SDSWCC Measurement System

Automated environment controllable stress-controllable 1D soil column for measuring transient hydraulic properties

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◆ SDPFs SDSWCCs

SDPFs

SDSWCCs

◆ , K_0 SDPF

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◆ SDSWCC

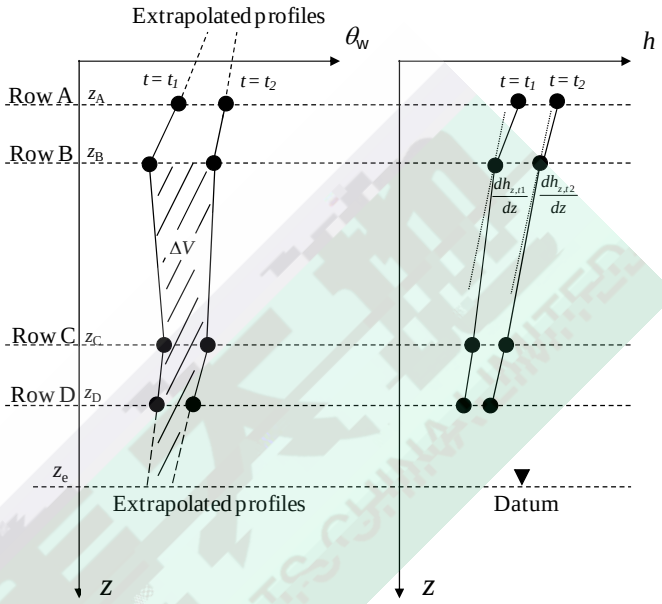
Geo-Experts IPM $h_{zi,tj}$ t_j (j = 1, 2) z_i (i = A, B, C SDPF and D)

VWC

PWP

SDSWCC VWC PWP .

LVDT



1. $t = t_1$ t_2, **(Ng & Leung 2012)**

– IPM

$$k_{zB,tave} = -\frac{v_{zB,tave}}{i_{zB,tave}} \quad (3)$$

1

h t_1 t_2 z_A, z_B, z_C, z_D z

(z_B) $t_{ave} = (t_1 +$ $t_2)/2$ ($v_{zB,tave}$)

$$v_{zB,tave} = -\frac{\Delta V}{t_2 - t_1} + v_{ze,tave} \quad (1)$$

ΔV $t = t_1$ t_2 $\theta_w(z, t)$

$v_{ze,ta}$ v z_e

$t_{ave} = (t_1 + t_2)/2$

$i_{zB,tave}$,

:\

$$i_{zB,tave} = \frac{1}{2}\left(\frac{dh_{zB,t1}}{dz} + \frac{dh_{zB,t2}}{dz}\right)$$
$$= \frac{1}{4}\left[\left(\frac{h_{zA,t1} - h_{zB,t1}}{z_A - z_B} + \frac{h_{zB,t1} - h_{zC,t1}}{z_B - z_C}\right) + \left(\frac{h_{zA,t2} - h_{zB,t2}}{z_A - z_B} + \frac{h_{zB,t2} - h_{zC,t2}}{z_B - z_C}\right)\right] \quad (2)$$

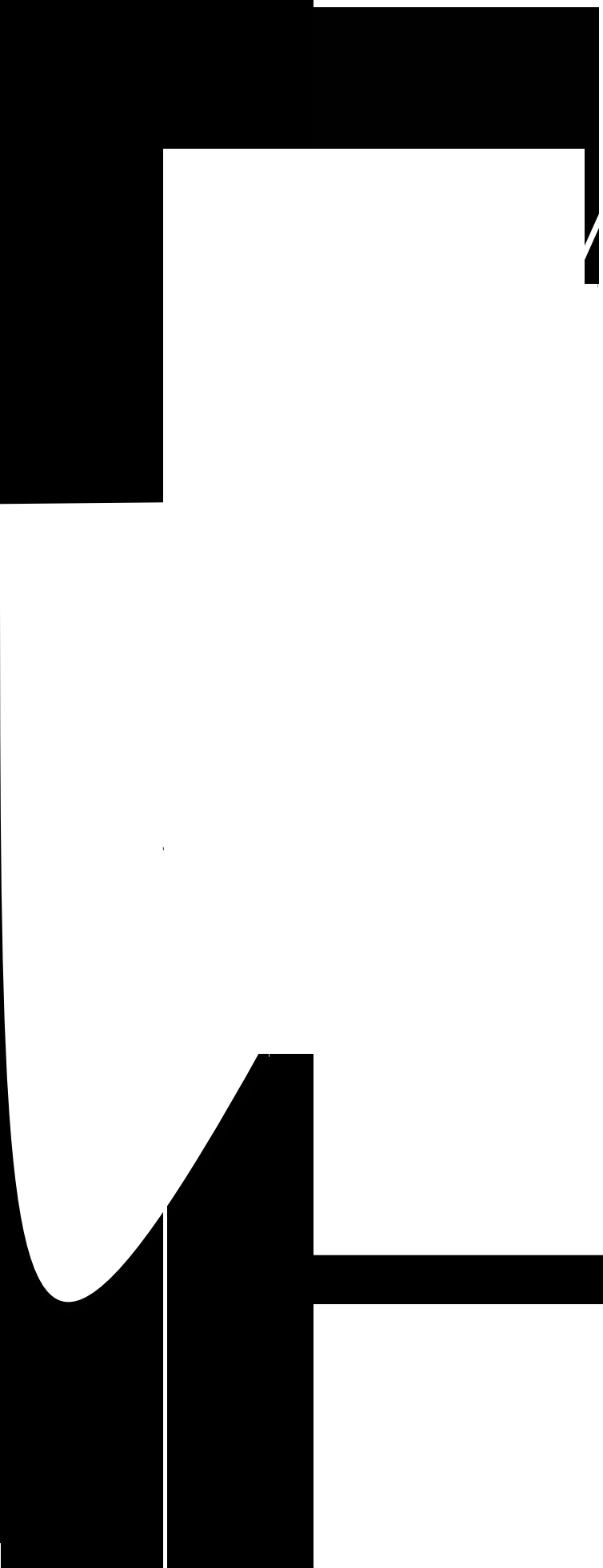
Geo-Experts

(Mariotte’s bottle.)

1 $v_{ze,tave}$

1

SDSWCCs SDPFs



1	*	
		: 150 mm
		: 190 mm
		: 1000 mm
2	**VWC**	: 60 mm
3		: 5 mm
4	**( )**	
i	*k*	
		: 150 mm
		: 200 mm
ii		
		: 5 kg
		: 0.01 g
5		
		: 10 kN
		: 50 mm
		: 0 – 450 kPa
		: 0 – 1000 kPa
6	**( )**	
		: 2 MPa
		: 0.5 mV/V
		: 2 % RO
		: 1 channel, 4 dig

* ( ) 6.

** VWC PWC