## ERRATA • Z.P. Bažant, Scaling of Structural Strength, Hermes-Penton Science, London 2002; and second revised ed., Elsevier 2005—in press

*Due to a production error, the following errata prepared by the Author were missed from the printing of this book.*

P. 11, Fig. 1.4b, switch "6" with "1", and "2" with "1".

P. 18. Above the $2^{nd}$ line from bottom, the following paragraph has accidentally been skipped and must be inserted:

"We already know that the scaling law must be a power law. So we set

$$\bar{u}_i = \lambda^{m+1} u_i \qquad (a)$$

where $m$ is an unknown exponent. Substituting this into the foregoing dimensionless expression for strains, we get

$$\bar{\epsilon}_{ij} = \lambda^m (\partial_j u_i + \partial_i u_j)/2 \qquad (b)$$

From this and the rest of the preceding dimensionless equations, the following transformation rules then ensue

$$\bar{\epsilon}_{ij} = \lambda^m \epsilon_{ij}, \quad \bar{\sigma}_{ij} = \lambda^m \sigma_{ij}, \quad \bar{\sigma}_N = \lambda^m \sigma_N,$$

$$\bar{p}_i = \lambda^m p_i, \quad \bar{f}_i = \lambda^{m-1} f_i, \quad \bar{u}_i = \lambda^{m+1} u_i \qquad (c)$$

To determine $m$, we need to consider the material properties, especially the failure criterion."

P. 19, Eq. 1.14: Add $E$ before "= const.", and 2 lines above: Replace exponent "2" by exponent "3".

P. 19, line below Eq. 1.13, replace $\sigma_{22}$ by $\bar{\sigma}_{22}$. Also, on the line above heading, replace "1983" by "1993".

P. 21 Fig. 2.1 Replace $D'$ by $D$.

P. 27, $2^{nd}$ line from bottom, replace $u_i$ by $u_i/D$.

P. 31 Fig. 2.5: In the numbers that label the ordinates of the lowest figure, replace the decimal commas with decimal points.

P. 43, $2^{nd}$ line above Eq. 2.45, replace "Noting" by: "Setting $\sigma$ = constant (strength limit) = $f_{r\infty}$ and noting". On line 5 from bottom: replace " $D_b/2$ " by: " $2D_b$ ", and do the same on the last line of this page. Also, on line 2 below Eq. 2.45, replace " $)^r$ " with " $)^{1/r}$ ".

P. 50, line below Eq. 2.63: Replace $K$ by $\bar{K}$. In Eq. 2.63: replace " $\bar{\epsilon}"_{ij}$ " by " $\frac{1}{2}\bar{K}"_t$. In Eq. 2.63: replace " $\bar{\epsilon}''_{ij}$" by: " $\frac{1}{2}\bar{K}''_t$". On the line below Eq. 2.63, after "where", insert: " $\bar{\sigma}' = -\bar{w}^p$, and".

P. 54, line 6 below Eq. 3.7, delete ")" before "(Freudenthal". On line 2 below Eq. 3.2, delete the word "some". In the last line of first paragraph: Replace $\sigma$ by bold $\boldsymbol{\sigma}$.

P. 59, lines 4 and 11, replace " $-m/n$ " with " $-n/m$ ".

P. 84, lines 6, 7, 8, four-times replace " $r_w$ " with " $R_w$ ".

P. 101, in Fig. 4.12 top left, replace "$C$", "$C_1$", "$C_2$" by "$c$", "$c_1$", "$c_2$".

P. 113, line 2 of item 3, replace "1997)" by "1987)".

P. 180, line 1 under figure, replace "(or" by "($v = w/2 =$".

P. 183, Fig. 9.3, change every "V" to "v".

P. 192, Fig. 9.6 (middle): In the slope indicator, replace "$r$" by "2".

P. 194: Below Eq. 9.46, insert the phrase: "(except that the condition $\lim_{D\to 0} d\sigma_N/dD < 0$ for the cohesive crack model is not satisfied)." Also, on line 4 below Eq. (b), after "concrete" insert: "(because $d\sigma_N/dD \to 0$ for $D \to 0$)". Also, replace equation label "(b)" by: "(9.46a)".

P. 200, Fig. 9.7 caption: Replace "for three basic types" by "for the third basic type".

p. 203, line below Eq. 9.81, before "and" insert ", which is not compatible with the cohesive crack model (see Sec. 2.12)," Also, at the end of $2^{nd}$ line below Eq. 9.81, insert: "However, to match the asymptotics of the cohesive crack model (finite slope $d\sigma_N/dD$, Sec. 2.12), it is necessary that $D_1 > D_0$."

P. 222, top 2 lines, replace "tensors $\boldsymbol{\eta}$ and" by: "tensor $\boldsymbol{\eta}$ and degree 0 of tensor". Also, remove the minus in the exponent in the equation on the left (but not on the right).

P. 224–226. On line 5 above Eq. 10.19, delete " $\Phi_{ijk}$ (not a homogeneous function of degree 1) "; in Eqs. 10.20, 10.24 and line 3 on p. 225, replace exponent 3/2 with 1/2, in Eq. 10.19 exponent " $-(1+p/q)$ " with " $-p/q$ ", in Eq. 10.19 and second line of p. 225, delete " 1 ".

p. 205, line above Eq. 9.75, delete the word "equally".

P. 208, line below Eq. 9.108: Replace "(9.73)" by "(9.75)".

P. 220, line 2 of Fig. 10.1 caption, replace "(a,d)" by "(a,e)".

P. 223, line 3 below Eq. 10.17, replace " $\sigma_N... = 0$)." by: " $\bar{\Phi}_{ijk} = 0$, which causes that the term with $K$ in Eq. 10.15 dominates, and thus $\sigma_N \propto D^{-2}$ for $K < \infty$ and $\sigma_N \propto D^{-2+pq} \propto D^{-3/2}$ for $K \to \infty$, i.e., incompressible material). "

## IMPROVEMENTS

P. 17, lines 3-4 of Sec. 1.7: Replace "Buckingham's" by "Vashy-Buckingham's".

P. 82, line 6 from bottom, delete misplaced "f4".

P. 111. Replace "possesses" by "to possess".

P. 188, line 2 should not be indented.

P. 202. Insert the word "have" at the end of the first line of the second paragraph.

P. 224, lines 5 and 4 above Eq. 10.19, replace "$\eta$ and $\Phi_{ijk}$ are ..., we" by: "$\bar{\epsilon}_{ij} = \epsilon_{ij} = w\hat{\epsilon}_{ij}, \bar{\epsilon} = \epsilon = w\hat{\epsilon}$ and $\bar{\eta}_{ijk} = w\eta_{ijk}$, $\eta$ is a homogeneous function of

degree 1 of $\boldsymbol{\eta}$ and $\Phi_{ijk}$ is a homogeneous function of degree 0 of $\boldsymbol{\epsilon}$, we". Also, on line 4 above Eq. 10.19, replace " $w\hat{\Phi}_{ijk}$ " by:  " $\hat{\Phi}_{ijk}$ ". In Eq. 10.19, replace exponent $-(1+p/q)$ by exponent $-p/q$. Furthermore, on $2^{nd}$ line above Eq. 10.20, after "(10.19)", insert:    with " $p=1, q=2$ ".

P. 226, line 2, replace $1+(p/q)$ by: $p/q$; and on line 3, replace " $3/2$ " by:   " $1/2$ " P

P. 225 Delete the entire 2nd, 3rd and 4th paragraphs (beginning with "Now it.." and ending with ".. reasonable.", and replace them by:    "From Eq. (10.20), we see that the asymptotic load deflection curve for $D \to 0$ begins with a vertical tangent (i.e., infinite elastic stiffness). In other words, the elastic part of response for $D \to 0$ is not captured by this theory."

P. 226, line above Eq. 10.23, replace "  $= 1/2)$ " by " $= 2)$ ". Also, in Eq. 10.24, replace exponent $3/2$ by exponent $1/2$, and replace $\bar{\epsilon}$ in denominator by  $\epsilon$ .

P. 227, Fig.10.2, delete the two curves of $P$ versus $w$ at the bottom of figure (keeping only the top diagram), and modify the caption by dropping "(a)" and the entire passage "(b) strange ... profile."

P. 228, line 3 below heading, replace " , characterized by locking, seems unreasonable " by  "gives excessive size effect and asymptotically vanishing elastic part of response." On lines 4 and 5, replace "the present" by   "it follows that the"; on line 6, delete "in the future" and add at the end "Such modified theory is essentially identical to the TNT (Taylor-based nonlocal) theory developed independently (based on different arguments) by Gao et al. (2000) as a replacement of their original theory analyzed in this section."

P. 233. Insert: "Vashy, A. (1892). "Sur les lois de similitude en physique." *Annales télégraphiques* 19, 25–28."