Errata

Igor Mataić
On structure and rate dependence of Perniö clay
School of Engineering
Aalto University publication series DOCTORAL DISSERTATIONS 08/2016
Date of Errata: 05.02.2016

Chapter 2.3.6, page 30, Figure 2.4

Errors in legend of Figure 2.4 Axial strain history at the center line of a sampling cylinder. Correct Figure 2.4 is:

![Figure 2.4](image-url)  

*Figure 2.4* Axial strain history at the centre line of a sampling cylinder [modified after Baligh et al. 1987].
Chapters 6.1.3, 6.2.3 and 7.1.3, pages 130, 174 and 240

Limitations of $w/\gamma$ specimen quality criteria in recognizing natural variance in initial properties in situ. For saturated soil with known specific gravity, water content and unit weight are related by:

$$\gamma = \frac{G_s + e}{1 + e} \cdot \gamma_w \quad \text{and;} \quad e = G_s \cdot w$$

Water content and unit weight of a one-dimensionally compressed soil reflect depositional conditions, i.e. initial density of the sediment, specific gravity, rate of deposition and water chemistry, etc.; and effects of post depositional processes, i.e. stress history, consolidation history and chemical history including processes such as water table fluctuations, aging, leaching, desiccation, weathering, etc. [Torrance 1974, Wood 1985, Hight et al. 1987]. Natural variation in water content values is common, especially in soft clay deposits. Reduction in values of $w/\gamma$ ratio in situ is thus not limited to effects of sampling disturbance. Low values of $w/\gamma$ may occur in situ as a result of construction activities and consolidation over long period of time, as evidenced by the influence of Perniö embankment. Furthermore, reduction of $w/\gamma$ values in situ may occur as a result of sliding history and changes in fabric over time. The $w/\gamma$ criteria is thus not a straight forward criteria for evaluation of sampling caused disturbance.

Chapters 6.1.3, 6.2.3 and 7.1.3, pages 130, 174 and 240

Influence of accuracy of the interpretation of effective overburden on results of $\Delta e/e_0$ specimen quality criteria. Results of $\Delta e/e_0$ specimen quality criteria [Lunne et al. 2006], are influenced by accuracy of the interpretation of the effective overburden stresses. The effective overburden stresses were derived based on assumption of hydrostatic pore pressure distribution, as no relevant pore pressure measurements in situ were available. Availability of direct unit weight and pore pressure measurement at the sampling locations would increase accuracy of interpretation of effective overburden stresses and consequently accuracy of conclusions derived based on $\Delta e/e_0$ specimen quality criteria.

Chapter 6.1.1, page 127, paragraph 2

Effects of incrementally loaded procedure on accuracy of interpretation of the preconsolidation pressure. Loading under conditions of LIR=1 used in incrementally loaded oedometer test is rather crude test methodology that can have significant impact on accuracy of the interpretation of the consolidation test results [Janbu et al. 1981]. Furthermore, due to the research objectives, IL oedometer tests were made adopting load periods of 24 h instead EOP procedure. Depending of the loading pattern imposed, the testing methodology may lead to significant reductions of the preconsolidation pressure interpreted us-
ing the bilinear approach. In the thesis, the effects of reduced preconsolidation pressure, i.e. $\sigma'_p/\sigma'_{vo}<1$, that may have been related to crude 24 hour IL procedure at LIR=1, are reported to be solely an effect of specimen disturbance.

**Chapters 6.1.8, 6.2.5 and 7.1.8, pages 156, 196 and 274**

Influence of IL procedure and LIR on magnitude of $c_{oa}/c_c$ parameter in oedometer and triaxial consolidation tests. Similarly to effects of IL testing procedure on magnitude of preconsolidation pressure, loading period duration, loading pattern, as well as LIR used do influence resulting magnitude of compressibility indices, secondary compression coefficient and $c_{oa}/c_c$ parameter interpreted. The effects of testing procedures on magnitude of the parameters are described as being mainly the effects of quality of the specimens considered. Furthermore, in addition to interpretation approaches based on traditional methods, advanced interpretation approaches of creep parameters based on CRS oedometer test results should have been utilized [Länsivaara 1999]. Comparison of creep parameters in IL tests with those interpreted from CRS tests, i.e. based on Figures 6.49-6.52, would increase reliability and clarity of the conclusions derived.

**Chapter 4.3.3, page 74, paragraph 3**

Effects of theory defining pore pressure response in CRS test on resulting parameters interpreted. Theoretical assumptions of specimen pore pressure response during CRS test influence results of interpretation of the tests, as well as evaluation of validity of unique compression curve concept [Wissa et al. 1971, Wood 2015]. Namely, effective stresses in CRS tests are calculated based on theoretical assumption of pore pressure response within the specimen [Janbu et al. 1981, Länsivaara 1995]. The validity of the approach is commonly restricted to limited range of strain-rates imposed. This fact may introduce limitations to accuracy of conclusions derived, especially concerning CRS tests performed at very high rates of straining.

**Chapter 7.7.1, page 233, paragraph 2**

Estimation of coefficient of earth pressure at rest based on interpretation of single $K_o$ test. Single $K_o$ test does not provide sufficient basis for evaluation of coefficient of earth pressure at rest. In $K_o$ test, substantial loading of the specimen under condition $\varepsilon_r=0$ is needed so to reach stress range of normally consolidated behavior. Additional $K_o$ tests should have been performed so to enable evaluation of level of accuracy of $K_o$ values interpreted, i.e. to ensure final stress ratio reached in the tests corresponding with $K_o$ values in situ [Länsivaara 2016]. Furthermore, the $K_o$ test should have considered distinctive units of Perniö soft clay deposit, i.e. sublayers A, B and C.
Chapter 7.1.1, page 233, Figure 7.1

Error in legend of Figure 7.1 Stress paths in anisotropic consolidation tests on natural and reconstituted Perniö clay. Correct Figure 7.1 is:

![Figure 7.1](image)

Figure 7.1 Stress paths in anisotropic consolidation tests on natural and reconstituted Perniö clay.

Chapter 7.1.1, page 234, Table 7.1

Errors in usage of symbols in Table 7.1 Final stress conditions in CAD triaxial tests. Correct Table 7.1 is:

<table>
<thead>
<tr>
<th>Consolidation stress ratio $\eta$</th>
<th>Consolidation stress ratio $\sigma''/\sigma'_1$</th>
<th>Cell pressure $\sigma'_3$ [kPa]</th>
<th>Vertical effective stress $\sigma'_1$ [kPa]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.85</td>
<td>0.459</td>
<td>20.0</td>
<td>43.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40.0</td>
<td>87.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60.0</td>
<td>130.7</td>
</tr>
<tr>
<td>0.6</td>
<td>0.571</td>
<td>20.0</td>
<td>35.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40.0</td>
<td>70.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60.0</td>
<td>105.1</td>
</tr>
<tr>
<td>0.4</td>
<td>0.687</td>
<td>20.0</td>
<td>29.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40.0</td>
<td>58.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60.0</td>
<td>87.3</td>
</tr>
</tbody>
</table>

Chapter 7.1.4, page 251, Figures 7.13 and 7.14

Errors in titles of Figures 7.13 and 7.14. Correct titles of Figures 7.13 and 7.14 are:
**Figure 7.13** Yield curves of Perniö clay in $p'/\sigma_v$-$q/\sigma_v$ plane, $M=1.32$.

**Figure 7.14** Yield curves of Perniö clay in $p'/\sigma_v$-$q/\sigma_v$ plane, $M=1.10$.

**Chapters 7.1 and 7.2, pages 233 and 280**

Influence of effects of membrane on results of triaxial consolidation and undrained shear tests. In interpretation of results of triaxial tests effects of membrane were not considered. The effects of membrane do have influence on triaxial results presented and contribute to the scatter reported [Länsivaara 2016].

**Reference, page 327**

Reference to D. M. Wood 1983 is missing. Correct reference is:


**Reference**


Länsivaara, T. personal communication, January 2016.


