



# Lessons Learned from Public-Facing Large Diameter CIPP Interceptor Rehabilitation

March PUG Meeting  
March 10, 2026

# Agenda

- Overview
- Design Considerations
- Challenges
- Lessons Learned
- Questions

# Overview

- Wastewater:
  - Serves 740,000 people
  - 88-square-mile area
- The Interceptor System handles an average daily flow of 60 million-gallon-per-day (MGD)
  - 320 MGD at peak capacity
  - 29 miles of gravity sewers
  - 8 miles of force main
  - 15 pump stations



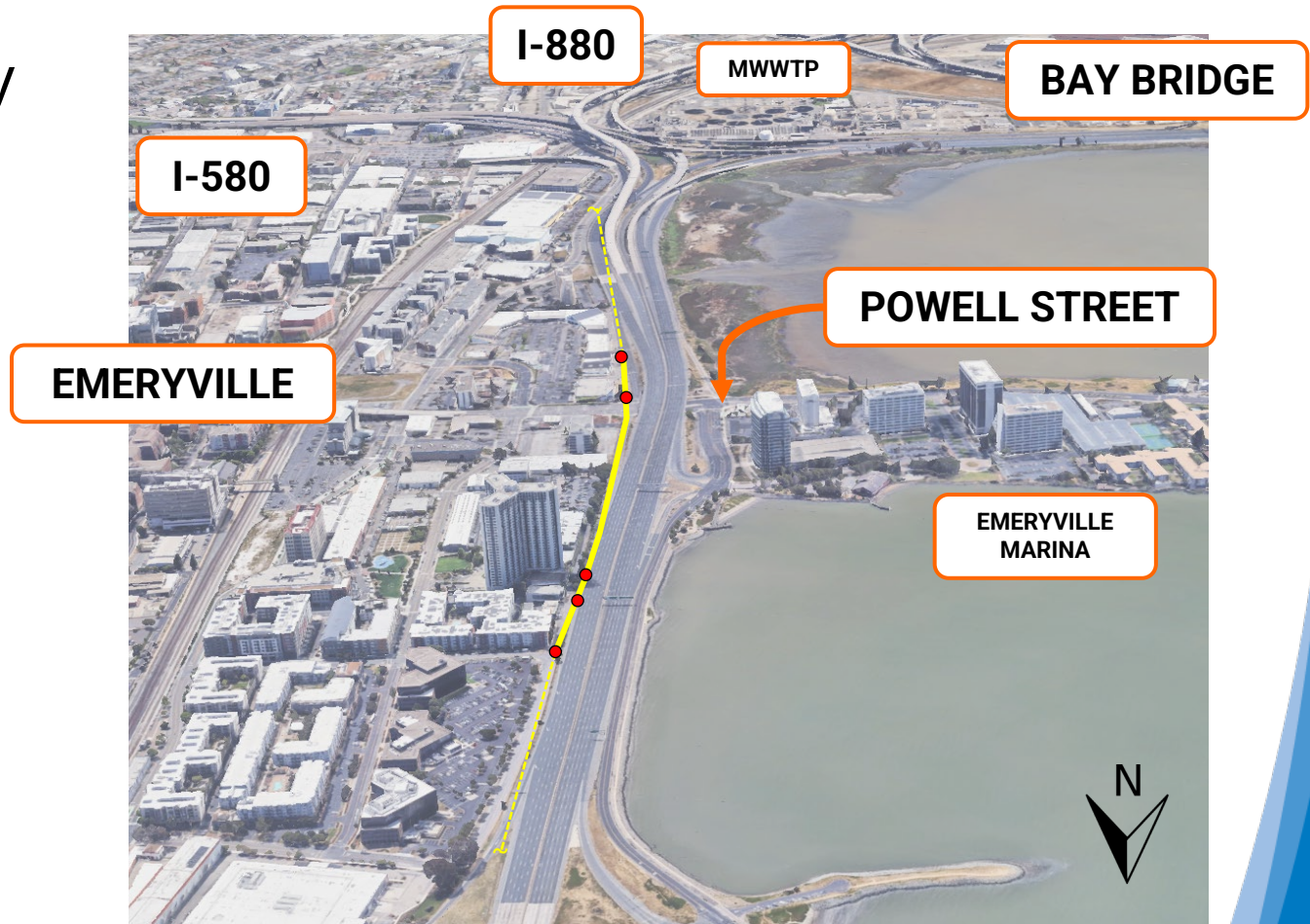
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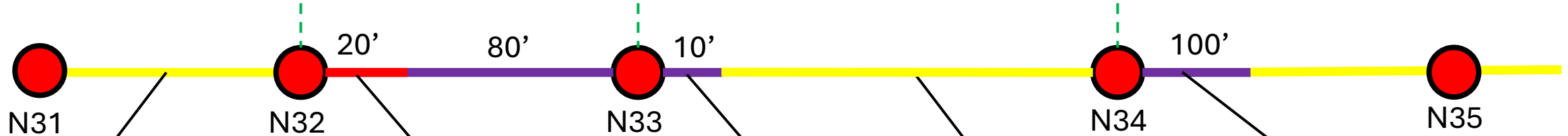
# Overview

- Majority of routing under freeway
- Converging freeways
- Powell St
- Public impact



# Overview

SIDELINE, TYP



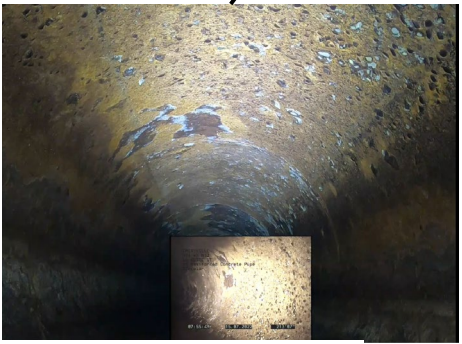
N31

N32

N33

N34

N35



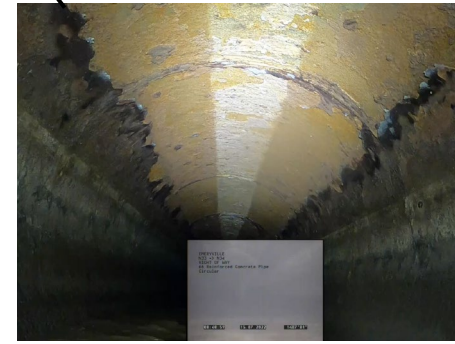
N31, 213' downstream



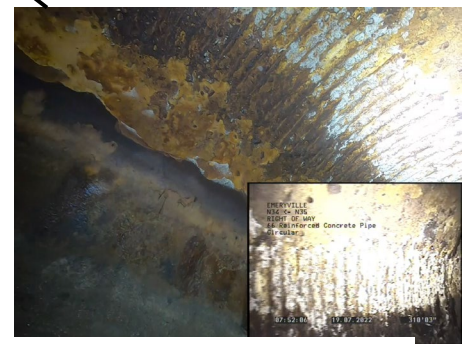
N32, 7' downstream



N33, 3' downstream



N33, 1487' downstream



N34, 80' downstream



N32, from upstream view



N32, 7' downstream



N33, 253' downstream



N34, downstream view



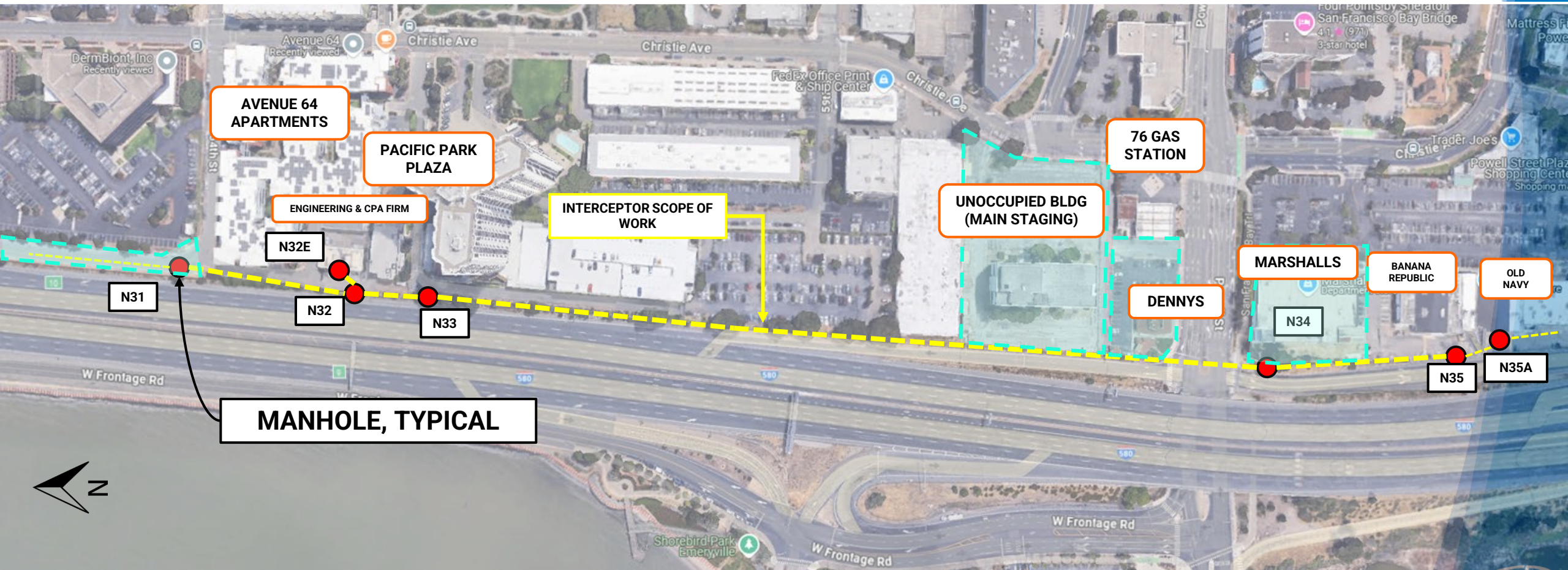
N34, 40' downstream

 Interceptor

 Major Defects

 Significant Defects

# Overview



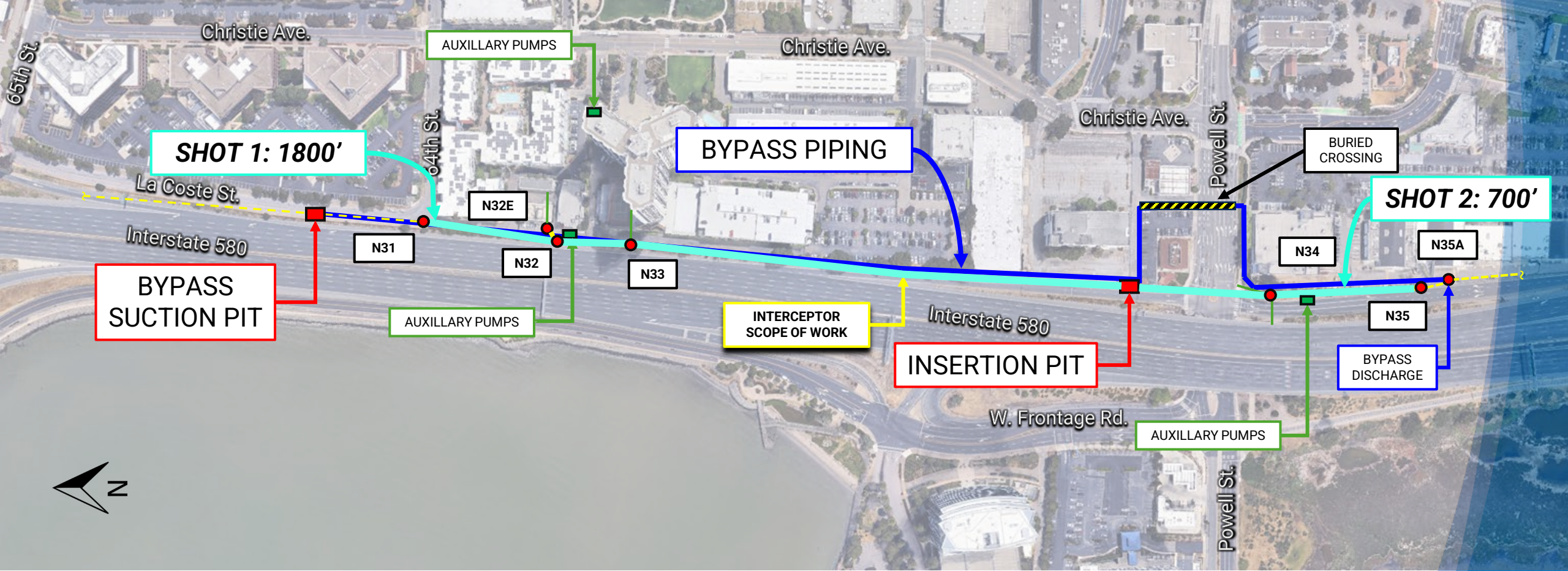
# Design Considerations - Sliplining

Pros: weather independent, familiarity  
Cons: large access pits, bend limitations



# Design Considerations - CIPP

Pros: smaller access points, continuous structural liner  
Cons: bypass required, weather dependent



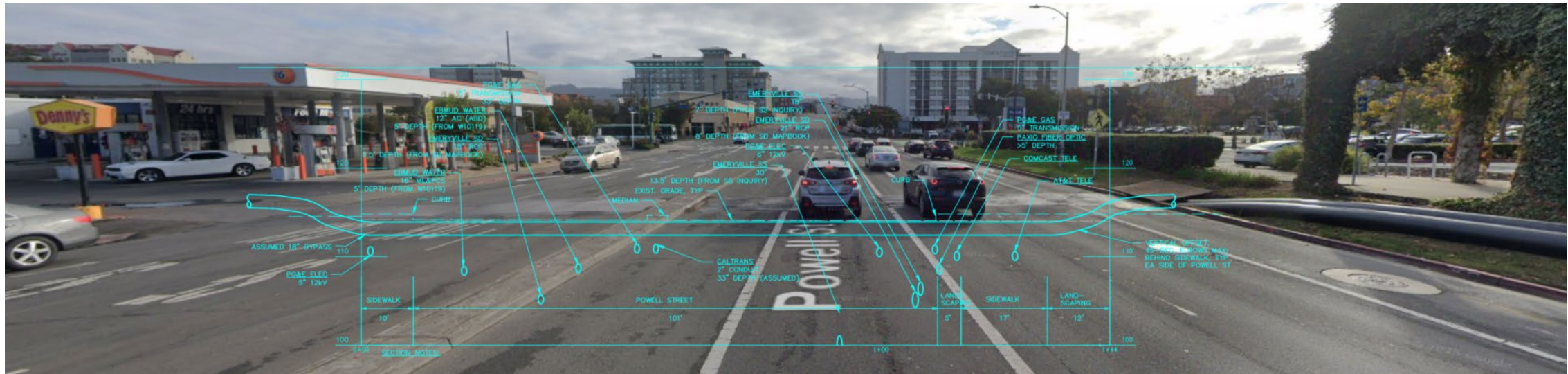
# Overview

- Contract awarded to SAK for \$9.8M
  - JMB – Civil
  - Sunbelt – Bypass
  - H&R – Manhole Rehabilitation
- Key Stakeholders
  - City of Emeryville
  - Caltrans
  - 10 private properties
    - 3 required Temporary Construction Easement

# Overview

- 2500' of 66" RCP rehabilitated using CIPP
  - Shot lengths: 1800' and 700'
  - 39mm wall thickness, water-cured with masking agent
- 15 MGD bypass system with (2) 18" HDPE lines
  - Main pumps: 2 duty, 2 standby, 1 ragging
  - (3) Auxiliary stations: 1 duty, 1 standby each with flow-through plugs and chopper pumps
- 5 manholes rehabilitated with mortar-epoxy lining system

# Challenges



Powell St Shallow Crossing

# Challenges

- Constant irrigation leaks onto Powell Street
- Repeated coordination with the City to address public concern
- Lessons learned: always request private property maintenance contact information



Powell Street Irrigation Leaks

# Challenges

## Differing Site Conditions

- Unforeseen 30" pipe discovered halfway in excavation
  - Not in as-builts or USA markings
- Project came to a stop
- Coordination with Caltrans for temporary removal and replacement



30" Storm Drain at Insertion Pit

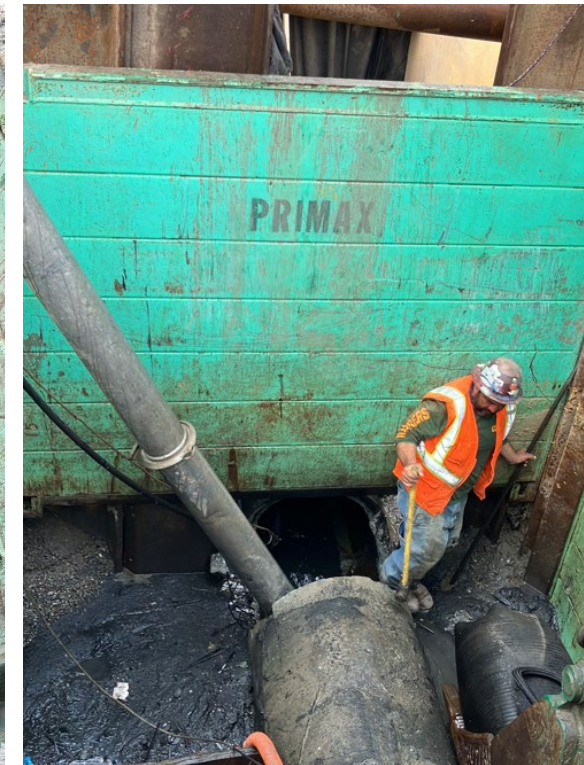
# Challenges

## Differing Site Conditions

- Silt issues
- Tidal flows
- Removal
- New problems discovered

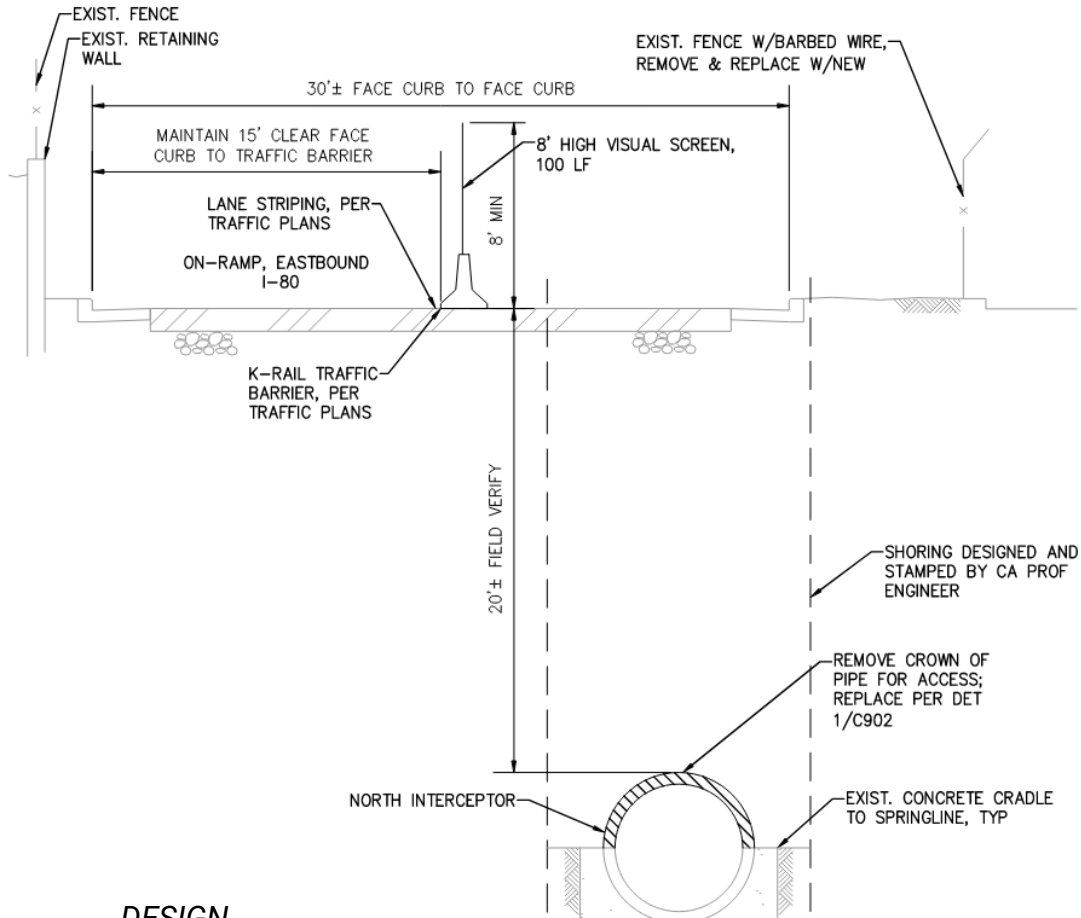


Tidal Flows

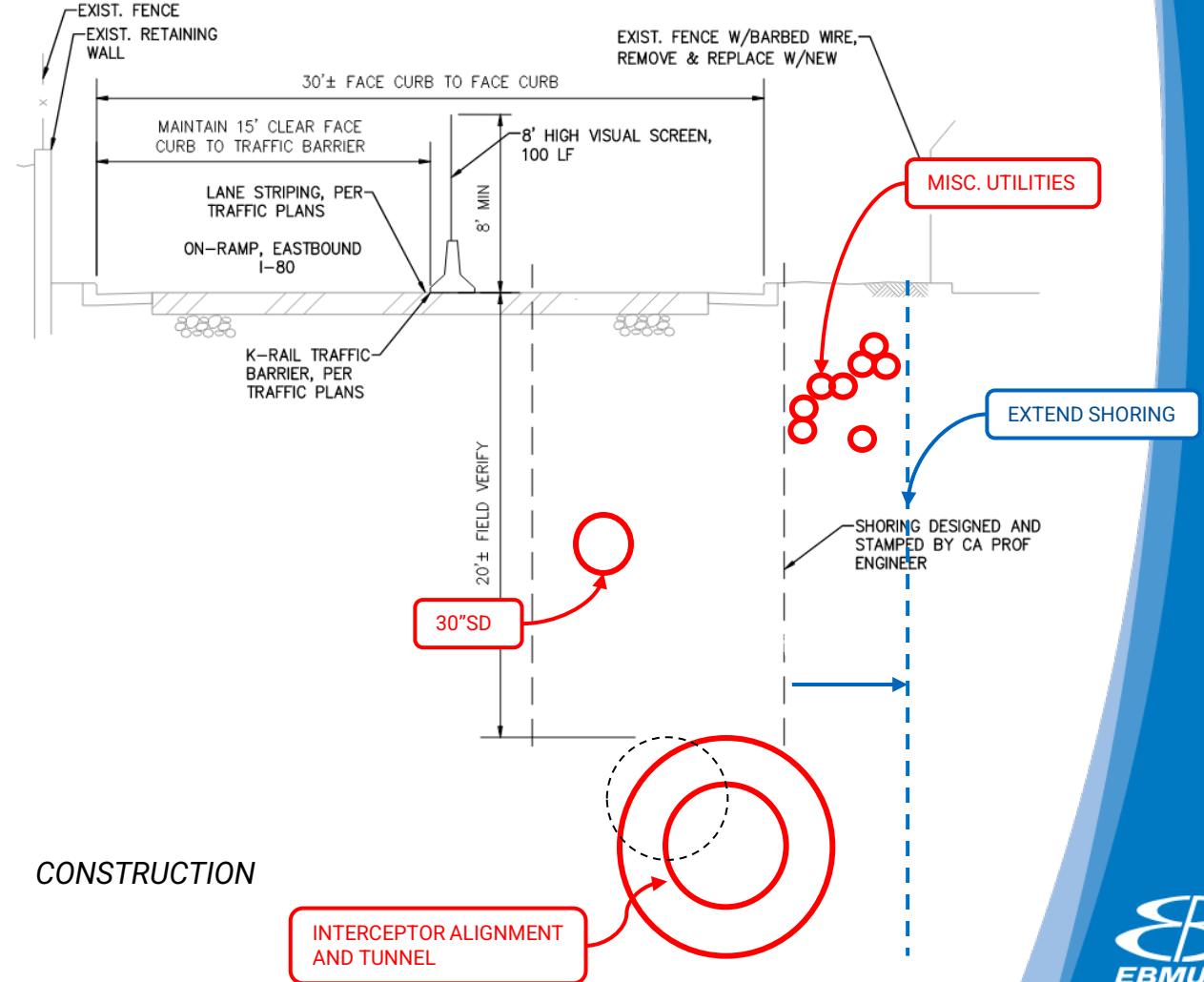


Storm Drain Removal

# Challenges



DESIGN



CONSTRUCTION

# Challenges

## Differing Site Conditions

- 9 utilities
  - 6 abandoned
  - 3 active utilities
- Extend Shoring
  - Considerations
  - Shoring re-review



Utility Conflicts



Coordinated Utility Relocations

# Challenges

## Differing Site Conditions



Tunneled Interceptor

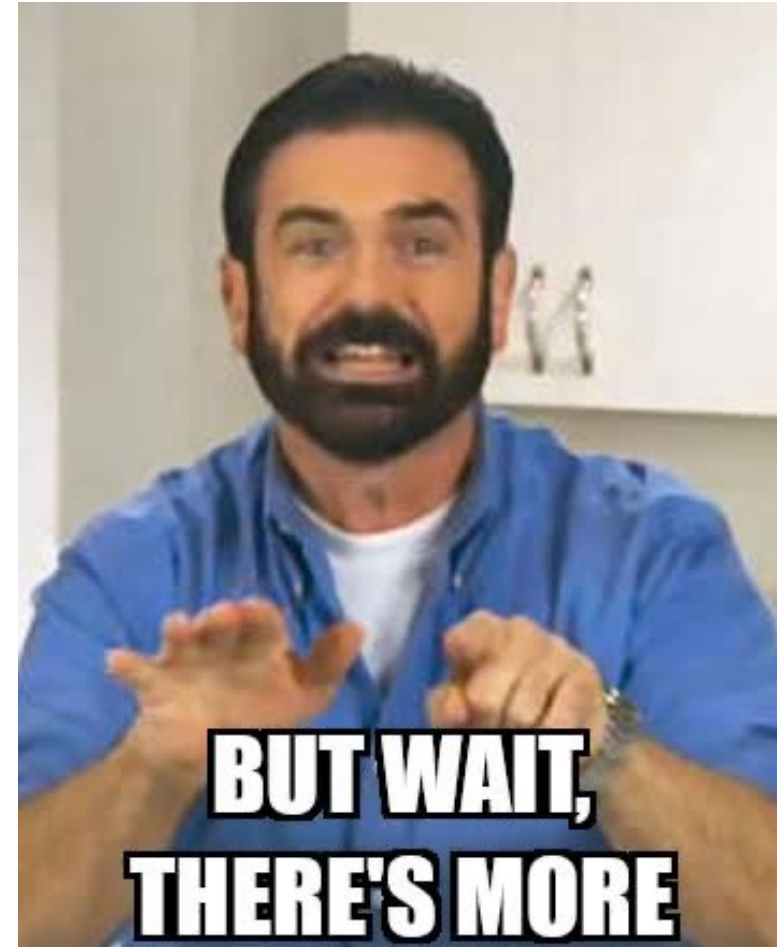


Cut Int. Ready for CIPP

# Challenges

## Differing Site Conditions - Summary

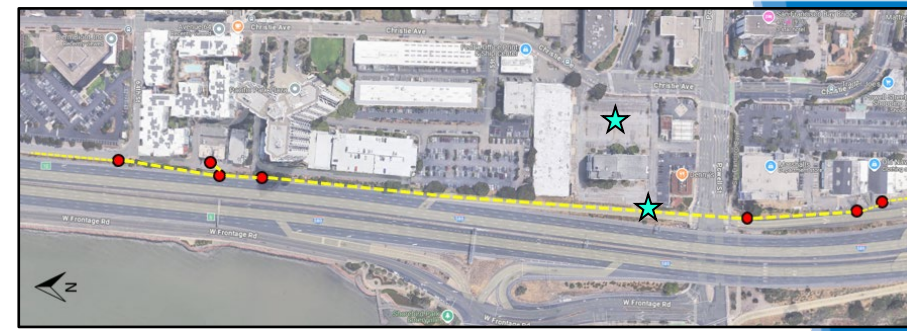
- Change Orders: ~\$550k
- Delay: 4 weeks total
- Lessons Learned
  - Start early or set milestones and incentives to start sooner
  - Utility location in Caltrans R/W



# Challenges

## Failed Liner

- Liner failed on Shot 1
- Liner removed into workable pieces for curing
- Failed liner staged at unoccupied building



Failed Liner

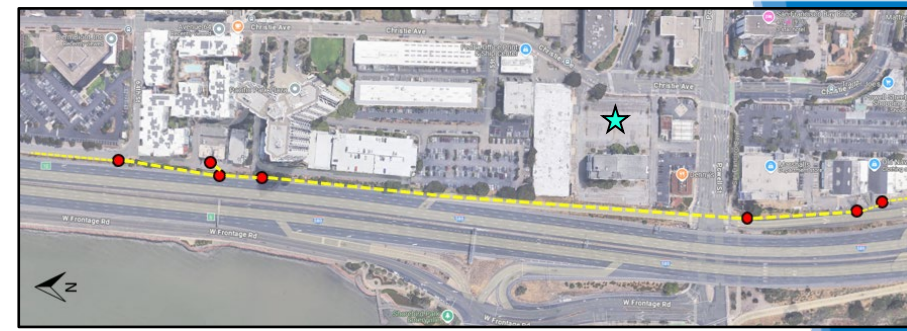
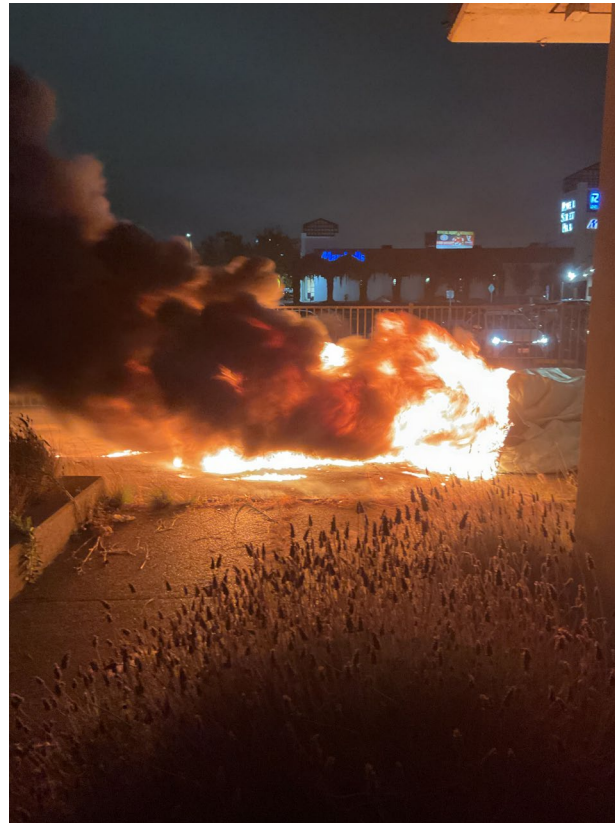


Seam Tear

# Challenges

## Liner Combustion

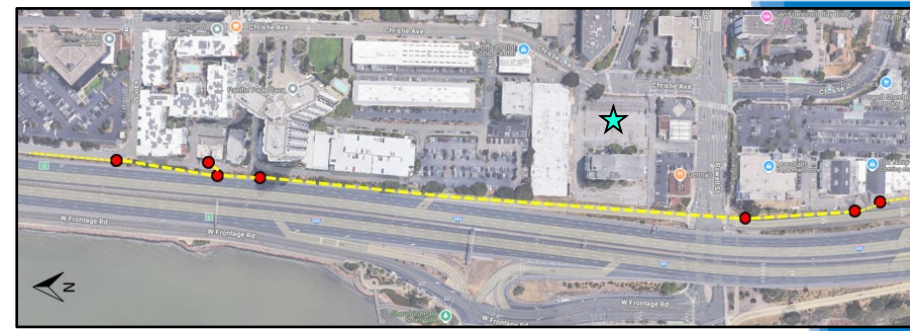
- Liner self-ignited
- Reason
- Public Impact
- Next steps?



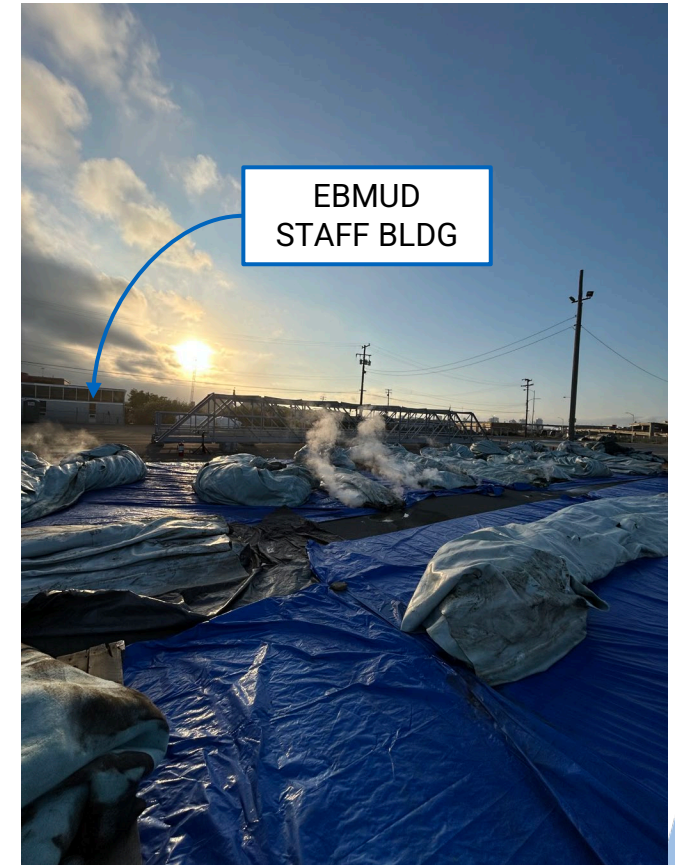
# Challenges

## Liner Curing

- Liner relocation
- Staff impact



Liner at Main Staging Area

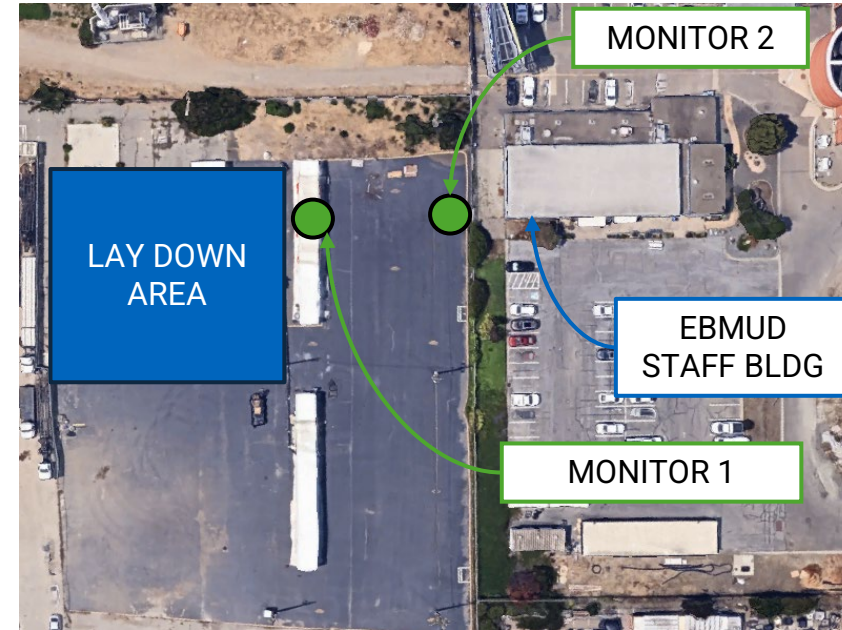


Remote Staging Area at Plant

# Challenges

## Odor

- Mitigating odor
- Artificially curing liner
- Odor monitoring
- Odor during “normal” lining process



	BEFORE CURING	AFTER CURING
MONITOR 1	1.5 – 18.9 ppm	0 – 1.6 ppm
MONITOR 2	0 – 0.6 ppm	0 – 0.2 ppm

\*CAL/OSHA PEL: 50ppm

\*\*OEHHA REL: 4.9ppm

# Result

## Successful Liner Install



Shot 1@ 5-degree bevel



Shot 2

# Challenge

## Restoration - LCC



# Challenges

## Restoration – Manhole Rehab

- Composite mortar-epoxy lining
- Specification requirements
- Pull test results
- Issue
  - Inadequate prep
  - or
  - Existing manhole issue



Completed Rehab



Pull Test Results

# Challenges

## Restoration – Manhole Rehab

- Cut “windows” into restored manhole
- Re-prepped areas with more rigorous QC and holdpoints
- Retest results
- Conclusion



Retesting



Retest Results

# Challenges

## Restoration – Manhole Rehab

	INITIAL RESULTS (PSI)	RETEST (PSI)	SPEC REQUIREMENT (PSI)
TEST 1	50	138	200
TEST 2	126	116	200
TEST 3	82	177	200
TEST 4	59	54	200
TEST 5	145	212	200
TEST 6	190	121	200
TEST 7	112	123	200
TEST 8	62	97	200

RETEST SUMMARY TABLE



MANHOLE CORE

# Conclusion

- Lessons Learned
  - Start early or set milestones and incentives to start sooner
  - Utility locating in Caltrans R/W
  - Set QC hold points during manhole rehabilitation
- Recommendations
  - Coordinate early and often with public, private properties, and prevailing agencies
  - 24/7 Inspection



# Questions?

