

ROCKLAND COUNTY INTERCEPTOR SEWER REHABILITATION

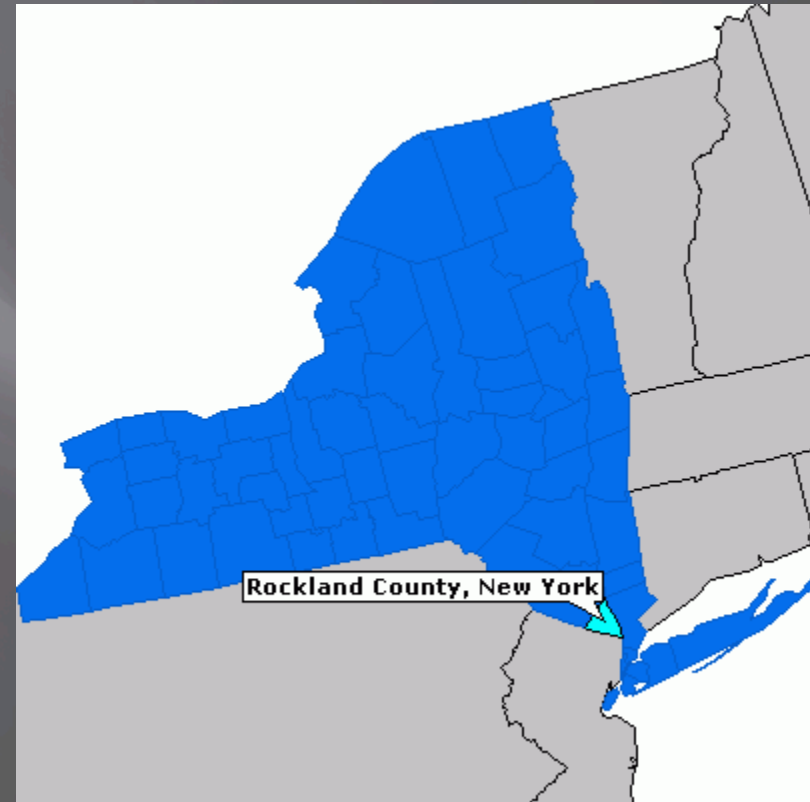
NEWEA 2017

Rockland

New York



- Rockland County Sewer District No. 1
 - Formed in 1963
- Serves the Towns of Ramapo and Clarkstown, and several parcels in the Town of Orangetown
- Operates and maintains the major interceptors and pumping stations in the system
- Wastewater treatment plant originally constructed to treat 10 MGD
- Development in Rockland County resulted in the expansion of the treatment facility to 28.9 MGD in the mid 1980's



I&I REDUCTION

- ▣ Aggressive and successful I&I reduction plan
- ▣ Reduced excess flows to sewer plant by almost 40%
- ▣ Unintended result ...
 - Increased time for wastewater to travel to the treatment facility
 - Increased settling of organic matter in the collection system

MIC AND SEVERE DETERIORATION

- ▣ Routine 5-year CCTV inspection revealed severe deterioration of 36" RCP interceptor
- ▣ Exposed soil held by root masses



MIC AND SEVERE DETERIORATION

- ❑ Interceptor located less than a mile upstream from the wastewater treatment plant
- ❑ Failure would cause sewage backups and major disruption within the District
- ❑ Interceptor passes under two roadways and is within a railroad right-of-way – creating possible permitting issues



EVALUATING SOLUTIONS

▣ CIPP

- Good choice for smaller diameter pipes
- No trenching required
- Can allow water flow in annular space

▣ Trench-and-replace

- Railway easement and roadways complicated permitting issues, would have caused delays the District could not afford
- More costly and inconvenient solution

EVALUATING SOLUTIONS

- ▣ CCCP – Centrifugally Cast Concrete Pipe
 - Applied to existing pipe walls
 - Adheres tightly to CMP, cast iron, steel plating, brick, and clay
 - Trenchless and small staging area
 - Works in round, elliptical, arched, and box culverts/ pipes/ interceptors 30” to 144” in diameter
 - Structural and watertight
- ▣ Selected CCCP, with Ace Pipe and National Water Main Cleaning Company performing the installation



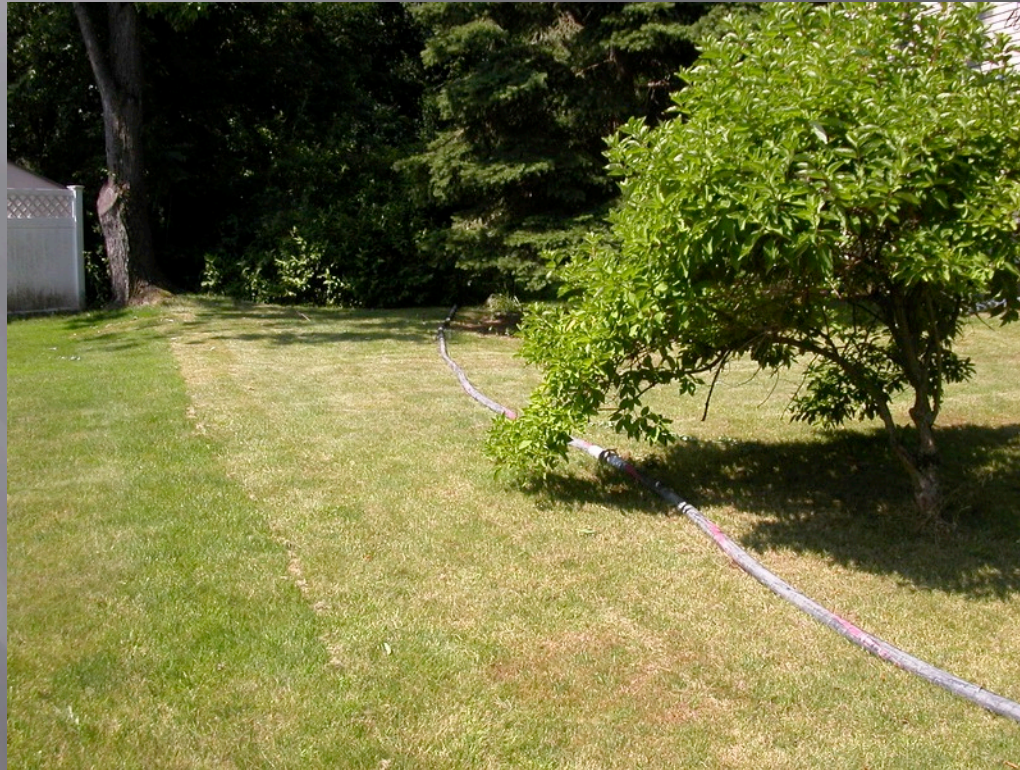
Equipment for Spin Cast Application



Equipment Parked On Shoulder



Hose Laid Across Lawn



Lining Equipment Inserted Through Manhole



Injection Port



Infiltration Stopped



ENGINEERING AND DESIGN: CHALLENGE

- ▣ CCCP spincaster sprays even layers on existing structure
- ▣ Small voids and gaps can be patched; new inverts can be poured
- ▣ Long stretches of exposed earth and missing pipe presented a challenge
- ▣ Pipe cavity needed to be stabilized from '10:00' to '2:00'

ENGINEERING AND DESIGN: PLAN

- ▣ Custom-fabricated sheet steel inserts
- ▣ Calculated lining thickness
 - Third party engineer provided recommended design
 - ▣ Level of loading
 - ▣ In-place performance of surrounding soils
 - ▣ Existing pipe's current condition
 - ▣ Maintain tensile bending stress at the crown and invert less than the flexural stress strength (modulus of rupture), and incorporating a factor of safety of 2.0
 - ▣ Calculated design thickness: 1.0"
 - ▣ RECOMMENDED design thickness: 1.5" to include additional factor of safety during the void grouting process
 - Rehabilitated pipe designed to accept:
 - Surface live loading
 - External hydrostatic pressure from groundwater
 - Temporary loading exerted by placement of grout fill
 - Design plan specified filling cavernous voids with grout replacement following pipe re-lining

Rockland County NY



MATERIALS: INSERTS



MATERIALS: CCCP and Antimicrobial Additive

- ▣ CCCP Material
 - Engineered fine aggregate concrete composite

- ▣ Con^{mic}Shield[®]
 - Quat-based biocide that prevents Microbiologically Induced Corrosion (MIC)
 - Prevents the colonization of acid producing aerobic bacteria on the concrete's exposed surfaces

INSTALLATION PROCESS

- Inserts installed
- Dewatered via temporary diversion to parallel sewer
- ▣ Inserted CCCP spincaster via manhole



INSTALLATION PROCESS

Spincasting



QUALITY ASSURANCE AND SAFETY

- ▣ Even layer application
 - Visual inspections
 - Depth gauges
 - Material usage per lineal foot of cast pipe
- ▣ Confined space safety – Corrosive gases
 - Worked from upstream manholes
 - Trained operators for confined space entry
 - Equipped with gas sensors
 - Monitored soil stability
 - Flushed pipes prior to entry
 - Ventilated space
- ▣ Post installation monitoring scheduled as part of ongoing preventative maintenance plan

CONCLUSION

- ▣ Repairs completed quickly, safely, and cost-effectively
- ▣ Rehabilitated interceptor is structurally sound and permanently corrosion-resistant
- ▣ District is rewriting specs to include CCCP for future projects
- ▣ Collaboration, cooperation, and innovation between contractors and suppliers resulted in quality structural repair



Discussion and Q&A

Thank you!

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