SOIL & FOUNDATION STABILIZATION AND LIFTING
WITH STRUCTURAL POLYMER MATERIAL

1.0 Description.

1.1 This work shall consist of the patented URETEK Deep Injection Process, US Patent No. 6,634,831 B2 of soil densification to repair base and sub-base soils under structural foundations or slabs by furnishing and injecting structural polymer material into the soils beneath the foundation or slab through injection tubes inserted into drilled holes at locations and depths as shown on the plans or as directed by the engineer while monitoring for movement at the surface. Injection of material shall continue as needed into the soils to lift the foundation or slab as needed. Contractor must have license to perform the US Patent and provide evidence of such with any bid.

2.0 Material Requirements.

2.1 The material used shall be URETEK 486 STAR or Engineer approved equal.

2.2 The material shall be a two-part, one-to-one ratio by volume, closed cell, hydro-insensitive, high density structural polymer system.

2.3 The material shall have a minimum free rise density of 3 lbs/cubic foot maximum of 4.5 lbs/cubic foot.

2.4 The material shall have a minimum compressive strength of 30 psi.

2.5 The material shall have a minimum tensile strength of 30 psi.

2.6 The material shall reach 90% compressive strength in 30 minutes.

2.7 The material shall be a structural polymer mixture, having a water insoluble diluent, which permits the formation of the polymer in excess water.

2.8 These characteristics must be certified by the manufacturer.

3.0 Equipment Requirements.

The contractor shall provide at a minimum, the following equipment:

3.1 A truck or trailer mounted pumping unit capable of injecting the high density structural polymer material beneath the pavement through tubes to the depths required. The pumping unit shall be capable of controlling the rate of flow of material as required to densify soils and prevent pavement blowouts.

3.2 Pressure and temperature control devices capable of maintaining proper temperature and proportionate mixing of the polymer component materials.

3.3 Pneumatic or electric drills capable of efficiently drilling 1/2” to 2” diameter injection holes through the pavement without damaging the structural integrity of the existing pavement.

3.4 Laser Levels, Digital Levels, or dial indicator devices capable of monitoring movement at the surface of the foundation or slab to verify that the injected base and sub-base soils have been properly densified and to monitor lift to proper grade as needed.

3.5 A portable dynamic cone penetrometer for on-site soils investigation to assist in location of weak sub-base soils and determination of injection pattern through tubes to densify weak soils.

3.6 All necessary light towers, electric generators, compressors, heaters, hoses, containers, valves and gauges to efficiently conduct and control the work.

4.0 Construction Requirements.

4.1 The contractor shall provide a foundation or slab profile from level measurements of each area where the foundation or slab structures require attention. Each profile shall be accepted by the engineer prior to performing the work at the project location.

4.2 Dynamic cone penetrometer testing may be required as directed by the engineer to confirm existing sub-grade soil conditions.

4.3 For soil densification and compaction of unconsolidated base soils and stabilization of foundations or slabs a series of 1/2" – 2" holes (as required for tube placement) shall be drilled at approximately 3-4 foot spaced intervals through the pavement above the area requiring soil remediation. The polymer material shall then be injected through injection tubes inserted into the drilled holes to the proper depth or depths as required. The exact location, spacing, hole size and depth shall be selected by the contractor and approved by the engineer.

4.4 For stabilization and leveling of faulted joints of concrete slabs, the polyurethane material shall be injected through tubes inserted to a depth of approximately 2-3' below the pavement surface to extend approximately 1' into the soils beneath the base materials at approximately 3-4 foot spaced intervals. Injection may also be required directly beneath the slab to fill voids and if alignment cannot be sufficiently achieved, injection directly under the slab may be required to bring to final grade.

4.5 Continuous level or dial indicator micrometer readings shall be in place and monitored by the contractor during injection to determine sufficient material usage and soils densification.

5.0 Testing Requirements. Dynamic Cone Penetrometer (DCP) Testing – At the request of the Engineer, the Contractor shall provide pre-injection DCP testing in various locations as determined by the Engineer to assist in determination of the injection pattern and injection depth(s).

6.0 Basis of Payment. The project will be paid on a Lump Sum basis as determined by the contract price.