
TOWN OF AMHERST
SOILS AND RESIDENTIAL FOUNDATION STUDY

Prepared For:

Town of Amherst

5583 Main Street
Williamsville NY 14221

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Prepared By:

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EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers and the Town of Amherst conducted a one-year cooperative investigation of residential foundation damages in Amherst, New York (2004-05). The study purpose was to determine (1) the extent and scope, (2) causative factors, and (3) provide recommendations to Town officials and homeowners. The study methods included a literature review, house inspections (43 sites), soil sampling (32 sites), field inspections (bimonthly), and a phone survey (52 homeowners).

Nearly 1,100 foundation repair permits and foundation inquiries have been received by the Town since 1987. Seventy-five percent of the permits and inquiries are located north of Main Street on lowlands with fine-grained lacustrine (geologic lake) soils. The town-wide foundation damage rate on lacustrine soils is about 3 percent, but in several affected areas the rate is an order of magnitude greater. The cost of some foundation-related repairs exceeded \$100,000, but most homeowners have spent less than \$20,000.

The damages generally result from lateral pressures and/or differential settlement. Lateral pressures are caused by soil weight, frost, hydrostatic pressure, and shrink/swell. The backfill and the underlying foundation soils are classified as moderate to highly expansive and undergo volumetric change as their moisture content varies. A non-uniform change in soil moisture content across the foundation footprint is a primary causative factor for differential settlement. A second primary causative factor for differential settlement involves the soft stratum that underlies the stiff stratum, where many residential footings are placed. This soft clay stratum is susceptible to consolidation with a drop in groundwater elevation and/or the addition of perimeter fill material. In addition to problematic soil conditions, foundation inspections revealed that houses were designed and constructed without fully considering lateral pressures and potential settlement.

The primary recommendation to the Town is to develop and adopt new guidelines for the design/ construction and assessment/repair of residential foundations to supplement existing building codes. Recommendations for homeowners include conducting an annual foundation inspection and retaining a licensed, qualified engineer when appropriate.