Brief History of NU Database of Laboratory Creep and Shrinkage Data

The first large worldwide database was assembled under NSF support during 1976-1978 at Northwestern University (NU) by Liisa Panula, a doctoral student of Z.P. Bažant. This database was included in the series of six papers presenting the BP Model [1].

At the "Hubert Rüsch Workshop" held during the international ACI Fall convention in 1979, a joint ACI-RILEM committee was set up to reorganize the computer presentation of the Northwestern University database and add several data. This work was carried out in RILEM committee TC107 chaired by Bažant, within subcommittee F led by Harald Müller, and resulted in 1992 into the joint NU-RILEM-ACI Database (1992) approved by both RILEM and ACI-209. Apart from a few additions, vast majority of the data consisted of the data assembled in the 1970s by Liisa Panula. In 2008, a few additions were made at Northwestern by Bažant's student G.-H. Li [2].

A major extension, which more than doubled the NU database, was carried out (mainly under the support of the U.S. Department of Transportation) during 2010–2013 at Northwestern by Mija Hubler [3], Bažant's doctoral student (who then became a faculty member at UC Boulder), partly in collaboration with Roman Wendner, a that time a postdoc at NU (for details see [3]). It contained over 4,000 test curves and about 40,000 data points. It was presented at NU website, with a duplicate at RILEM website, and was used in journal articles [4, 5] justifying model B4.

In 2021, major improvements, leading to a better organized user-friendly computer format, have been carried out at CTU Prague by Prof. Vít Šmilauer and his students, in partial collaboration with Prof. Roman Wan-Wendner at Ghent University. Further improvements by Prof. A. Abdullah Dönmez, collaborating with Bažant, are in progress at Technical University Istanbul. Šmilauer's updates are included in the file available here, and Dönmez's ones are yet to be added (as of April 2021).

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Further updates are planned

References

[1] Bažant, Z. P. and Panula, L. (1978-79). "Practical prediction of time-dependent deformations of concrete.", *Materials and Structures*, RILEM, Paris (11) Part I, "Shrinkage", pp. 307–316. Part II, "Basic creep", pp. 317–328. Part III, "Drying creep", pp. 415–424. Part IV, "Temperature effect on basic creep", pp. 425–434.

[2] Bažant, Z. P. and Li, G.-H. (2008). "Comprehensive database on concrete creep and shrinkage.", *ACI Materials Journal*, 106(6, Nov.-Dec.), pp. 635–638.

[3] Hubler, M.H., Wendner, R., and Bažant, Z.P. "Comprehensive database for concrete and shrinkage: Analysis and recommendations for testing and recording." *ACI Materials Journal* 112 (4), 547–558.

[4] Hubler, M.H., Wendner, R., and Bažant, Z.P. (2015). "Statistical justification of model B4 for drying and autogenous shrinkage of concrete and comparisons to other models." *Materials and Structures* 48 (4), 797–814.

[5] Wendner, R., Hubler, M.H., and Bažant, Z.P. (2015). "Statistical justification of model B4 for multi-decade concrete creep using laboratory and bridge databases and comparisons to other models". *Materials and Structures* 48 (4), 815–833.