References made in 2022 Rasmus Nordal Distinguished Lecture

Andreasen, A. & Andersen, J., 1930, "Ueber die Beziehung zwischen Kornabstufung und Zwischenraum in Produkten aus losen Körnern" (On the relationship between grain gradation and spacing in loose grain products), *Kolloid-Zeitschrift*, **50**, pp. 217-228.

Arnold, G., Werkmeister, S., and Alabaster, D., 2007, "The effect of grading on the performance of basecourse aggregate", Land Transport New Zealand Research Report **325**, 51 pp. https://www.nzta.govt.nz/assets/resources/research/reports/325/docs/325.pdf

China Mining News, 2022, "What is the future trend of Chinese aggregates market?", March 28th. http://en.zgss.org.cn/industry/d_6241879c2da0fa004d668475.html

Cho, G.-C., Dodds, J. & Santamarina, J. C., 2006, "Particle shape effects on packing density, stiffness, and strength: natural and crushed sands", *Jnl. Geotechnical & Geoenvironmental Engineering*, **132**(5), pp. 591–60.

Dahal, B. & Mishra D., 2020, "Discrete Element Modeling of Permanent Deformation Accumulation in Railroad Ballast Considering Particle Breakage", *Front. Built Environ*., Sec. Transportation & Transit Systems, 14 January.

Dawson A.R., 1997, "Rutting in unsurfaced roads - materials and structure interaction effects", *Proc. Symposium on Thinly Surfaced Pavements*, Univ. New Brunswick, Fredericton, Canada, pp. 101-108.

Dawson A.R., Numrich R and Lekarp F, 1998, "Rutting in granular pavement layers", *Kolloquium Prüfung und Bewertung von Konstrucktionsschichten im Straßenbau*, 21 & 22 July, Dresden, Germany, Technische Universität Dresden, Fakultät Bauingenieurwesen, Heft **8**, pp 415-428.

de Larrard, F., 1999, "*Concrete mixture proportioning: a scientific approach"*, London: E & FN Spon.

Fennis-Huijben, S.A.A.M, 2011, "*Design of Ecological Concrete by Particle Packing Optimization"*, PhD thesis, Technische Universiteit Delft.

Fuller, W.B., & Thompson, S.E., 1907, "The laws of proportioning concrete", *Transactions*, American Society of Civil Engineers, **57**(2), pp. 222-298.

Funk, J.E. & Dinger, D.R., 1994, "*Predictive Process Control of Crowded Particulate Suspensions - Applied to Ceramic Manufacturing"*. Boston: Kluwer Academic Publishers.

Furnas, C.C., 1929, "Flow of gasses through beds of broken solids", Bureau of Mines, *Bulletin*, p.307, US Govt. Print. Office.

García, A., Michot-Roberto, S., Dopazo-Hilario, S., Chiarelli, A. & Dawson, A.R., 2020, "Creation of realistic virtual aggregate avatars", *Powder Technology*, **378**(B), pp760-71.

Goode, J.F. & Lufsey, L.A., 1962, "A new graphical chart for evaluating aggregate gradation", *Proceedings AAPT*, **31**, pp. 13-26.

Gu, F., 2015, "*Characterization and Performance Prediction of Unbound Granular Bases with and without Geogrids in Flexible Pavements*", PhD thesis, Texas A&M University.

Gu, F., Zhang, Y., Luo, X., Sahin, H. & Lytton, R.L., 2017, "Characterization and prediction of permanent deformation properties of unbound granular materials for Pavement ME Design", *Construction and Building Materials*, **155**, November, pp.584-592

He, H., Zheng, J. and Li, Z., 2020, "Comparing Realistic Particle Simulation Using Discrete Element Method and Physics Engine", *Proc. Geo-Congress*, Geotech., Am. Soc. Civil Eng'rs., Special Publ'n 317, pp.464-472.

He, H., Zheng, J., Sun, Q. and Li, Z., 2019, "Simulation of Realistic Particles with Bullet Physics Engine", *Proc. IS-Glasgow 2019*, E3S Web of Conferences, **92**, 14004, 5pp.

Hertz, H., 1881, "Ueber die Berührung fester elastischer Körper" (On the contact of elastic solids), *Journal für die reine und angewandte Mathematik* **92**, pp.156-171.

Jain, A., 2017, "*Discrete Element Modeling of Railway Ballast for Studying Railroad Tamping Operation*", MS thesis, VirginiaTech

Karatza, Z., Andò, E., Papanicolopulos, S-A, Viggiani, G. & Ooi, J.Y., 2019, "Effect of particle morphology and contacts on particle breakage in a granular assembly studied using X-ray tomography", *Granular Matter*, **21**:44.

Korkiala-Tanttu, L., Laaksonen, R. and Törnqvist, J., 2003, *Effect of the spring and overload on the rutting of a low-volume road - HVS-Nordic-research*, Finnra Report **22/2003**, Finnish Road Administration, Helsinki, 2003, 39pp.

Kwon, J., Kim, S., Tutumluer, E. & Wayne, M., 2017, "Characterisation of unbound aggregate materials considering physical and morphological properties", *Int. J. Pavement Eng*., **18**(4), pp:303-308.

Lay, M.G., 1992, "*Ways of the World: a history of the world's roads and of the vehicles that used them"*, Rutgers University Press, 424 pp.

Little, P.H., 1993, "*The design of unsurfaced roads using geosynthetics"*, PhD thesis, Dept. of Civil Eng., Univ. Nottingham. http://eprints.nottingham.ac.uk/13141/1/357845.pdf

Mallett (illustrator), 1867, "Aveling & Porter Steam Road Roller", *Engineering*, 4th Oct.

Masad, E., Al-Rousan, T., Button, J, Little, D. & Tutumluer, E., 2007, "*Test Methods for Characterizing Aggregate Shape, Texture, and Angularity*", NCHRP Report **555**, National Academies Press.

McAdam, J.L., 1823, "*Remarks on the Present System of Road Making*", Longman, Hurst, Rees, Orme and Brown. https://www.gutenberg.org/ebooks/65022

Miao, Y., Yu, W., Hou, Y., Guo, L. & Wang, L., 2019, "Investigating the Functions of Particles in Packed Aggregate Blend using a Discrete Element Method", *Materials*, **12**, pp. 556-572.

Michot-Roberto, S., García, A., Dopazo-Hilario, S., Chiarelli, A. & Dawson, A.R., 2021, "The Spherical Primitive and Perlin Noise Method to Recreate Realistic Aggregate Shapes", *Granular Matter*, **23**, Article 41, 11pp.

Michot-Roberto, S., García-Hernández, A., Dopazo-Hilario, S. & Dawson, A.R., 2021, "Use of a physics toolbox to simulate aggregate packings", *Construction & Building Materials*, **311**, Paper 125254.

National Academy of Sciences, 1962, "*The AASHO Road Test, Report 7 – Summary Report*", Highway Research Board Spec. Rept. 61G.

Nijboer, L.W., 1948, "*Plasticity as a factor in the design of dense bituminous road carpets"*. Elsevier.

Peduzzi, P., 2019, "*Sand and sustainability: Finding new solutions for environmental governance of global sand resources*", UN Environment Program, Geneva

Proctor, R.R., 1933, "Fundamental principles of soil compaction", *Eng'ng News Rec.*, **111** (9, 10, 12, & 13).

Roque, R., Kim, S. & Guarin, A., 2006, "*Mixture tests to evaluate gradations for investigations in the accelerated pavement testing facility*", Tallahassee, FL: Florida Department of Transportation, Report D0111449.

Stark, N., Hay, A.E., Cheel, R. and Lake, C.B., 2014, *"*The impact of particle shape on the angle of internal friction and the implications for sediment dynamics at a steep, mixed sand–gravel beach"*, Earth Surf. Dynam*., **2**, pp.469–480.

Talbot, A.N. & Richart, F.E., 1923, "The strength of concrete in relation to the cement, aggregates and water", Univ. Illinois Engineering Experiment Station, *Bulletin* No. **137**.

Tutumluer, E., 2022, "*Unbound Aggregate Pavement Layers – Dynamic Loading Behavior and its Characterization*", 2021 Carl L. Monismith Lecture at the ASCE 2022 Geo-Congress, Charlotte, NC. https://www.youtube.com/watch?v=tO5LgUtADvs

US Geological Service, 2022, "Mineral Commodity Summaries 2022 - Stone (Crushed)", https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-stone-crushed.pdf & "Mineral Commodity Summaries 2022 - Sand and Gravel (Construction)", https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-sand-gravel.pdf

Vavrik, W.R., Huber, G.A., Pine, W.J., Carpenter, S.H. & Bailey, R., 2002, "Bailey Method for Gradation Selection in HMA Mixture Design". Transportation Research Board, *Circular* No. **E-C044**.

von Terzaghi, K., 1924, "Die Theorie der hydrodynamischen Spannungserscheinungen und ihr erdbautechnisches Anwendungsgebiet" (The theory of hydrodynamic stress phenomena and their field of application in earthworks), *Proc. 1st Int'l Congress for Applied Mechanics*, Delft, pp. 288–294.

Werkmeister, S., Dawson, A.R. & Wellner, F., 2001, "Permanent deformation behavior of granular materials and the shakedown theory", *Jnl. Transportation Research Board*, **1757**, pp. 75-81.

Werkmeister, S., Numrich, S., Dawson, A.R. & Wellner, F., 2003, "Design of granular pavement layers considering climatic conditions", *Jnl. Transportation Research Board*, **1837**, pp. 61-70.

Woné, M., 2019, "Ballast compaction for track renewal works: a numerical study by DEM simulations", *Railway Engineering 2019*, Edinburgh, ECS Publications, 11pp.

Yideti, T.F., Birgisson, B, Jelagin, A. & Guarin, D., 2013, "Packing theory-based framework to evaluate permanent deformation of unbound granular materials", *Int'l Jnl. Pavement Engineering*, **14**(3), pp. 309-320.

Zegzulka, J., Necas, J., Rozbroj, J., Gelnar, D., Ramírez-Gómez, A. & Jezerska, L., 2022, "Internal friction angle model of particles", *Scientific Reports*, **12**(1), 2036.

Zhang, X., Zhao, C., Zhai, W., Li, X., Feng, Y. & Mustoe, G., 2017, "DEM Analysis of Ballast Breakage Under Train Loads and Its Effect on Mechanical Behaviour of Railway Track", *Proc. 7th Int'l Conf. Discrete Element Methods*, pp:1323-1333.