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FOUNDATION UNDERPINNING WITH MINI-PILES “A FIRST” IN GUYANA, SOUTH AMERICA

Richard P. Stulgis¹, Member ASCE, Brock E. Barry², Member ASCE, Francis S. Harvey, Jr.³, Member, ASCE

ABSTRACT: In 1994, USAID provided funding to the Sisters of Mercy of the Americas for construction of a three-story expansion to the St. Joseph’s Mercy Hospital in Georgetown, Guyana, South America. Subsurface conditions consist of approximately 16.5 m of very soft to soft marine clay overlying stiff to very stiff clays. The foundation system employed was a soil-supported, monolithically-cast, reinforced concrete mat foundation with down-turned beams arranged in a grid pattern below the mat. Damaging building settlement occurred within the first few years after completion of construction. In 1997, investigations were conducted to identify the cause of the on-going building settlement, and a remedial foundation design was subsequently developed. Foundation underpinning was performed in 2000, and consisted of installation of 102 grouted mini-piles (approximately 15 cm in diameter; 21 to 29 m long) drilled through the foundation mat and upper soft clay into the underlying very stiff/hard clay stratum. This is the first use of drilled, grouted mini-pile foundations in Guyana. Load transfer to the mini-pile foundations was achieved by constructing 28 reinforced concrete pile caps at existing column locations. The paper will describe: a) the nature of the building settlement problem, b) the basis for and details of the remedial foundation design, c) the unique aspects of mini-pile installation adopted by the Contractor, d) results of pile load tests, e) and post-construction settlement monitoring results.

¹ Director of Consulting Services; Geocomp Corporation, 125 Nagog Park, Acton, MA 01719

² Staff Engineer; Haley & Aldrich of New York, 200 Town Centre Dr., Rochester, NY 14623

³ Principal; Harvey & Tracy Associates, Inc, 143 Dewey St., Worcester, MA 01610