LIST OF SYMBOLS AND NOTATION

Symbol		**Units**
ψ	matrix potential	cm
Φ	total potential head	cm
Z	the gravitational potential.	cm
q	the volumetric water flux across a unit area perpendicular to the direction of flow	cm
k_S	saturated hydraulic conductivity	cm/hr
$\dfrac{\partial \Phi}{\partial Z}$	the hydraulic gradient	--
θ	the volumetric water content,	--
θs	the volumetric water content at saturation	--
θr	the irreducible minimum water content	--
S	the sink term.	cm/hr
$C(\psi)$	the differential moisture capacity or soil capacity	cm^{-1}
b_b	bubbling pressure	cm
λ	the pore size distribution index.	--
Se	effective saturation	--
Sw	the saturation ratio	--
kr	The relative hydraulic conductivity	--
m	a parameter estimated from the soil-water retntion curve	--
B	the inverse of the pore size distribution index of soil	--
γs	particle density	g/cm^3
z	layer thickness	cm
$\Delta\, zs$	change in layer thickness	cm
V	volume of soil matrix	cm^3
ΔV	change in volume of soil matrix	cm^3
Vc	volume of crack	cm^3

Symbol		Units
r_s	geometry factors	--
P	rainfall	cm
I	irrigation	cm
Im	infiltration into matrix	cm
Imax	maximum infiltration rate into matrix	cm
I_c	inflow to cracks	cm
P_c	cracks porosity	--
w	the soil water content	--
c_c	connectivity	--
S_c	the internal area of soil cracks	m^2/m^2
$P_c(0)$	crack porosity on a soil surface	m^2/m^2
$A_c(0)$	cracks area on a soil surface	m^2/m^2
A	unit area of a soil	m^2
S_c	soil layer thickness	cm
S_{st}	Internal surface of a soil cracks in the cracked soil layer	m^2/m^2
V_{ct}	The integral volume of a soil cracks	cm^3/cm^2
VR	void ratio	--
CR	The clay ratio	--
$COLE_{rod}$	Coefficient of linear extendibility rod method	--
$COLE_{stn}$	Coefficient of linear extendibility standard method	--
L_s	Linear shrinkage	--
d	depth of the crack	cm
l_c	The specific cracks length	m/m^2
L.L	liquid limit	--
P.I	plasticity index	--
P.L	plastic limit	--
F.C	field capacity	--

Symbol		Units
W.P	wilting point	--
A.W	available moisture content	--
BDw	wet bulk density	g/cm^3
BDd	dry bulk density	g/cm^3
W	crack width	cm
q_c	The rate of horizontal infiltration of water entering the matrix from the cracks	cm/hr
ψ_f	pressure head at wetting front	cm
$\bar{w}_c$	average cracks width	cm
$\bar{d}_c$	average cracks depth	cm
AM	available moisture content	--
F	accumulative infiltration	cm
f	the wetting from	cm
t_p	the time when water begins to pond on the surface	hr
f	infiltration rate	cm/hr
Y	radial distance from centre of the crack	cm
r	the crack half width	cm
c	Correction factor for crack width	--
b	constant depend on the soil texture	
m.c	is the volumetric moisture content	
K	hydraulic conductivity of the crack matrix interface	cm/hr
t_y	infiltration time	hr
A_c	specific surface area of cracks	cm^2/cm^2
$S(\psi)$	horizontal infiltration rate of water from water in side cracks into soil matrix	cm/hr
Aj	matrix coefficient	--
Bj	matrix coefficient	--

Symbol		**Units**
Cj	matrix coefficient	--
Ej	matrix coefficient	--
ΔZ	mesh size	cm
Δt	time incremental	minute
i	time index	--
R	rainfall	mm
Ss	surface water storage	mm
Sc	crack storage	mm
W_a	water absorbed in the topsoil	mm
E	evaporation from the field	mm
D	surface runoff	mm
B	the flow component by passing the topsoil matrix	mm
j	space index	--
Ψ_m	measured pressure suction	cm
Ψ_p	predicted pressure suction	cm