



## Hampton Discovers the Benefit of Using Con<sup>mic</sup>Shield<sup>®</sup>

In 2000, the manholes near City Hall in Hampton, Virginia, were identified as being severely deteriorated from high levels of hydrogen sulfide gas which fed bacteria to form Microbiologically Induced Corrosion. When unprotected concrete is exposed to Hydrogen Sulfide Gas, bacteria can quickly grow creating sulfuric acid which allows structural damage in just a few short years. This was the case in the City of Hampton.

The City of Hampton chose to fix the manhole on Queens Way using a process called PERMAFORM<sup>®</sup> fortified with Con<sup>mic</sup>Shield<sup>®</sup>. PERMAFORM<sup>®</sup> is a unique, patented process for reconstructing manholes quickly and cost-effectively, involving neither excavation nor interruption of the flow. Lightweight steel panels are assembled inside the manhole and concrete is poured between the form and existing wall. After the concrete has hardened, the formwork is removed leaving a completely sealed, structurally sound, 'manhole within a manhole'. Con<sup>mic</sup>Shield<sup>®</sup> is a revolutionary technology for the effective and economical prevention of Microbiologically Induced Corrosion, commonly developed in concrete sewer pipe and manholes. It prevents the acid-producing bacteria (Thiobacillus) from colonizing into concentrations that produce sulfuric acid. Con<sup>mic</sup>Shield<sup>®</sup> is an additive that easily can be added to concrete prior to placing.

Unlike coatings or plastic linings, Con<sup>mic</sup>Shield<sup>®</sup> molecularly bonds to the cement particles. It cannot wash off, chip off, peel off, delaminate or pinhole!

The Queens Way manhole was renewed by City of Hampton crews in February 2001. The manhole was then re-inspected by Barry Dobbins, Wastewater I&I Manager in September of 2006. As expected, the manhole shows no sign of deterioration.

(See picture below on left).

That same year another manhole on the same line within a few feet of the Queens Way manhole was also renewed, but for comparison sake, this one was done without Con<sup>mic</sup>Shield<sup>®</sup>. When this manhole was inspected in September 2006, it was already showing signs of severe deterioration.

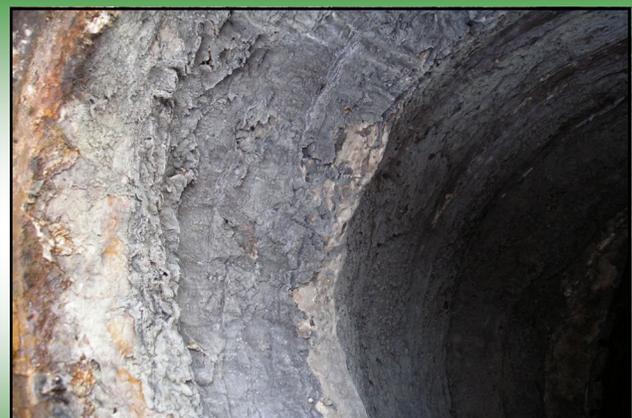
(See picture below on right ).

**CONSHIELD Technologies Inc. can be contacted at 1-877-543-2094 or [info@conshield.com](mailto:info@conshield.com). Barry Dobbins of the City of Hampton can be contacted at 757-726-7944.**

With Con<sup>mic</sup>Shield<sup>®</sup> Additive



No Con<sup>mic</sup>Shield<sup>®</sup> Additive



These photos taken in September of 2006 by Barry Dobbins with the City of Hampton clearly show the benefits of Con<sup>mic</sup>Shield<sup>®</sup>. The manhole on the left was fortified with Con<sup>mic</sup>Shield<sup>®</sup> and the manhole in the photo on the right was not.



## SUGGESTED SPECIFICATIONS FOR READY-MIX CONCRETE FOR POURED-IN-PLACE SEWER STRUCTURES

**Additions to Project Specification where corrosion resistant cast-in-place concrete is needed to resist microbial induced corrosion (MIC) of sewer structures.**

### **Antimicrobial Additive:**

- Antimicrobial additive, Con<sup>mic</sup>Shield<sup>®</sup>, shall be used to render the concrete uninhabitable for bacteria growth.
- The liquid antibacterial additive shall be an EPA registered material and the registration number shall be submitted for approval prior to use in the project.
- The amount to be used shall be as recommended by the manufacturer of the antibacterial additive. This amount shall be included in the total water content of the concrete mix design.
- The additive shall be added into the concrete mix water to insure even distribution of the additive throughout the concrete mixture.
- The ready-mix supplier shall submit a letter of certification to the project owner stating that the correct amount and correct mixing procedure were followed for all antimicrobial concrete.
- The antibacterial additive shall have successfully demonstrated prevention of MIC in sanitary sewers for ten or more years.
- The antibacterial shall be used by factory certified plants and contractors.
- After the concrete takes initial set, Con<sup>mic</sup>Shield<sup>®</sup> color identifier-indicator (Con<sup>mic</sup>Shield<sup>®</sup> ID) shall be applied to the interior surface.

**Acceptance:** Acceptance shall be a letter of certification from the concrete provider to the project owner stating that the correct amount and correct mixing procedure were followed for all antimicrobial concrete.

**Quality Assurance:** The concrete producer shall retain two labeled specimens from each production run. One set shall be retained by the concrete producer and the other set shall be sent to CONSHIELD Technologies, Inc. or independent laboratory as directed by the engineer for verification on a random or as needed basis.

**Field Repairs:** Field repairs to the precast concrete shall be made using Con<sup>mic</sup>Shield<sup>®</sup> Joint Set Grout pre-portioned and factory packaged that requires the addition of no other components. This repair grout may be used for filling joints, lift holes, damaged areas, benches and similar.

**Note:** Con<sup>mic</sup>Shield<sup>®</sup>, liquid antimicrobial additive is available from CONSHIELD Technologies, Inc. EPA Registration 75174-2-47000; Phone: **(877) 543-2094**.