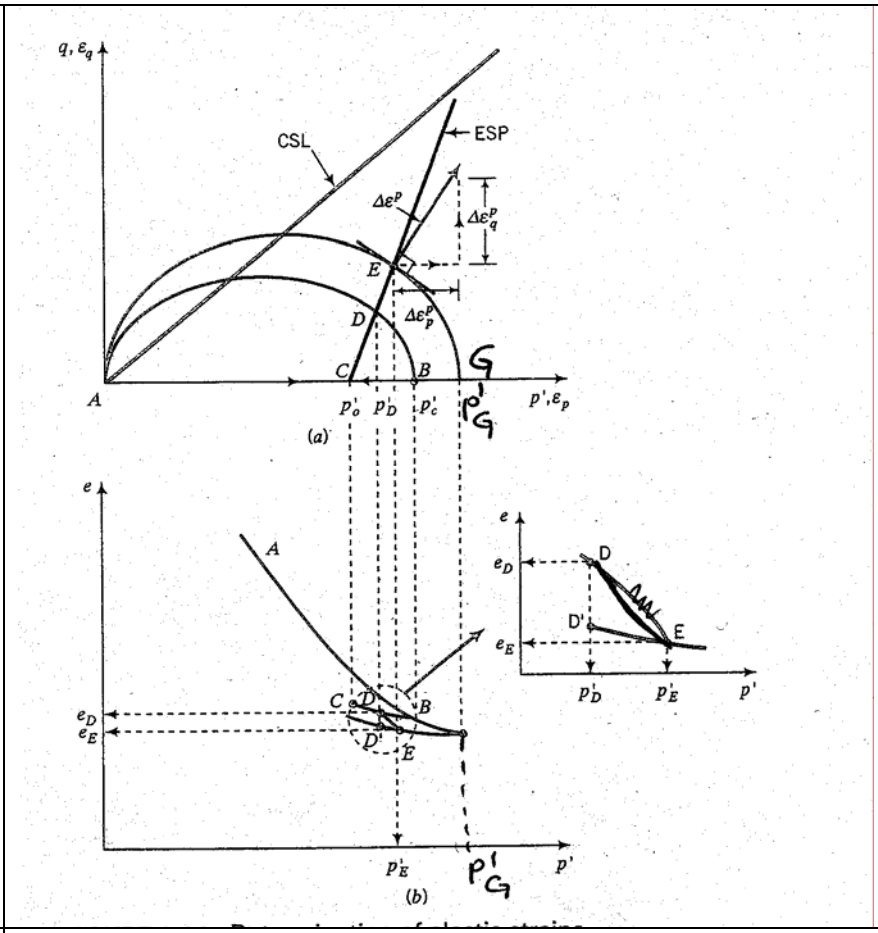
Budhu, M "Soil Mechanics and Foundations"

Errata (First Printing)

Despite the many layers of checking, some typographical, drafting and other errors slipped though in the first printing of the text and CD. The author sincerely apologies for these errors. For updates point your browser to: http://www.u.arizona.edu/~budhu

Page	Correction
Pages 28	Step 4: Replace Gravel = 3% by Gravel = 0 Replace Sand = 95.8% by Sand = 98.8%
Page 74	Problem 2:12. Add Clay to silt ratio is 3:1 in the last line.
Pages 88, 89: Eqs. (3.10), (3.13), (3.14)	Replace the first and last [ ] by { }. The { } denotes vectors.
Page 114 Eq.(3.68)	Replace q_s/H_o by $2q_s/\pi$
Page 129, 9th line from bottom of page	Replace $q_2 = q_2 + \Delta q_2$ by $q_2 = q_1 + \Delta q_2$
Page 164, Eq. (4.30) and Eq. (4.32)	Replace sin Mz/H_{dr} and (sinMz/H_{dr}) respectively by sin (Mz/H_{dr})
Page 170 Step 4	The equation should read $u_{i,j+1} = u_{i,j} + 0.25(u_{i-1,j} - 2u_{i,j} + u_{i+1,j})$
Page 185, Eq. (4.47)	Replace t^2 by r^2
Page 190, 3rd line from Step 2	Replace $(1- e_o)$ by $(1 + e_o)$
Page 196, Problem 4.1, line 2	Add. At the start of the loading the sample height was 19.17mm.
Page 197, Problem 4.17,line 2	.. circular embankment***, 10m diameter,*** with ..
Page 202, Fig. 5.3 (b)	Change e_z to ε_z
Page 220, Fig. 5.17 (c)	Replace σ'_p and σ'_{cs} by ϕ'_p and ϕ'_{cs}
Page 222, Step 3, line 2	Replace horizontal by vertical
Page 233	See link Example 5.7
Page 276, Step 5	Add $p'_f = \frac{q_f}{M_e} = \frac{110}{0.66} = 166.7\text{kPa}$
Page 279, lines 3 and 5	Replace q/p by q/p′
Page 285, Fig E6.3d	Delete q_f and p'_f from the e and p′ axes respectively.
Page 288, Fig 6.13 and 2nd line in 2nd paragraph from bottom.	Replace ε_d by ε_q

Page 290 (Replace Figure 6.14)	
Page 291	Replace Eq. (6.36) by $\Delta\varepsilon_p = \frac{\Delta e}{1+e_o} = \left(\frac{\lvert e_D - e_E\rvert}{1+e_o}\right) = \frac{1}{1+e_o}\left\{(\lambda-\kappa)\ln\frac{p'_G}{p'_c} + \kappa\ln\frac{p'_E}{p'_D}\right\}$ Replace Eq. (6.39) by $\Delta\varepsilon^p_p = \Delta\varepsilon_p - \Delta\varepsilon^e_p = \left(\frac{\lambda-\kappa}{1+e_0}\right)\ln\frac{p'_G}{p'_c}$
Page 294	Replace Step 5 and Step 6 by Step 5: Calculate strain increments after yield. Equation (6.36): $\Delta\varepsilon_p = \frac{1}{1+e_o}\left\{(\lambda-\kappa)\ln\frac{p'_G}{p'_c} + \kappa\ln\frac{p'_E}{p'_D}\right\} =$ $\frac{1}{1+1.4}\left\{(0.16-0.05)\ln\frac{240.5}{225} + 0.05\ln\frac{184}{180}\right\} = 35\times10^{-4}$ Equation(6.39): $\Delta\varepsilon^p_p = \frac{\lambda-\kappa}{1+e_o}\ln\frac{p'_G}{p'_c} = \frac{0.16-0.05}{1+1.4}\ln\frac{240.5}{225} = 31\times10^{-4}$ Equation(6.45): $\Delta\varepsilon^p_q = \Delta\varepsilon^p_p \frac{q_E}{M_c^2\left\{p'_E - \frac{(p'_c)_E}{2}\right\}} = 31\times10^{-4}\frac{102}{1^2\left(184-\frac{240.5}{2}\right)} = 50\times10^{-4}$ Assume that G remains constant, we can calculate the elastic shear strain from From equation (6.46): $\Delta\varepsilon^e_q = \frac{\Delta q}{3G} = \frac{12}{3\times3655} = 11\times10^{-4}$ Step 6: Calculate total strains.

	Total volumetric stains: $\varepsilon_p = \Delta\varepsilon_p^e + \Delta\varepsilon_p = (38 + 35)\ x10^{-4} = 73 \times 10^{-4}$ Total shear strains: $\varepsilon_q = \Delta\varepsilon_q^e + \Delta\varepsilon_q^p = \{(82 + 11) + 50\} x\ 10^{-4} = 173 \times 10^{-4}$
Page 299	Replace Step 7 to Step 14 by Step7: $\Delta\varepsilon_p = \frac{1}{1+e_o}\left\{(\lambda-\kappa)\ln\frac{p'_G}{p'_c} + \kappa\ln\frac{p'_E}{p'_D}\right\} = \frac{1}{1+1.15}\left\{(0.25-0.05)\ln\frac{262.9}{250} + 0.05\ln\frac{228}{224}\right\} = 51\times10^{-4}$ Step 8: $\Delta\varepsilon_p^p = \frac{\lambda-\kappa}{1+e_o}\ln\frac{p'_G}{p'_c} = \frac{(0.25-0.05)}{1+1.15}\ln\frac{262.9}{250} = 45\times10^{-4}$ Step 9: $\Delta\varepsilon_q^p = \Delta\varepsilon_p^p\frac{q}{M^2(p'-\frac{p'_c}{2})} = 45\times10^{-4}\frac{83.9}{0.94^2\left(228-\frac{262.9}{2}\right)} = 44\times10^{-4}$ Step 10: $\Delta\varepsilon_q^e = \frac{\Delta q}{3G} = \frac{12}{3\times4207} = 1.0\times10^{-3}$ Step 11: $\Delta\varepsilon_q = \Delta\varepsilon_q^e + \Delta\varepsilon_q^p = (10+44)\times10^{-4} = 54\times10^{-4}$ Step 12: $\varepsilon_p = (\Delta\varepsilon_p^e)_{initial} + \Delta\varepsilon_p = (26+51)\times10^{-4} = 77\times10^{-4}$ Step 13: $\varepsilon_q = (\Delta\varepsilon_q^e)_{initial} + \Delta\varepsilon_q = (57+54)\times10^{-4} = 111\times10^{-4}$ Step 14: $\varepsilon_1 = \varepsilon_q + \frac{\varepsilon_p}{3} = (111+\frac{77}{3})\times10^{-4} = 137\times10^{-4}$
Page 308, Figure 6.16, caption	Replace Σ by σ
Page 327, equation (7.21)	$d_c = 1 + 0.2\frac{D_f}{B}$
Page 336, Example 7.5, Line 3 Step 2, line 4	Insert '5m below' after at Replace q_q by $\boldsymbol{q_a}$
Page 337, Eq. 7.31	Replace e_I by e_L
Page 345 step 2 line 2 Page 346 step 3 line 3	Replace ¾ by 3/2 and 0.94 by 0.89 Replace 0.94 by 0.89 and 18 mm by 17 mm
Page 347	Step 5: line 2, replace $\mu_s = 0.4(0.5)^{-.38} = 0.52$ by $\mu_s = 0.45(0.5)^{-.38} = 0.59$ Replace $\mu_{emb} = 1 - 0.4\frac{4}{5}(1+\frac{4}{3}\times0.5) = 0.47$ by $\mu_{emb} = 1 - 0.04\frac{4}{5}(1+\frac{4}{3}\times0.5) = 0.94$ Step 6: line 3, replace 0.52 by 0.59, 0.47 by 0.94, 0.011m by 0.026m and 11mm by 26mm
Pages 353 and 354	Replace equations (7.53) to (7.56) with the following **Axisymmetric**

	$I_{co} = 0.1 + 0.8\left(\frac{z}{B}\right)$ for $\frac{z}{B} \le \frac{1}{2}$ (7.53) $I_{co} = \frac{2}{3} - \frac{1}{3}\left(\frac{z}{B}\right)$ for $2 \ge \frac{z}{B} > \frac{1}{2}$ (7.54) **Plane strain** $I_{co} = 0.2 + 0.3\left(\frac{z}{B}\right)$ for $\frac{z}{B} \le 1$ (7.55) $I_{co} = \frac{2}{3} - \frac{1}{6}\left(\frac{z}{B}\right)$ for $4 \ge \frac{z}{B} > 1$ (7.56)
Page 349, Step 1	After $\frac{H_o}{B}$, insert $= \frac{H_1}{B}$; replace Table B1 by Table B1.2
Page 359 Step 2 line 4 line 7 line 12 line 15	 Replace 1.5/3 by 1.5/1.5 and 0.91 by 0.81 Replace 0.91 by 0.81 and 3.7 by 3.3 Replace 2.5/5.5 by 4.0/2.75 and 0.92 by 0.73 Replace 0.92 by 0.73 and 8.8 by 9.3
Page 360 line 3	Replace 3.7 + 8.8 + 6.9 = 19.4 mm by Replace 3.3 + 9.3+ 6.9 = 19.5 mm
Page 365, Exercise 7.1	Replace $N_\gamma = \frac{2(1+\tan^2\phi')}{\{2-(1+\tan^2\phi')\}(1-\tan^2\phi')}$ **by** $N_\gamma = \frac{2\tan\phi'\left(\tan^2\phi' - 3\right)}{\left[\left(1+\tan\phi'\right)^2 - 2\right]\left(1-\tan\phi'\right)} = \frac{2\sin 3\phi'}{\cos\phi' - \sin 3\phi'}$
Page 367, Problem 7.11, line 9	Replace E_u = 1000kPa by ***E_u = 100MPa*** and E′ = 900kPa by ***E' = 90MPa*** Add OCR = 10 after C_r = 0.035
Page 380, Table 8.3,line 3	Replace $\frac{s_u - 25}{70}$ by $\frac{s_u - 25}{90}$
Page 387, Table 8.7, line 11	Replace C≥ 0.4 by $C \le 0.4$
Page 394, Solution 8.6, line 5	Group: Perimeter = **4**(2s + D) = ...
Page 403, Solution 8.8, line 6	Group piles: $L_g = B_g =$ **2**s +D = ...
Page 412, Problem 8.3, Figure P8.3	The OCR for the top, middle and bottom layers are 1.2, 2 and 4 respectively.
Page 413, Problem 8.5, Figure P8.5	The saturated unit weights of the sand and clay are 17.5 kN/m^3 and 18.5 kN/m^3 respectively.
Page 413, Problem 8.6 line 1 line 4	loose fill ***(ϕ'_{cs} = 15^o, γ_{sat} = 15kN/m^3)*** $\phi'_{cs} = 28^o$, ***OCR = 8*** and γ_{sat} = 18kN/m^3
Page 414, Problem 8.8, line 3	0.45m ***and E_p = 20,000MPa.***
Page 422, Section 9.5.1, line 3	Replace ΔH by Δh
Page 461	Equation (10.21): Change –β/2 to +β/2

	Replace H_o^2 by H^2 where H is the vertical distance from the heel Equation (10.25): Add cosβ after $K_{aR} = 1/K_{pR}$ =
Page 473, Solution 10.3, Step 2, line 2 and line 4	Replace H_o by H_o^2
Page 475, Step 4, line 3	Replace both H_o by H_o^2
Page 485, line 10	Replace R is greater by R is ***not*** greater
Page 489, line 8	Replace (M;iO)a by $(M_o)_a$
Page 494, Figure E10.7b	The diagram showing the distribution of the pore water pressure should start at the ground water level not at the anchor location.
Page 500	Figure E10.8e: Delete the bottom portion below and including D and replace 2m by 1m **Level 3 (Fig. E10.8e)** Delete next two lines Third line: Replace $D + C_2 = 104.6 \times 3$ by $C_2 = 104.6 \times 1 = 104.6$ kN/m Delete fourth line **Step 5:** Third line should read $C = C_1 + C_2 = 104.6 + 104.6 = 209.2$ kN/m Delete fourth line
Page 503, line 12	Replace the first H_o by H_o^2
Page 508, line 17 Line 16	Replace 7 by 3.5 and 725.2 by 363 Replace 725.2 by 363 and 10 by 5.
Page 509, line 3 from bottom Line 2 from bottom	Replace 8.4 by 4.2 and 1262.5 by 631 Replace 1262.5 by 631 and 12.8 by 6.4
Page 511, line 13	Replace H by H_o^2
Page 534, Figure 11.5(c)	Replace W by W_j
Page 536, 11.8.1 Bishop's Method, line 19	Replace 11.4a by ***11.5c***
Page 536, 11.8.1 Bishop's Method, equation (11.19)	Replace $\sum W_j x_j = \sum T_j R = 0$ by $\sum W_j x_j - \sum T_j R = 0$
Page 539 Equation (11.36)	Replace tan θ_j by tan Φ'_j
Pages 569, 570	Replace all negative δ values with positive values. The values on the ordinate for the top left hand graph on page 569 are 1, 100 not 0.1 and 1
Page 571, 3.6	Replace -11.6×10^{-4} by -3.25×10^{-5}
Page 571, 2.12	Replace SP by SP-SC
Page 571, 2.16	Replace 0.835 by 0.71 and 1.085 by 0.96
Page 571, 3.6	Replace 17.3 by 22.4 and 8.9 by 11.6
Page 571, 3.16	Replace 57kPa by 134 kPa
Page 572, 4.12	Replace (c) 4.1×10^{-4} m^2/kN by 1.6×10^{-4} m^2/kN
Page 572, 4.14	Replace (c) 30.003 by (c) 31.02
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Solution 9.6	The calculation for a is: $a = \frac{b}{\cos\beta} - \cos\beta\sqrt{b^2 - H^2\cot^2\beta} = \frac{65}{\cos 26.6} - \cos 26.6\sqrt{65^2 - 20^2(\cot 26.6)^2} = 26.8m$

	and q is $q = ak \sin\beta \tan\beta = 26.8 \times 100 \times 1 \times 10^{-6} \times \sin 26.6 \times \tan 26.6 = 6 \times 10^{-4} cm^3 / \sec$
Solution 9.7	The calculation for q is: $q = 2kf = 2 \times 1.2 \times 10^{-6} \times 3.6 \times 100 = 8.64 \times 10^{-4} cm^3 / \sec$
Solution 9.8	H = 1m + 8m = 9m = 900cm The calculation for q is: $q = khN_f/N_d = 1 \times 10^{-5}$ (cm^2/sec) x 900 (cm) x 8.5/6 = 12.8 x 10^{-3} cm^3/sec.