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(CRS)

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() Lee et al. (ASTM - D4186, 2002)

(CRS)

Almeida et .

() Hamilton and Crawford

() al.

Lee et al. ()

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(Dubak, 2003)

(Younes and Chung, 2005)

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Esmith and Wahls .

() Hamilton and Crawford,)

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(1959)

() Wissa et al.

Wissa et al.

() Esmith and Wahls

() Sallfors .

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Gromen et %

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() al.

() Sheahan and Watters .

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() Sheahan and Watters

(Load Cell)

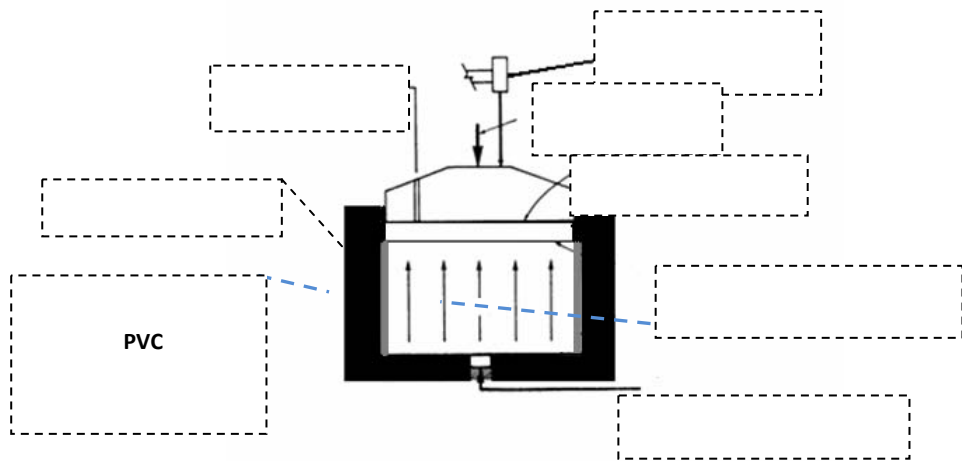
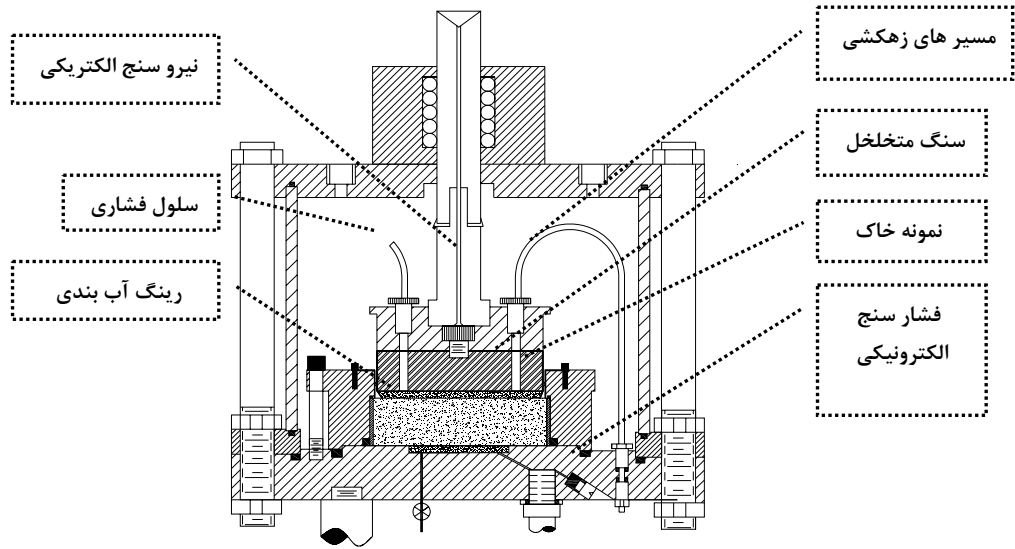
(LVDT)

CRS

()	PL (%)		LL (%)		Gs	
CL		/		/	/	A
CL	/	/		/	/	B
CH					()	C
CH					()	D

CRS

(kPa)		%	%/min	
1/24	1/18	14/2	/	1A
	1/18	10/2	/	2A
	1/16	68/1	/	3A
	1/17	68/1	/	4A
9/4	1/13	67/4	/	1B
132/6	1/11	66/2	/	2B
203	1/17	10/1	/	3B
526	1/18	68/4	/	4B
2	2/4	19	/	1C
14	2/4	18	/	2C
22	2/41	19	/	3C
50/6	2/5	14	/	4C
1/7	0/9	33	/	1D
9/6	0/90	30	/	2D
22	0/93	32/96	/	3D
30/5	0/92	32/96	/	4D



1D 1C 1B 1A

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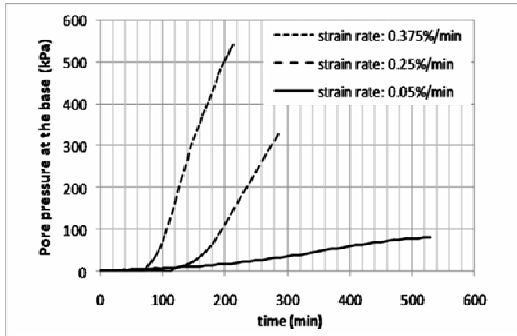
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0.025%/mm

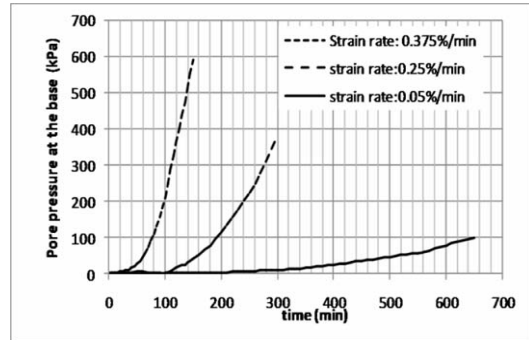
0.025%/min

0.025%/mm

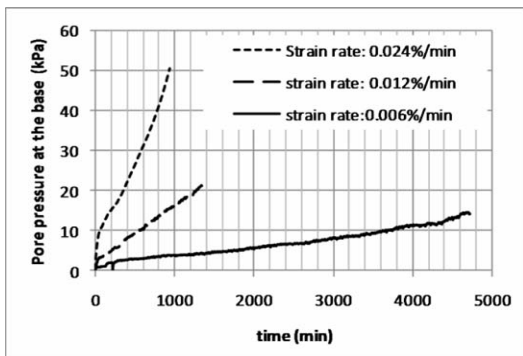
0.025%/mm



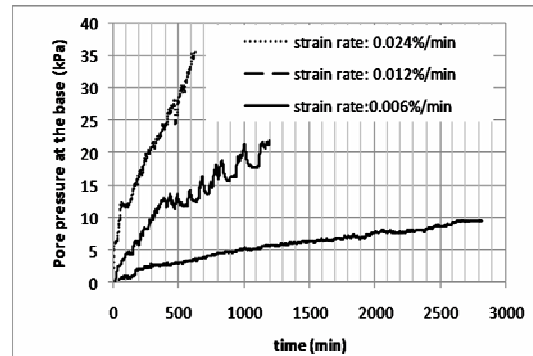
B



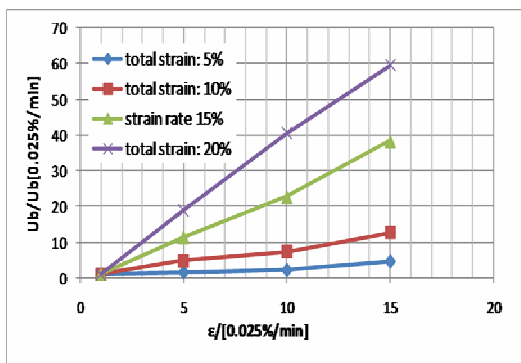
A



D

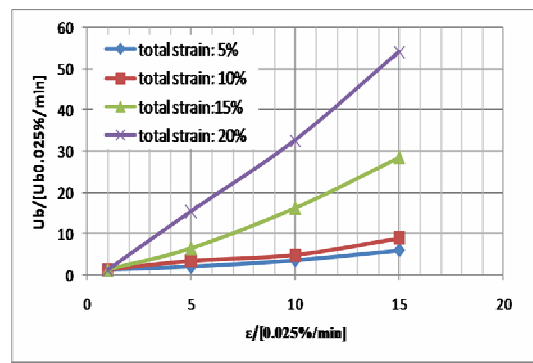


C



B

0.025%/min



A

0.025%/min

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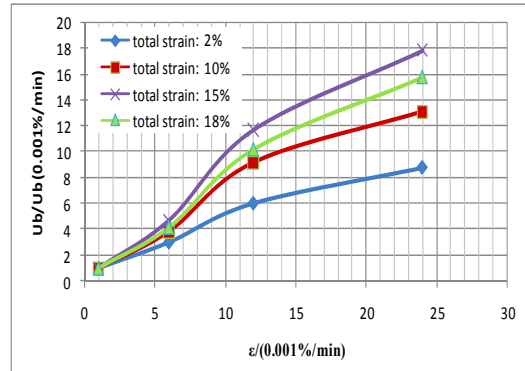
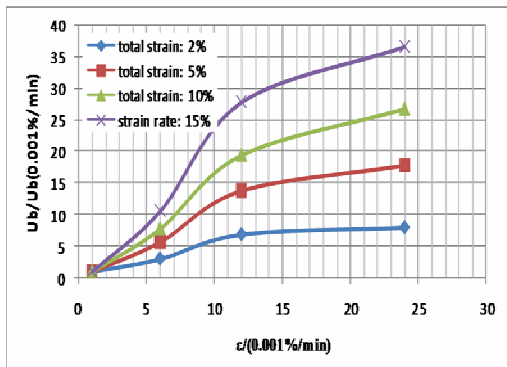
0.001%/min

() () ()

B A

D C

B A



0.001%/min

D

0.001%/min

C

() ()

() (u_b/σ)

() ()

B A

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D C

C

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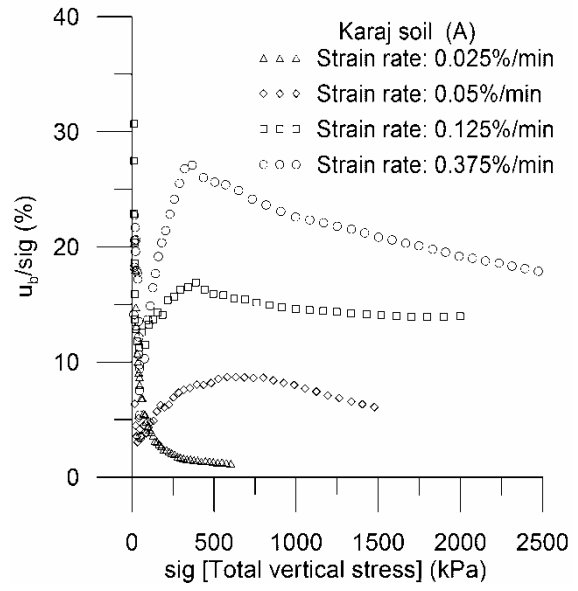
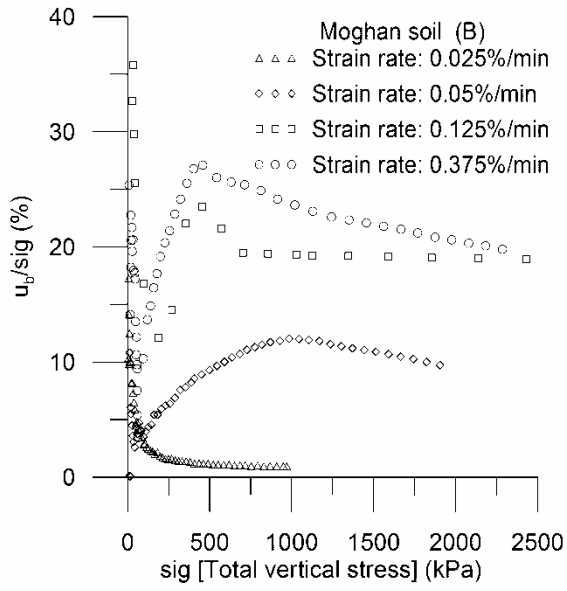
D

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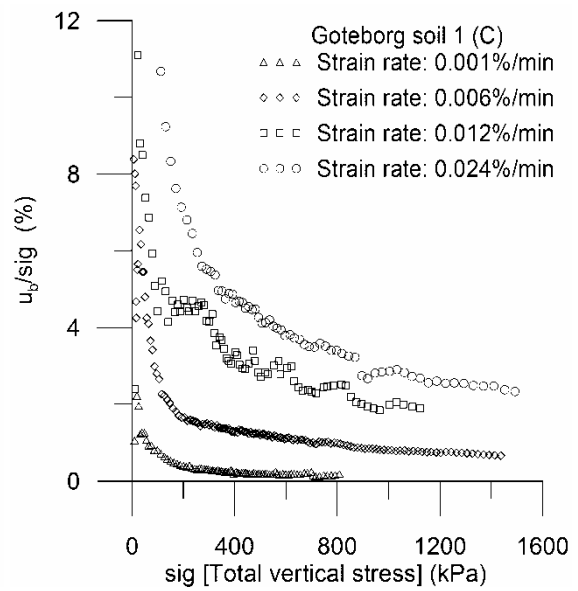
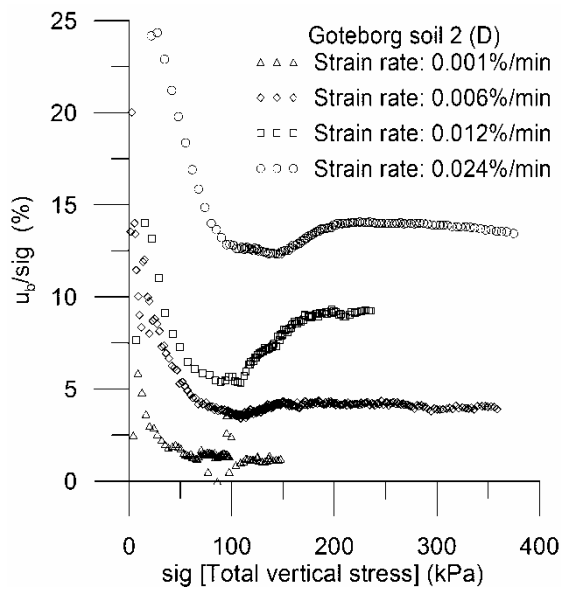
C

C



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D

C

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B A

D

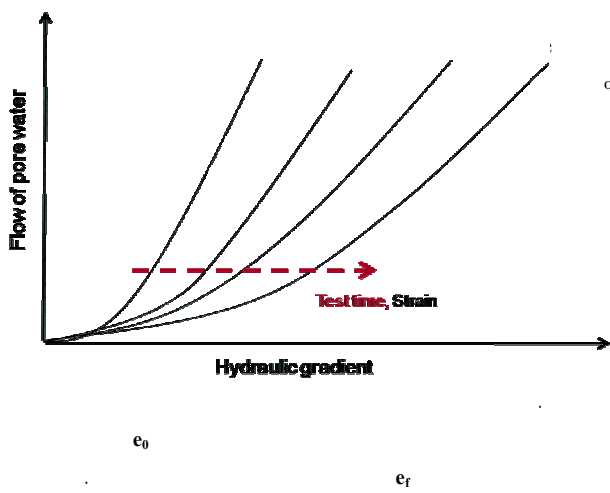
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CD

(Dubak, 2003)



Mitchell and Younger,)

(1967

() Hansbo

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(Juirnarongrit, 2003

CRS

v-i

(i)

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v-i

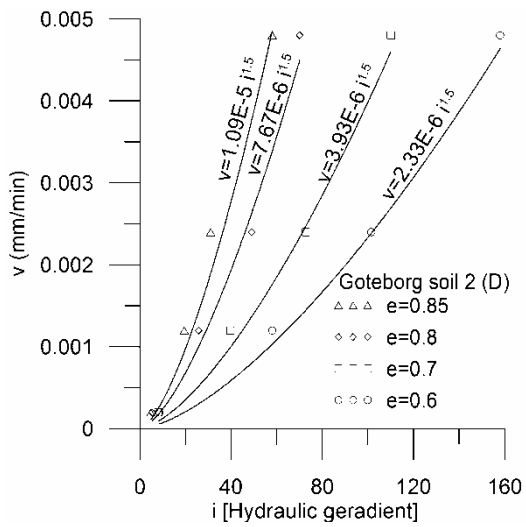
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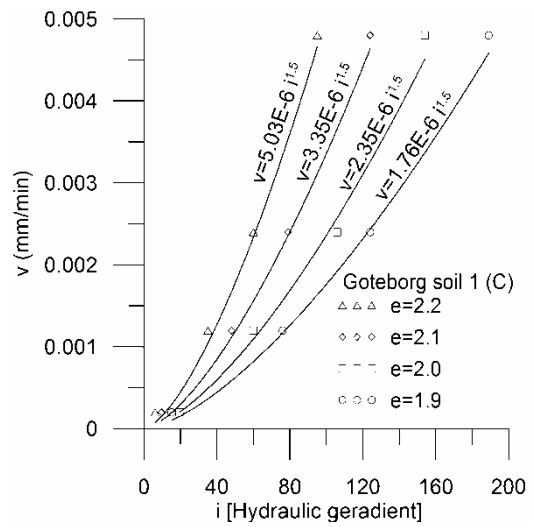
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(Mitchell and Soga, 2005)



(PI=66) D



(PI=60) C

v-i

v-i

(Hansbo, 1960; 2001; 2003)

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(u_b/σ)

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CRS

(CL)

%

()

(CL)

(CH)

CRS

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