CASE STUDY

Grain Bin Foundation Repair

TERRATHANE™

PROBLEM

Soil consolidation and settlement happens. It's a fact of farm life. Secondary consolidation slowly forces water out of the spaces between soil particles. As this happens, soil particles move close together and settling occurs. Floors drop and become uneven. Newer grain silos and bins are using concrete floors instead of metal, and as secondary consolidation occurs beneath them, depressed or settled areas, form within the bin floor. Grain accumulates in the depressed areas, but cannot be retrieved by the bin sweeper. In fact, the sweeper, a kind of auger that transports grain up from the floor.

This is exactly what Kirk Roberts of CJGeo, a Williamsburg, Virginia-based, commercial and industrial foundation repair and geotechnical contractor, found when he got the job to repair the foundation of a massive 106-foot diameter grain bin at a poultry processing facility on the Eastern Shore of Maryland. "Once they removed the hundreds of thousands of bushels of grain, we found the floor had dropped some three inches in one section of the bin leaving a large pocket of grain out of reach of the bin sweeper.

SOLUTION

CJGeo decided to use a polyurethane void filling and concrete lifting technology called geotechnical polyurethane foam to solve the problem. "A concrete foundation is a concrete foundation," says Roberts. "We use this geotechnical poly foam technology to repair warehouse foundations, apartment complexes, and concrete slab highways. Why not on a grain bin?"

Roberts says his company uses a product called TerraThane™ by the US company, NCFI Polyurethanes. "They were instrumental in some of the very first geotechnical poly foams formulated and produced in the US and have perfected it, so we trust them. TerraThane is relatively simple, clean, and easy to use. The conventional thought would require us, or someone, to jackhammer up and rip out the concrete foundation then repour the damaged section. That would take heavy equipment, weeks or even months of very disruptive work, cost a small fortune, and be exceedingly difficult as the two doors are six feet off the ground and only eight square feet." Roberts adds having to work around ventilation ducts and troughs made the project more difficult, but TerraThane gave his team flexibility. "It would have been near impossible using any other method."

RESULTS

"With TerraThane Geotechnical Polyurethane Foam, we drilled small, unobtrusive 5/8th inch holes then injected 5,000-6,000 pounds of TerraThane until the void was filled and the concrete lifted to a level position.

"Saving time is the same as saving money."

We then capped the holes, did a bit of light cleaning up, and were out of there." According to Roberts the work took only two days and they refilled the grain bin on day three. "Saving time is the same as saving money. In this case, we saved the processor money by using TerraThane™ instead of concrete replacement, and more money by getting the job completed in only two days. TerraThane™ is ideal for repairing the concrete foundations of grain bins and silos."

Learn more at
www.TerraThane.com
or call
1-800-346-8229

TERRATHANE™

50 YEARS OF FOAM

NCFI POLYURETHANES

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TERRATHANE™ 24 SERIES SYSTEM

DESCRIPTION

TerraThane™ 24 series, geotechnical polyurethane systems are two-component, closed-cell, rigid polyurethane foam designed for concrete raising/lifting/leveling, void fill and cavity fill applications. These are specially designed for bridge approaches and departures, highway and street sections, airport runways and taxiways and residential and commercial concrete slabs. Polyurethane foam has been used in these applications for over 40 years, and NCFI Polyurethane has manufactured these foams for over 20 years.

- Available in hydrophobic or hydro-insensitive formulations.
- Injectable through 5/8" hole making the process less intrusive.
- Flows well to ensure complete void fill and support before raising and lifting.
- Conforms to all irregular shapes.
- Controlled expansion rate to minimize over lifting.
- Fast cure enabling concrete section(s) to be put back into service quickly.
- Lightweight, minimizing pressure on potentially shifting substrate.
- Mixing of two components done by machine for speed and accuracy.
- No minimum batch size and no pre-mixing required, resulting in little to no waste.
- Only one mix design required for entire job: no re-mixing required.

TYPICAL PHYSICAL PROPERTY RANGES FOR TERRATHANE™ 24 SERIES SYSTEMS

Densities: 2.0lb/ft^3 upwards to 6.0lb/ft^3
Compression Strengths: 32 psi upwards to 120 psi (free rise, ASTM D1621)
TerraThane™ systems reach 90% of compression strength within approximately 15 minutes of application.

TerraThane™ polyurethane foams are tested to ASTM test methods including but not limited to, D1622, D1623, D2127, C518, D2842, Closed-cell content NCFI TM-300 and D2126. TerraThane™ polyurethane systems have excellent resistance to solvents. Maximum service temperatures range from 180°F (82.2°C) to 200°F (93.3°C).

The above values are average values obtained from laboratory experiments and should serve only as a guide. Consult NCFI for detailed technical data sheets and MSDS sheets for further details.

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