

Deep Energy Foundations: Geotechnical Challenges and Design Considerations

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Dissertation submitted to the faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

In
Civil and Environmental Engineering

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February 1, 2013
Blacksburg, Virginia

Keywords: Geothermal, Energy Piles, Thermo-mechanical, Heat Exchanger, and Thermal Conductivity.
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Description of item under review for fair use: Appendix I Design weather data for the three selected locations from ASHRAE Fundamentals Handbook (2009) [used under fair use 2013, P.130]

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Description of item under review for fair use: Table 7-2. Typical values of Fsc (Kavanaugh and Rafferty, 1997 - used under fair use, 2013, P.191)

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Description of item under review for fair use: Table 7-1. Equivalent diameters and thermal resistances for Polyethylene U-tubes (Kavanaugh and Rafferty, 1997 - used under fair use, 2013, P.191)

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Description of item under review for fair use: Table 5-1. Components of exterior and interior walls, roof, and floor (McQuiston et al., 2004 - used under fair use, 2013, P.92)

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Description of item under review for fair use: Table 3-4. Liquid temperature change through ground coupled heat pumps (Kavanaugh and Rafferty, 1997 - used under fair use, 2013, P.48)

Report generated on: 05-01-2013 at : 19:42:36

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Description of item under review for fair use: Table 2-5. Specific heat and heat capacity of concrete (ACI, 2002 - used under fair use, 2013, P.24)

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Description of item under review for fair use: Table 2-4. Typical thermal conductivity for different soils (from Salomone and Marlowe, 1989 - used under fair use, 2013, P.21)

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Description of item under review for fair use: Table 2-3. Typical values for β and \square proposed by Côte and Konrad (2005 - used under fair use, 2013, P.19)

Report generated on: 05-01-2013 at : 19:39:24

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Description of item under review for fair use: Table 2-2. Typical proposed values for k (Côte and Konrad, 2005 - used under fair use, 2013, P.18)

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Description of item under review for fair use: Table 2-1. Typical values for the thermal properties of soils (Clarke et al., 2008 - used under fair use, 2013, P.14)

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Description of item under review for fair use: Figure 8.43. Validating the proposed finite element approach with the Lambeth College thermomechanical in-situ test results (Bourne-Webb et al., 2009 - used under fair use, 2013, P.322)

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Description of item under review for fair use: Figure 8.42. Validating the proposed finite element approach with the EPFL thermo-mechanical in-situ test results (Laloui et al., 2006 - used under fair use, 2013, P.42)

Report generated on: 05-01-2013 at : 19:34:23

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Description of item under review for fair use: Figure 8.31. Effect of thermal heating load on Energy Piles (Knellwolf et al. 2011 - used under fair use, 2013, P.303)

Report generated on: 05-01-2013 at : 19:33:26

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Description of item under review for fair use: Figure 8.29. Spring analogy for analyzing the mechanical response in a pile foundation (Knellwolf et al. 2011- under fair use, 2013, P.300)

Report generated on: 05-01-2013 at : 19:53:10

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Description of item under review for fair use: Figure 8.28. Load-transfer curves for the unit shaft friction and the unit base resistance (Frank and Zhao, 1982 - used under fair use, 2013, P.299)

Report generated on: 05-01-2013 at : 19:32:26

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Description of item under review for fair use: Figure 6.1. General location of the test site with respect to Virginia Tech main campus in Blacksburg, VA [from Google maps - used under fair use, 2013, P. 151]

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Description of item under review for fair use: Figure 3.1. Details of Ground Coupled Heat Pump (Siegenthaler, 2010 - used under fair use, 2013, P. 38)

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Description of item under review for fair use: Figure 2.5. Thermally induced soil-pile interaction during Energy Pile operation adapted from (Bourne- Webb et al., 2009 - used under fair use, 2013, P. 30)

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Description of item under review for fair use: Figure 2.3. Thermal conductivity against dry density and water content for frozen and unfrozen soils(adapted from Brandl, 2006 - used under fair use, 2013): (a) coarse-grained frozen soil; (b) coarse grained unfrozen soil; (c) fine-grained frozen soil; (d) fine-grained unfrozen soil, P. 22

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