KYLE M. ROLLINS

CURRICULUM VITAE

EDUCATION

Ph.D., Geotechnical Engineering, Univ. of Calif., Berkeley, Dec. 1987
Dissertation: The influence of Structures on Potential Liquefaction Damage
Minors: Seismology and Structural Mechanics
Honors: The Berkeley Doctoral Fellowship (3 year award)

M.S. level Study, Civil Engineering, Brigham Young Univ., 1982-1983
Honors: Tau Beta Pi Fellowship

B.S. Summa Cum Laude, Civil Engineering, Brigham Young Univ., April 1982
Honors: 3.99 GPA, highest in CE Dept. history; 4-yr Kimball Presidential Scholarship

PROFESSIONAL EXPERIENCE

Jan 1987 to Present, Full, Assoc. & Asst. Prof., Civil Eng, Dept, Brigham Young Univ., Provo, UT.

- Taught grad. & undergrad. courses in Geotechnical specialty area with consistent "excellent" teacher ratings.
- Performed research with 134 graduate students, produced more than 220 technical papers, and received over $8.0 million in research grants.

Research Accomplishments-Foundation Engineering

- Performed eleven full-scale lateral pile group tests (tripling world database) and developed p-multiplier vs. pile spacing curves for sand and clays.
- Performed 30 uplift load tests and developed design equations for skin friction on drilled shaft foundations in gravelly soil.
- Performed full-scale load tests to evaluate cyclic passive force-deflection relationships on pile caps and abutments and developed new design procedure.
- Developed passive force reduction factor equation for skewed abutments
- Conducted 32 full-scale lateral pile load tests on piles near MSE walls and developed p-multipliers to account for reduced lateral soil resistance.

Research Accomplishments-Earthquake Engineering

- Performed world's first full-scale lateral pile group load tests in sand liquefied by controlled blasting and developed lateral load-deflection (p-y) curves for liquefied sand.
- Conducted field tests to evaluate liquefaction induced downdrag
- Produced probabilistic liquefaction triggering curves for gravels based on a Dynamic Cone Penetration (DPT) and shear wave velocity tests at gravel liquefaction around the world.
- Developed relationships for shear modulus and damping versus cyclic shear strain in gravels necessary for computer analysis of ground shaking hazard.
- Performed world's first Statnamic (large-strain dynamic) lateral pile group load tests to evaluate damping resistance on piles in soft clay.

Research Accomplishments-Soil Improvement

- Worked with New Zealand Earthquake Commission to evaluate approved ground improvement methods based on controlled blasting tests in Christchurch.
- Developed simplified methods for predicting lateral pile resistance from ground improvement around piles (NCHRP report 697)
- Established design procedures for liquefaction mitigation of silty sands using stone columns with wick drains
- Developed pressuremeter-based testing procedure for identifying collapsible soil.
- Improved techniques for treating collapsible soils using dynamic deep compaction.

1984-1986 Research Assistant with Prof. H. Bolton Seed, Univ. of California, Berkeley. Performed research on the influence of buildings on liquefaction and subsequent performance. Conducted soil-structure interaction studies for buildings in Mexico City. Performed finite analyses and developed computer graphics interfaces for seismic analyses of Aswan High Dam, Egypt.

Summers 1982-1984, Design Engineer, Rollins, Brown and Gunnell, Inc., Provo, UT. Participated in the design of over 10 earth-fill dams in the intermountain west and performed slope stability analyses and finite element seepage analyses. Prepared plans and specifications for two earth-fill dams and conducted feasibility level study for $100 million water storage project in Wyoming involving pipelines, tunnel, pumping plant, and storage reservoir. Performed liquefaction and dynamic stability analyses for Middle Creek Dam, MT; West Fork Dam, WY; and Sevier River Bridge Dam, UT. Conducted slope stability evaluations for a number of natural slopes involving landslide repair. Prepared soil and foundation investigation reports for structures, roadways, and airport.

Summer 1979-1981, Soils Lab Technician/Inspector, Rollins, Brown, and Gunnell, Inc., Provo, UT. Participated in borrow investigations and supervised drilling operations for South Creek Dam, UT. Performed laboratory testing of soils including triaxial, direct shear, consolidation and permeability tests.

PROFESSIONAL SOCIETY MEMBERSHIPS

- American Society of Civil Engineers (ASCE)
  - Past Chair of ASCE Geo-Institute Technical Committee on Soil Improvement (2010-2016)
  - Former Member ASCE National Conference Coordination Committee (2010-2014)
  - Former Associate Editor ASCE Journal of Geotechnical and Geo-environmental Engineering
  - Technical Program Chair for GeoCongress 2012
- Member, TRB Committee on Seismic Design and Performance of Bridges – AFF50
- Chair, TRB Subcommittee on Geoseismic Issues in Bridge Design
- Editorial Board Member of Ground Improvement Journal, Institute of Civil Engineers (UK)
- Member Geotechnical Extreme Engineering Reconnaissance (GEER) association- Post earthquake team member for earthquakes in Costa Rica, Japan, Chile, & Ecuador.
- International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE)
- Technical Associate of ADSC: The Intl. Assoc. of Foundation Drilling-Invited speaker at national professor training seminar
- Earthquake Engineering Research Institute (EERI) – BYU Student Chapter Advisor 2002-2014, 2020
- Technical Associate PDCA: Pile Driving Contractors Association - Three time invited speaker at national professor training seminar
- Universities Council on Geotechnical Engineering Research (USUCGER)

- Board Member 2018-2021 and 2001-2004
- Deep Foundations Institute-invited speaker at national and international seminars
- Tau Beta Pi & Phi Kappa Phi– Engineering and Technology College representative conducting initiation events and judging competitions

HONORS & AWARDS

- ASCE Geo-Institute Cross-USA speaker for 2023-2024
- Invited-Speaker at 2nd Croatian Conf. on Earthquake Engineering, 2023
- Keynote Speaker for 1st Intl. Webinar series on Geotechnical Earthquake Engineering, IIT-Roorkee
- State-of-the-Art Speaker on liquefaction mitigation for ASCE GeoCongress 2022
- 45th Northwest Geotechnical Workshop (FHWA), Best Technical Presentation, 2021
- Hussein Professorship, BYU Civil & Environ. Engrg. Dept., 2018-2022
- Wallace Hayward Baker Award, Geo-Institute of ASCE, 2018
- Utah Governor's Medal for Science & Technology, 2017
- Keynote speaker, Indian Geotechnical Conference 2016, Chennai India
- George Sowers Symposium State-of-the-Practice Lecture, ASCE Georgia Geo-Institute Chapter and the Georgia Tech CEE Geosystems Group, 2014
- Jorj O. Osterberg Memorial Lecture & Award, Deep Foundations Institute, 2014
- Excellence in Citizenship Award, BYU Fulton College of Engineering and Technology, 2013
- James Cooper Best Paper Award-7th National Seismic Conf. on Bridges, 2013
- Research Trailblazer Award, Utah Department of Transportation, 2012
- ASCE GeoInstitute GeoFlorida Conference Top Paper award (from 370 papers), 2010
- Cross-Canada Geotechnical Lecturer, Canadian Geotechnical Society, Fall 2009
- BYU Karl G. Maeser Research and Creative Work Award, 2008
- James Cooper Best Paper Award-6th National Seismic Conf. on Bridges, 2008
- BYU College of Engineering and Technology Global Study Fellowship, 2006
- International Faculty Scholar at Indian Institute of Technology-Madras, Indian National Program for Earthquake Engineering Education, Spring 2006
- Utah Engineers Council Engineering Educator of the Year, 2000
- BYU Civil & Environmental Engineering Dept. Scholarly Productivity Award, 2000
- National ASCE Walter Huber Research Prize, 1999
- ASCE Utah Engineering Educator of the Year, 1999
- National ASCE Arthur M. Wellington Prize for paper in the Journal of Geotechnical Engineering, 1996
- Two papers listed among top ten in the ASCE Journal of Geotechnical Engineering during 1993-1994 and 1994-1995.
- ASEE-DOW Chemical Outstanding Young Faculty Award, 1991.
- ASEE-Navy Fellowship, 1990

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PEER-REVIEWED JOURNAL AND TECHNICAL PUBLICATIONS

1. Roy, J., ROLLINS, K., Dakal, R., and Cubrinovski, M. (2023). "A Comparative Study between the DPT and CPT in Evaluating Liquefaction Potential for Gravelly Soil at the Port of Wellington." . J. Geotechnical and Geoenviron. Engrg., ASCE (Accepted Jan 2023)\

2. Roy, J. ROLLINS, K., Athanasopoulos-Zekkos, A, Zekkos, D. (2023). "Correlation between Shear Wave Velocity and Dynamic Cone Resistance for Gravelly Soil." J. Geotechnical and Geoenviron. Engrg, ASCE, Accepted, Forthcoming

3. Roy, J. and ROLLINS, K.M. (2022). "Effect of hydraulic conductivity and impeded drainage on the liquefaction potential of gravelly soils." Canadian Geotechnical J., Canadian Science Publishing, 58(11) pp. 1950-1968, https://doi.org/10.1139/cgj-2021-0579

4. Salvatore, N., Pizzi, A., ROLLINS, K., Pagliaroli, A., Amoroso, S. (2022) "Liquefaction assessment of gravelly soils: the role of in situ and laboratory geotechnical tests through the case study of the Sulmona basin (Central Italy)." Italian Journal of Geosciences, 141(2):216-229 DOI: 10.3301/IJG.2022.18

5. Roy, J. ROLLINS, K.M., Athanasopoulos-Zekkos, A., Harper, M., Linton, N, Basham, M. Greenwood, W., Zekkos, D. (2022). "Gravel liquefaction assessment using dynamic cone penetration and shear wave velocity tests based on field performance from the 1964 Alaska earthquake." Soil Dynamics and Earthquake Engineering 160, Sept. (2022) 107357 https://doi.org/10.1016/j.soildyn.2022.107357

6. Amoroso, S; Martínez, M. F.; Monaco, P.; Tonni, L.; Gottardi, G.; ROLLINS, K. M.; Minarelli, L.; Marchetti, D.; Wissmann, K. J. (2022). Monitoring ground improvement by Rammed Aggregate Piers using a combined CPTU and SDMT approach at a silty sand liquefaction-prone site in Emilia-Romagna, Procs. CPT22 Bologna: 5th International Symposium on Cone Penetration Testing, Paper 1131, 6 p.

7. Colella, V; Cortellazzo, G.; Amoroso, S; Dei Svaldi, A.; ROLLINS, K.M.; Minarelli, L. (2022) "Stress increase induced by impact precast pile driving." Procs. CPT22 Bologna: 5th International Symposium on Cone Penetration Testing, Paper 1194, 6 p..

8. ROLLINS, K.M. and Wilson, A. (2022) "Lateral response of 0.6 m pipe piles near a mechanically stabilized earth (MSE) wall." Procs. 20th Intl. Conf. Soil Mech. and Geotechnical Engrg. Sydney, Australia.

9. ROLLINS, K.M., Roy, J., Athanasopoulos-Zekkos, A., Zekkos, D., Amoroso, S., Cao, Z., Millana, G., Vassallo, M., Di Giulio, G. (2022). "A New V_s-Based Liquefaction Triggering Procedure for Gravelly Soils." J. Geotechnical and Geoenvironmental Engrg., 148(6), 15 p. ASCE DOI: 10.1061/(ASCE)GT.1943-5606.0002784

10. Amoroso, S., Martinez, M.G. Monaco, P., Tonni, L., Gottardi, G., ROLLINS, K.M., Minarelli, L., Marchetti, D., Wissmann, K. (2022). "Comparative study of CPTU and SDMT in a silty sand liquefaction-prone site improved by Rammed Aggregate Piers and subjected to controlled blasting." J. Geotechnical and Geoenvironmental Engrg., ASCE 148(6), 18 p. DOI: 10.1061/(ASCE)GT.1943-5606.0002801

11. Minarelli, L., Amoroso, S., Civico, R., De Martini, P.M., Lugli, S., Martelli, L., Molisso, F., ROLLINS, K.M., Salocchi, A., Stefani, M., Cultrera, G., Milana, G., Fontana, D. (2022). "Liquefied sites of the 2012 Emilia earthquake: a comprehensive database of the geological and geotechnical features (Quaternary alluvial Po plain, Italy), Bulletin of Earthquake Engineering, Springer Science, March https://doi.org/10.1007/s10518-022-01338-7

12. ROLLINS, K.M., Luna, A., Budd, R., Besendorfer, J., Hatch, C., Han, J. Gladstone, R. (2022). "Lateral pile resistance, wall displacement, and induced reinforcement force for laterally loaded single piles near mechanically stabilized earth walls." J. Geotechnical and Geoenvironmental Engrg. ASCE 148(3). https://doi.org/10.1061/(ASCE)GT.1943-5606.0002739

13. Pesci, A., Teza, G., Loddo, F., ROLLINS, K.M., Anderson, P., Minarelli, L., and Amoroso, S., (2022). "Remote sensing of induced liquefaction: TLS and SfM for a full-scale blast test." J. Surveying Engineering, ASCE, 148(1), 12 p. DOI: 10.1061/(ASCE)SU.1943-5428.0000379

14. Onyelowe, K.C., Onyia, M.E., Aneke, F.I., Bui-Van, D., and ROLLINS, K.M. (2022). "Assessment of compressive strength, durability, and erodibility of quarry dust-based geopolymer cement stabilized expansive soil." Multiscale and Multidisciplinary Modeling Experiments and Design, Springer, 5, p. 81-90, https://doi.org/10.1007/s41939-021-00104-7

15. Amoroso, S., ROLLINS, K.M., Wissmann, K., and Minerelli, L. (2021). "Estimation of lateral spreading by SPT, CPTU and DMT following the 2016 M_w7.8 Ecuador earthquake." Procs. 6th Intl. Conf. on Geotechnical Site Characterization, Intl. Society for Soil Mechanics and Geotechnical Engineering, 8 p.

16. ROLLINS, K.M., Roy, J., Amoroso, S., Linton, N. (2021). "Evaluation of the Dynamic Cone Penetration Test (DPT) for liquefaction triggering at gravel sites in Alaska and Italy." Procs. 6th Intl. Conf. on Geotechnical Site Characterization, Intl. Society for Soil Mechanics and Geotechnical Engineering, 12 p.

17. ROLLINS, K.M., Roy, J., Athanasopoulos-Zekkos, A., Zekkos, D., Amoroso, S., Cao, Z. (2021). "New dynamic cone penetration test-based procedure for liquefaction triggering assessment of gravelly soils." J. Geotechnical and Geoenvironmental Engrg. ASCE, 147(12), 13 p. http://doi.org/10.1061/(ASCE)GT.1943-5606.0002686

18. ROLLINS, K.M., Amoroso, S., Anderson, P., Tonni, L., Wissmann, K. (2021). "Liquefaction mitigation of silty sands using rammed aggregate piers based on blast-induced liquefaction testing." J. Geotechnical and Geoenvironmental Engrg. ASCE, 147(9), http://doi.org/10.1061/(ASCE)GT.1943-5606.0002563

19. Rollins K. and Lusvardi C. (2021) "Chapter 4: Liquefaction-Induced Pile Downdrag from Full-Scale Testing." In: Sitharam T., Jakka R., Kolathayar S. (eds), Latest Developments in Geotechnical Earthquake Engineering and Soil Dynamics. Springer Transactions in Civil and Environmental Engineering, Singapore. p. 87-99.

20. Talesnick, M., Ringel, M., and ROLLINS, K. (2021). "Development of a hybrid soil pressure sensor and its application to soil compaction." Canadian Geotechnical Journal, 58(6) 811-822, https://doi.org/10.1139/cgj-2020-0272

21. ROLLINS, K.M., Singh, M., Roy, J. (2020). "Simplified equations for shear-modulus degradation and damping of gravels." J. Geotechnical and Geoenvironmental Engrg. ASCE, 146(9), 10 p. https://doi.org/10.1061/(ASCE)GT.1943-5606.0002300

22. Salocchi A. C., Minarelli L., Lugli S., Amoroso S., ROLLINS K.M., Fontana D. (2020). "Liquefaction source layer for sand blows induced by the 2016 megathrust earthquake (M_w 7.8) in Ecuador (Boca de Briceño).", J. South American Earth Sciences,

doi: https://doi.org/10.1016/j.jsames.2020.102737.

23. Shamsabadi, A., Schwicht, D.E.W., Dasmeh, A., ROLLINS, K.M, Taciroglu, E. (2020). "Validated lateral seismic force-displacement backbone curves for high speed rail bridge abutments". J. Bridge Engineering, ASCE . https://ascelibrary.org/doi/10.1061/%28ASCE%29BE.1943-5592.0001533

24. ROLLINS, K.M., Amoroso, S., Milan, G., Minerelli, L., Vassallo, M., Di Giulio, G. (2020). "Gravel liquefaction assessment using the dynamic cone penetration test based on field performance from the 1976 Friuli earthquake." J. Geotechnical & Geoenvironmental Engrg., ASCE, 146(6) https://DOI.org/10.1061/(ASCE)GT.1943-5606.0002252

25. Morales, C, Ledezma, C., Saez, E., Boldrini, S., and ROLLINS, K.M., (2020). "Seismic failure of an old pier during the 2014 M_w8.2, Pisagua, Chile earthquake." Earthquake Spectra, EERI, Vol. 36, No. 2, https://journals.sagepub.com/doi/10.1177/8755293019891726

26. Ishimwe, E., Coffman, R.A., and ROLLINS, K.M. (2020). "Predicting blast-induced liquefaction within the New Madrid seismic zone." AIMS Geosciences, Vol. 6, Issue 1, 71-91. http://doi: 10.3934/geosci.2020006

27. Shamsabadi, A., Dasmeh, A., Nojoumi, A., ROLLINS, K.M and Taciroglu, E. (2019). "Lateral capacity model for backfills reacting against skew-angled abutments under seismic loading" J. Geotechnical & Geoenvironmental Engrg., ASCE, 146(2), **https://doi.org/10.1061/(ASCE)GT.1943-5606.0002183**

28. Amoroso, S. ROLLINS, K.M., Andersen, P., Gottardi, G. Tonni, L., García Martinez, M.F., Wissmann, K., Minarelli, L., Comina, C., Fontana, D., De Martini, P.M., Monaco, P., Pesci, A., Sapia, V., Vassallo, M., Anzidei, M., Carpena, A,, Cinti, F., Civico, R., Coco, C., Conforti, D., Doumaz, F., Giannattasioh, F., Di Giulio, G., Foti, S., Loddo, F., Lugli, S., Manuel, M., Marchetti, D., Mariotti, M., Materni, V., Metcalfe, B., Milana, G., Pantosti, D., Pesce, A., Salocchi, A.C., Smedile, A., Stefani, M., Tarabusi, G., Teza, G., (2019). "Blast-induced liquefaction in silty sands for full-scale testing of ground improvement methods: Insights from a multidisciplinary study." Engineering Geology, Elsevier, 17 p., https://doi.org/10.1016/j.enggeo.2019.105437

29. Cao, Z, ROLLINS, K.M., Yuan, X., Youd, T.L., Talbot, M., Roy, J.., Amoroso, S., (2019). "Applicability and reliability of CYY formula based on Chinese Dynamic Penetration Test for liquefaction evaluation of gravelly soils." Chinese Journal of Geotechnical Engineering, 41(9): 1628-1635, https://doi.org/10.11779/CJGE201601018

30. ROLLINS, K.M. Fredrickson, A., Scott, E. (2019). "Effect of Interface Friction on Passive Force on Bridge Abutments." Procs. 7th Intl. Conf. on Ground Deformation Characteristics of Geomaterials (IS-Glasgow 2019), E3S Web of Conferences 92, EDP Sciences, Les Ulis, France, Article No. 13013, 5 p. https://doi.org/10.1051/e3sconf/20199213013

31. ROLLINS, K.M., Oakes, C., Meservy, T. (2019). "Liquefaction Mitigation Potential of Prefabricated Vertical Drains from Large-Scale Laminar Shear Box Testing." Procs. 16th Pan American Conference on Geotechnical Engineering & Soil Mechanics, IOS Press, Amsterdam, Netherlands, p. 2104-2115. https://doi:10.3233/STAL190272

32. ROLLINS, K.M., Black, R., Schwicht, D.E., Shamsabadi, A. (2019). "Passive force-deflection curves for transition zone backfills for high-speed rail bridge abutments." Procs., 17th European Conference on Soil Mechanics and Geotechnical Engineering, Iceland Geotechnical Society, 8 p. doi: 10.32075/17ECSMGE-2019-0112

33. Kevan, L.I., ROLLINS, K.M., Coffmann, R.A., and Ishimwe, E., (2019). "Full-scale blast liquefaction testing in Arkansas USA to evaluate pile downdrag and neutral plane concepts." Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions, Procs. 7th Intl. Conf. on Earthquake Geotechnical Engineering, Taylor and Francis, p. 648-655.

34. Amoroso, S., ROLLINS, K.M., Andersen, P., Gottardi, G., Tonni, L., Garcia Martinez, M.F., Wissmann, K., and Minarelli, L. (2019). "Full-scale testing of liquefaction mitigation using rammed aggregate piers in silty sands." Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions, Procs. 7th Intl. Conf. on Earthquake Geotechnical Engineering, Taylor and Francis, p. 656-663.

35. Athanasopoulos-Zekkos, A., Zekkos, D., ROLLINS, K.M., Hubler, J., Higbee, J., Platis, A. (2019). "Earthquake performance and characterization of gravel-size earthfills in the ports of Cephalonia, Greece, following the 2014 Earthquakes." Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions, Procs. 7th Intl. Conf. on Earthquake Geotechnical Engineering, Taylor and Francis, p. 1212-1219.

36. ROLLINS, K.M. and Amoroso, S. (2019). "Evaluation of dynamic cone penetration test for liquefaction assessment of gravels from case histories in Italy." Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions, Procs. 7th Intl. Conf. on Earthquake Geotechnical Engineering, Taylor and Francis, p. 4744-4751.

37. ROLLINS, K.M., Wagstaff, K.B., Black, R., (2019). "Passive Force-Deflection Curves for Controlled Low-Strength Material (CLSM) and Lightweight Cellular Concrete (LCC)." GeoCongress 2019: Earth Retaining Structures and Geosynthetics **https://doi.org/10.1061/9780784482087.011** (GSP 306), ASCE, 10 p.

38. ROLLINS, K.M., Youd, T.L. and Talbot, M. (2018). "Evaluation and Optimization of Dynamic Cone Penetration Test (DPT) for Assessment of Liquefaction in Gravelly Soils." Procs. Dam Safety 2018, Assoc. of State Dam Safety Officials, Seattle, Washington, 17 p.

39. ROLLINS, K.M., Talbot, M., and Youd, T.L. (2018). "Evaluation of Dynamic Cone Penetration Test for Liquefaction Assessment of Gravels from Case Histories in Idaho." Procs. Geotechnical Earthquake Engineering and Soil Dynamics V, 11 p.

40. Amoroso, S., ROLLINS, K.M., Lusvardi, C., Monaco, P., and Milana, G. (2018). "Blast-Induced Liquefaction Results at the Silty-Sand Site of Mirabello (Emilia Romagna Region, Italy)." Procs. Geotechnical Earthquake Engineering and Soil Dynamics V, 10 p.

41. Sebastian Lopez, J. Vera-Grunauer, X., ROLLINS, K., and Salvatierra, G. (2018) "Gravelly Soil Liquefaction after the 2016 Ecuador Earthquake." Procs. Geotechnical Earthquake Engineering and Soil Dynamics V, 13 p.

42. Morales, C., Ledezma, C., Saez, E., and ROLLINS, K (2018). "Simplified Evaluation of the Seismic

Failure of an old Wharf During the 2014 M_w8.2, Pisagua, Chile earthquake." Procs. Geotechnical Earthquake Engineering and Soil Dynamics V, 14 p.

43. Rollins, K.M., Luna, A., Besendorfer, J., Hatch, C., Han, J., Gladstone, R. (2018). "Lateral Resistance of Abutment Piles near Mechanically Stabilized Earth walls." Procs., International Foundation Congress and Equipment Expo. 10 p.,

44. Russell, D. and ROLLINS, K.M. (2018). "Lateral Resistance of Piles within Corrugated Metal Sleeves." Procs., International Foundation Congress and Equipment Expo. 10 p.

45. Ishimwe, E., Coffman, R.A., and ROLLINS, K.M. (2018). "Analysis of post-liquefaction axial capacities of driven pile and drilled shaft foundations." Procs., International Foundation Congress and Equipment Expo. 10 p.

46. Amoroso, S., Rollins, K.M. Monaco, P., Holtrigter, M., and Thorp, A. (2018). "Monitoring ground improvement using the seismic dilatometer in Christchurch, New Zealand." Geotechnical Testing Journal, ASTM, Vol. 41, No. 5, pp. 946-966, https://doi.org/10.1520/GTJ20170376.

47. Rollins, K.M., Strand, S.R., and Hollenbaugh, J.E. (2018). "Liquefaction Induced Downdrag and Dragload from Full-Scale Tests." Developments in Earthquake Geotechnics, Chapter 5, Springer International Publishing, Editor: Iai, S., 89-109 p.

48. Amoroso, S., Milana, G., ROLLINS, K.M., Comina, C. Minarelli, L. Manuelo, M.R., Monaco, P. et al. (2017). "The First Italian Blast-Induced Liquefaction Test (Mirabello, Emilia-Romagna, Italy): Description of Experiment and Preliminary Results." Annals of Geophysics, Vol. 60, No. 5, S0556; doi: 10.4401, 19 p.

49. ROLLINS, K.M., Youd, T.L. and Talbot, M. (2017). "Liquefaction Evaluation at a Gravel Site using the Dynamic Penetration Test and the Becker Penetration Test." Procs. Performance Based Design III, Vancouver, Canada, 8 p.

50. Martinez, A., Hube, M.A., ROLLINS, K.M. (2017) "Analytical Fragility Curves for Non-Skewed Highway Bridges in Chile." J., Engineering Structures, Elsevier Ltd., Vol. 141, June, p. 530-542.

51. ROLLINS, K. and Oakes, C. (2017). "Effectiveness of Vertical Drains for Liquefaction Mitigation Based on Large-Scale Laminar Shear Box Testing." Procs. 19th Intl. Conf. on Soil Mech. and Geotechnical Engrg., Seoul, Korea, 5 p.

52. ROLLINS, K.M., Scott, E., Marsh, A. (2017). "Geofoam Inclusions for Reducing Passive Force on Bridge Abutments Based on Large-Scale Tests." Procs. Geotechnical Frontiers, Geotechnical Special Publication 279, ASCE, p. 59-68.

53. Fredrickson, A., ROLLINS, K.M., Nicks, J. (2017). Passive force-deflection behavior of geosynthetically reinforced soil (GRS) backfill based on large-scale tests." Procs. Geotechnical Frontiers, Geotechnical Special Publication 278, ASCE, p. 23-32.

54. Franke, K.W. and ROLLINS, K.M. (2017). "Lateral spread displacement and bridge foundation case histories from the 1991 M7.6 Earthquake near Limón, Costa Rica." J. Geotechnical and Geoenvironmental Engineering, ASCE, Vol. 143, No. 6, 17 p. https://doi.org/10.1061/(ASCE)GT.1943-5606.0001653

55. De La Maza, G., Williams, N., Saez, E., ROLLINS, K., Ledezma, C. (2017) "Liquefaction-induced lateral spread in Lo Rojas, Coronel, Chile. field study and numerical modeling." Earthquake Spectra, EERI, Vol. 33, No. 1, 219-240

56. Tryon, G., ROLLINS, K., Williams, N., Franke, K., Saez, E., Ledezma, C. (2017) "Comparison of measured and computed lateral spread displacements for Mw 8.8 Maule Chile case histories." Procs. 16th World Conf. on Earthquake Engineering, Santiago, Chile, 10 p., Paper 2640

57. Candia, G., Ledezma, C., Montalva, G., ROLLINS, K. (2017). "Geotechnical Observations From the 2014 Iquique Earthquake." Procs. 16th World Conf. on Earthquake Engineering, Santiago, Chile, 10 p., Paper 2163.

58. Nikolaou, S., Vera-Grunauer, X., Gilsanz,, R. Luque, R., Kishida, T., DiazFanas, G., Antonaki, N. Toulkeridis, T., Miranda, E., Diaz, V., Alzamora, D., AthanasopoulosZekkos, A., Lyvers, G., Morales, E., López, P., ROLLINS, K., Wood, C., O'Rourke, T., Lopez, S. (2017). "GEER-ATC Mw7.8 Ecuador 4/16/16 Earthquake Reconnaissance Part 1: Seismological & Ground Motion Aspects." Procs. 16th World Conf. on Earthquake Engineering, Santiago, Chile, 10 p

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RESEARCH PROJECTS

1. "Evaluation and Improvement of Methods to Consider Influence of Surface Clay Layers on Liquefaction-Induced Settlement from Large Database", $123,980 External Grant from US Geological Survey Earthquake Hazard Reduction Program, April 2022-2024.

2. "Behavior of Reinforced and Unreinforced Lightweight Cellular Concrete (LCC) for Retaining Walls", $325,700 FHWA Pooled Fund Study TPF-5(433), Utah, California, Louisiana, Missouri, New York, Oregon, Washington, Federal Highway Administration.

3. "RAPID: Blast Testing to Investigate Resin-Injection Treatment for Liquefaction Mitigation", Grant from the National Science Foundations, $191,335, March 2019- March 2021

4. "Proposed AASHTO Specifications for Design of Piles for Downdrag" Project No. 12-116, National Cooperative Highway Research Program (NCHRP), Transportation Research Board, $40,000 Contract, 2019-2020

5. "Evaluation of Lateral Pile Resistance Near MSE Walls at a Dedicated Wall Site-Phase 2" $240,000 FHWA Pooled Fund study TPF-5(381), Utah, Kansas, Florida, California, Wisconsin, and Minnesota DOTs, 2018-2022.

6. "Improved Correlations for Soil Parameters in LPILE Analysis", $50,000, Utah Department of Transportation. 2018-2022

7. "Collaborative Research: Integrated Field and Laboratory Based Assessment of Liquefaction Triggering and Residual Strength of Gravelly Soil", $558,700 grant from National Science Foundation, Sept. 2017-Sept. 2023 with Prof. Adda Athanaspoulos-Zekkos, Univ. of Michigan ($279,878 BYU)

8. “Passive Force-Deflection Relationships for Transition Zone Backfill for California High Speed Rail”, WSP, $127,000 award, 2017-2019

9. “Passive Force-Deflection Behavior of Controlled-Low Strength Backfill” Grant, FHWA Pooled Fund Study, $130,000, California, Utah, Wisconsin DOTs, 2016-2021.

10. “Evaluation and Optimization of Dynamic Cone Penetration test (DPT) for Deterministic and Performance Based Assessment of Liquefaction in Gravel.” US Geological Survey, External Earthquake Hazard Research Program, $91,637, 2016-2017.

11. “EAGER:Downdrag load tests in Liquefied Sand” $37,000 grant from NSF, 2016-2018

12. “Axial Behavior of Piles in Liquefied Sand”, $300,000 grant from the Arkansas Dept. of Transportation, with Prof. Rick Coffman, Univ. of Arkansas (BYU portion $100,000). 2015-2017.

13. “Pile Downdrag Testing using Blast Liquefaction” $42,000 grant from PEER, FHWA, and Utah DOT, 2014-2015.

14. “RAPID: Pile Downdrag Behavior Based on Blast Liquefaction Testing” $199,955 grant from the US National Science Foundation, 2014-2015.

15. “Evaluation of Lateral Pile Resistance Near MSE Walls at a Dedicated Wall Site” $324,000, FHWA Pooled Fund Study TPF-5(272), Utah, Florida, Oregon, Iowa, Kansas, Montana, Massachusetts, Minnesota, New York, Texas, 2014-2016

16. “Evaluation of EQ Drains using Laminar Box and Shaking Table Tests”, FHWA Pooled Fund Study $115,000, Utah, California, New York, and Alaska DOTs, 2014-2016.

17. “Passive Force-Displacement Relationships for Skewed Abutments” $285,000, FHWA Pooled Fund Study, Utah, California, Oregon, Montana, Minnesota, New York DOTs, 2012-2015.

18. “Development and Validation of Performance Based Design Procedures for Kinematic Loading of Pile Foundations During Lateral Spreading”, NSF Grant, $220,492, 2012-2015.

19. “EAGER: Evaluation of effectiveness of Vertical Drains for Liquefaction Mitigation”, $50,000 grant from the US National Science Foundation, 2010-2014.

20. “Wick Drain Effectiveness in Sensitive Clays”, $56,300 Contract with the Utah Dept. of Transportation, 2010-2011.

21. “Subsurface investigation and analysis of bridges in Costa Rica damaged by lateral spreading to evaluate and improve design procedures for kinematic loading of piles”, $89,699 Grant from the U.S. Geological Survey Earthquake Hazard Research Program, 2010-2011.

22. “Lateral Load Resistance of Piles Near MSE Walls”, Current $50,485 Contract with the Utah Dept. of Transportation, 2009-2011.

23. “Stone Column Treatment with Wick Drains in Silty Sands”, Current $49,243 grant from Utah Dept. of Transportation, 2006-2007.

24. “Full-Scale Field Testing Experiences for Undergraduate Students”, Current $19,010 Mentoring grant from the Office of Research and Creative Activities, Brigham Young University, 2006-2008.

25. “Project 24-30 Design Guidelines for Increasing the Lateral Resistance of Highway Bridge Pile Foundations by Improving Weak Soils” $500,000 contract with National Cooperative Highway Research Program of the Transportation Research Board, 2006-2008.

26. “Dynamic Passive Pressure on Pile Caps and Abutments”, $265,000 pooled fund contract with Utah Dot as lead agency and Caltrans, New York DOT, Oregon DOT, and Montana DOT as co-sponsors, 2006-2008

27. “Field Testing Experiences for Undergraduate Students”, Completed $15,810 Mentoring grant from the Office of Research and Creative Activities-Brigham Young University, 2004-2005.

28. “Dynamic Passive Pressure on Full-Scale Pile Caps-NEESR-II” Current $388,436 grant from NSF under Network for Earthquake Engineering Simulation Research Initiative program, 2004-2007.

29. “Evaluation of Downdrag Forces Resulting From Embankment Settlement” Current $45,327 grant from Utah DOT, 2004-2005

30. Liquefaction Mitigation using Vertical Composite Drains: Full-Scale Testing for Pile Applications, Current $133,205 grant (with cost-sharing) from Transportation Research Board IDEAS program, 2004-2005.

31. “Liquefaction Mitigation Using Vertical Drainage: Full-Scale Testing.” Completed $106,705 grant (with cost-sharing) from Transportation Research Board-IDEAS program, 2002-2003 (2 students funded.)

32. “Static and Dynamic Lateral Load Testing of Pile Groups in Soft Clay.” Completed $252,000 grant from NSF, 2001-2004. (4 students funded.)

33. “Rate Effects on Vertical Load Resistance of Piles in Clay.” Current $150,000 grant from UDOT/FHWA, 2001-2004, with Prof. David Jensen. (2 students funded.)

34. “Lateral Resistance of Deep Foundations in Liquefied Sand.” Completed $104,800 grant from NSF, 2001-2004. (2 Students funded.)

35. “Full-Scale Lateral Pile Cap and Backfill Load Testing.” Completed $88,700 grant from Utah DOT and FHWA, 2000-2003, (1 Ph.D. Student funded.)

36. “Roadway Distress Study for I-15 near Nephi, Utah.” Completed $44,000 grant from Utah DOT, 2000-01, (1 student funded.)

37. “Corrosion Evaluation of Original I-15 Pipe Piles.” Completed $43,600 grant from Utah DOT and FHWA, 2000-2003 (1 student funded.)

38. “Response, Analysis and Design of Pile Groups subjected to Lateral, Uplift and Compressive Loads.” Completed $417,605 grant from Utah, California, New York, Arizona, and Washington Depts. of Transportation (5 students funded) 1999-2002.

39. “Lateral Load Behavior of Deep Foundations in Liquefied Ground.” Completed $670,000 grant (with Scott Ashford, U.C. San Diego) from California DOT, Utah DOT, Oregon DOT, Washington DOT, Missouri DOT, New York DOT and Federal Highway Administration, 1998-2001 (4 students Funded).

40. “Pile Load Testing for Improving Pile Design on the I-15 Corridor in Salt Lake Valley, Utah.” Completed $39,000 contract with Wasatch Constructors, Inc. 1997-1998 (3 students funded)

41. “Transforming Swampland into Nauvoo, the City Beautiful-A Civil Engineering Perspective.” Completed $5300 grant from the BYU Religious Studies Center, 1997-1998 (1 student funded)

42. “Seismic Zonation using Geotechnical Site Response Mapping, Salt Lake Valley, Utah.” Completed $30,000 grant from the U.S. Geological Survey (with Utah Geological Survey), 1997-1998, (1 student funded)

43. “Destructive Testing Options for Abandoned I-15 Structures.” Completed $10,000 grant from Utah Dept. of Transportation, 1997.

44. “Full-scale Static and Dynamic Lateral Load Testing of a Pile Group in Soft Clay.” Completed $197,400 grant from Utah DOT, FAA, NCEER, FHWA, and NSF, 1995-1997, (3 students funded)

45. “In-Situ Collapsible Soil Testing.” Completed $12,500 grant from Utah DOT, 1995-1996, (1 student funded)

46. “Ground Response at I-15 Bridge Sites on Soft Ground in Salt Lake Valley, Utah.” Completed $41,000 grant from Utah DOT, 1994-1996, (2 students funded)

47. “Ground Response and Damage Intensity Correlations in Heavy Damage Zones on Basin Fringe Locations During the Northridge Earthquake.” Completed $72,000 grant from NSF, 1994-1997. (4 students funded)

48. “Ultimate Skin Friction on Drilled Shafts in Gravels using Uplift Load Testing.” Completed $55,000 grant from Utah DOT, 1992-1994. (3 students funded, 2 papers)

49. “Optimal Moisture Content Considerations for Dynamic Compaction.” Completed $50,385 grant from NSF, Natural and Man-Made Hazard Mitigation Section, 1991-1992. (2 students funded, 2 papers)

50. “Prediction of Liquefaction in Centrifuge Model Tests Using Total Stress Methods.” Completed $15,000 grant from NSF, Earthquake Hazard Mitigation Section, October 1991-April 1993. (1 student funded, 1 paper)

51. “Liquefaction Investigations for the 1991 Costa Rica Earthquake.” Completed $20,000 grant from NSF Earthquake Hazard Mitigation Section, with Dr. T.L. Youd, May 1991-May 1992. (2 students funded, 3 papers)

52. “Amplification of Earthquake Motions in Salt Lake Valley due to Basin Geometry and Shallow Soil Response.” Completed $24,622 grant from the U.S. Army Corp of Engineers, Waterways Experiment Station, Vicksburg, Mississippi, Sept. 1990-Feb. 1992. (1 student funded, 1 report, 1 paper)

53. “Earthquake Damage Potential Mapping for Salt Lake Valley.” Completed $20,000 grant from the Utah Geological Survey, Sept. 1990-March 1992. (1 student funded, 1 report to date)

54. “Verification of Ground Response Techniques for Soft Soil Profiles.” Completed $50,000 grant from NSF Earthquake Hazard Mitigation Section, May 1990-May 1992. (2 student funded, 3 papers to date)

55. “Evaluation of Pile and Drilled Shaft Design Equations and Constructions Procedures.” Completed $30,000 grant from Utah Dept. of Transportation ($15,000 to Prof. Loren Anderson, Utah State Univ. For the pile foundation analysis) and $5,000 grant from the Drilled Shaft Contractors Assoc., 1990-1991 (1 student funded, 2 papers)

56. “Collapsible Soil Hazard Mapping for Cedar City Area.” $5,000 grant from Utah Geological and Mineral Survey, 1989-1990. (1 student funded, 3 papers)

57. “Three-Dimensional Flow Modeling of a Perched Water Zone at Idaho National Engineering Laboratory.” Graduate student support from US Geological Survey (1 student funded)

58. Research Initiation Grant: “Mitigation Measures for Small Structures on Collapsible Soils.” $46,700 NSF grant, 1988-1989. (1 student funded, 3 papers)

59. “Collapsible Soil Hazard Mapping on Southern Wasatch Front.” $10,500 grant from Utah Geological and Mineral Survey, 1987-1988. (1 student funded, 3 papers)

60. “Laboratory Simulation of Collapsible Alluvial Soil Deposition.” $4000, BYU Research Initiation Grant, 1987 (1 student funded, 1 paper)

UNIVERSITY AND DEPARTMENT COMMITTEE WORK

- Chair, Dept. Faculty Development Committee (2018-Present)
- Faculty Advisor, Tau Beta Pi Chapter (2016-present)
- Member, Dept. Faculty Development Committee (2014-2018)
- Member, University Advancement in Rank Committee (2011-2014)
- Chair, Dept. Faculty Development Committee (2009-2011)
- Member, University Advancement in Rank Appeals Committee (2009-2011)
- Member, University 10 year NCAA Academic Review Committee (2008)
- College Representative to University Faculty Advisory Committee (2006-2009)
- Member, College Advancement-in-Rank Committee (2006-2009)
- Member, Search Committee for Dean of College of Engineering and Technology (2004)
- Chair, Dept. Geotechnical Specialty Group (1989-1994, 2001-2008, 2011-present)
- Member, Dept. Undergraduate Committee Member (1994-2006)
- Chapter Advisor, BYU Earthquake Engineering Research Institute Chapter (1996-present)
- Member, Univ. Presidential Scholarship Committee (1991-1996)
- Member, Dept. Advancement in Rank Committee (1988-1989, 1990-1991, 1993, 2005)
- Member, Dept. Scholarship and Recruiting Committee (1989-1994)
- Member, Dept. Graduate Committee Member (1989-1994)

TECHNICALLY SIGNIFICANT CONSULTING

Liquefaction and Slope Stability Evaluations

- Seismic Hazard Expert Panel on Wanapum Dam, Washington
- AT&T Building Evaluation, Oakland and Berkeley, California,
- External Reviewer, Resin Injection Trials, Christchurch, New Zealand, Ministry of Business, Innovation and Employment
- Ground Improvement Blast Liquefaction Trials in Christchurch, New Zealand, for Tonkin & Taylor and the New Zealand Earthquake Commission
- Foundation Testing in Liquefied Sand for Cooper River Bridge in Charleston, South Carolina (longest cable-stayed bridge in N. and S. America) for South Carolina Dept. of Transportation.
- Runway and Perimeter Dike Expansion-Static and Seismic Stability Analysis for Provo, Utah Airport
- Great Salt Lake Inter-island Diking Project-Static and Seismic Stability Analysis for RBG Engineering (Utah Div. of Water Resources)
- Liquefaction risk assessment for Salt Lake City, Utah Water Reclamation plant.
- Forsythe Dam, Utah – Static and Seismic Slope Stability Analysis for RBG Engineering
- Sand Hollow Dam, Utah – Static and Seismic Deformation Analysis for RBG Engineering
- Trial Lake Dam, Utah – Static and Seismic Stability Analysis for Provo River Water Users
- Smokey Canyon Dam, Idaho – Static and Seismic Stability Analysis for Simplot Mining Company
- Viva Naughton Dam, Wyoming – Seismic Stability Analysis for Utah Power & Light Company
- Ashton Dam, Idaho – Static and Seismic Stability Analysis for Utah Power and Light Company

Seismic Site Response Evaluations

- 22 story Eagle Gate Plaza, Salt Lake City
- Salt Lake City International Airport Parking Plaza

- I-15 Interchange Structures in Salt Lake City, Utah
- Salt Lake International Airport Expansion with RBG Engineering

Blast Vibration Analysis

- Expert Witness for Anderson, St. Denis, and Glen, Attorneys., Jacksonville, Florida

Lateral Pile Load Investigations

- Foundations for Reflectors at Ivanpah Solar Power Generating Station near Primm, Nevada (World's largest Solar Power Facility) for BrightSource with Ninyo and Moore, Las Vegas.
- Foundations for Emergency Escape System for Launch Pad 39B, Kennedy Space Center, Florida with Reynolds, Smith and Hills, Inc.
- Micropile foundations for Vehicle Assembly Building, Kennedy Space Center, Florida with Reynolds, Smith and Hills, Inc.