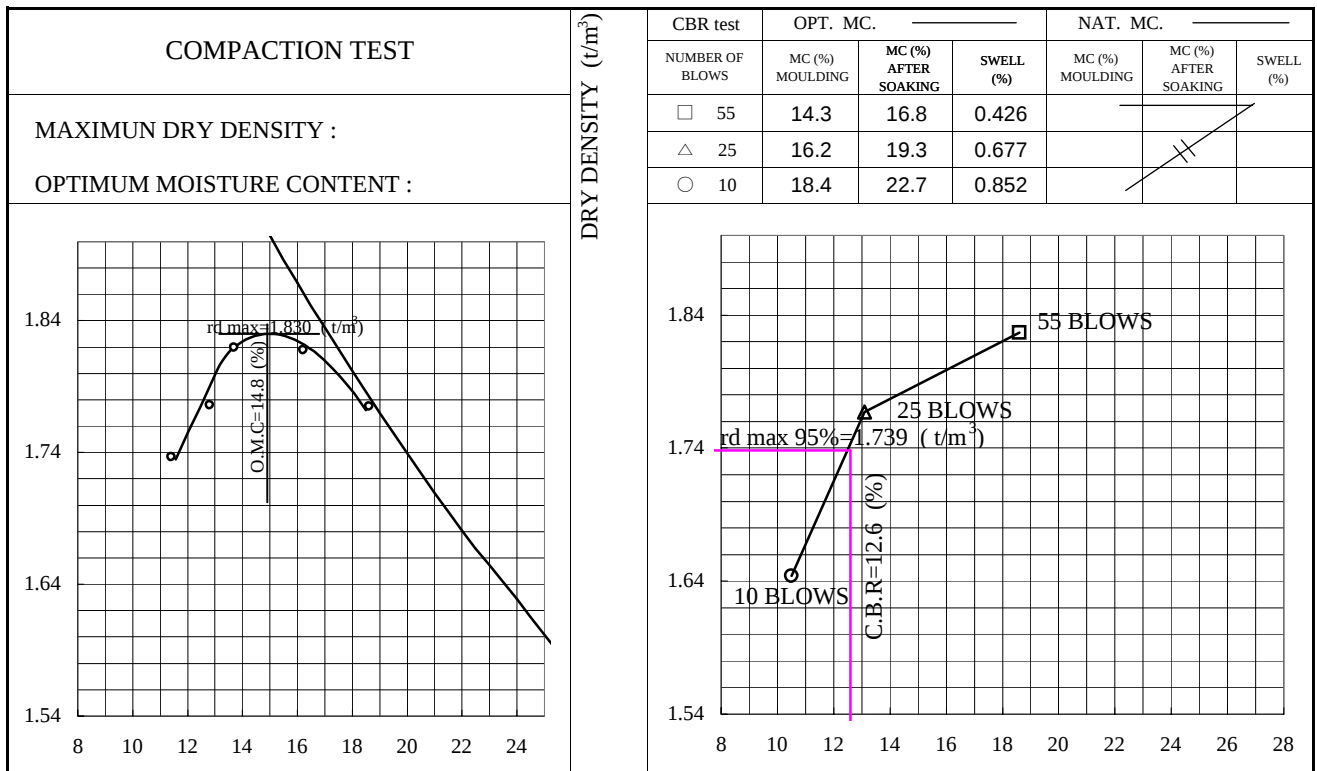
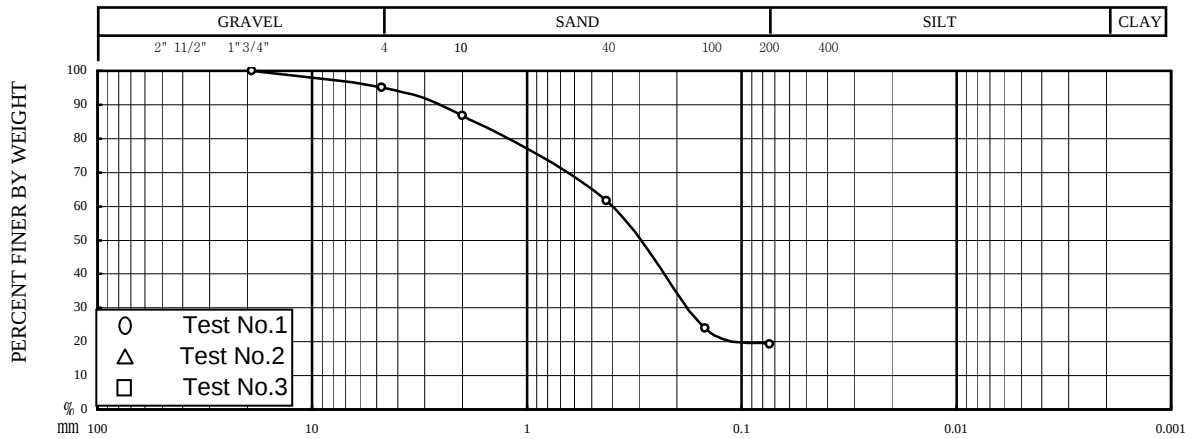


							TP-NO. KTP-4			
DATE	DEPTH (m)	CURVE NO.	THICKNESS	DESCRIPTION	NMC (%)	LL (%)	PI (%)	G _s	IN SITU DENSITY	USCS
	1.5	-	-	SILTY SAND	12.6	NP	-	2.67	-	SM

Compaction & C . B . R test (A & D Method)

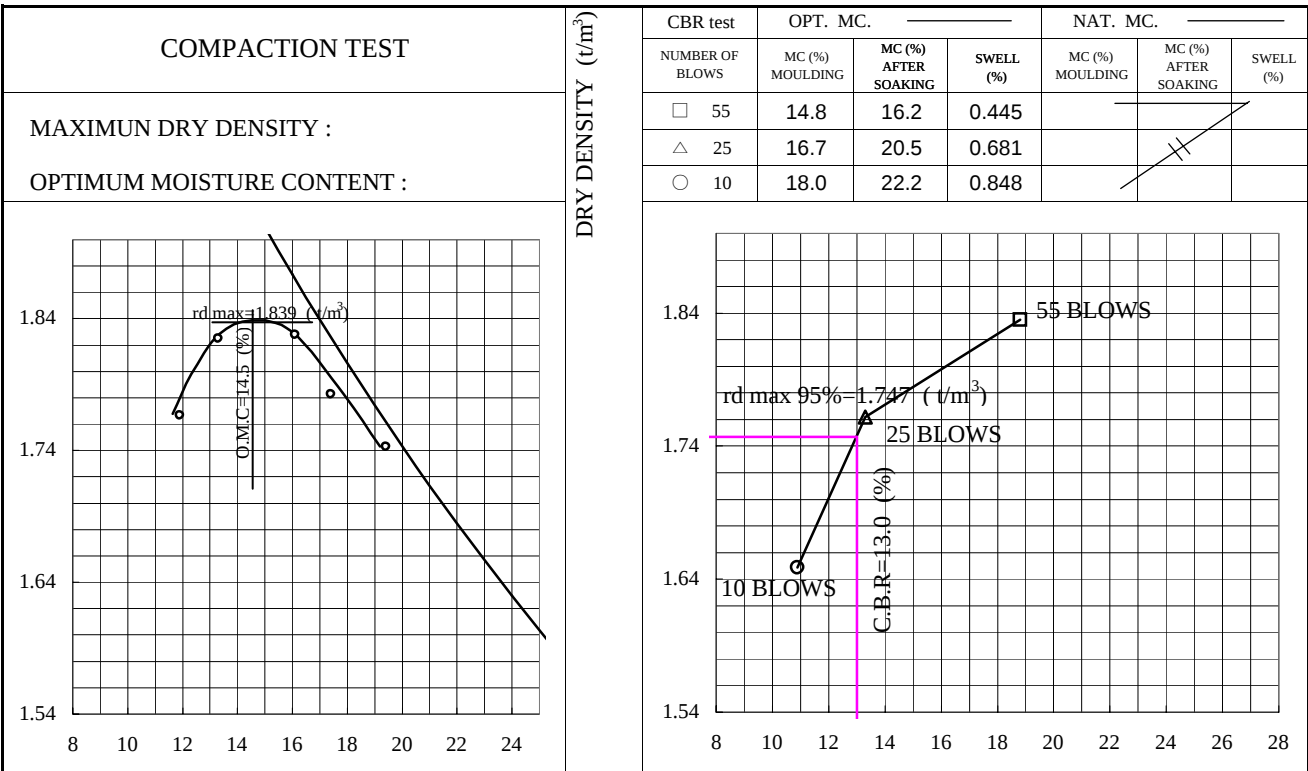
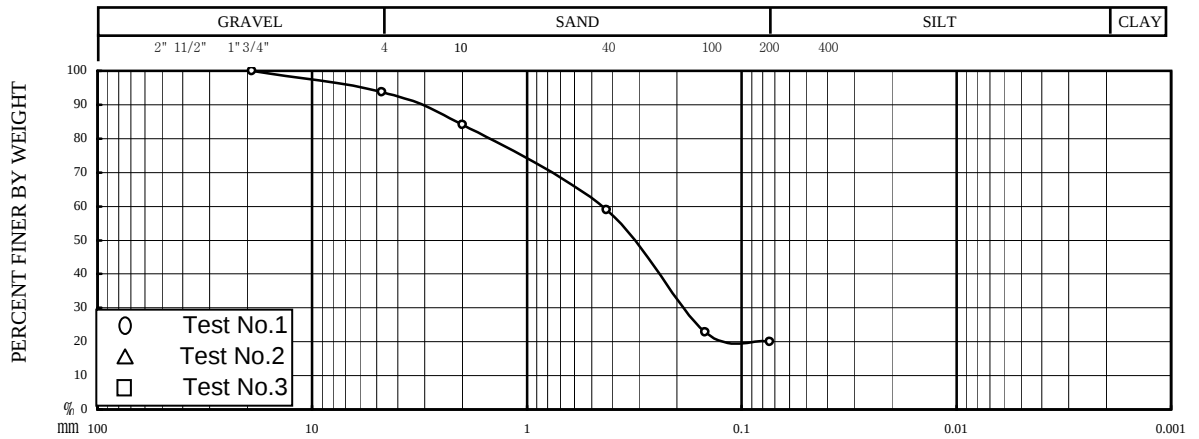
METHOD	MAX. rd (t/m ³)	O . M . C (%)
A	-	-
D	1.830	14.8



							TP-NO. KTP-5			
DATE	DEPTH (m)	CURVE NO.	THICKNESS	DESCRIPTION	NMC (%)	LL (%)	PI (%)	G _s	IN SITU DENSITY	USCS
	1.5	-	-	SILTY SAND	13.0	NP	-	2.68	-	SM

Compaction & C.B.R test (A & D Method)

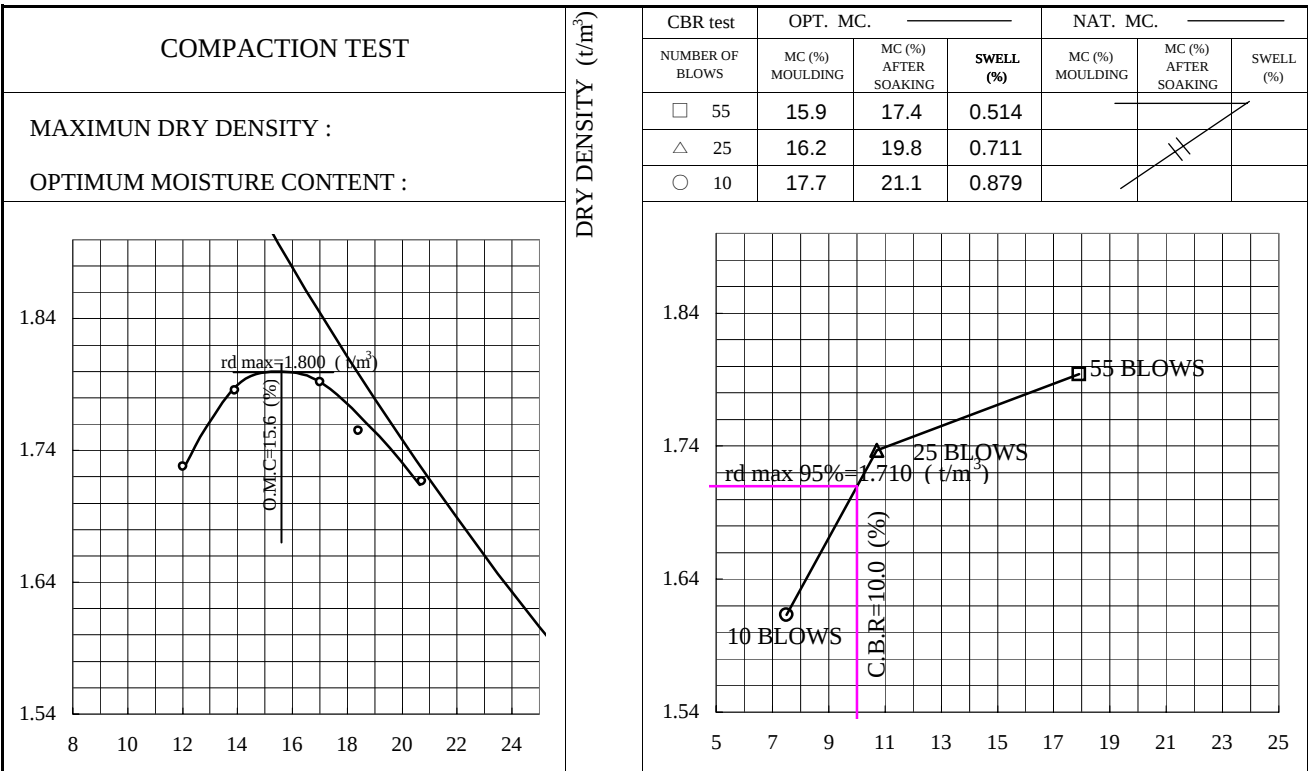
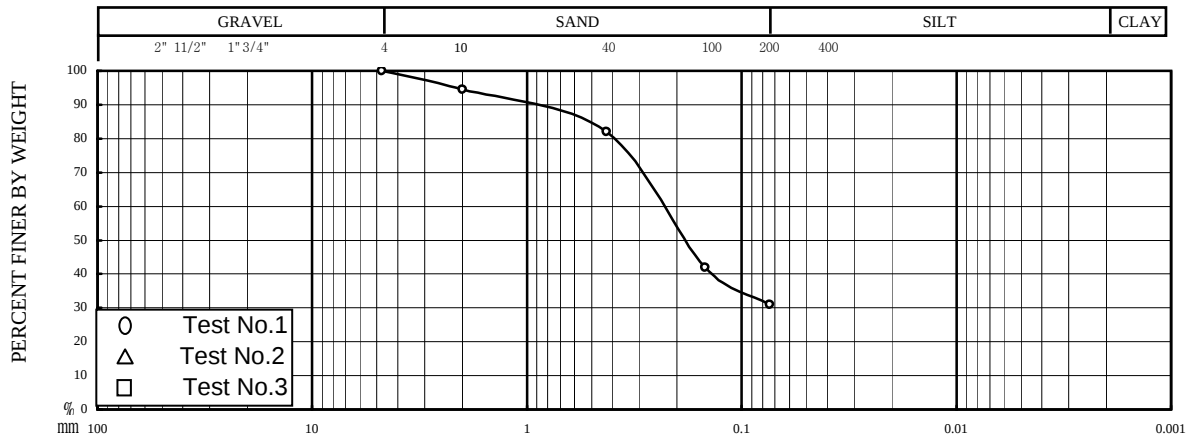
METHOD	MAX. rd (t/m ³)	O. M. C (%)
A	-	-
D	1.839	14.5



							TP-NO. KTP-6			
DATE	DEPTH (m)	CURVE NO.	THICKNESS	DESCRIPTION	NMC (%)	LL (%)	PI (%)	G _s	IN SITU DENSITY	USCS
	1.2	-	-	SILTY SAND	17.4	NP	-	2.69	-	SM

Compaction & C.B.R test (A & D Method)

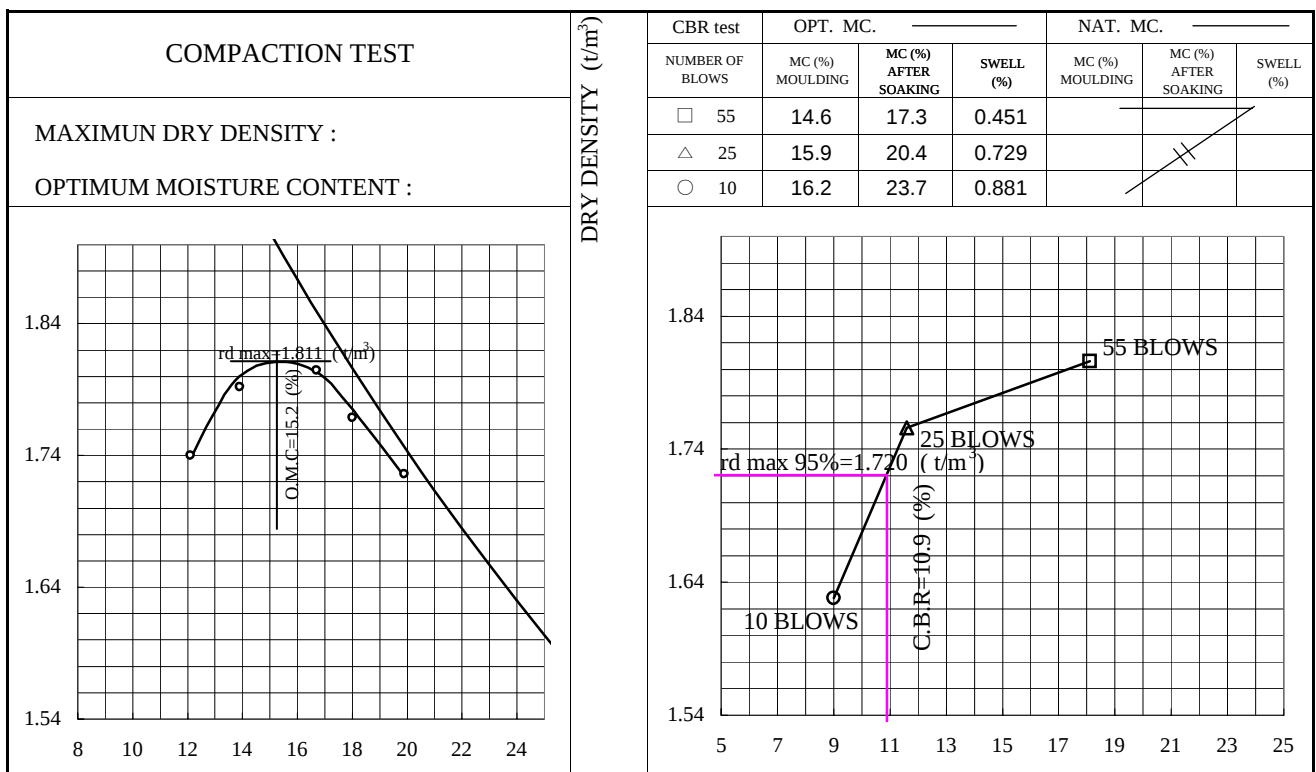
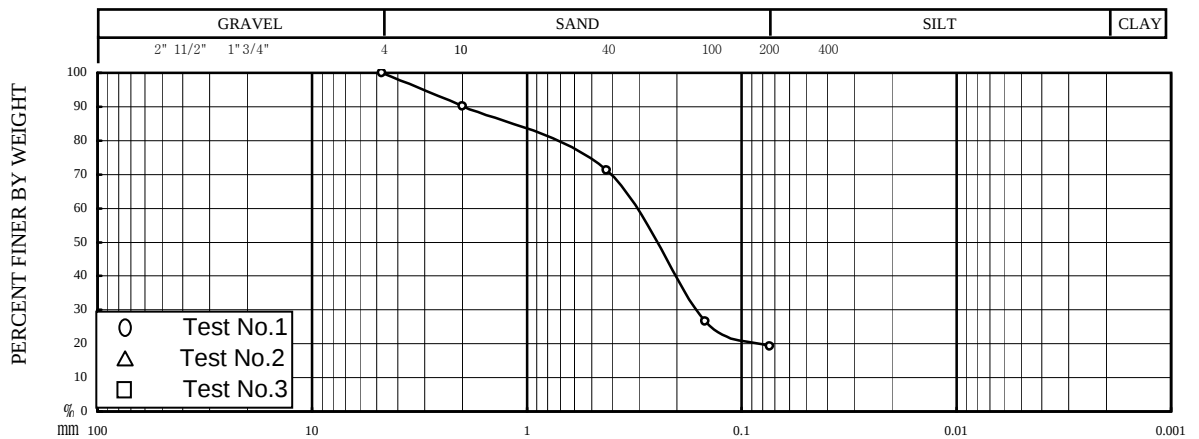
METHOD	MAX. rd (t/m ³)	O. M. C (%)
A	-	-
D	1.800	15.6



							TP-NO. KTP-7			
DATE	DEPTH (m)	CURVE NO.	THICKNESS	DESCRIPTION	NMC (%)	LL (%)	PI (%)	G _s	IN SITU DENSITY	USCS
	1.5	-	-	SILTY SAND	12.6	NP	-	2.68	-	SM

Compaction & C . B . R test (A & D Method)

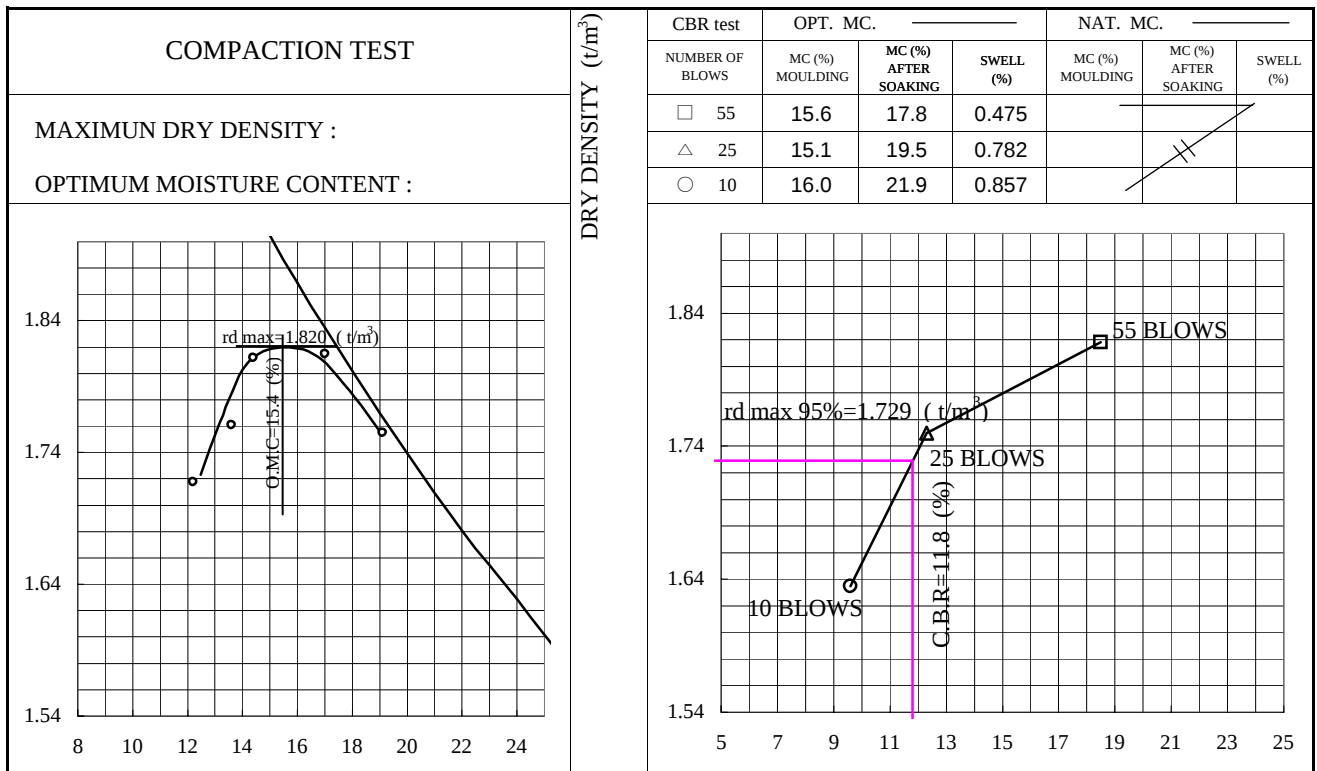
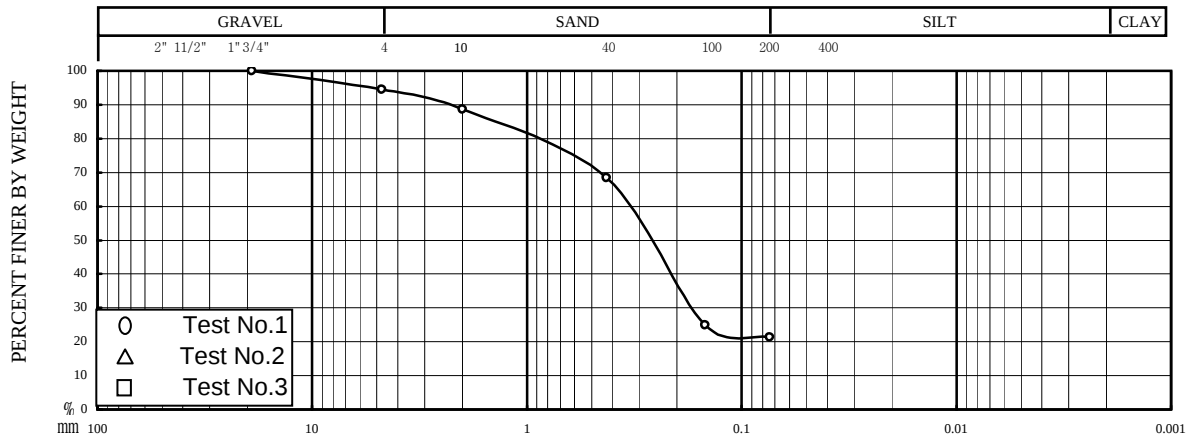
METHOD	MAX. rd (t/m ³)	O . M . C (%)
A	-	-
D	1.811	15.2



							TP-NO. KTP-8			
DATE	DEPTH (m)	CURVE NO.	THICKNESS	DESCRIPTION	NMC (%)	LL (%)	PI (%)	G _s	IN SITU DENSITY	USCS
	1.5	-	-	SILTY SAND	13.1	NP	-	2.67	-	SM

Compaction & C . B . R test (A & D Method)

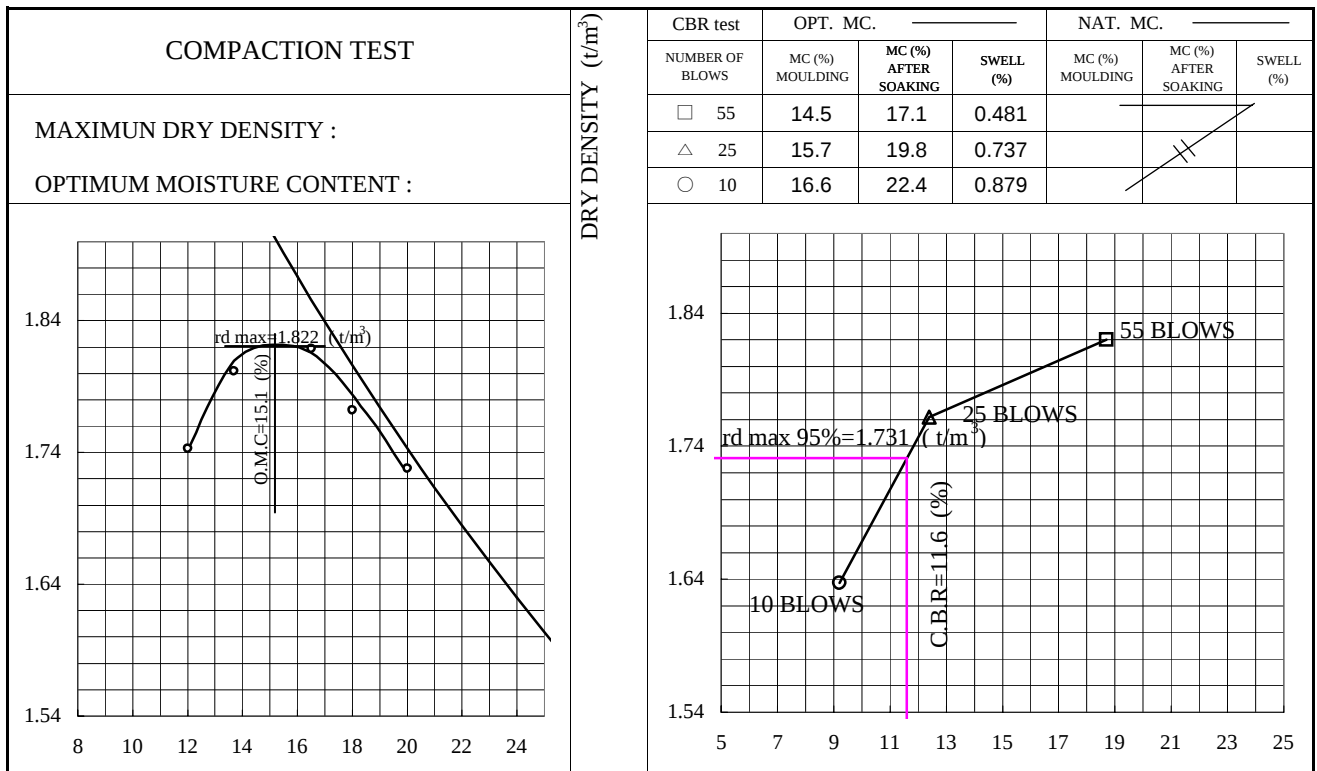
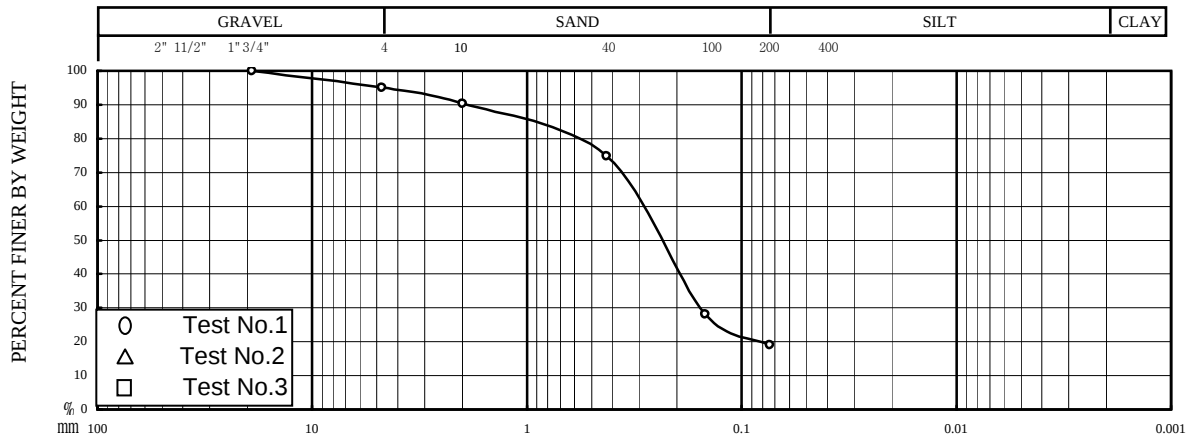
METHOD	MAX. rd (t/m ³)	O . M . C (%)
A	-	-
D	1.820	15.4



							TP-NO. KTP-10			
DATE	DEPTH (m)	CURVE NO.	THICKNESS	DESCRIPTION	NMC (%)	LL (%)	PI (%)	G _s	IN SITU DENSITY	USCS
	1.5	-	-	SILTY SAND	11.9	NP	-	2.68	-	SM

Compaction & C . B . R test (A & D Method)

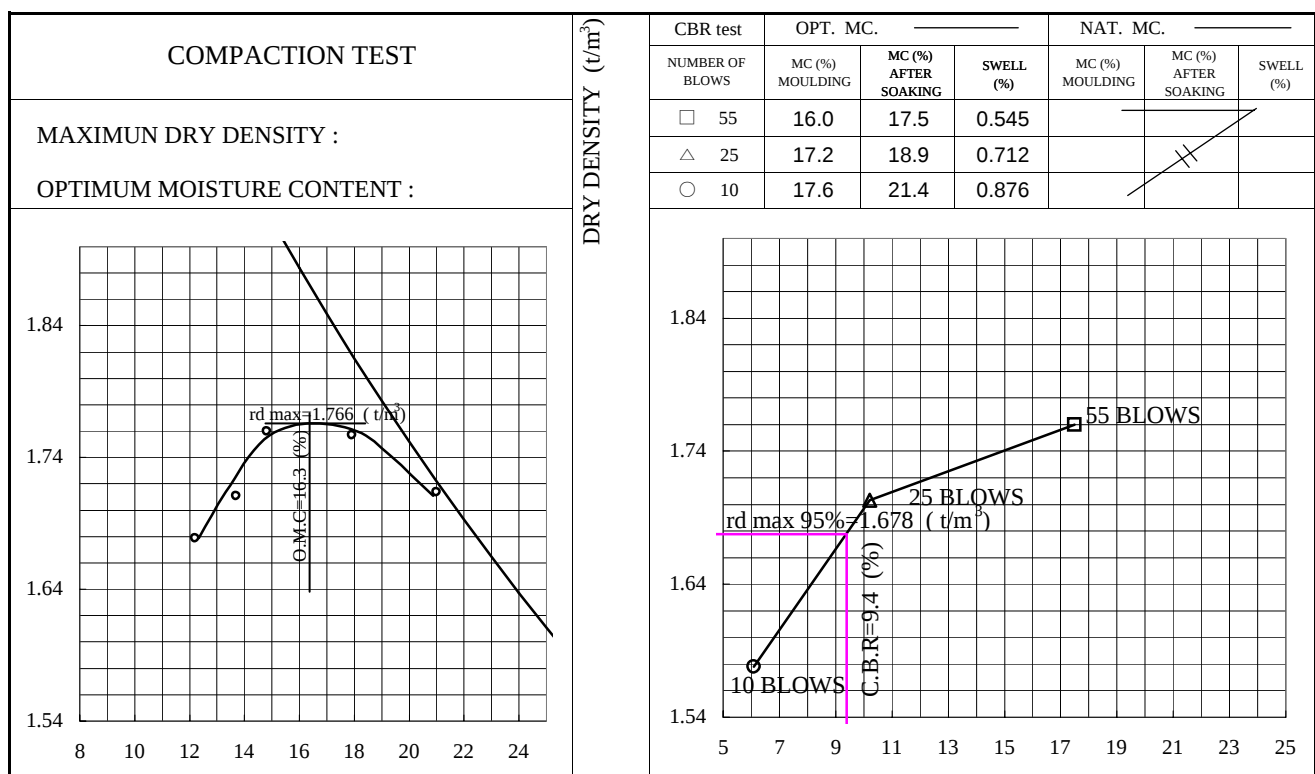
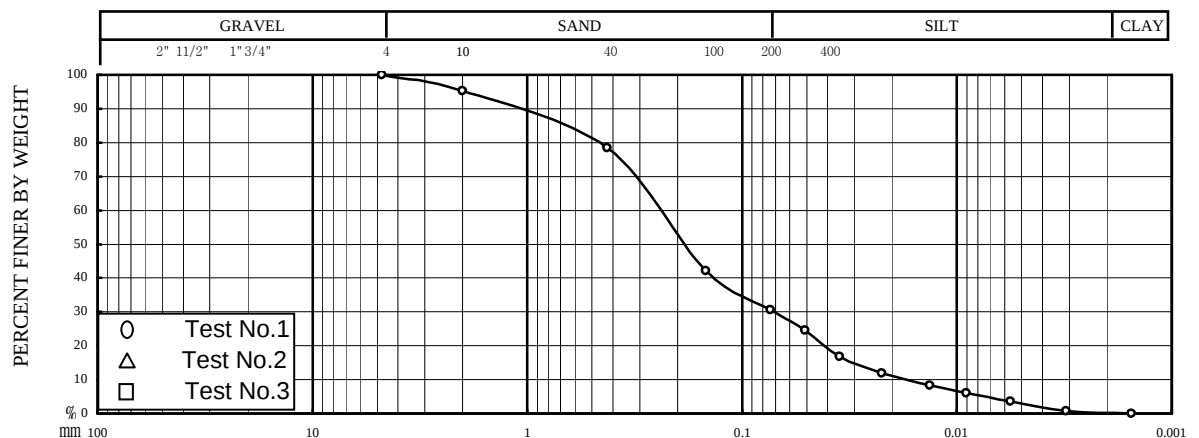
METHOD	MAX. rd (t/m ³)	O . M . C (%)
A	-	-
D	1.822	15.1



							TP-NO. KTP-11			
DATE	DEPTH (m)	CURVE NO.	THICKNESS	DESCRIPTION	NMC (%)	LL (%)	PI (%)	G _s	IN SITU DENSITY	USCS
	1.4	-	-	CLAYEY SAND	18.4	NP	-	2.70	-	SC

Compaction & C . B . R test (A & D Method)

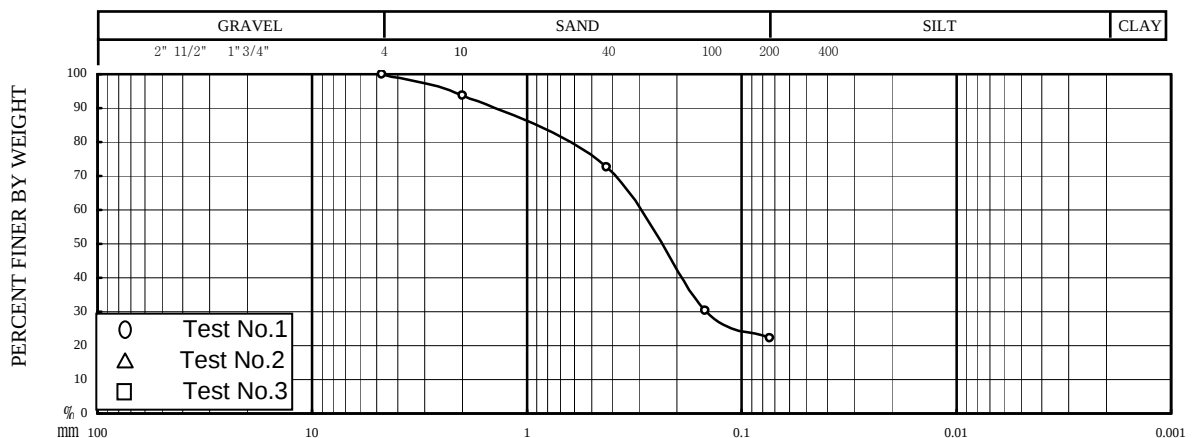
METHOD	MAX. rd (t/m ³)	O . M . C (%)
A	-	-
D	1.766	16.3



							TP-NO. KTP-12			
DATE	DEPTH (m)	CURVE NO.	THICKNESS	DESCRIPTION	NMC (%)	LL (%)	PI (%)	G _s	IN SITU DENSITY	USCS
	1.5	-	-	SILTY SAND	12.2	NP	-	2.67	-	SM

Compaction & C . B . R test (A & D Method)

METHOD	MAX. rd (t/m ³)	O . M . C (%)
A	-	-
D	1.807	15.4



COMPACTION TEST	DRY DENSITY (t/m ³)	CBR test	OPT. MC.			NAT. MC.		
		NUMBER OF BLOWS	MC (%) MOULDING	MC (%) AFTER SOAKING	SWELL (%)	MC (%) MOULDING	MC (%) AFTER SOAKING	SWELL (%)
MAXIMUM DRY DENSITY :		□ 55	15.9	17.7	0.492			
OPTIMUM MOISTURE CONTENT :		△ 25	16.5	19.2	0.765			
		○ 10	17.2	21.9	0.880			

rd max = 1.807 (t/m³)

O.M.C = 15.4 (%)

rd max 95% = 1.717 (t/m³)

C.B.R = 10.6 (%)

DIRECT SHEAR TEST

Project : 제2영동(서울~원주) 고속도로 민간투자사업 실시계획(7공구) 지반조사 Date : 2007. 12.

Sample No : KTP-7

Depth(m) : 1.5

Sample No type : Un-Disturb. Disturb.

Specific Gravity of Sample : 2.68

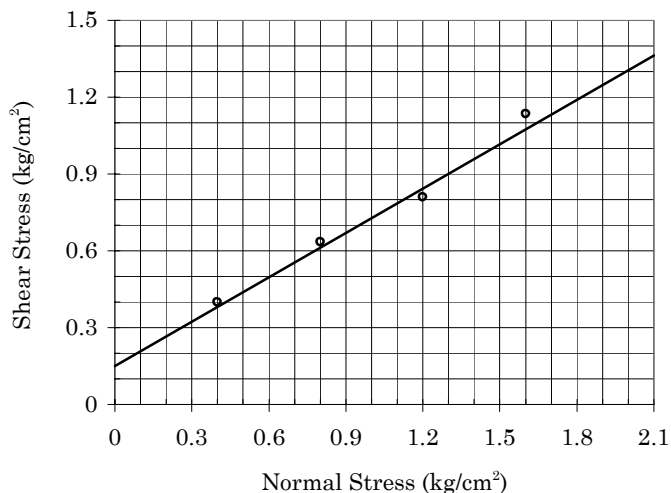
Type of Test App. Un-Saturated

Specimen Area A 28.274 (cm²)

" Initial Height H 2.00 (cm)

" Volume V 56.549 (cm³)

TEST No				1	2	3	4	AVERAGE
Initial	Sample Weight	W	(g)	94.44	94.56	94.53	94.49	94.50
	Wet Density	rt	(g/cm ³)	1.670	1.672	1.672	1.671	1.671
	Water Content	W	(%)	13.2	12.6	12.9	13.0	12.9
	Dry Density	rd	(g/cm ³)	1.475	1.485	1.481	1.478	1.480
	Void Ratio	e		0.817	0.805	0.810	0.813	0.811
	Saturation	S	(%)	43.4	42.0	42.6	43.0	42.7
Normal Load				(kg/cm ²)	0.400	0.800	1.200	1.600
Consolidate Time				(min)				
Settlement				(cm)				
Final	Sample Weight	W	(g)					
	Wet Density	rt	(g/cm ³)					
	Water Content	W	(%)					
	Dry Density	rd	(g/cm ³)					
	Void Ratio	e						
	Saturation	S	(%)					
	Sample Volume	V	(cm ²)					
Elapsed Time				(mm/min)	1/1	1/1	1/1	1/1
Maximun Shear Stress				(kg/cm ²)	0.400	0.634	0.810	1.136



Cohesion C = 0.15 (kg/cm²)

Internal Friction =

ϕ = 30

Shear Strength after consolidation _____ (kg/cm²)

DIRECT SHEAR TEST

Project : 제2영동(서울~원주) 고속도로 민간투자사업 실시계획(7공구) 지반조사 Date : 2007. 12.

Sample No : KTP-12

Depth(m) : 1.5

Sample No type : Un-Disturb. Disturb.

Specific Gravity of Sample : 2.67

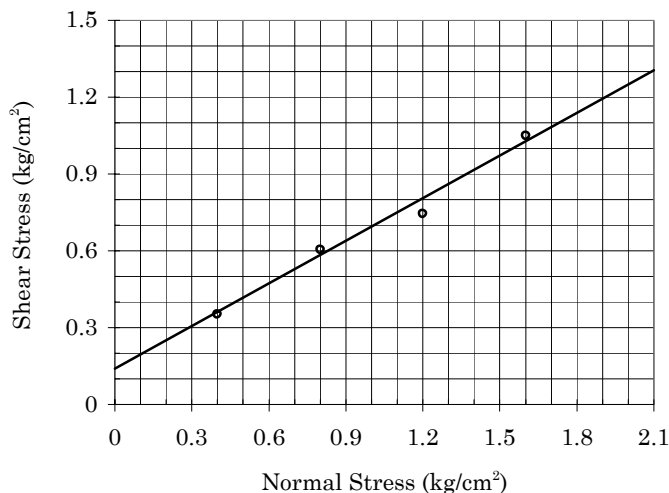
Type of Test App. Un-Saturated

Specimen Area A 28.274 (cm²)

" Initial Height H 2.00 (cm)

" Volume V 56.549 (cm³)

TEST No				1	2	3	4	AVERAGE
Initial	Sample Weight	W	(g)	93.56	93.41	93.61	93.72	93.58
	Wet Density	rt	(g/cm ³)	1.655	1.652	1.655	1.657	1.655
	Water Content	W	(%)	12.4	12.7	12.2	12.0	12.3
	Dry Density	rd	(g/cm ³)	1.472	1.466	1.475	1.480	1.473
	Void Ratio	e		0.814	0.821	0.810	0.804	0.812
	Saturation	S	(%)	40.7	41.2	40.3	39.8	40.5
Normal Load				(kg/cm ²)	0.400	0.800	1.200	1.600
Consolidate Time				(min)				
Settlement				(cm)				
Final	Sample Weight	W	(g)					
	Wet Density	rt	(g/cm ³)					
	Water Content	W	(%)					
	Dry Density	rd	(g/cm ³)					
	Void Ratio	e						
	Saturation	S	(%)					
	Sample Volume	V	(cm ²)					
Elapsed Time				(mm/min)	1/1	1/1	1/1	1/1
Maximun Shear Stress				(kg/cm ²)	0.353	0.605	0.746	1.051



Cohesion C = 0.14 (kg/cm²)

Internal Friction =

ϕ = 29

Shear Strength after consolidation _____ (kg/cm²)

흙 의 실 내 투 수 시 험

공사명: 제2영동(서울~원주) 고속도로 민간투자사업 실시설계(7공구) 지반조사

시료번호, 깊이: KTP-7 (D-METHOD 95%) 1.5(M)

시험자:

시험일자: 2007. 12.

유리관의 직경	cm	0.48	공시체의 상태	시험전	시험후
유리관의 단면적	a cm	0.181	(용기+시료)의 중량 W' g	4187.8	
시료 직경	cm	9.70	시료 중량 $W_t = W' - W_0$ g	2030.0	
투수 면적	A cm	78.540	습윤 밀도 $r_t = W_t / V$ g	2.035	
시료 길이	L cm	4.50	포 화 도 S_r %	88.7	
시료 체적	$V=AL$ cm ³	997.46	함 수 비 W %	18.6	
용기 중량	W_0 g	2157.8	건조 밀도 r_d g/cm ³	1.716	
토립자의 비중	G_s	2.68	간 극 비 e	0.562	
측정번호		1	2	3	
측정개시시각	t1	14:00	14:00		
측정종료시각	t2	15:00	15:00		
t2 - t1		3600	3600		
정수위법	수두 h cm	10	10		
	$A*(t_2 - t_1)$	282744	282744		
	L/h	0.450	0.450		
	투수량 Q cm ³	22.76	23.49		
	$Q/A(t_2 - t_1)$	8.05E-05	8.31E-05		
	kr	3.62E-05	3.74E-05		
변수위법	시각 t1에서의 수위 h1cm				
	시각 t2에서의 수위 h2cm				
	h1/h2				
	$\log_{10}(h_1/h_2)$				
	a*L				
	aL/A				
	$2.3/(t_2 - t_1)$				
	kr				
수온 T °C		15.0	15.0		
μ_T / μ_{15}		1.0000	1.0000		
$k_{15} = k_T * (\mu_T / \mu_{15})$		3.62E-05	3.74E-05		
평균치	k_{15} cm/sec	3.68E-05			

비고: μ_T 는 T °C에서의 물의 점성계수

건조 밀도 $r_d = r_t / (1 + (W/100))$ g/cm³

정수위법 $kr = (L/A) * (Q/A(t_2 - t_1))$ cm/sec

변수위법 $kr = (aL/A) * (2.3 / (t_2 - t_1)) * (\log_{10}(h_1/h_2))$ cm/sec

흙 의 실 내 투 수 시 험

공사명: 제2영동(서울~원주) 고속도로 민간투자사업 실시설계(7공구) 지반조사

시료번호, 깊이: KTP-12 (D-METHOD 95%) 1.5(M)

시험자:

시험일자: 2007. 12.

유리관의 직경	cm	0.48	공시체의 상태	시험전	시험후
유리관의 단면적	a cm	0.181	(용기+시료)의 중량 W' g	4181.7	
시료 직경	cm	9.70	시료 중량 $W_t = W' - W_0$ g	2023.9	
투수 면적	A cm	78.540	습윤 밀도 $r_t = W_t / V$ g	2.029	
시료 길이	L cm	4.50	포 화 도 S_r %	86.7	
시료 체적	$V=AL$ cm ³	997.46	함 수 비 W %	17.9	
용기 중량	W_0 g	2157.8	건조 밀도 r_d g/cm ³	1.721	
토립자의 비중	G_s	2.67	간 극 비 e	0.551	
측정번호		1	2	3	
측정개시시각	t1	11:00	11:00		
측정종료시각	t2	12:00	12:00		
t2 - t1		3600	3600		
정수위법	수두 h cm	10	10		
	$A*(t_2 - t_1)$	282744	282744		
	L/h	0.450	0.450		
	투수량 Q cm ³	30.24	29.34		
	$Q/A(t_2 - t_1)$	1.07E-04	1.04E-04		
	kr	4.81E-05	4.67E-05		
변수위법	시각 t1에서의 수위 h1cm				
	시각 t2에서의 수위 h2cm				
	h1/h2				
	$\log_{10}(h_1/h_2)$				
	a*L				
	aL/A				
	$2.3/(t_2 - t_1)$				
	kr				
수온 T °C		15.0	15.0		
μ_T / μ_{15}		1.0000	1.0000		
$k_{15} = k_T * (\mu_T / \mu_{15})$		4.81E-05	4.67E-05		
평균치	k_{15} cm/sec	4.74E-05			

비고: μ_T 는 T °C에서의 물의 점성계수

건조 밀도 $r_d = r_t / (1 + (W/100))$ g/cm³

정수위법 $kr = (L/A) * (Q/A(t_2 - t_1))$ cm/sec

변수위법 $kr = (aL/A) * (2.3 / (t_2 - t_1)) * (\log_{10}(h_1/h_2))$ cm/sec