BOOK REVIEW

Foundations on Rock, Second Edition

Reviewed by

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REFERENCE: Wyllie, D. C., *Foundations on Rock, Second Edition,* E. and F. N. Spon, London and New York, 1999, 401 pp.

In the author's introduction to the first edition of this book, published in 1992, he states that the book's main purpose is ". . .to assist the reader in the identification of potentially unstable rock foundations, to demonstrate design methods appropriate for a wide range of geological conditions and foundation types, and to describe rock construction methods." The intended reader, he says, is the design professional in geotechnical engineering. In his introduction to the second edition, the author states that design and construction practices have not changed since the writing of the first edition, hence the reason for writing the second edition is to include updated technical material and to ". . .add information on new projects where valuable experience on rock foundations has been documented." The coverage in the second edition fulfills the author's stated intentions.

The chapter headings are: Characteristics of Rock Foundations; Structural Geology; Rock Strength and Deformability; Investigation and *In Situ* Testing Methods; Bearing Capacity, Settlement, and Stress Distribution; Stability of Foundations; Foundations of Gravity and Embankment Dams; Rock Socketed Piers; Tension Foundations; and Construction Methods in Rock. A long list of symbols used, three appendices, and a detailed index are included to assist the reader. High-quality illustrations and abundant references are excellent resources.

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In any book of this type, a reviewer can always point out a host of materials that could have been included. For example, in addition to the I.S.R.M. test methods described, there are also ASTM standards, both laboratory and *in situ*, that could have been cited, and some of these ASTM standards include precision statements. There is also a considerable body of probabilistic/statistical methods and supporting software that go well beyond what is presented in the book, and which can be quite useful when correctly applied.

An unfortunate blemish has been carried forward unchanged from the first edition. In Chapter 2 and Appendix I, the author treats the equal-area projection as a type of stereographic projection, which it is not, and in Figures I.1 and I.2, he presents illustrations of polar and equatorial stereographic projections and labels them as "polar equal area stereonet" and "equatorial equal area net," respectively. (Figure I.2 is actually the Wulff net or "stereonet," widely used in structural geology.) The stereographic projection is equiangular, hence conformal; it is not equal-area. The equal-area projection is not conformal. The two projections are expressed by different projection equations. Distinguishing clearly between the two is not merely an issue of nomenclature. If poles were plotted on stereographic projections like those in Figures I.1 and I.2 and were then counted and contoured, assuming these are equal-area projections (i.e., with unit counting areas of *uniform* size), then point-counts or clustering toward the center of each projection would be biased high and point-counts or clustering toward the edge of each diagram would be biased low. The author would have served his readers far better by advocating what is standard practice in structural geology, namely, use of the equal area projection (Schmidt net) for plotting fabric diagrams (contoured frequencies of the orientations of poles) and the stereographic projection (Wulff net) for solving angle problems.

Overall, Wyllie has produced a useful book. Should a third edition be undertaken, it is hoped that the suggestions and errors discussed above will be addressed.