

APPENDIX C
List of Symbols

a	Well spacing	$G(\bar{T})$	A function used in analysis of partially penetrating well
a,b	Dimensions defining boundary of non-circular source	h	Net head on well system corrected for well losses
A_c	Effective average distance from well center to external boundary of source	h_a	Allowable net head beneath top stratum at landside toe of levee on dam
A_e	Equivalent radius of a group of wells	h_c	Piezometric head midway between wells in circular array
c (1)	Conversion factor used in determining the effective length of a pervious foundation covered by a semipervious blanket	h_d	Maximum head landward from a slot or line of wells
C (2)	Hazen-Williams coefficient	h_g	Head at boundary between artesian and gravity flow
C (3)	One-half the length of a finite line source	h_m	Net head midway between well corrected for well losses
C_u	Coefficient of uniformity	h_o	Excess hydrostatic head beneath the top stratum at landside levee toe
d	Thickness of a pervious stratum	h_p	Net head at any point p
\bar{d}	Transformed thickness of pervious stratum layer with thickness = d	h_w	Head at well
d_m	Thickness of pervious foundation layers (summation of $m = 1$ to $m = n$)	h_x	Head beneath top stratum at distance x from landslide toe of levee
D	Thickness of pervious foundation	h_{av}	Average net head in plane of wells corrected for well losses
\bar{D}	Transformed thickness of pervious foundation	h_{wj}	Head at well j in a system of n wells
D'	Thickness of sloping entrance face of pervious foundation	Δh_d	Difference in elevation between landslide piezometric surface and well outlets
D_n	Grain size for which n percent of the sample is smaller	H	Net head on well system. Difference between riverside pool and landslide tailwater
e	Void ratio	H_1	Total head measured from bottom of pervious foundation
F_t	Permeability transformation factor	H_e	Entrance loss in screen and filter
FS	Factor of safety	H_f	Frictional head loss
g	Acceleration due to gravity	H_m	Net head midway between wells
G_p	Flow correction factor for partially penetrating well	H_v	Velocity head loss

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H_w	Well losses	L_B	Distance from line of wells to blocked exit
H_{av}	Average net head in plane of wells	L_e	Distance from line of wells to seepage exit
H_{mn}	Net head midway between n number of wells	ΔL_1	Extra length of pervious foundation due to sloping entrance face
H_{moo}	Net head midway between wells in infinite line	n	Number of wells in group
ΔH_m	Excess head above the well outlet midway between wells	M	Slope of hydraulic grade line (at middepth of pervious foundation)
i_c	Critical hydraulic gradient	ΔM	Difference in slopes of hydraulic grade line river-side and landside of toe of levee
j_o	Downward force acting against uplift pressure	p	A point
k	Coefficient of permeability	Q_a	Artesian component of seepage flow
\bar{k}	Coefficient of permeability of transformed stratum	Q_g	Gravity component of seepage flow
k_b	Vertical permeability of top stratum	Q_s	Total amount of seepage beneath levee
\bar{k}_e	Effective permeability of multistratum transformed aquifer	Q_w	Discharge from a single well
k_f	Horizontal permeability of pervious substratum	Q_{wj}	Flow from well j
k_h	Coefficient of permeability in horizontal direction	Q_{wp}	Flow from partially penetrating well
k_L	Coefficient of permeability from laboratory tests	Q_{sw}	Seepage flow beyond well system
k_v	Coefficient of permeability in vertical direction	r	Radial distance from well (distance from point p to real well)
k_m	Permeability of pervious foundation layers (summation of $m = 1$ to $m = n$)	r_c	Rows of circular array of well
k_n	Vertical permeability of individual layers comprising top stratum ($n =$ layer number)	r_i	Distance from i^{th} well to point p
k_{bL}	Vertical permeability of landside top stratum	r_{ij}	Distance from well i to well j
k_{bR}	Vertical permeability of riverside top stratum	r'	Distance from point p to image well
L	Distance from source to seepage exit	r_o	Distance from well to center of finite line source
L_1	Distance from source to landside toe of levee or dam	r_w	Radius of well
L_2	Base width of impervious levee and berm	r_{wj}	Effective well radius of well j
L_3	Length of pervious foundation and top stratum beyond landside toe of levee	R	Radius of influence
		R_i	Radius of influence of i^{th} well
		R_j	Radius of influence of well j

S	Distance from effective seepage entry to line of wells	Z_c	Thickness of top stratum below collector ditch
S_j	Distance from infinite line seepage to multiple wells	Z_n	Thickness of individual layers comprising top stratum (n = layer number)
v	Flow velocity in well	Z_t	Transformed thickness of landside top stratum for uplift computations
W	Actual well penetration	Z_{bL}	Transformed thickness of landside top stratum
\overline{W}	Effective well penetration	Z_{bR}	Transformed thickness of riverside top stratum
x,y,z	Cartesian coordinates	α	Angle of entrance face
x_a	Distance from effective seepage entry to point where gravity flow occurs	γ	Unit weight of soil
x_g	Length over which gravity flow occurs to well line	γ_w	Unit weight of water
x_1	Distance from effective seepage entry to river-side toe of levee	γ'	Submerged unit weight of soil
x_3	Distance from landside toe of levee to effective seepage exit	Θ_a	Average uplift factor
Z	Thickness of top stratum	Θ_m	Midwell uplift factor
Z_b	Transformed thickness of top stratum	$\Delta\Theta$	Change in Θ_a and Θ_m per 1 log cycle of a/r_w
		δ	Offset distance between well and center of circular source
		\S	Shape factor