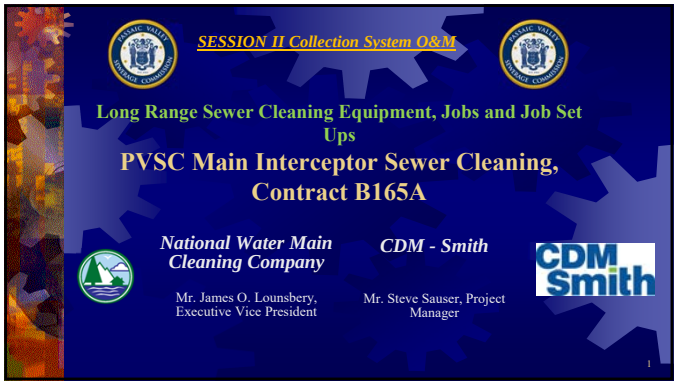
SESSION II Collection System O&M
Long Range Sewer Cleaning Equipment, Jobs and Job Set Ups
PVSC Main Interceptor Sewer Cleaning, Contract B165A
National Water Main Cleaning Company
Mr. James O. Lounsbery, Executive Vice President
CDM - Smith
Mr. Steve Sauser, Project Manager
CDM Smith
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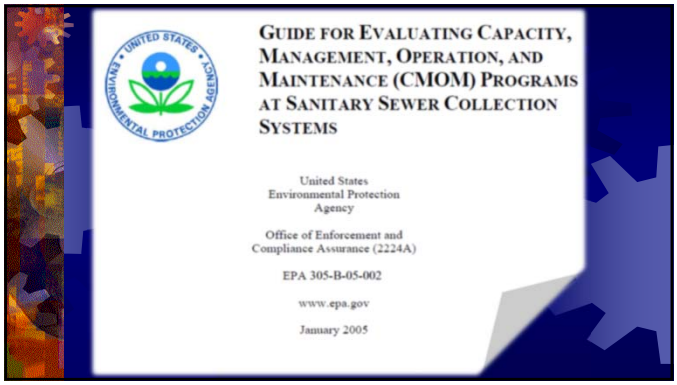
GUIDE FOR EVALUATING CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE (CMOM) PROGRAMS AT SANITARY SEWER COLLECTION SYSTEMS
United States Environmental Protection Agency
Office of Enforcement and Compliance Assurance (2224A)
EPA 305-B-05-002
www.epa.gov
January 2005

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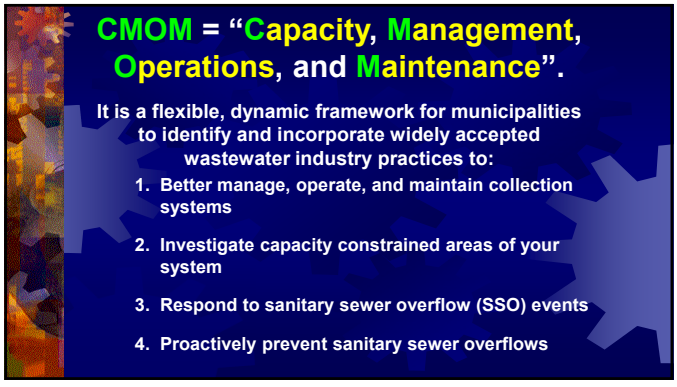
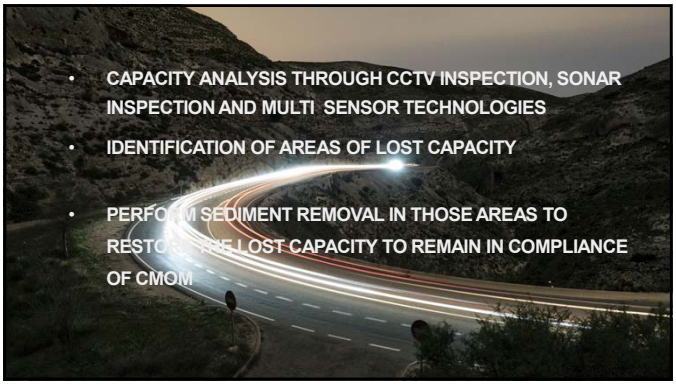
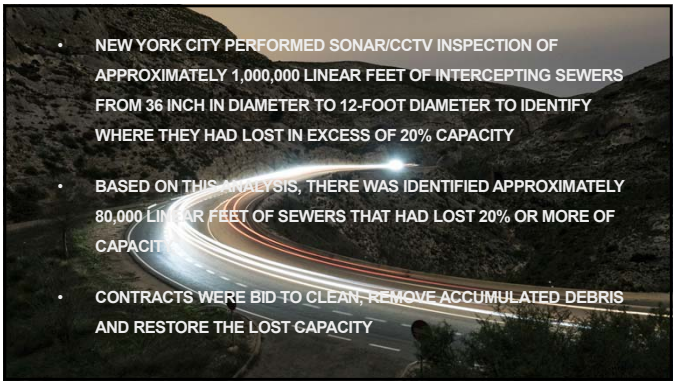

CMOM = "Capacity, Management, Operations, and Maintenance".
It is a flexible, dynamic framework for municipalities to identify and incorporate widely accepted wastewater industry practices to:
1. Better manage, operate, and maintain collection systems
2. Investigate capacity constrained areas of your system
3. Respond to sanitary sewer overflow (SSO) events
4. Proactively prevent sanitary sewer overflows

3


CAPACITY ANALYSIS THROUGH CCTV INSPECTION, SONAR INSPECTION AND MULTI SENSOR TECHNOLOGIES
IDENTIFICATION OF AREAS OF LOST CAPACITY
PERFORM SEDIMENT REMOVAL IN THOSE AREAS TO RESTORE LOST CAPACITY TO REMAIN IN COMPLIANCE OF CMOM

4


NEW YORK CITY PERFORMED SONAR/CCTV INSPECTION OF APPROXIMATELY 1,000,000 LINEAR FEET OF INTERCEPTING SEWERS FROM 36 INCH IN DIAMETER TO 12-FOOT DIAMETER TO IDENTIFY WHERE THEY HAD LOST IN EXCESS OF 20% CAPACITY
BASED ON THIS ANALYSIS, THERE WAS IDENTIFIED APPROXIMATELY 80,000 LINEAR FEET OF SEWERS THAT HAD LOST 20% OR MORE OF CAPACITY
CONTRACTS WERE BID TO CLEAN, REMOVE ACCUMULATED DEBRIS AND RESTORE THE LOST CAPACITY

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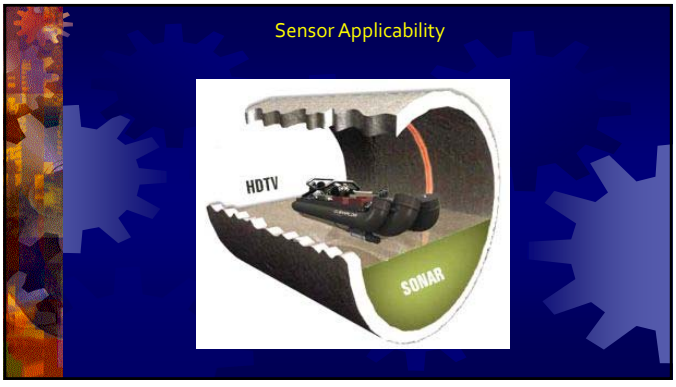
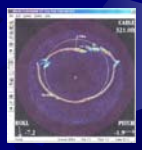

Sensor Applicability
HDTV
SONAR

6

Combination CCTV/Sonar

Application – To Evaluate sediment levels and significant structural deficiencies:

- Surcharged pipe lines
- Siphons & River Crossings



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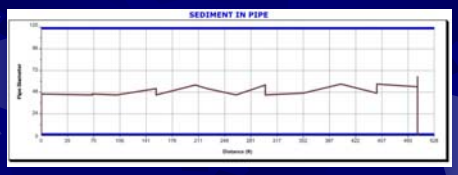
Combination CCTV/Sonar



Results of Sonar Inspection of a Half Full 120 inch Sewer

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Combination CCTV/Sonar

SEDIMENT DATA

Max grease on top:	Avg. Sediments on top:	Est. Sediments Vol. on top:	Blockage % on top:
0.0	0.0		
Max debris on bottom:	**Avg. Sediments on bottom:**	**Est. Sediments Vol. on bottom:**	**Blockage % on bottom:**
58.0	49.8	20,897.11 cu ft	39.6 %
Max debris sum:	**Avg. Sediment sum:**	**Est. Sediment Vol. sum:**	**Total blockage %:**
58.0	49.8	20,897.11 cu ft	39.6 %

Results of Sonar Inspection of a Half Full 120 inch Sewer – Approximately 775 Cubic Yards of Debris in less than 500 Feet of Pipes

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Sewer and Drain Cleaning

FACTS:

- Standard 80 gallon/min combo jet vacs
- 125 gal/min, 150 gal/min and 175 gal/min utilized for large diameter cleaning.
- 2 Jet/vac with rail gear utilized on track working for MBTA,.Amtrak, NYC transit Authority.
- Vacuum truck utilized for wet/well cleaning
- Vacuum trucks utilized for vacuum excavation services
- Easement Machine Utilized for Continuous Sewer segment in off road areas.

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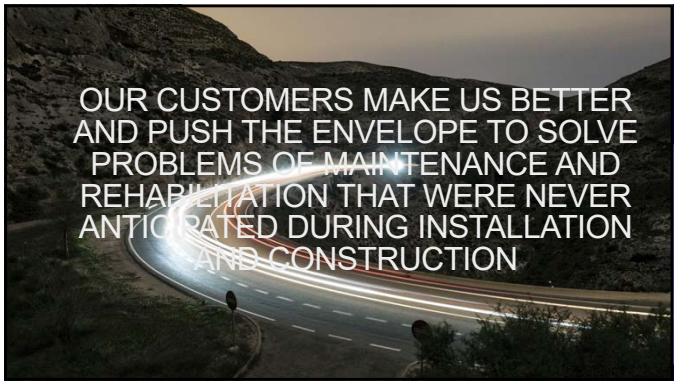

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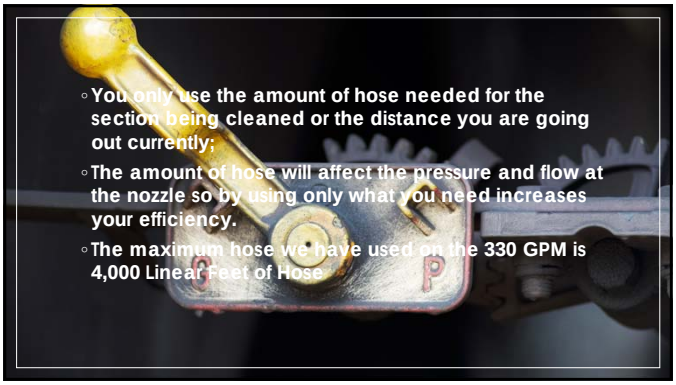

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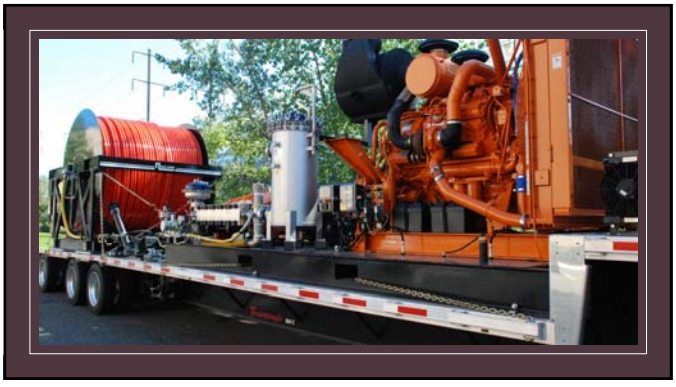

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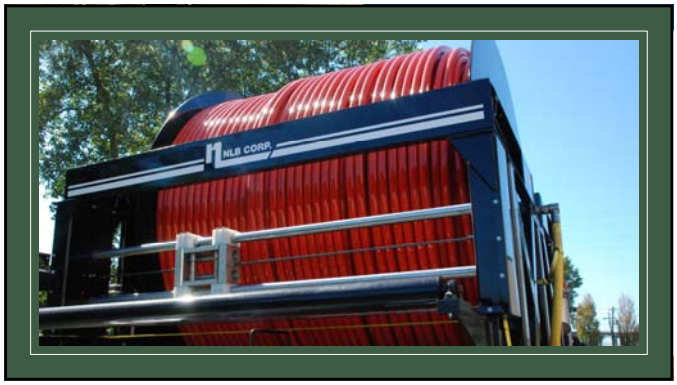

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Wards Island Bronx Interceptor

The Wards Island Bronx Interceptor was one of the Unique interceptors identified in inspections completed in 2012

- Constructed between 1933 and 1940
- The Interceptor receives all flow from Marble Hill, Van Courtland Park, Fordham Heights, Kingsbridge Heights, Morris Heights, and Highbridge areas of the Bronx
- Our 2012 inspection of the Interceptor indicated that no repairs are required
- Over 70 years of service has led to a build up of compacted material that can cause potential overflow situations during high rainfall periods

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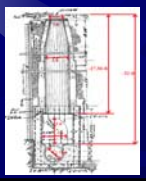
Wards Island Bronx Interceptor

What Makes this Interceptor Unique?

1. The distance between manholes is over 3000 feet in some locations
2. The manholes are not directly over the interceptor and are only accessible via 200 foot long adit tunnels
3. The interceptors are 80 to 120 feet below street level
4. One manhole, M19, can only be accessed from an entrance ramp onto the Major Deegan Expressway



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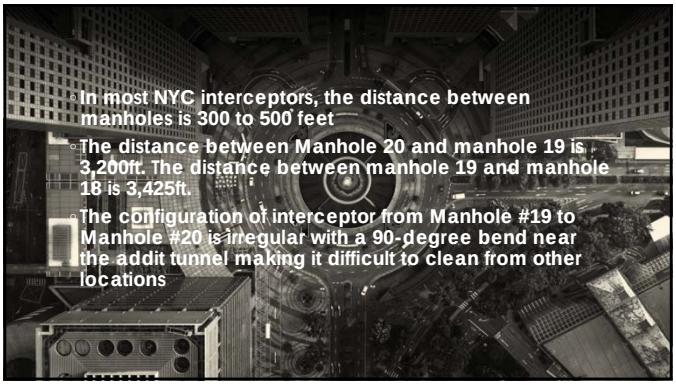

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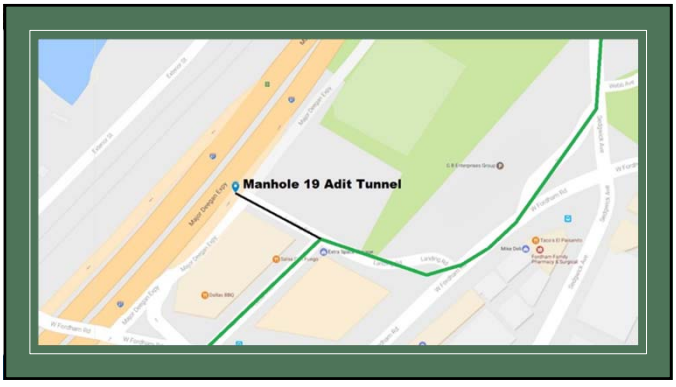

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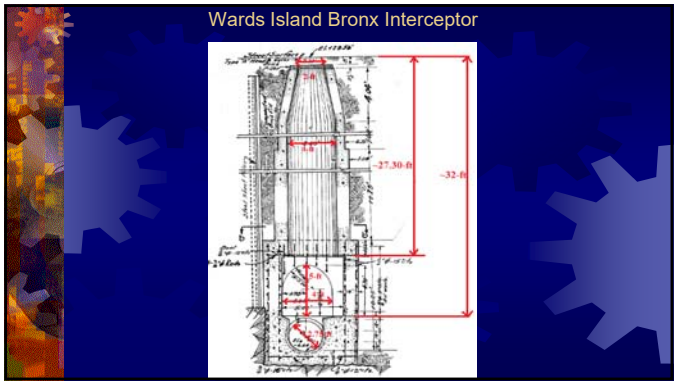

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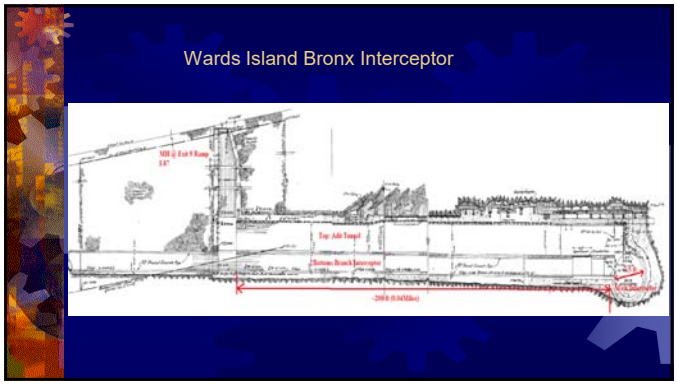

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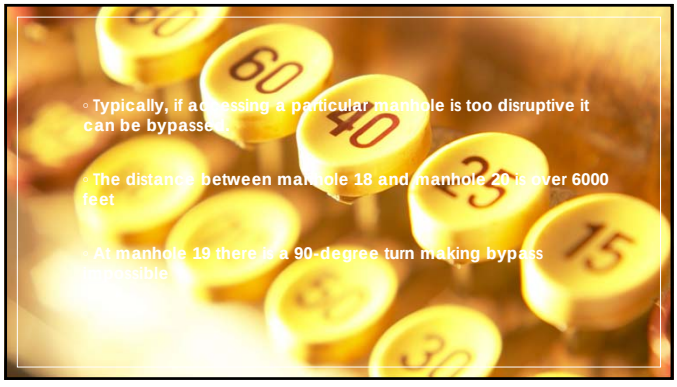

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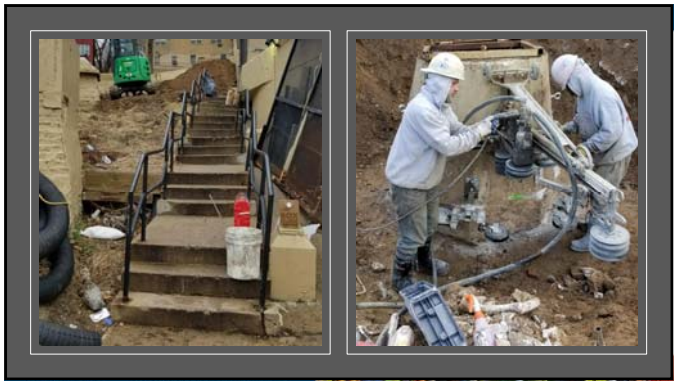

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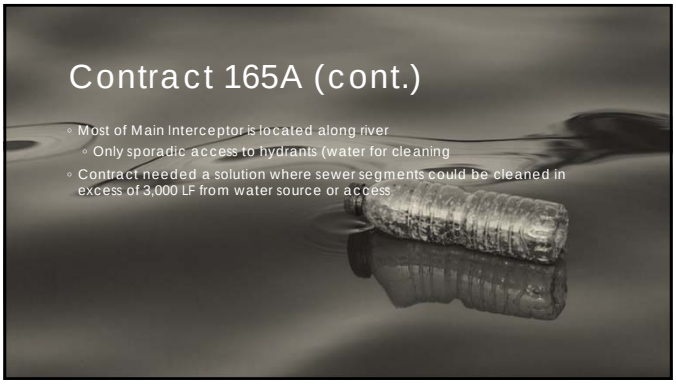

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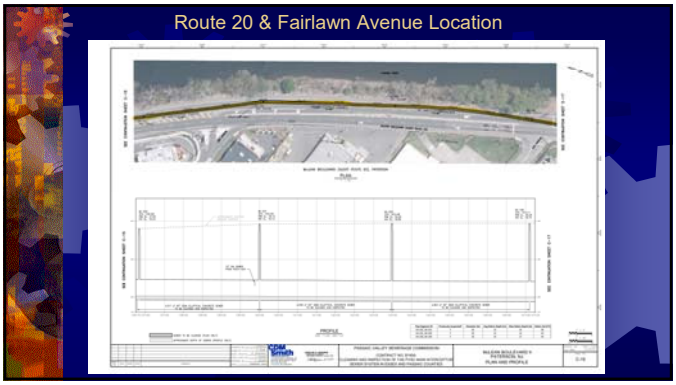

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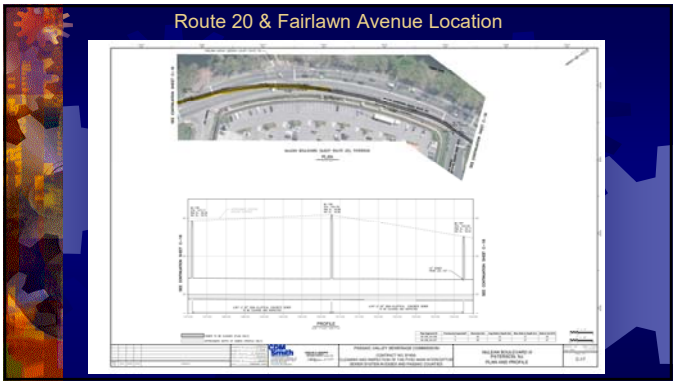

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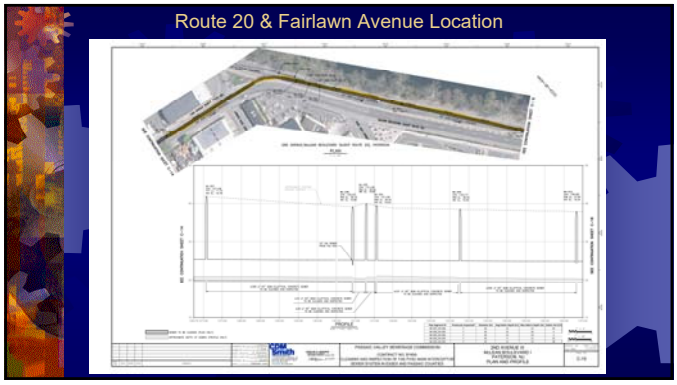

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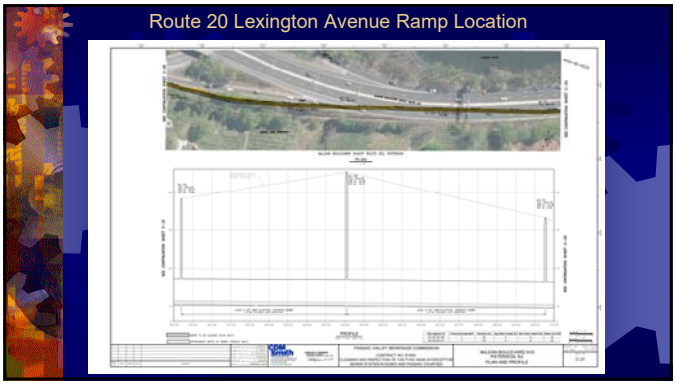

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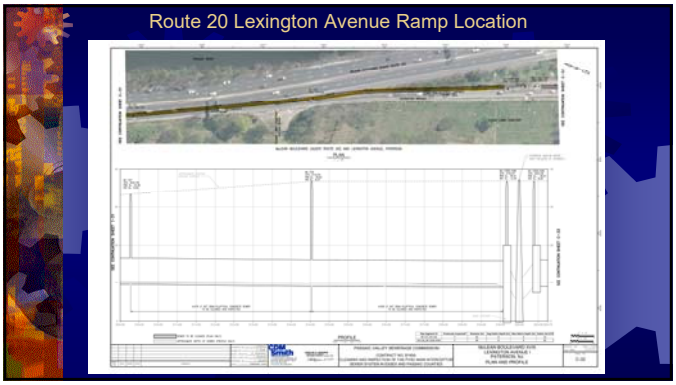

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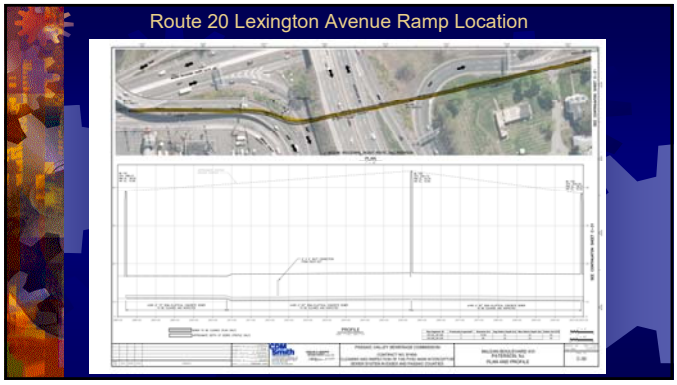

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- Route 20 and Easement Setup, Paterson, NJ

Another good setup was on MH-190, that was in the parking lot of Miranda restaurant. All the upstream manholes between there and [illegible] were in the easement or on Rt 20. We never had to [illegible] on the highway and impact traffic.

Saved us 61 days at $3,098 per shift or approximately $190,000 in MPT.

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Overall Potential Savings to Client by minimizing and eliminating Traffic Setups on these locations was approximately $557,500.

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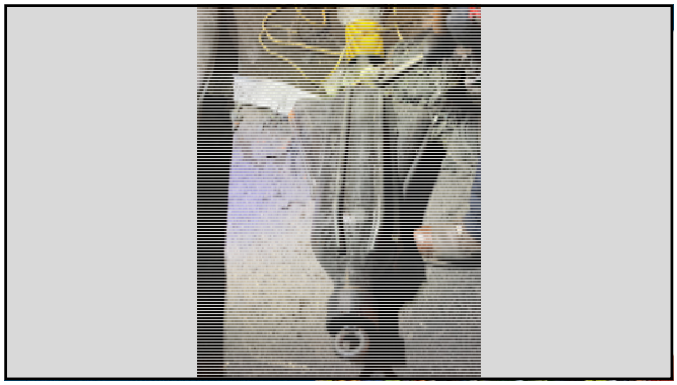

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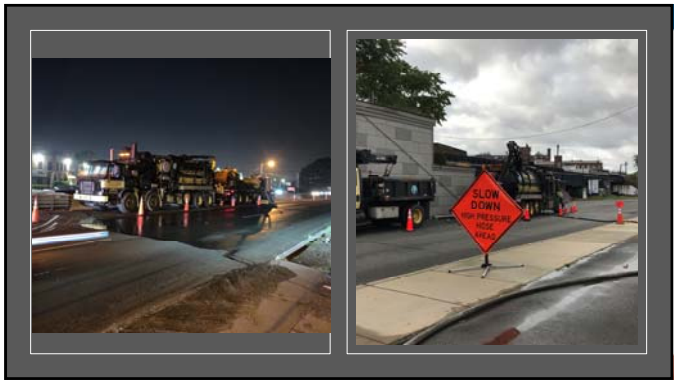

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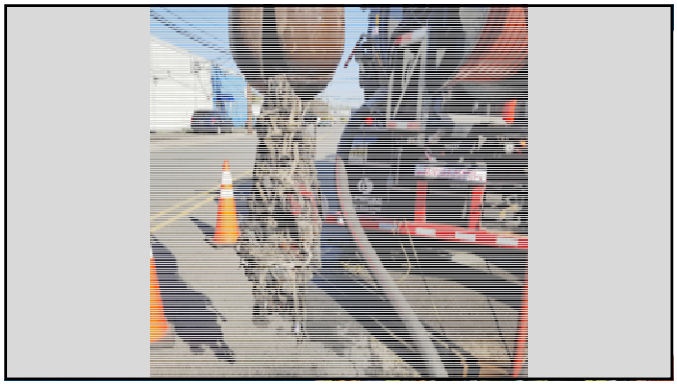

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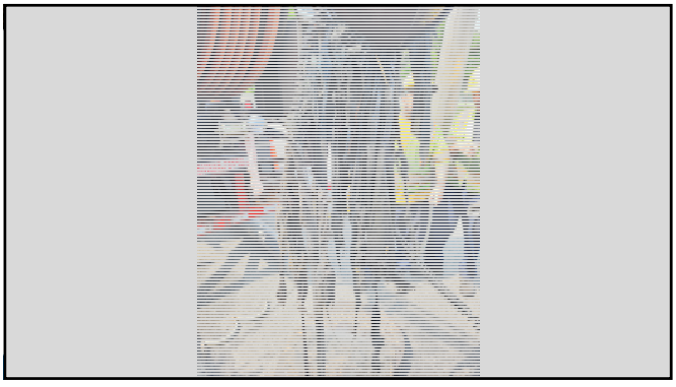

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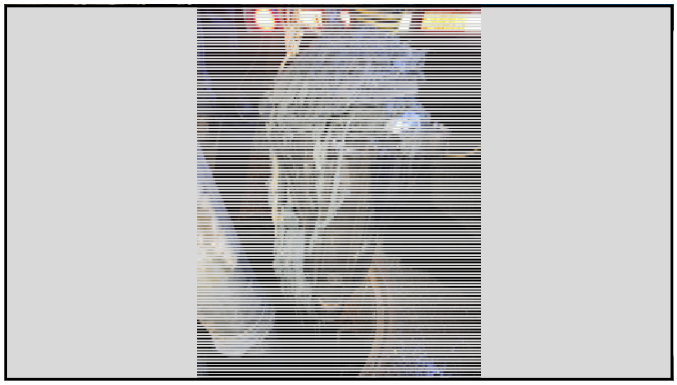

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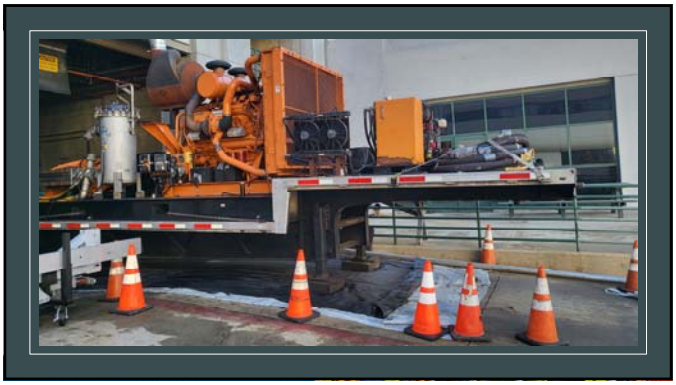

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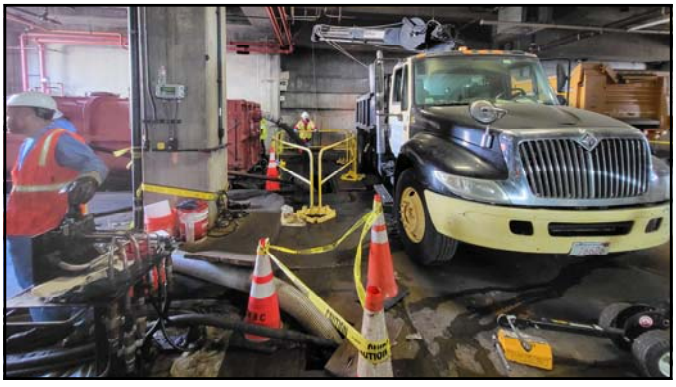

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