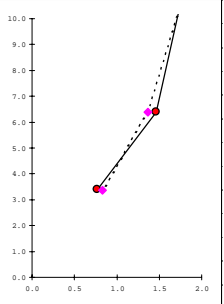
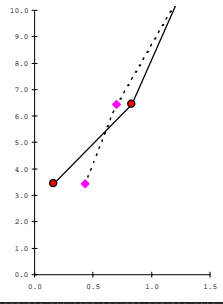
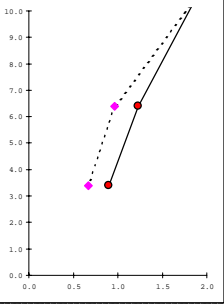
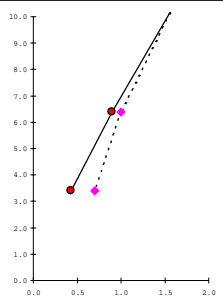
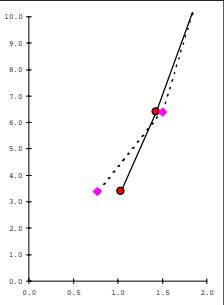
Lu= 0.5
Pc= - kgf/cm²



Result of Lugeon Test at Borehole SD2(5)

Location SO1				Location SO1			
Injecting Section 3 ~ 6 m				Injecting Section 12 ~ 15 m			
Ground Water Level 2.3 m				Ground Water Level 2.4 m			
Height of Pressure Gauge - cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting I - m				Pipe Length of Injecting I 13.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
0.0	0.0	0.0	0.0	3.0	20.6	3.3	6.9
0.0	0.0	0.0	0.0	6.0	46.0	6.1	15.3
0.0	0.0	0.0	0.0	10.0	97.0	9.5	32.3
0.0	0.0	0.0	0.0	6.0	67.0	5.9	22.3
0.0	0.0	0.0	0.0	3.0	54.0	3.1	18.0
Lu' = -				Lu' = 26.8			
Pc = - kgf/cm ²				Pc = 6.1 kgf/cm ²			
Location SO1				Location SO1			
Injecting Section 6 ~ 9 m				Injecting Section 15 ~ 18 m			
Ground Water Level 2.3 m				Ground Water Level 3.0 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting I 7.00 m				Pipe Length of Injecting I 16.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.5	3.3	0.5	3.0	10.3	3.4	3.4
6.0	3.3	6.3	1.1	6.0	17.0	6.4	5.7
10.0	9.2	10.3	3.1	10.0	30.7	10.3	10.2
6.0	4.2	6.3	1.4	6.0	20.9	6.4	7.0
3.0	1.1	3.3	0.4	3.0	17.5	3.4	5.8
Lu' = 1.8				Lu' = 8.4			
Pc = 6.3 kgf/cm ²				Pc = 6.4 kgf/cm ²			
Location SO1				Location SO1			
Injecting Section 9 ~ 12 m				Injecting Section 18 ~ 21 m			
Ground Water Level 2.0 m				Ground Water Level 3.0 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting I 10.00 m				Pipe Length of Injecting I 19.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.8	3.3	0.6	3.0	20.3	3.3	6.8
6.0	4.1	6.3	1.4	6.0	41.8	6.2	13.9
10.0	9.3	10.3	3.1	10.0	81.3	9.5	27.1
6.0	5.5	6.3	1.8	6.0	71.0	5.7	23.7
3.0	4.0	3.3	1.3	3.0	82.0	2.5	27.3
Lu' = 2.3				Lu' = 23.7			
Pc = 6.3 kgf/cm ²				Pc = 6.2 kgf/cm ²			

Result of Lugeon Test at Borehole SO1(1)

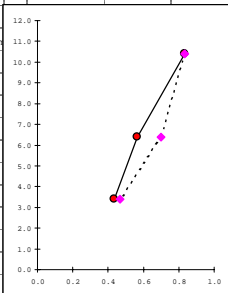
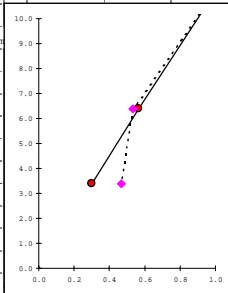
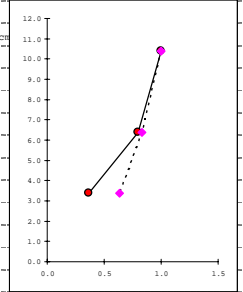
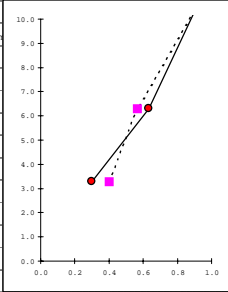
Location SO1				Location SO1			
Injecting Section 21 ~ 24 m				Injecting Section 30 ~ 33 m			
Ground Water Level 2.9 m				Ground Water Level 2.8			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 22.00 m				Pipe Length of Injecting Pa 31.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.5	3.4	0.5	3.0	2.3	3.4	0.8
6.0	2.6	6.4	0.9	6.0	4.4	6.4	1.5
10.0	6.1	10.4	2.0	10.0	5.2	10.4	1.7
6.0	3.0	6.4	1.0	6.0	4.1	6.4	1.4
3.0	1.9	3.4	0.6	3.0	2.5	3.4	0.8
							
Lu'= 1.3				Lu= 1.7			
Pc= 6.4 kgf/cm ²				Pc= - kgf/cm ²			
Location SO1				Location SO1			
Injecting Section 24 ~ 27 m				Injecting Section 33 ~ 36 m			
Ground Water Level 3.5 m				Ground Water Level 2.9			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 25.00 m				Pipe Length of Injecting Pa 34.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.5	3.4	0.2	3.0	2.7	3.4	0.9
6.0	2.5	6.4	0.8	6.0	3.7	6.4	1.2
10.0	3.7	10.4	1.2	10.0	5.6	10.4	1.9
6.0	2.1	6.4	0.7	6.0	2.9	6.4	1.0
3.0	1.3	3.4	0.4	3.0	2.0	3.4	0.7
							
Lu= 1.2				Lu= 1.8			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
Location SO1				Location SO1			
Injecting Section 27 ~ 30 m				Injecting Section 36 ~ 39 m			
Ground Water Level 2.9 m				Ground Water Level 2.9			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 27.00 m				Pipe Length of Injecting Pa 37.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.3	3.4	0.4	3.0	3.1	3.4	1.0
6.0	2.7	6.4	0.9	6.0	4.3	6.4	1.4
10.0	4.8	10.4	1.6	10.0	5.6	10.4	1.9
6.0	3.0	6.4	1.0	6.0	4.5	6.4	1.5
3.0	2.1	3.4	0.7	3.0	2.3	3.4	0.8
							
Lu= 1.5				Lu= 1.8			
Pc= 6.4 kgf/cm ²				Pc= - kgf/cm ²			

Result of Lugeon Test at Borehole SO1(2)

Location SO1				Location SO1				Location SO1			
Injecting Section 39 ~ 42 m				Injecting Section 48 ~ 51 m				Injecting Section 48 ~ 51 m			
Ground Water Level 2.9 m				Ground Water Level 2.7				Ground Water Level 2.7			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 40.00 m				Pipe Length of Injecting Pa 49.00 m				Pipe Length of Injecting Pa 49.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	5.3	3.4	1.8	3.0	5.7	3.4	1.9	3.0	5.7	3.4	1.9
6.0	6.9	6.4	2.3	6.0	7.4	6.4	2.5	6.0	7.4	6.4	2.5
10.0	9.8	10.4	3.3	10.0	9.6	10.3	3.2	10.0	9.6	10.3	3.2
6.0	5.4	6.4	1.8	6.0	6.6	6.4	2.2	6.0	6.6	6.4	2.2
3.0	2.6	3.4	0.9	3.0	4.7	3.4	1.6	3.0	4.7	3.4	1.6
Lu= 3.2				Lu= 3.1				Lu= 3.1			
Pc= - kgf/cm ²				Pc= - kgf/cm ²				Pc= - kgf/cm ²			
Location SO1				Location SO1				Location SO1			
Injecting Section 42 ~ 45 m				Injecting Section 51 ~ 54 m				Injecting Section 51 ~ 54 m			
Ground Water Level 2.7 m				Ground Water Level 2.6				Ground Water Level 2.6			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 43.00 m				Pipe Length of Injecting Pa 52.00 m				Pipe Length of Injecting Pa 52.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	6.0	3.4	2.0	3.0	5.1	3.4	1.7	3.0	5.1	3.4	1.7
6.0	7.5	6.4	2.5	6.0	6.7	6.3	2.2	6.0	6.7	6.3	2.2
10.0	9.4	10.3	3.1	10.0	8.9	10.3	3.0	10.0	8.9	10.3	3.0
6.0	8.0	6.4	2.7	6.0	6.8	6.3	2.3	6.0	6.8	6.3	2.3
3.0	7.1	3.4	2.4	3.0	4.5	3.4	1.5	3.0	4.5	3.4	1.5
Lu= 3.1				Lu= 2.9				Lu= 2.9			
Pc= - kgf/cm ²				Pc= - kgf/cm ²				Pc= - kgf/cm ²			
Location SO1				Location SO1				Location SO1			
Injecting Section 45 ~ 48 m				Injecting Section 54 ~ 57 m				Injecting Section 54 ~ 57 m			
Ground Water Level 2.8 m				Ground Water Level 2.9				Ground Water Level 2.9			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 46.00 m				Pipe Length of Injecting Pa 55.00 m				Pipe Length of Injecting Pa 55.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	9.5	3.4	3.2	3.0	5.7	3.4	1.9	3.0	5.7	3.4	1.9
6.0	13.0	6.3	4.3	6.0	7.4	6.4	2.5	6.0	7.4	6.4	2.5
10.0	18.0	10.3	6.0	10.0	9.6	10.4	3.2	10.0	9.6	10.4	3.2
6.0	10.9	6.3	3.6	6.0	8.0	6.4	2.7	6.0	8.0	6.4	2.7
3.0	9.3	3.4	3.1	3.0	6.0	3.4	2.0	3.0	6.0	3.4	2.0
Lu= 5.9				Lu= 3.1				Lu= 3.1			
Pc= - kgf/cm ²				Pc= - kgf/cm ²				Pc= - kgf/cm ²			

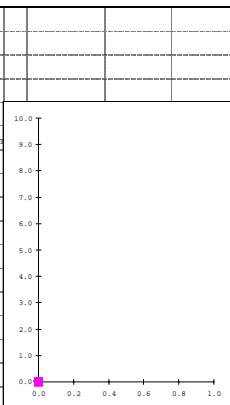
Result of Lugeon Test at Borehole SO1(3)

Location SO1				Location SO1			
Injecting Section		57 ~ 60 m		Injecting Section		66 ~ 69 m	
Ground Water Level		1.9 m		Ground Water Level		2.9 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		58.00 m		Pipe Length of Injecting Pa		67.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.9	3.3	0.3	3.0	1.1	3.4	0.4
6.0	1.9	6.3	0.6	6.0	2.4	6.4	0.8
10.0	2.7	10.3	0.9	10.0	3.0	10.4	1.0
6.0	1.7	6.3	0.6	6.0	2.5	6.4	0.8
3.0	1.2	3.3	0.4	3.0	1.9	3.4	0.6
Lu= 0.9				Lu= 1.0			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
Location SO1				Location SO1			
Injecting Section		60 ~ 63 m		Injecting Section		63 ~ 66 m	
Ground Water Level		2.9 m		Ground Water Level		2.9 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		61.00 m		Pipe Length of Injecting Pa		64.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.9	3.4	0.3	3.0	1.3	3.4	0.4
6.0	1.7	6.4	0.6	6.0	1.7	6.4	0.6
10.0	2.8	10.4	0.9	10.0	2.5	10.4	0.8
6.0	1.6	6.4	0.5	6.0	2.1	6.4	0.7
3.0	1.4	3.4	0.5	3.0	1.4	3.4	0.5
Lu= 0.9				Lu= 0.8			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			



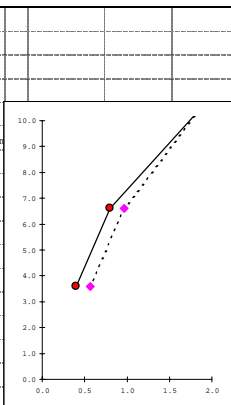
Result of Lugeon Test at Borehole SO1(4)

Location		SO2	
Injecting Section	3 ~ 6	m	
Ground Water Level	5.0	m	
Height of Pressure Gauge	-	cm	
Length of Test Section	3.0	m	
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$	kgf/cm	
Pipe Length of Injecting Pa	-	m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0



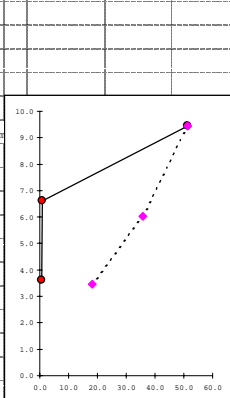
Lu' =	-
Pc =	- kgf/cm ²

Location		SO2	
Injecting Section	12 ~ 15	m	
Ground Water Level	5.0	m	
Height of Pressure Gauge	100.0	cm	
Length of Test Section	3.0	m	
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$	kgf/cm	
Pipe Length of Injecting Pa	13.00	m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.2	3.6	0.4
6.0	2.4	6.6	0.8
10.0	5.7	10.6	1.9
6.0	2.9	6.6	1.0
3.0	1.7	3.6	0.6



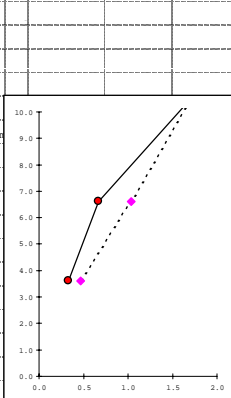
Lu' =	1.3
Pc =	6.6 kgf/cm ²

Location		SO2	
Injecting Section	6 ~ 9	m	
Ground Water Level	5.0	m	
Height of Pressure Gauge	100.0	cm	
Length of Test Section	3.0	m	
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$	kgf/cm	
Pipe Length of Injecting Pa	7.00	m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.7	3.6	0.6
6.0	2.4	6.6	0.8
10.0	154.0	9.4	51.3
6.0	107.0	6.0	35.7
3.0	54.7	3.5	18.2



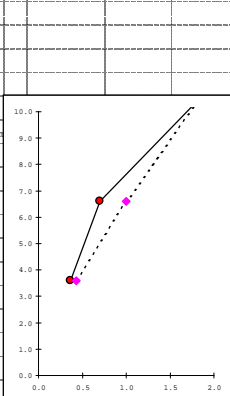
Lu' =	1.1
Pc =	6.6 kgf/cm ²

Location		SO2	
Injecting Section	15 ~ 18	m	
Ground Water Level	5.0	m	
Height of Pressure Gauge	100.0	cm	
Length of Test Section	3.0	m	
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$	kgf/cm	
Pipe Length of Injecting Pa	16.00	m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.0	3.6	0.3
6.0	2.0	6.6	0.7
10.0	5.2	10.6	1.7
6.0	3.1	6.6	1.0
3.0	1.4	3.6	0.5



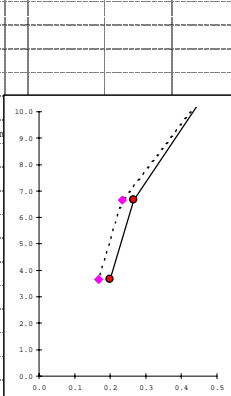
Lu' =	1.0
Pc =	6.6 kgf/cm ²

Location		SO2	
Injecting Section	9 ~ 12	m	
Ground Water Level	5.0	m	
Height of Pressure Gauge	100.0	cm	
Length of Test Section	3.0	m	
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$	kgf/cm	
Pipe Length of Injecting Pa	10.00	m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.1	3.6	0.4
6.0	2.1	6.6	0.7
10.0	5.6	10.6	1.9
6.0	3.0	6.6	1.0
3.0	1.3	3.6	0.4



Lu' =	1.1
Pc =	6.6 kgf/cm ²

Location		SO2	
Injecting Section	18 ~ 21	m	
Ground Water Level	5.5	m	
Height of Pressure Gauge	100.0	cm	
Length of Test Section	3.0	m	
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$	kgf/cm	
Pipe Length of Injecting Pa	19.00	m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.6	3.6	0.2
6.0	0.8	6.6	0.3
10.0	1.4	10.6	0.5
6.0	0.7	6.6	0.2
3.0	0.5	3.6	0.2

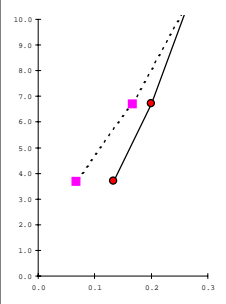
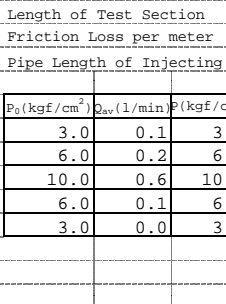
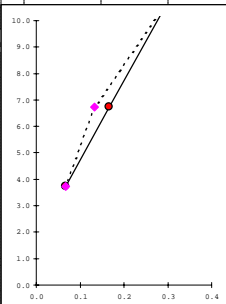
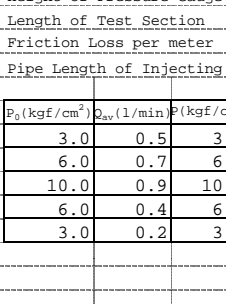
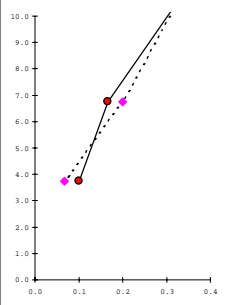
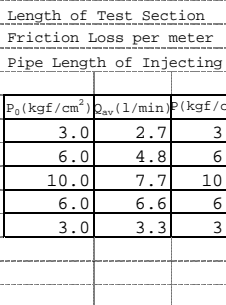


Lu =	0.4
Pc =	- kgf/cm ²

Result of Lugeon Test at Borehole SO2(1)

Location SO2				Location SO2			
Injecting Section		21 ~ 24 m		Injecting Section		30 ~ 33 m	
Ground Water Level		7.0 m		Ground Water Level		6.6 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		22.00 m		Pipe Length of Injecting Pa		31.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.7	3.8	0.2	3.0	0.8	3.8	0.3
6.0	0.9	6.8	0.3	6.0	0.9	6.8	0.3
10.0	1.3	10.8	0.4	10.0	1.0	10.8	0.3
6.0	0.6	6.8	0.2	6.0	0.7	6.8	0.2
3.0	0.5	3.8	0.2	3.0	0.5	3.8	0.2
Lu= 0.4				Lu= 0.3			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
Location SO2				Location SO2			
Injecting Section		24 ~ 27 m		Injecting Section		33 ~ 36 m	
Ground Water Level		6.7 m		Ground Water Level		6.6 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		25.00 m		Pipe Length of Injecting Pa		34.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.6	3.8	0.2	3.0	0.3	3.8	0.1
6.0	0.8	6.8	0.3	6.0	0.4	6.8	0.1
10.0	1.1	10.8	0.4	10.0	0.9	10.8	0.3
6.0	0.5	6.8	0.2	6.0	0.2	6.8	0.1
3.0	0.4	3.8	0.1	3.0	0.1	3.8	0.0
Lu= 0.3				Lu= 0.3			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
Location SO2				Location SO2			
Injecting Section		27 ~ 30 m		Injecting Section		36 ~ 39 m	
Ground Water Level		6.6 m		Ground Water Level		5.4 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		27.00 m		Pipe Length of Injecting Pa		37.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.5	3.8	0.2	3.0	0.2	3.6	0.1
6.0	0.6	6.8	0.2	6.0	0.5	6.6	0.2
10.0	1.3	10.8	0.4	10.0	1.1	10.6	0.4
6.0	0.7	6.8	0.2	6.0	0.4	6.6	0.1
3.0	0.5	3.8	0.2	3.0	0.2	3.6	0.1
Lu= 0.4				Lu= 0.3			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			

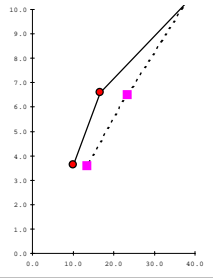
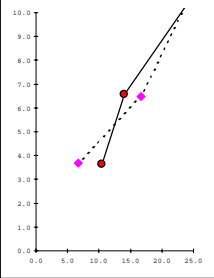
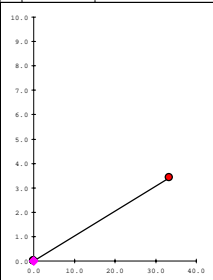
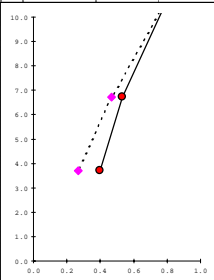
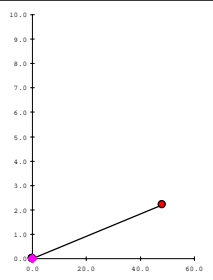
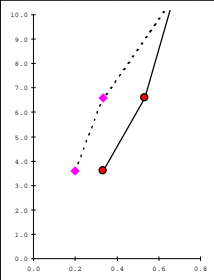
Result of Lugeon Test at Borehole SO2(2)

Location SO2				Location SO2			
Injecting Section 39 ~ 42 m				Injecting Section 48 ~ 51 m			
Ground Water Level 6.0 m				Ground Water Level 6.8 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 40.00 m				Pipe Length of Injecting Pa 49.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.4	3.7	0.1	3.0	0.1	3.8	0.0
6.0	0.6	6.7	0.2	6.0	0.2	6.8	0.1
10.0	0.8	10.7	0.3	10.0	0.6	10.8	0.2
6.0	0.5	6.7	0.2	6.0	0.1	6.8	0.0
3.0	0.2	3.7	0.1	3.0	0.0	3.8	0.0
							
Lu= 0.3				Lu= 0.2			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
Location SO2				Location SO2			
Injecting Section 42 ~ 45 m				Injecting Section 51 ~ 54 m			
Ground Water Level 6.2 m				Ground Water Level 5.0 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 43.00 m				Pipe Length of Injecting Pa 52.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.2	3.7	0.1	3.0	0.5	3.6	0.2
6.0	0.5	6.7	0.2	6.0	0.7	6.6	0.2
10.0	0.9	10.7	0.3	10.0	0.9	10.6	0.3
6.0	0.4	6.7	0.1	6.0	0.4	6.6	0.1
3.0	0.2	3.7	0.1	3.0	0.2	3.6	0.1
							
Lu= 0.3				Lu= 0.3			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
Location SO2				Location SO2			
Injecting Section 45 ~ 48 m				Injecting Section 54 ~ 57 m			
Ground Water Level 6.4 m				Ground Water Level 5.0 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 46.00 m				Pipe Length of Injecting Pa 55.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.3	3.7	0.1	3.0	2.7	3.6	0.9
6.0	0.5	6.7	0.2	6.0	4.8	6.6	1.6
10.0	1.0	10.7	0.3	10.0	7.7	10.6	2.6
6.0	0.6	6.7	0.2	6.0	6.6	6.6	2.2
3.0	0.2	3.7	0.1	3.0	3.3	3.6	1.1
							
Lu= 0.3				Lu= 2.4			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			

Result of Lugeon Test at Borehole SO2(3)

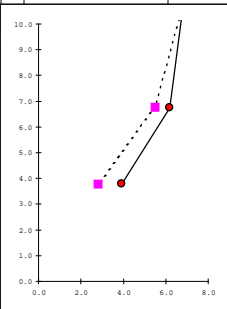
Location SO2				Location SO2			
Injecting Section		57 ~ 60 m		Injecting Section		66 ~ 69 m	
Ground Water Level		5.1 m		Ground Water Level		6.4 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		58.00 m		Pipe Length of Injecting Pa		67.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.4	3.6	0.1	3.0	0.9	3.7	0.3
6.0	0.8	6.6	0.3	6.0	1.5	6.7	0.5
10.0	1.3	10.6	0.4	10.0	1.8	10.7	0.6
6.0	0.6	6.6	0.2	6.0	1.3	6.7	0.4
3.0	0.4	3.6	0.1	3.0	0.9	3.7	0.3
Lu= 0.4				Lu= 0.6			
Pc= -		kgf/cm ²		Pc= -		kgf/cm ²	
Location SO2				Location SO2			
Injecting Section		60 ~ 63 m		Injecting Section		63 ~ 66 m	
Ground Water Level		5.4 m		Ground Water Level		5.1 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		61.00 m		Pipe Length of Injecting Pa		64.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.3	3.6	0.1	3.0	0.2	3.6	0.1
6.0	0.5	6.6	0.2	6.0	0.3	6.6	0.1
10.0	1.1	10.6	0.4	10.0	0.9	10.6	0.3
6.0	0.6	6.6	0.2	6.0	0.4	6.6	0.1
3.0	0.4	3.6	0.1	3.0	0.1	3.6	0.0
Lu= 0.3				Lu= 0.3			
Pc= -		kgf/cm ²		Pc= -		kgf/cm ²	

Result of Lugeon Test at Borehole SO2(4)

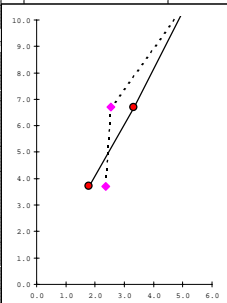
Location SO3				Location SO3			
Injecting Section		3 ~ 6 m		Injecting Section		12 ~ 15 m	
Ground Water Level		5.5 m		Ground Water Level		6.1 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa				Pipe Length of Injecting Pa			
4.00 m				13.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	30.0	3.6	10.0	3.0	31.5	3.6	10.5
6.0	50.0	6.6	16.7	6.0	42.0	6.5	14.0
10.0	114.0	10.3	38.0	10.0	71.1	10.2	23.7
6.0	70.0	6.5	23.3	6.0	50.0	6.5	16.7
3.0	40.0	3.6	13.3	3.0	20.0	3.7	6.7
Lu' = 24.4				Lu' = 18.1			
Pc = 6.6 kgf/cm ²				Pc = 6.5 kgf/cm ²			
							
Location SO3				Location SO3			
Injecting Section		6 ~ 9 m		Injecting Section		15 ~ 18 m	
Ground Water Level		8.0 m		Ground Water Level		6.1 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa				Pipe Length of Injecting Pa			
7.00 m				16.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	100.0	3.4	33.3	3.0	1.2	3.7	0.4
0.0	0.0	0.0	0.0	6.0	1.6	6.7	0.5
0.0	0.0	0.0	0.0	10.0	2.4	10.7	0.8
0.0	0.0	0.0	0.0	6.0	1.4	6.7	0.5
0.0	0.0	0.0	0.0	3.0	0.8	3.7	0.3
Lu' = 97.8				Lu = 0.8			
Pc = - kgf/cm ²				Pc = - kgf/cm ²			
							
Location SO3				Location SO3			
Injecting Section		9 ~ 12 m		Injecting Section		18 ~ 21 m	
Ground Water Level		5.5 m		Ground Water Level		5.0 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa				Pipe Length of Injecting Pa			
10.00 m				19.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	144.1	2.2	48.0	3.0	1.0	3.6	0.3
0.0	0.0	0.0	0.0	6.0	1.6	6.6	0.5
0.0	0.0	0.0	0.0	10.0	2.0	10.6	0.7
0.0	0.0	0.0	0.0	6.0	1.0	6.6	0.3
0.0	0.0	0.0	0.0	3.0	0.6	3.6	0.2
Lu' = 218				Lu = 0.6			
Pc = - kgf/cm ²				Pc = - kgf/cm ²			
							

Result of Lugeon Test at Borehole SO3(1)

Location		SO3	
Injecting Section		21 - 24 m	
Ground Water Level		7.0 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²	
Pipe Length of Injecting Pa		22.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	11.8	3.8	3.9
6.0	18.6	6.7	6.2
10.0	20.5	10.7	6.8
6.0	16.5	6.8	5.5
3.0	8.4	3.8	2.8
Lu=		6.7	
Pc=		- kgf/cm ²	



Location		SO3	
Injecting Section		24 - 27 m	
Ground Water Level		6.1 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²	
Pipe Length of Injecting Pa		25.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	5.4	3.7	1.8
6.0	10.0	6.7	3.3
10.0	15.5	10.7	5.2
6.0	7.6	6.7	2.5
3.0	7.1	3.7	2.4
Lu=		4.9	
Pc=		- kgf/cm ²	

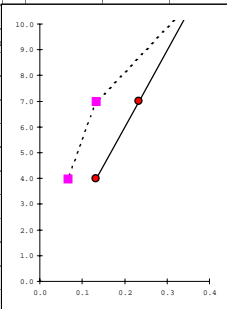


Result of Lugeon Test at Borehole SO3(2)

Location SO4 Injecting Section 3 ~ 6 m Ground Water Level Mill m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting Pipe - m				Location SO4 Injecting Section 12 ~ 15 m Ground Water Level 8.9 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting Pipe 13.00 m																																																
<table border="1"> <thead> <tr> <th>P_0 (kgf/cm²)</th> <th>Q_{av} (l/min)</th> <th>P (kgf/cm²)</th> <th>q (l/min/m)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> </tbody> </table>		P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<table border="1"> <thead> <tr> <th>P_0 (kgf/cm²)</th> <th>Q_{av} (l/min)</th> <th>P (kgf/cm²)</th> <th>q (l/min/m)</th> </tr> </thead> <tbody> <tr><td>3.0</td><td>0.8</td><td>4.0</td><td>0.3</td></tr> <tr><td>6.0</td><td>0.9</td><td>7.0</td><td>0.3</td></tr> <tr><td>10.0</td><td>1.1</td><td>11.0</td><td>0.4</td></tr> <tr><td>6.0</td><td>0.5</td><td>7.0</td><td>0.2</td></tr> <tr><td>3.0</td><td>0.4</td><td>4.0</td><td>0.1</td></tr> </tbody> </table>		P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	3.0	0.8	4.0	0.3	6.0	0.9	7.0	0.3	10.0	1.1	11.0	0.4	6.0	0.5	7.0	0.2	3.0	0.4	4.0	0.1
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)																																																	
0.0	0.0	0.0	0.0																																																	
0.0	0.0	0.0	0.0																																																	
0.0	0.0	0.0	0.0																																																	
0.0	0.0	0.0	0.0																																																	
0.0	0.0	0.0	0.0																																																	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)																																																	
3.0	0.8	4.0	0.3																																																	
6.0	0.9	7.0	0.3																																																	
10.0	1.1	11.0	0.4																																																	
6.0	0.5	7.0	0.2																																																	
3.0	0.4	4.0	0.1																																																	
Lu' = - Pc = - kgf/cm ²		Lu = 0.4 Pc = - kgf/cm ²																																																		
Location SO4 Injecting Section 6 ~ 9 m Ground Water Level Mill m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting Pipe 7.00 m				Location SO4 Injecting Section 15 ~ 18 m Ground Water Level 10.0 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting Pipe 16.00 m																																																
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1.5	105.0	1.8	35.0																																																	
0.0	0.0	0.0	0.0																																																	
0.0	0.0	0.0	0.0																																																	
0.0	0.0	0.0	0.0																																																	
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Lu' = 193 Pc = - kgf/cm ²		Lu = 0.2 Pc = - kgf/cm ²																																																		
Location SO4 Injecting Section 9 ~ 12 m Ground Water Level 9.3 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting Pipe 10.00 m				Location SO4 Injecting Section 18 ~ 21 m Ground Water Level 10.5 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting Pipe 19.00 m																																																
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P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)																																																	
1.5	0.0	2.5	0.0																																																	
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0.0	0.0	0.0	0.0																																																	
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Lu' = 0 Pc = - kgf/cm ²		Lu = 0.2 Pc = - kgf/cm ²																																																		

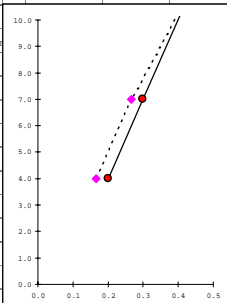
Result of Lugeon Test at Borehole SO4(1)

Location		SO4	
Injecting Section		21 - 24 m	
Ground Water Level		8.8 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²	
Pipe Length of Injecting Pa		22.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.4	4.0	0.1
6.0	0.7	7.0	0.2
10.0	1.1	11.0	0.4
6.0	0.4	7.0	0.1
3.0	0.2	4.0	0.1



Lu= 0.3
Pc= - kgf/cm²

Location		SO4	
Injecting Section		24 - 27 m	
Ground Water Level		9.0 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²	
Pipe Length of Injecting Pa		25.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.6	4.0	0.2
6.0	0.9	7.0	0.3
10.0	1.3	11.0	0.4
6.0	0.8	7.0	0.3
3.0	0.5	4.0	0.2

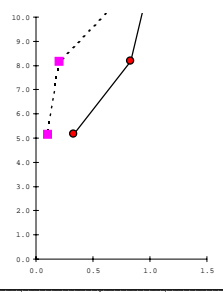
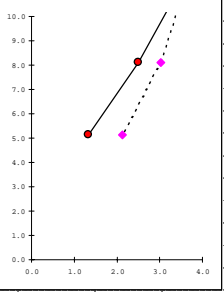
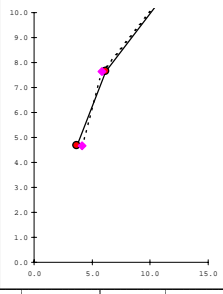
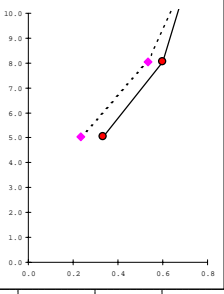
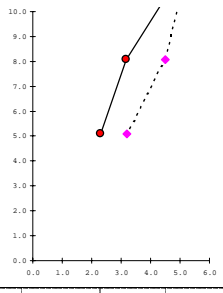
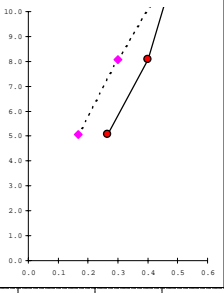


Lu= 0.4
Pc= - kgf/cm²

Result of Lugeon Test at Borehole SO4(2)

Location SG1 Injecting Section 3 ~ 6 m Ground Water Level 2.2 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 4.00 m				Location SG1 Injecting Section 12 ~ 15 m Ground Water Level 9.5 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 13.00 m																																															
<table border="1"> <thead> <tr> <th>P_0 (kgf/cm²)</th> <th>Q_{av} (l/min)</th> <th>P (kgf/cm²)</th> <th>g (l/min/m)</th> </tr> </thead> <tbody> <tr><td>1.5</td><td>10.2</td><td>1.8</td><td>3.4</td></tr> <tr><td>3.0</td><td>18.8</td><td>3.3</td><td>6.3</td></tr> <tr><td>6.0</td><td>29.6</td><td>6.3</td><td>9.9</td></tr> <tr><td>3.0</td><td>21.0</td><td>3.3</td><td>7.0</td></tr> <tr><td>1.5</td><td>12.2</td><td>1.8</td><td>4.1</td></tr> </tbody> </table>	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	g (l/min/m)	1.5	10.2	1.8	3.4	3.0	18.8	3.3	6.3	6.0	29.6	6.3	9.9	3.0	21.0	3.3	7.0	1.5	12.2	1.8	4.1		<table border="1"> <thead> <tr> <th>P_0 (kgf/cm²)</th> <th>Q_{av} (l/min)</th> <th>P (kgf/cm²)</th> <th>g (l/min/m)</th> </tr> </thead> <tbody> <tr><td>3.0</td><td>56.0</td><td>3.8</td><td>18.7</td></tr> <tr><td>6.0</td><td>87.0</td><td>6.4</td><td>29.0</td></tr> <tr><td>10.0</td><td>122.0</td><td>9.7</td><td>40.7</td></tr> <tr><td>6.0</td><td>82.5</td><td>6.4</td><td>27.5</td></tr> <tr><td>3.0</td><td>56.0</td><td>3.8</td><td>18.7</td></tr> </tbody> </table>	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	g (l/min/m)	3.0	56.0	3.8	18.7	6.0	87.0	6.4	29.0	10.0	122.0	9.7	40.7	6.0	82.5	6.4	27.5	3.0	56.0	3.8	18.7	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	g (l/min/m)																																																
1.5	10.2	1.8	3.4																																																
3.0	18.8	3.3	6.3																																																
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Lu' = 14.3				Lu' = 41.8																																															
Pc = -	kgf/cm ²			Pc = -	kgf/cm ²																																														
Location SG1 Injecting Section 6 ~ 9 m Ground Water Level 4.8 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 7.00 m				Location SG1 Injecting Section 15 ~ 18 m Ground Water Level 9.3 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 16.00 m																																															
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P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	g (l/min/m)																																																
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Lu' = 5.6				Lu' = 113.5																																															
Pc = 6.6	kgf/cm ²			Pc = 4.9	kgf/cm ²																																														
Location SG1 Injecting Section 9 ~ 12 m Ground Water Level 4.9 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 10.00 m				Location SG1 Injecting Section 18.35 ~ 21 m Ground Water Level 18.0 m Height of Pressure Gauge 100.0 cm Length of Test Section 2.7 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 19.35 m																																															
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P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	g (l/min/m)																																																
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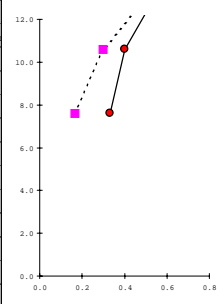
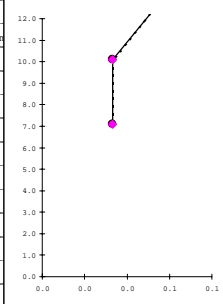
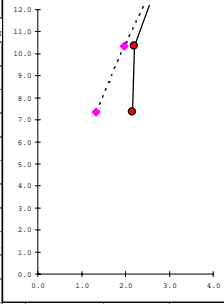
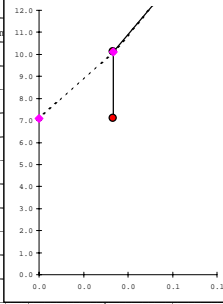
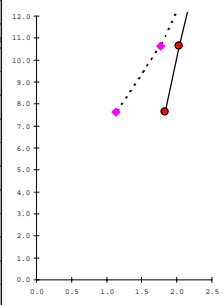
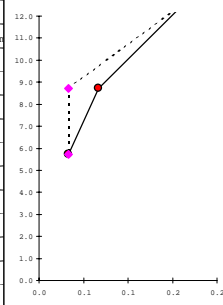
Result of Lugeon Test at Borehole SG1(1)

Location SGI				Location SGI			
Injecting Section 21 ~ 24 m				Injecting Section 30 ~ 33 m			
Ground Water Level 20.7 m				Ground Water Level 20.3 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 22.00 m				Pipe Length of Injecting Pa 31.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.0	5.2	0.3	3.0	4.0	5.1	1.3
6.0	2.5	8.2	0.8	6.0	7.5	8.1	2.5
10.0	3.1	12.2	1.0	10.0	11.3	12.1	3.8
6.0	0.6	8.2	0.2	6.0	9.1	8.1	3.0
3.0	0.3	5.2	0.1	3.0	6.4	5.1	2.1
							
Lu' = 1.1				Lu' = 3.0			
Pc = - kgf/cm ²				Pc = - kgf/cm ²			
Location SGI				Location SGI			
Injecting Section 24 ~ 27 m				Injecting Section 33 ~ 36 m			
Ground Water Level 16.0 m				Ground Water Level 19.4 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 25.00 m				Pipe Length of Injecting Pa 34.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	11.1	4.7	3.7	3.0	1.0	5.0	0.3
6.0	18.5	7.6	6.2	6.0	1.8	8.0	0.6
10.0	37.4	11.5	12.5	10.0	2.2	12.0	0.7
6.0	17.6	7.6	5.9	6.0	1.6	8.0	0.5
3.0	12.4	4.7	4.1	3.0	0.7	5.0	0.2
							
Lu' = 8.1				Lu' = 0.8			
Pc = 7.6 kgf/cm ²				Pc = - kgf/cm ²			
Location SGI				Location SGI			
Injecting Section 27 ~ 30 m				Injecting Section 36 ~ 39 m			
Ground Water Level 20.0 m				Ground Water Level 19.6 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 28.00 m				Pipe Length of Injecting Pa 37.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	6.9	5.1	2.3	3.0	0.8	5.1	0.3
6.0	9.5	8.1	3.2	6.0	1.2	8.1	0.4
10.0	15.9	12.1	5.3	10.0	1.5	12.1	0.5
6.0	13.5	8.1	4.5	6.0	0.9	8.1	0.3
3.0	9.6	5.1	3.2	3.0	0.5	5.1	0.2
							
Lu' = 3.7				Lu' = 0.5			
Pc = 8.1 kgf/cm ²				Pc = - kgf/cm ²			

Result of Lugeon Test at Borehole SG1(2)

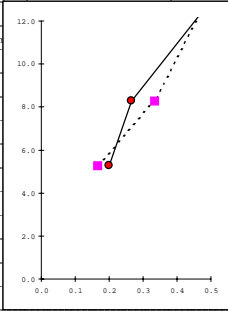
Location SG1				Location SG1			
Injecting Section 39 ~ 42 m				Injecting Section 48 ~ 51 m			
Ground Water Level 19.6 m				Ground Water Level 46.8 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting 40.00 m				Pipe Length of Injecting 49.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.7	5.1	0.2	3.0	6.2	7.8	2.1
6.0	1.1	8.1	0.4	6.0	10.0	10.7	3.3
10.0	1.7	12.1	0.6	10.0	24.0	14.6	8.0
6.0	0.9	8.1	0.3	6.0	10.5	10.7	3.5
3.0	0.4	5.1	0.1	3.0	7.0	7.8	2.3
Lu' = 0.5				Lu = 3.0			
Pc = - kgf/cm ²				Pc = 10.7 kgf/cm ²			
Location SG1				Location SG1			
Injecting Section 42 ~ 45 m				Injecting Section 51 ~ 54 m			
Ground Water Level 20.4 m				Ground Water Level 46.7 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting 43.00 m				Pipe Length of Injecting 52.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.4	5.1	0.1	3.0	1.0	7.8	0.3
6.0	0.5	8.1	0.2	6.0	1.7	10.8	0.6
10.0	0.9	12.1	0.3	10.0	2.0	14.8	0.7
6.0	0.2	8.1	0.1	6.0	1.1	10.8	0.4
3.0	0.1	5.1	0.0	3.0	0.5	7.8	0.2
Lu' = 0.2				Lu = 0.5			
Pc = - kgf/cm ²				Pc = - kgf/cm ²			
Location SG1				Location SG1			
Injecting Section 45 ~ 48 m				Injecting Section 54 ~ 57 m			
Ground Water Level 18.9 m				Ground Water Level 48.0 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting 46.00 m				Pipe Length of Injecting 55.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.5	5.0	0.2	3.0	0.5	7.9	0.2
6.0	0.7	8.0	0.2	6.0	0.9	10.9	0.3
10.0	1.2	12.0	0.4	10.0	1.3	14.9	0.4
6.0	0.4	8.0	0.1	6.0	0.7	10.9	0.2
3.0	0.2	5.0	0.1	3.0	0.4	7.9	0.1
Lu' = 0.3				Lu = 0.3			
Pc = - kgf/cm ²				Pc = - kgf/cm ²			

Result of Lugeon Test at Borehole SG1(3)

Location SGI				Location SGI			
Injecting Section		57 ~ 60 m		Injecting Section		66 ~ 69 m	
Ground Water Level		45.0 m		Ground Water Level		40.0 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		58.00 m		Pipe Length of Injecting Pa		67.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.0	7.6	0.3	3.0	0.1	7.1	0.0
6.0	1.2	10.6	0.4	6.0	0.1	10.1	0.0
10.0	1.9	14.6	0.6	10.0	0.2	14.1	0.1
6.0	0.9	10.6	0.3	6.0	0.1	10.1	0.0
3.0	0.5	7.6	0.2	3.0	0.1	7.1	0.0
Lu= 0.4				Lu= 0.0			
Pc= - kgf/cm²				Pc= 10.1 kgf/cm²			
							
Location SGI				Location SGI			
Injecting Section		60 ~ 63 m		Injecting Section		69 ~ 72 m	
Ground Water Level		42.7 m		Ground Water Level		40.0 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		61.00 m		Pipe Length of Injecting Pa		70.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	6.5	7.4	2.2	3.0	0.1	7.1	0.0
6.0	6.6	10.4	2.2	6.0	0.1	10.1	0.0
10.0	8.8	14.3	2.9	10.0	0.2	14.1	0.1
6.0	5.9	10.4	2.0	6.0	0.1	10.1	0.0
3.0	4.0	7.4	1.3	3.0	0.0	7.1	0.0
Lu= 2.1				Lu= 0.0			
Pc= - kgf/cm²				Pc= - kgf/cm²			
							
Location SGI				Location SGI			
Injecting Section		63 ~ 66 m		Injecting Section		72 ~ 75 m	
Ground Water Level		45.5 m		Ground Water Level		26.3 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		64.00 m		Pipe Length of Injecting Pa		73.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	5.5	7.6	1.8	3.0	0.1	5.7	0.0
6.0	6.1	10.6	2.0	6.0	0.2	8.7	0.1
10.0	7.0	14.6	2.3	10.0	0.5	12.7	0.2
6.0	5.3	10.6	1.8	6.0	0.1	8.7	0.0
3.0	3.4	7.6	1.1	3.0	0.1	5.7	0.0
Lu= 2.0				Lu= 0.1			
Pc= - kgf/cm²				Pc= - kgf/cm²			
							

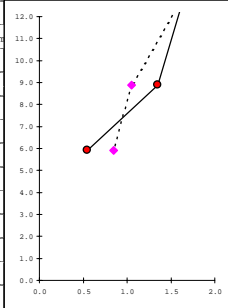
Result of Lugeon Test at Borehole SGI(4)

Location		SG1	
Injecting Section		75 ~ 78 m	
Ground Water Level		21.7 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m	
Friction Loss per meter		$7 \times 10^{-6} \times Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		76.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.6	5.3	0.2
6.0	0.8	8.3	0.3
10.0	1.4	12.3	0.5
6.0	1.0	8.3	0.3
3.0	0.5	5.3	0.2



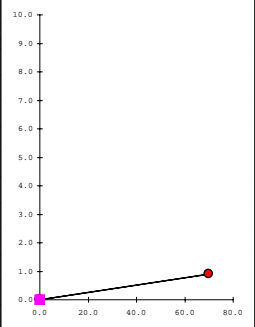
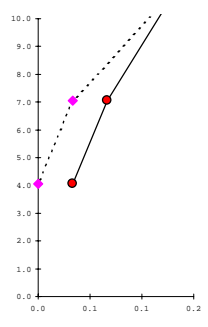
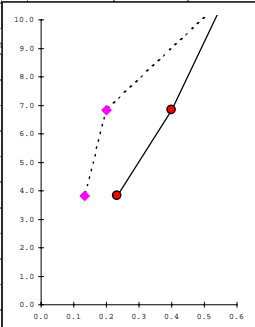
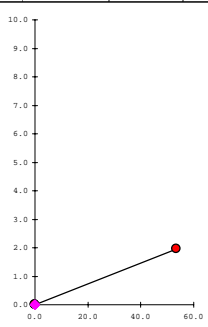
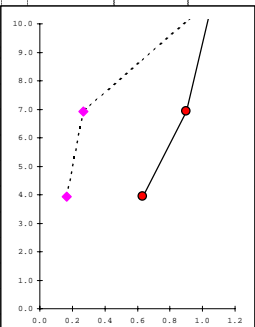
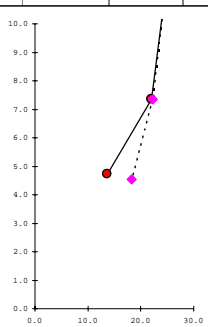
Lu= 0.4
 PC= - kgf/cm²

Location		SG1	
Injecting Section		78 ~ 80 m	
Ground Water Level		28.0 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		2.0 m	
Friction Loss per meter		$7 \times 10^{-6} \times Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		79.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.1	5.9	0.6
6.0	2.7	8.9	1.4
10.0	3.3	12.9	1.7
6.0	2.1	8.9	1.1
3.0	1.7	5.9	0.9



Lu= 1.4
 PC= - kgf/cm²

Result of Lugeon Test at Borehole SG1(5)

Location SG2				Location SG2			
Injecting Section		3 ~ 6 m		Injecting Section		12 ~ 15 m	
Ground Water Level		5.3 m		Ground Water Level		9.6	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pipe		4.00 m		Pipe Length of Injecting Pipe		13.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
0.0	0.0	0.0	0.0	3.0	0.1	4.1	0.0
1.5	210.1	0.9	70.0	6.0	0.2	7.1	0.1
0.0	0.0	0.0	0.0	10.0	0.4	11.1	0.1
0.0	0.0	0.0	0.0	6.0	0.1	7.1	0.0
0.0	0.0	0.0	0.0	3.0	0.0	4.1	0.0
							
Lu' = 783		Pc = - kgf/cm ²		Lu = 0.1		Pc = - kgf/cm ²	
Location SG2				Location SG2			
Injecting Section		6 ~ 9 m		Injecting Section		15 ~ 18 m	
Ground Water Level		7.3 m		Ground Water Level		17.3	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pipe		7.00 m		Pipe Length of Injecting Pipe		16.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.7	3.8	0.2	3.0	160.3	1.9	53.4
6.0	1.2	6.8	0.4	0.0	0.0	0.0	0.0
10.0	1.7	10.8	0.6	0.0	0.0	0.0	0.0
6.0	0.6	6.8	0.2	0.0	0.0	0.0	0.0
3.0	0.4	3.8	0.1	0.0	0.0	0.0	0.0
							
Lu = 0.5		Pc = - kgf/cm ²		Lu' = 274		Pc = - kgf/cm ²	
Location SG2				Location SG2			
Injecting Section		9 ~ 12 m		Injecting Section		18 ~ 21 m	
Ground Water Level		8.3 m		Ground Water Level		18.4	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pipe		10.00 m		Pipe Length of Injecting Pipe		19.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	1.9	3.9	0.6	3.0	41.0	4.7	13.7
6.0	2.7	6.9	0.9	6.0	65.9	7.4	22.0
10.0	3.2	10.9	1.1	10.0	74.1	11.2	24.7
6.0	0.8	6.9	0.3	6.0	66.9	7.3	22.3
3.0	0.5	3.9	0.2	3.0	54.9	4.5	18.3
							
Lu = 1.0		Pc = - kgf/cm ²		Lu = 23.8		Pc = - kgf/cm ²	

Result of Lugeon Test at Borehole SG2(1)

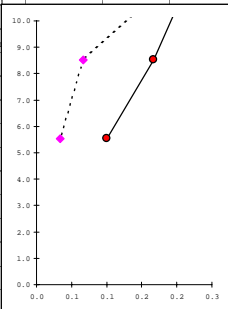
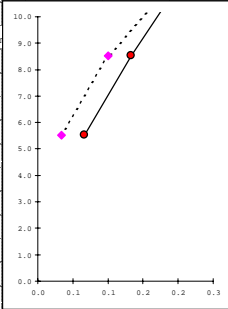
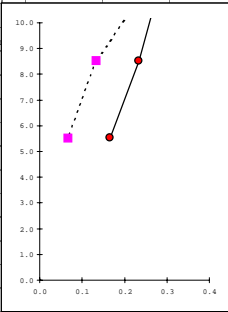
Location SG2 Injecting Section 21 ~ 24 m Ground Water Level 22.5 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 22.00 m				Location SG2 Injecting Section 30 ~ 33 m Ground Water Level 24.3 Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 31.00 m																																															
<table border="1"> <thead> <tr> <th>P_0(kgf/cm²)</th> <th>Q_{av}(l/min)</th> <th>P(kgf/cm²)</th> <th>q(l/min/m)</th> </tr> </thead> <tbody> <tr><td>3.0</td><td>85.4</td><td>4.2</td><td>28.5</td></tr> <tr><td>6.0</td><td>111.7</td><td>6.4</td><td>37.2</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> </tbody> </table>	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	3.0	85.4	4.2	28.5	6.0	111.7	6.4	37.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		<table border="1"> <thead> <tr> <th>P_0(kgf/cm²)</th> <th>Q_{av}(l/min)</th> <th>P(kgf/cm²)</th> <th>q(l/min/m)</th> </tr> </thead> <tbody> <tr><td>3.0</td><td>0.2</td><td>5.5</td><td>0.1</td></tr> <tr><td>6.0</td><td>0.4</td><td>8.5</td><td>0.1</td></tr> <tr><td>10.0</td><td>0.6</td><td>12.5</td><td>0.2</td></tr> <tr><td>6.0</td><td>0.2</td><td>8.5</td><td>0.1</td></tr> <tr><td>3.0</td><td>0.1</td><td>5.5</td><td>0.0</td></tr> </tbody> </table>	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	3.0	0.2	5.5	0.1	6.0	0.4	8.5	0.1	10.0	0.6	12.5	0.2	6.0	0.2	8.5	0.1	3.0	0.1	5.5	0.0	
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3.0	0.1	5.5	0.0																																																
Lu' = 51.5 Pc = - kgf/cm ²		Lu = 0.2 Pc = - kgf/cm ²																																																	
Location SG2 Injecting Section 24 ~ 27 m Ground Water Level 24.5 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 25.00 m				Location SG2 Injecting Section 33 ~ 36 m Ground Water Level 24.2 Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 34.00 m																																															
<table border="1"> <thead> <tr> <th>P_0(kgf/cm²)</th> <th>Q_{av}(l/min)</th> <th>P(kgf/cm²)</th> <th>q(l/min/m)</th> </tr> </thead> <tbody> <tr><td>3.0</td><td>109.0</td><td>3.5</td><td>36.3</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> <tr><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr> </tbody> </table>	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	3.0	109.0	3.5	36.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		<table border="1"> <thead> <tr> <th>P_0(kgf/cm²)</th> <th>Q_{av}(l/min)</th> <th>P(kgf/cm²)</th> <th>q(l/min/m)</th> </tr> </thead> <tbody> <tr><td>3.0</td><td>0.2</td><td>5.5</td><td>0.1</td></tr> <tr><td>6.0</td><td>0.4</td><td>8.5</td><td>0.1</td></tr> <tr><td>10.0</td><td>0.8</td><td>12.5</td><td>0.3</td></tr> <tr><td>6.0</td><td>0.3</td><td>8.5</td><td>0.1</td></tr> <tr><td>3.0</td><td>0.1</td><td>5.5</td><td>0.0</td></tr> </tbody> </table>	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	3.0	0.2	5.5	0.1	6.0	0.4	8.5	0.1	10.0	0.8	12.5	0.3	6.0	0.3	8.5	0.1	3.0	0.1	5.5	0.0	
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Lu' = 105 Pc = - kgf/cm ²		Lu = 0.2 Pc = - kgf/cm ²																																																	
Location SG2 Injecting Section 27 ~ 30 m Ground Water Level 24.3 m Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 28.00 m				Location SG2 Injecting Section 36 ~ 39 m Ground Water Level 24.2 Height of Pressure Gauge 100.0 cm Length of Test Section 3.0 m Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm Pipe Length of Injecting 37.00 m																																															
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Lu = 0.1 Pc = - kgf/cm ²		Lu = 0.2 Pc = - kgf/cm ²																																																	

Result of Lugeon Test at Borehole SG2(2)

Location		SG2	
Injecting Section		39 ~ 42 m	
Ground Water Level		24.2 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		40.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.5	5.5	0.2
6.0	0.7	8.5	0.2
10.0	0.9	12.5	0.3
6.0	0.4	8.5	0.1
3.0	0.2	5.5	0.1
Lu=		0.3	
Pc=		- kgf/cm ²	

Location		SG2	
Injecting Section		42 ~ 45 m	
Ground Water Level		24.3 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		43.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.2	5.5	0.1
6.0	0.4	8.5	0.1
10.0	0.7	12.5	0.2
6.0	0.3	8.5	0.1
3.0	0.1	5.5	0.0
Lu=		0.2	
Pc=		- kgf/cm ²	

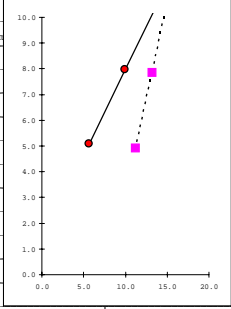
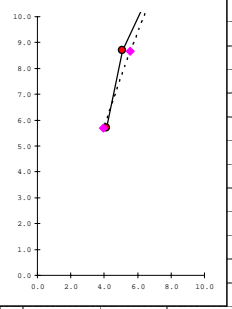
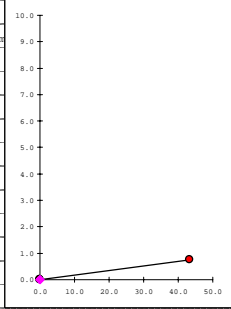
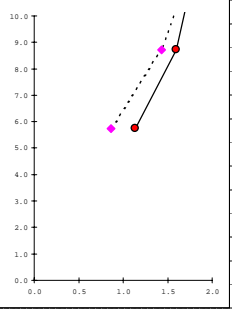
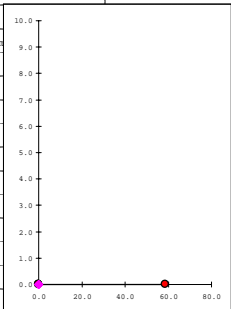
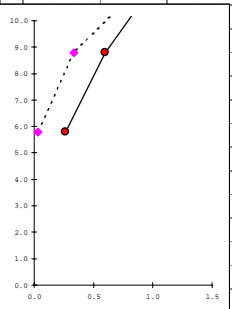
Location		SG2	
Injecting Section		45 ~ 48 m	
Head of Water Pressure			
Ground Water Level		24.3 m	
Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		46.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.3	5.5	0.1
6.0	0.5	8.5	0.2
10.0	0.7	12.5	0.2
6.0	0.2	8.5	0.1
3.0	0.1	5.5	0.0
Lu=		0.2	
Pc=		- kgf/cm ²	



Result of Lugeon Test at Borehole SG2(3)

Location SG3				Location SG3			
Injecting Section		3 ~ 6 m		Injecting Section		12 ~ 15 m	
Ground Water Level		Null m		Ground Water Level		13.9	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		4.00 m		Pipe Length of Injecting Pa		13.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
1.0	150.0	0.9	50.0	1.0	134.0	0.9	44.7
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lu' = 543				Lu' = 522			
PC = - kgf/cm ²				PC = - kgf/cm ²			
Location SG3				Location SG3			
Injecting Section		6 ~ 9 m		Injecting Section		15 ~ 18 m	
Ground Water Level		6.3 m		Ground Water Level		12.4	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		7.00 m		Pipe Length of Injecting Pa		16.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	50.0	3.6	16.7	3.0	17.5	4.3	5.8
6.0	65.0	6.5	21.7	6.0	28.4	7.2	9.5
10.0	110.0	10.1	36.7	10.0	50.1	11.1	16.7
6.0	80.0	6.4	26.7	6.0	30.4	7.2	10.1
3.0	64.5	3.5	21.5	3.0	20.0	4.3	6.7
Lu' = 27.6				Lu' = 12.9			
PC = 6.5 kgf/cm ²				PC = 7.2 kgf/cm ²			
Location SG3				Location SG3			
Injecting Section		9 ~ 12 m		Injecting Section		18 ~ 21 m	
Ground Water Level		8.0 m		Ground Water Level		15.2	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm	
Pipe Length of Injecting Pa		10.00 m		Pipe Length of Injecting Pa		19.00 m	
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.5	3.9	0.2	3.0	20.4	4.6	6.8
6.0	0.9	6.9	0.3	6.0	31.4	7.5	10.5
10.0	1.2	10.9	0.4	10.0	63.4	11.1	21.1
6.0	0.7	6.9	0.2	6.0	40.9	7.4	13.6
3.0	0.5	3.9	0.2	3.0	31.1	4.5	10.4
Lu = 0.4				Lu' = 13.6			
PC = - kgf/cm ²				PC = 7.5 kgf/cm ²			

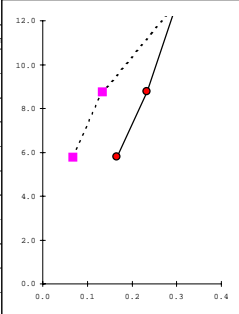
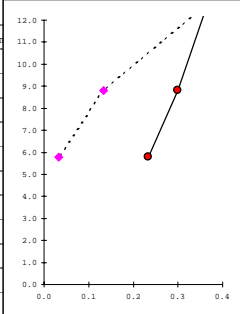
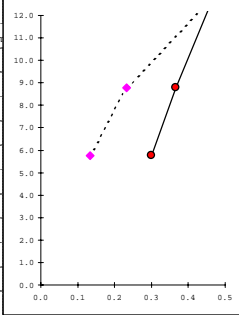
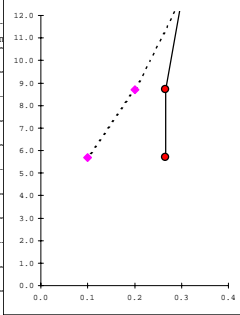
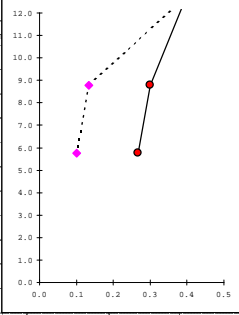
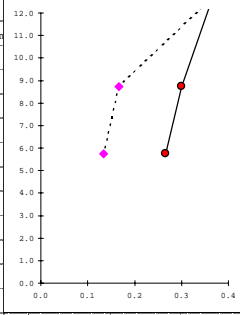
Result of Lugeon Test at Borehole SG3(1)

Location SG3				Location SG3			
Injecting Section 21 ~ 24 m				Injecting Section 30 ~ 33 m			
Ground Water Level 20.1 m				Ground Water Level 26.3 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 22.00 m				Pipe Length of Injecting Pa 31.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	17.0	5.1	5.7	3.0	12.4	5.7	4.1
6.0	29.9	8.0	10.0	6.0	15.3	8.7	5.1
10.0	47.2	11.8	15.7	10.0	23.8	12.6	7.9
6.0	39.5	7.9	13.2	6.0	16.7	8.7	5.6
3.0	33.5	4.9	11.2	3.0	11.8	5.7	3.9
$Lu' = 11.2$				$Lu' = 5.5$			
$Pc = 5.1$ kgf/cm ²				$Pc = 8.7$ kgf/cm ²			
							
Location SG3				Location SG3			
Injecting Section 24 ~ 27 m				Injecting Section 33 ~ 36 m			
Ground Water Level 26.0 m				Ground Water Level 26.3 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 25.00 m				Pipe Length of Injecting Pa 34.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
1.0	130.0	0.7	43.3	3.0	3.4	5.7	1.1
0.0	0.0	0.0	0.0	6.0	4.8	8.7	1.6
0.0	0.0	0.0	0.0	10.0	5.6	12.7	1.9
0.0	0.0	0.0	0.0	6.0	4.3	8.7	1.4
0.0	0.0	0.0	0.0	3.0	2.6	5.7	0.9
$Lu' = 584$				$Lu = 1.7$			
$Pc = -$ kgf/cm ²				$Pc = -$ kgf/cm ²			
							
Location SG3				Location SG3			
Injecting Section 27 ~ 30 m				Injecting Section 36 ~ 39 m			
Ground Water Level 26.1 m				Ground Water Level 26.8 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 27.00 m				Pipe Length of Injecting Pa 37.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
1.5	176.0	0.0	58.7	3.0	0.8	5.8	0.3
0.0	0.0	0.0	0.0	6.0	1.8	8.8	0.6
0.0	0.0	0.0	0.0	10.0	3.7	12.8	1.2
0.0	0.0	0.0	0.0	6.0	1.0	8.8	0.3
0.0	0.0	0.0	0.0	3.0	0.1	5.8	0.0
$Lu' = Leak$				$Lu = 0.8$			
$Pc = -$ kgf/cm ²				$Pc = -$ kgf/cm ²			
							

Result of Lugeon Test at Borehole SG3(2)

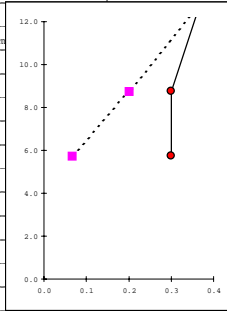
Location SG3				Location SG3			
Injecting Section		39 - 42 m		Injecting Section		48 - 51 m	
Ground Water Level		26.8 m		Ground Water Level		28.8 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²	
Pipe Length of Injecting Pa		40.00 m		Pipe Length of Injecting Pa		49.00 m	
P₀ (kgf/cm²)	Q_{av} (l/min)	P (kgf/cm²)	q (l/min/m)	P₀ (kgf/cm²)	Q_{av} (l/min)	P (kgf/cm²)	q (l/min/m)
3.0	1.3	5.8	0.4	3.0	0.7	6.0	0.2
6.0	1.6	8.8	0.5	6.0	0.9	9.0	0.3
10.0	2.7	12.8	0.9	10.0	1.2	13.0	0.4
6.0	1.3	8.8	0.4	6.0	0.5	9.0	0.2
3.0	0.9	5.8	0.3	3.0	0.2	6.0	0.1
Lu= 0.6				Lu= 0.3			
Pc= - kgf/cm²				Pc= - kgf/cm²			
Location SG3				Location SG3			
Injecting Section		42 - 45 m		Injecting Section		51 - 54 m	
Ground Water Level		27.8 m		Ground Water Level		26.2 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²	
Pipe Length of Injecting Pa		43.00 m		Pipe Length of Injecting Pa		52.00 m	
P₀ (kgf/cm²)	Q_{av} (l/min)	P (kgf/cm²)	q (l/min/m)	P₀ (kgf/cm²)	Q_{av} (l/min)	P (kgf/cm²)	q (l/min/m)
3.0	0.9	5.9	0.3	3.0	0.6	5.7	0.2
6.0	1.1	8.9	0.4	6.0	0.9	8.7	0.3
10.0	2.1	12.9	0.7	10.0	1.2	12.7	0.4
6.0	0.9	8.9	0.3	6.0	0.5	8.7	0.2
3.0	0.4	5.9	0.1	3.0	0.2	5.7	0.1
Lu= 0.5				Lu= 0.3			
Pc= - kgf/cm²				Pc= - kgf/cm²			
Location SG3				Location SG3			
Injecting Section		45 - 48 m		Injecting Section		54 - 57 m	
Ground Water Level		27.8 m		Ground Water Level		26.7 m	
Height of Pressure Gauge		100.0 cm		Height of Pressure Gauge		100.0 cm	
Length of Test Section		3.0 m		Length of Test Section		3.0 m	
Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²		Friction Loss per meter		$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm ²	
Pipe Length of Injecting Pa		46.00 m		Pipe Length of Injecting Pa		55.00 m	
P₀ (kgf/cm²)	Q_{av} (l/min)	P (kgf/cm²)	q (l/min/m)	P₀ (kgf/cm²)	Q_{av} (l/min)	P (kgf/cm²)	q (l/min/m)
3.0	0.9	5.9	0.3	3.0	0.8	5.8	0.3
6.0	1.1	8.9	0.4	6.0	0.9	8.8	0.3
10.0	1.7	12.9	0.6	10.0	1.1	12.8	0.4
6.0	0.9	8.9	0.3	6.0	0.5	8.8	0.2
3.0	0.5	5.9	0.2	3.0	0.2	5.8	0.1
Lu= 0.4				Lu= 0.3			
Pc= - kgf/cm²				Pc= - kgf/cm²			

Result of Lugeon Test at Borehole SG3(3)

Location SG3				Location SG3			
Injecting Section 57 ~ 60 m				Injecting Section 66 ~ 69 m			
Ground Water Level 26.7 m				Ground Water Level 26.9 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 58.00 m				Pipe Length of Injecting Pa 67.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.5	5.8	0.2	3.0	0.7	5.8	0.2
6.0	0.7	8.8	0.2	6.0	0.9	8.8	0.3
10.0	0.9	12.8	0.3	10.0	1.1	12.8	0.4
6.0	0.4	8.8	0.1	6.0	0.4	8.8	0.1
3.0	0.2	5.8	0.1	3.0	0.1	5.8	0.0
Lu= 0.3				Lu= 0.3			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
							
Location SG3				Location SG3			
Injecting Section 60 ~ 63 m				Injecting Section 69 ~ 72 m			
Ground Water Level 26.7 m				Ground Water Level 26.0 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 61.00 m				Pipe Length of Injecting Pa 70.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.9	5.8	0.3	3.0	0.8	5.7	0.3
6.0	1.1	8.8	0.4	6.0	0.8	8.7	0.3
10.0	1.4	12.8	0.5	10.0	0.9	12.7	0.3
6.0	0.7	8.8	0.2	6.0	0.6	8.7	0.2
3.0	0.4	5.8	0.1	3.0	0.3	5.7	0.1
Lu= 0.4				Lu= 0.3			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
							
Location SG3				Location SG3			
Injecting Section 63 ~ 66 m				Injecting Section 72 ~ 75 m			
Ground Water Level 26.7 m				Ground Water Level 26.4 m			
Height of Pressure Gauge 100.0 cm				Height of Pressure Gauge 100.0 cm			
Length of Test Section 3.0 m				Length of Test Section 3.0 m			
Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm				Friction Loss per meter $7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm			
Pipe Length of Injecting Pa 64.00 m				Pipe Length of Injecting Pa 73.00 m			
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)	P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.8	5.8	0.3	3.0	0.8	5.7	0.3
6.0	0.9	8.8	0.3	6.0	0.9	8.7	0.3
10.0	1.2	12.8	0.4	10.0	1.1	12.7	0.4
6.0	0.4	8.8	0.1	6.0	0.5	8.7	0.2
3.0	0.3	5.8	0.1	3.0	0.4	5.7	0.1
Lu= 0.3				Lu= 0.3			
Pc= - kgf/cm ²				Pc= - kgf/cm ²			
							

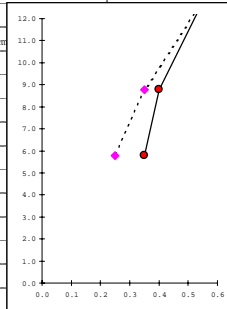
Result of Lugeon Test at Borehole SG3(4)

Location	SG3		
Injecting Section	75 ~ 78 m		
Ground Water Level	26.4 m		
Height of Pressure Gauge	100.0 cm		
Length of Test Section	3.0 m		
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		
Pipe Length of Injecting Pa	76.00 m		
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.9	5.7	0.3
6.0	0.9	8.7	0.3
10.0	1.1	12.7	0.4
6.0	0.6	8.7	0.2
3.0	0.2	5.7	0.1



Lu=	0.3		
Pc=	- kgf/cm ²		

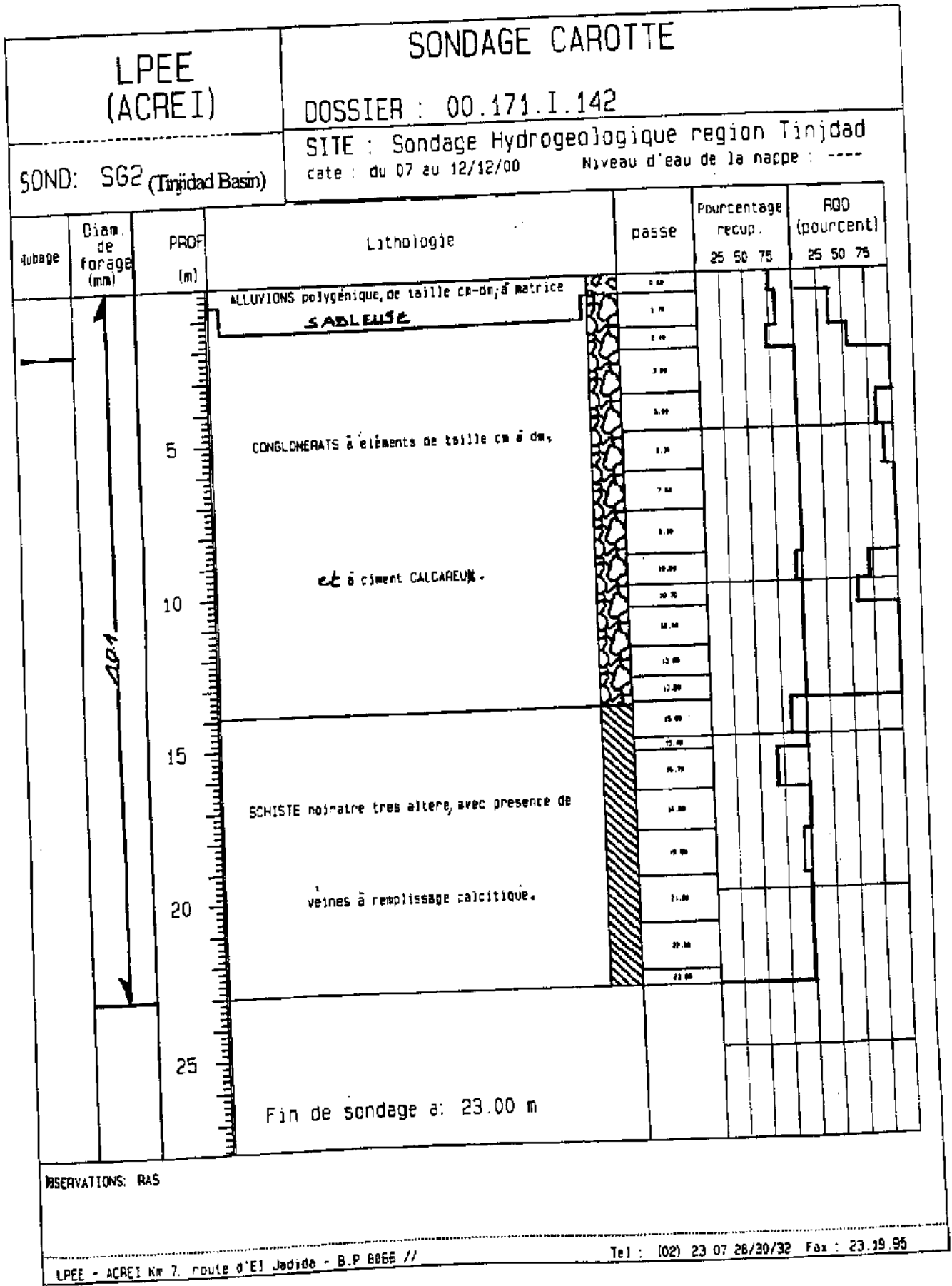
Location	SG3		
Injecting Section	78 ~ 80 m		
Ground Water Level	26.7 m		
Height of Pressure Gauge	100.0 cm		
Length of Test Section	2.0 m		
Friction Loss per meter	$7 \cdot 10^{-6} \cdot Q_{av}^2$ kgf/cm		
Pipe Length of Injecting Pa	79.00 m		
P_0 (kgf/cm ²)	Q_{av} (l/min)	P (kgf/cm ²)	q (l/min/m)
3.0	0.7	5.8	0.4
6.0	0.8	8.8	0.4
10.0	1.1	12.8	0.6
6.0	0.7	8.8	0.4
3.0	0.5	5.8	0.3



Lu=	0.4		
Pc=	- kgf/cm ²		

Result of Lugeon Test at Borehole SG3(5)

LPEE (ACREI)		SONDAGE CAROTTE									
SOND: SG1 (Tinjdad Basin)		DOSSIER : 00.171.I.142									
		SITE : Sondage Hydrogeologique region Tinjdad									
		date : du 05 au 05/12/00			Niveau d'eau de la nappe : 3.15 m						
Tubage	Diam de forage (mm)	PROF (m)	Lithologie	passe	Pourcentage recup			ROD (pourcent)			
					25	50	75	25	50	75	
	101	0	SABLE à grains fins à moyens avec de rares galets	0.00							
		1.00	ALLUVIONS à argile fine avec	1.00							
		2.00	SCHISTE verdâtre, altéré	4.00							
		3.00	SCHISTE verdâtre fracturé avec joints ARGILEUX	5.00							
		7.00									
			Fin de sondage à: 7.00 m								
OBSERVATIONS: RAS											
LPEE - ACREI Km 7, route d'El Jadida - B.P 6055 //						Tel : (02) 23 07 28/30/32 Fax : 23.19.95					



RESERVATIONS: RAS

LPEE - ACREI Km 7, route d'El Jadide - B.P. 8066 //

Tel : (02) 23 07 28/30/32 Fax : 23 19 95

Result of Permeability Test

SG1 (Tinjidat Basin)

TABLEAU RECAPITULATIF D'ESSAI D'EAU LUGEON

CHANTIER: SONDAGE HYDROGEOLOGIQUE REGION TINJIDAD

Sondage n°	Passe	Unité Lugein	Observations
SG1	De 3.50 à 6.40 m	0.67	RAS

TABLEAU RECAPITULATIF D'ESSAI DE PERMEABILITE

LEFRANC-MANDEL

INTERPRETATION SOUS CHARGE VARIABLE

Sondage n°	Passe	Unité Lugein m/s	Observations
SG1	De 0.50 à 3.50 m	$4.8 \cdot 10^{-8}$	RAS

SG2 (Tinjidat Basin)

TABLEAU RECAPITULATIF D'ESSAI D'EAU LUGEON

CHANTIER: SONDAGE HYDROGEOLOGIQUE REGION TINJIDAD

Sondage n°	Passe	Unité Lugein	Observations
SG2	De 5.00 à 10.00 m	0.372	RAS
	De 10.00 à 15.00 m	1	RAS
	De 15.00 à 20.00 m	0.372	RAS
	De 20.00 à 23.00 m	2.4	Contournement à partir de 3 bars

TABLEAU RECAPITULATIF D'ESSAI DE PERMEABILITE
LEFRANC-MANDEL
INTERPRETATION SOUS CHARGE VARIABLE

Sondage n°	Passe	Unité Lugein m/s	Observations
SG2	De 0.50 à 5.00 m	$9.4 \cdot 10^{-7}$	RAS

SG3 (Tinjidat Basin)

TABLEAU RECAPITULATIF D'ESSAI D'EAU LUGEON
 CHANTIER: SONDAGE HYDROGEOLOGIQUE REGION TINJIDAD

Sondage n°	Passe	Unité Lugein	Observations
SG3	De 22.00 à 25.00 m	0.75	RAS

TABLEAU RECAPITULATIF D'ESSAI DE PERMEABILITE
LEFRANC-MANDEL
INTERPRETATION SOUS CHARGE VARIABLE

Sondage n°	Passe	Unité Lugein m/s	Observations
SG3	De 0.50 à 5.00 m	$9.7 \cdot 10^{-7}$	RAS
	De 5.00 à 10.00 m	$1.4 \cdot 10^{-6}$	RAS