

September 1998

Market Segment: *Sanitary Manholes - Maintenance & Repair*

One of the key problems of the sanitary manhole is the water infiltration through joints and cracks. The increase in inflow overloads the wastewater treatment system and increases the cost of the wastewater treatment. In some cases the inflow may result in discharge of untreated water causing an environmental hazard. There are problems related to chemical deterioration. The problems can be summarized into the following four areas:

Problem

Steel and Cone Interface (Chimney) Deterioration

Abrasion and freeze/thaw caused by flowing water deteriorates the top of the chimney or cone. The cracking and de-bonding of the grout sealing the interface causes the loss of the seal and interface between the chimney and frame becomes the primary source of water inflow.

Solution

Remove delaminated mortar seals, wet or dry sandblast and pressure wash the surface. Use *Fibre-Patch OV* to structurally repair the chimney. Apply two coats of *Cem-Kote Flex Plus*, approximately 3 mm (1.8 in) thick layer. Reinforce the *Cem-Kote Flex Plus* layer with the *Reinforcing Fabric HD*.

Problem

Deep Cracks in Manhole Walls

The deep cracks in the manhole walls allow water and debris inflow into waste water treatment system and also cause ex-filtration of contaminants into the surrounding environment.

Solution

Remove deteriorated, debonded and loose joint mortar. Wet or dry sandblast and pressure-wash the surface. Stop the active leaks using *Fibre-Patch WP (Water Plug)*. All leaking and seeping water must be stopped prior to sealing the cracks. Repair the deteriorated mortar areas using *Fibre-Patch OV*. Apply a thin coat 1.6 mm (1/16 in) of *Cem-Kote Flex Plus*, embed the *Reinforcing Fabric HD* and apply an additional 1.6 mm (1/16 in) thick layer of *Cem-Kote Flex Plus*.

Problem

Surface and Joint Deterioration

Hydrogen sulfide gas converted by oxidation and biochemical process into sulfuric acid, chemically attacks the concrete and mortar joints as well as the surface of the manhole. The deteriorated joints and the manhole surface allow water inflow and infiltration into waste water treatment system and seepage into the outside.

Solution

Wet or dry sandblast and pressure wash the surface. Stop the active leaks using *Fibre-Patch WP (Water Plug)*. All leaking and seeping water must be stopped prior to sealing the cracks. Apply *Cem-Kote Flex Plus* in two coats to waterproof the surface.

Note: Depending on the severity of the deterioration and cracks, the entire surface may be sprayed with *Cem-Kote Flex Plus*. When dealing with the entire wall surface, the reinforcing fabric is typically used on large cracks in the concrete liner or on joints of precast concrete segment manholes. The brick manhole may require

fabric only on large cracks or interfaces between the brick and concrete where applicable. The brick surface with leaking and deteriorated joints does not require the application of the reinforcing fabric.

There are manhole repairs requiring a thicker, typically ½in layer to repair and seal the surface and provide the reinforcement. In such case *Fibre-Patch OV* is applied by hand. *Spray-Con WS ST* wet shotcrete is employed when the repair layer is machine applied.

Problem

Invert and Bench Deterioration

The abrasion, freeze/thaw and chemical attack deteriorate the bench of the manhole. The water leaks at the interface of the bench and the walls and pipes seals and invert.

Solution

Clean the surface and stop the active water leaks using *Fibre-Patch WP* (Water Plug). Repair and seal the surface using *Fibre-Patch OV*. The fast setting *Fibre-Patch OV* allows for exposure to water in less than 45 minutes.

Restoration procedure:

Surface preparation

Wet sandblast and/or a high pressure water

Stopping active water

Hydraulic, fast setting *Fibre-Patch WP* (water plug) is used to fill holes, deep and wide cracks to stop water fast

Bench and Invert repair and waterproofing

Fibre reinforced, fast setting *Fibre-Patch OV* allows the fast repair with a minimum time interruption. The flow can be restored in 30 – 45 minutes.

Manhole wall repair and waterproofing

Fibre-Patch OV (hand applied) or *Spray-Con WS ST* (machine applied) provides waterproofing, chemical protection and structural support in one application. *Cem-Kote Flex Plus* provides a flexible, highly chemical resistant thin layer, when only waterproofing without structural repair is required.

Chimney repair and waterproofing

Cem-Kote Flex Plus provides an easy to apply, highly flexible waterproofing layer.

Gemite Products Inc. has an extensive experience in a wide variety of protection, maintenance and repair of concrete structures. Gemite Group offers effective and economical solutions, including technical support, material selection and site support worldwide through its network of associated companies.

...pool\literature prep\ market segments\ manholes

Gemite Products Inc.

Toll Free: 1-888-4-Gemite (888-443-6483)

e-mail: techinfo@gemite.com

USA: 160-3840 E. Robinson Road, Amherst NY 14228

Phone: 888-443-6483 Fax: 888-443-6329

CANADA: 1787 Drew Road, Mississauga ON L5S 1J5

Phone: 905-672-2020 Fax: 905-672-6780