J.C.R.

# ESTIMATING Ks of Pile, Diameter = 1.5, Length = 8 m (Bowles, 1991)

Project : CONSTRUCCIÓN DE PUENTE VEHICULAR Y OBRAS COMPLEMENTARIAS EN LA VÍA QUE COMUNICA LA VEREDA LOS ANDES EN EL MUNICIPIO DE PLANADAS, DEL DEPARTAMENTO DEL TOLIMA

Designer : Juan Carlos Rodríguez Mendoza

Localization Ibagué, Tolima

Abutment : Estribo derecho  State Limit :  R.F.F. :  R.P.F. :  R.G. Factor :  Scour (m) :

| Beam | |
|---|---|
| Width (m) : | 2.00 |
| Heigh (m) : | 1.60 |

| Group Pile | |
|---|---|
| Spacing (D) : | 2.40 |
| Spacing (m) : | 3.60 |
| Red. Factor : | 0.80 |

| Pile | |
|---|---|
| b (m) : | 1.50 |
| Shape : | Circular |
| f'c (Mpa) : | 28.00 |
| E (MPa) : | 24870.06 |
| Inertia (m⁴) : | 0.248504888 |
| L (m) : | 8.00 |
| E.I. (kN.m²): | 6180.33 |

| Coefficient | |
|---|---|
| $Fw_1$ : | 1.00 |
| $Fw_2$ : | 1.00 |
| Cm : | 1.25 |
| C : | 40.00 |
| n : | 0.50 |

| Considerations | |
|---|---|
| ΔH (m) | 0.0254 |
| B = D | Ok |

| Files | |
|---|---|
| Files : | 1 |

$$A_s = AS = F_{w1}.C_m.C.\left(cN_c + 0.50\gamma B_p N_\gamma\right)$$

$$B_s Z^n = BSZ^N = F_{w2}.C_m.C.\left(\gamma N_q Z^n\right)$$

| MATERIAL | Depth Beg. (m) | Depth End (m) | Depth Medium (m) | Depth | Element | γ (kN/m³) | ϕ' (°) | C ' (kPa) | Nc | Nq | Nγ | b (m) | Ah | Bh | ks (MN/m³) | Ks Group (MN/m³) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Beam | 0.00 | -0.01 | -0.01 | | Nothing | 0.00 | 0.00 | 0.00 | 5.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | #¡NUM! | #¡NUM! |
| | 0.00 | -0.01 | -0.01 | | Nothing | 0.00 | 0.00 | 0.00 | 5.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | #¡NUM! | #¡NUM! |
| | 0.00 | 0.00 | 0.00 | | Nothing | 0.00 | 0.00 | 0.00 | 5.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Column | 0.00 | 0.25 | 0.13 | 0.13 | Pile | 0.00 | 0.00 | 0.00 | 5.14 | 1.00 | 0.00 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.25 | 0.50 | 0.38 | 0.38 | Pile | 0.00 | 0.00 | 0.00 | 5.14 | 1.00 | 0.00 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.50 | 0.75 | 0.63 | 0.63 | Pile | 0.00 | 0.00 | 0.00 | 5.14 | 1.00 | 0.00 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.75 | 1.00 | 0.88 | 0.88 | Pile | 0.00 | 0.00 | 0.00 | 5.14 | 1.00 | 0.00 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1.00 | 1.25 | 1.13 | 1.13 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 255.22 | 204.18 |
| | 1.25 | 1.50 | 1.38 | 1.38 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 265.98 | 212.79 |
| | 1.50 | 1.75 | 1.63 | 1.63 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 275.88 | 220.70 |
| | 1.75 | 2.00 | 1.88 | 1.88 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 285.09 | 228.07 |
| | 2.00 | 2.25 | 2.13 | 2.13 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 293.74 | 234.99 |
| | 2.25 | 2.50 | 2.38 | 2.38 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 301.92 | 241.54 |
| | 2.50 | 2.75 | 2.63 | 2.63 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 309.70 | 247.76 |
| Depósitos Coluvio - Aluviales | 2.75 | 3.00 | 2.88 | 2.88 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 317.14 | 253.71 |
| | 3.00 | 3.25 | 3.13 | 3.13 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 324.27 | 259.42 |
| | 3.25 | 3.50 | 3.38 | 3.38 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 331.14 | 264.91 |
| | 3.50 | 3.75 | 3.63 | 3.63 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 337.76 | 270.21 |
| | 3.75 | 4.00 | 3.88 | 3.88 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 344.16 | 275.33 |
| | 4.00 | 4.25 | 4.13 | 4.13 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 350.37 | 280.29 |
| | 4.25 | 4.50 | 4.38 | 4.38 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 356.40 | 285.12 |
| | 4.50 | 4.75 | 4.63 | 4.63 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 362.26 | 289.81 |
| | 4.75 | 5.00 | 4.88 | 4.88 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 367.97 | 294.37 |
| | 5.00 | 5.25 | 5.13 | 5.13 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 373.54 | 298.83 |
| | 5.25 | 5.50 | 5.38 | 5.38 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 378.97 | 303.18 |
| | 5.50 | 5.75 | 5.63 | 5.63 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 384.29 | 307.43 |
| | 5.75 | 6.00 | 5.88 | 5.88 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 389.49 | 311.59 |
| | 6.00 | 6.25 | 6.13 | 6.13 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 394.58 | 315.67 |
| | 6.25 | 6.50 | 6.38 | 6.38 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 399.57 | 319.66 |
| | 6.50 | 6.75 | 6.63 | 6.63 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 404.47 | 323.58 |
| | 6.75 | 7.00 | 6.88 | 6.88 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 409.28 | 327.42 |
| | 7.00 | 7.25 | 7.13 | 7.13 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 414.00 | 331.20 |
| | 7.25 | 7.50 | 7.38 | 7.38 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 418.64 | 334.92 |
| | 7.50 | 7.75 | 7.63 | 7.63 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 423.21 | 338.57 |
| | 7.75 | 8.00 | 7.88 | 7.88 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 427.70 | 342.16 |
| | 8.00 | 8.00 | 8.00 | 8.00 | Pile | 20.37 | 43.00 | 0.00 | 105.10 | 99.01 | 186.52 | 1.50 | 142477.97 | 100841.69 | 427.70 | 342.16 |

