SECTION 31 43 00

CONCRETE RAISING / VOID FILLING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Lifting or filling voids under settled concrete slabs with polyurethane foam.

B. Repairing cracks in concrete slabs with fast set polyurethane resin.

C. Repairing drill holes with fast set polyurethane resin.

1.2 REFERENCES

A. ASTM D-1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics

B. ASTM D-1622 – Standard Test Method for Apparent Density of Rigid Cellular Plastics

C. ASTM D-638 – Standard Test Method for Tensile Properties of Plastics

D. ASTM D-1042D – Standard Test Method for Linear Dimensional Changes of Plastics Caused by Exposure to Heat and Moisture

E. NSF/ANSI 61-5 – Drinking Water System Components – Health Effects

1.3 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.

B. Installer Qualifications: Minimum 2 year experience installing similar products.

C. Test Section: Provide a test section for evaluation of injection techniques and application workmanship.
   1. Finish areas designated by Engineer.
   2. Do not proceed with remaining work until workmanship is approved by Engineer.
   3. Refinish test section as required to produce acceptable work.

1.5 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.
   1. Review the latest Technical Data Sheets, Safety Data Sheets, and instructions from manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Keep lids on tightly to prevent moisture from entering containers. Avoid direct contact with product. Use caution when opening as pressure may build up inside containers.

C. Handling: Handle materials to avoid damage.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Alchatek; 4508 Bibb. Blvd Suite B5, Tucker, GA 30084. Tel: (404) 618-0438. Fax: (678) 805-4783. Email: info@alchatek. Web: www.alchatek.com.

B. Substitutions: Not permitted.

2.2 APPLICATIONS/SCOPE

A. Product: AP Lift 440 as manufactured by Alchatek.

B. Material:
1. Two component, high strength, hydro insensitive, structural polyurethane foam.
2. Accessory: AP Pump Flush.
3. Accessory: AP Flush 125.
4. Accessory: AP Spall Repair 850.
5. Accessory: AP 3/8” MixMaster Injection Ports.
6. Accessory: AP Soak 130.

C. Physical Properties 77 degree F (25 degree C) – Liquid:
1. Mix Ratio A:B = 1:1 by volume.

D. Physical Properties – Cured Free Rise:
1. Compressive Strength (ASTM D-1621): 76 psi or 11,000 psf
2. Tensile Strength (ASTM D-638): 88 psi
3. Expansion (unconfined): 17-19 times
4. Shrinkage (ASTM D-1042/D): Less than 2%.

E. Reaction Times:
1. Initial Reaction: 8 seconds.
2. Full Rise: 30 seconds.
3. 90% Strength: 15 minutes

PART 3 EXECUTION

3.1 PREPARATION

A. Investigate job site. Locate all utilities and drainage pipes. Inspect drainage pipes before and after job to ensure there are no cracks or defects that foam material can enter. Use sewer inspection camera if necessary. Locate and mark any in-slab electrical conduits and avoid these areas when drilling.

B. Injection Equipment: Plural component 1:1 mix ratio proportioner capable of generating pressures of 1,500 p.s.i. minimum. A and B primary heaters controlled separately. Heated hoses. Impingement mix gun such as MixMaster Pro from Alchemy-Spetec.

C. Monitoring Equipment: A combination of laser levels, zip level, survey equipment, string lines, and / or dial indicators shall be used to monitor movement of concrete slabs.

D. Condition material overnight to 60 degrees to 90 degrees F (15 degrees to 32 degrees C).

E. Protect surfaces from foam that can blow out of injection holes, cracks, and joints. Use AP Flush 125 as a stain block on concrete and other surfaces during injection.

F. Sawcut joints if necessary prior to injection to prevent or release slabs from binding.

G. Repair cracks in concrete with AP Spall Repair 850 prior to or after injection (site specific decision).

H. Personal Protection: Use safety goggles, face shield, impermeable gloves, long sleeves and pants.

I. Use in well ventilated areas. Open doors and windows. In confined areas use mechanical ventilation to keep vapor concentrations low. Prevent direct contact with skin and eyes. Refer to SDS.

3.2 INSTALLATION

A. Mixing: None required. Keep lid tightly sealed when not in use and avoid splashing water into material containers.

B. Install in accordance with manufacturer's instructions.
1. Drill 3/8” injection holes. Spacing shall be determined on site and adjusted as necessary.
2. Set heater controllers for Part “A” and Part “B” and Hose Heat to temperatures as indicated on top of material drums.
3. Inject resin according to manufacturer’s recommendations.
4. Monitor movement of slabs. When lifting, do not lift more than 1/4" at a time per hole to avoid cracking the slab. Holes can be re-drilled and re-injected several times.
5. Ensure that all voids beneath the slab are filled. If void filling only, monitor slab for movement and stop when any is detected. Drill additional holes as necessary.

C. Cured material is chemically inert and safe to dispose of in landfill. Cleanup any spilled liquid resin and place in a suitable sealed container. Dispose of in accordance to applicable environmental regulations.

3.3 Dress Out

A. Remove injection ports and fill holes with AP Spall Repair 850.

B. Grind excess resin from face of concrete with wire brush or cup wheel if necessary but avoid scarring concrete.

3.4 CLEAN-UP

A. Flush injection equipment with AP Pump Flush when necessary. Remove cured material from metal components by soaking in AP Soak 130.

B. Clean off of skin with soap and water.

3.5 PROTECTION

A. Protect adjacent work area using plastic sheeting if necessary.

B. Spray concrete around injection holes, defects, cracks, and joints with AP Flush 125 to act as a barrier between the concrete and the foam and prevent staining of the concrete.

END OF SECTION