# BAY AREA WWTP CFRP REHABILITATION

structural TECHNOLOGIES

Northern California Pipe Users Group 2024 Sharing Technologies Seminar

NORTHERN CALIFORNIA PIPE USERS GROUP

structural TECHNOLOGIES

# Products, Investigation, Design Support & Installation

Pipeline Rehabilitation Solutions - Corrosion and Corrosion Control – Pipeline Renewal Management


**Atilana Bolton, PE**

Technical Project Manager

Pipelines Solutions



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Senior Manager

Municipal & Power Infrastructure


We provide

**solutions** that integrate products, engineering, and construction

structural

**Contracting Licensee**

**Non-union Construction**

- Specialty repair and maintenance
- Investigate, design, build
- Technology solutions
- Safety/quality control
- Field execution

PULLMAN

**Contracting Licensee**

**Union Construction**

- Skilled craftsman from union halls
- Specialty repair and maintenance
- Investigate, design, build
- Safety / quality control
- Field execution

structural TECHNOLOGIES

## Investigation

- Inspection assistance
- Specialized evaluation and testing protocols
  - Post-tensioning corrosion

## Products

- New PT hardware & stay cables
- PT repair systems
- Strengthening systems
- Corrosion protection systems
- Armoring

## Engineering Support

- Custom PT element design
- Solution development
- Design assist
- SIMCO durability design / service life modeling
- Acoustic monitoring

## Miscellaneous

- Installation support
- QA/QC
- Heavy lifting
- Hydrodemolition

# structural group

**ANNUAL REVENUE**
$800M+

**OFFERINGS**
Products
Engineering Support
Construction

**TOTAL EMPLOYEES**
3,000+

## structural TECHNOLOGIES

**ANNUAL REVENUE**
$150M

**REGIONAL TECHNOLOGY CENTERS**
- Baltimore, MD
- Dallas, TX
- Houston, TX
- Chicago, IL

## structural | PULLMAN

**ANNUAL REVENUE**
$650M

**AVERAGE NUMBER OF PROJECTS**
2,500

**MARKETS SERVED**
NORTH AMERICA & MIDDLE EAST

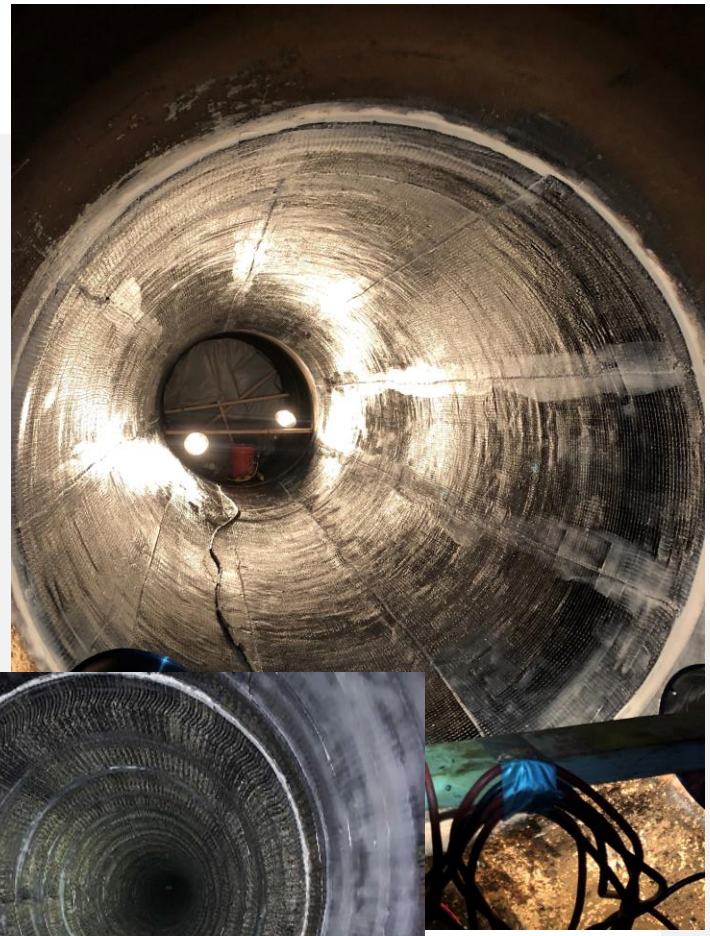
ENR Engineering News-Record

**#3**
CONCRETE CONTRACTOR

# *We Make Structures Stronger & Last Longer*

## Products & Systems

- **Pipe Repair & Upgrade**
- Concrete Restoration
- Strengthening
- Corrosion Control
- Moisture Mitigation
- Force Protection
- Post Tensioning
- Seismic Resiliency

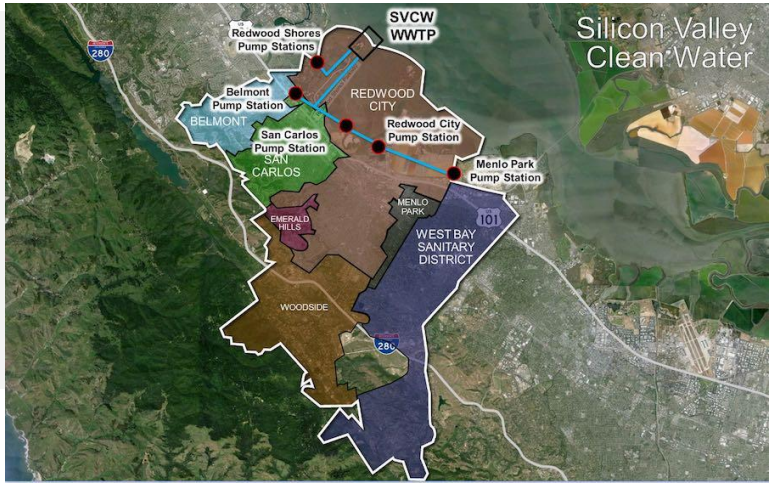


## Engineering Support

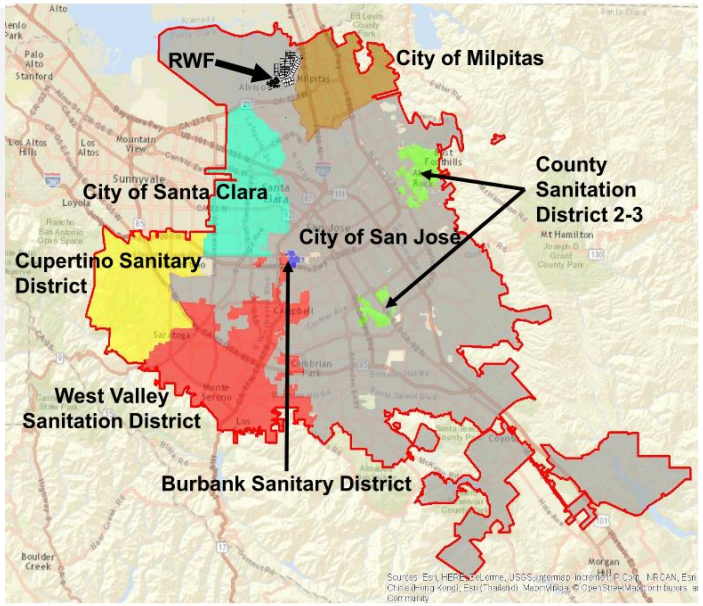
- Product Selection
- Design  Assistance
- Forensic Support

# Up Next…Asset Management Matters

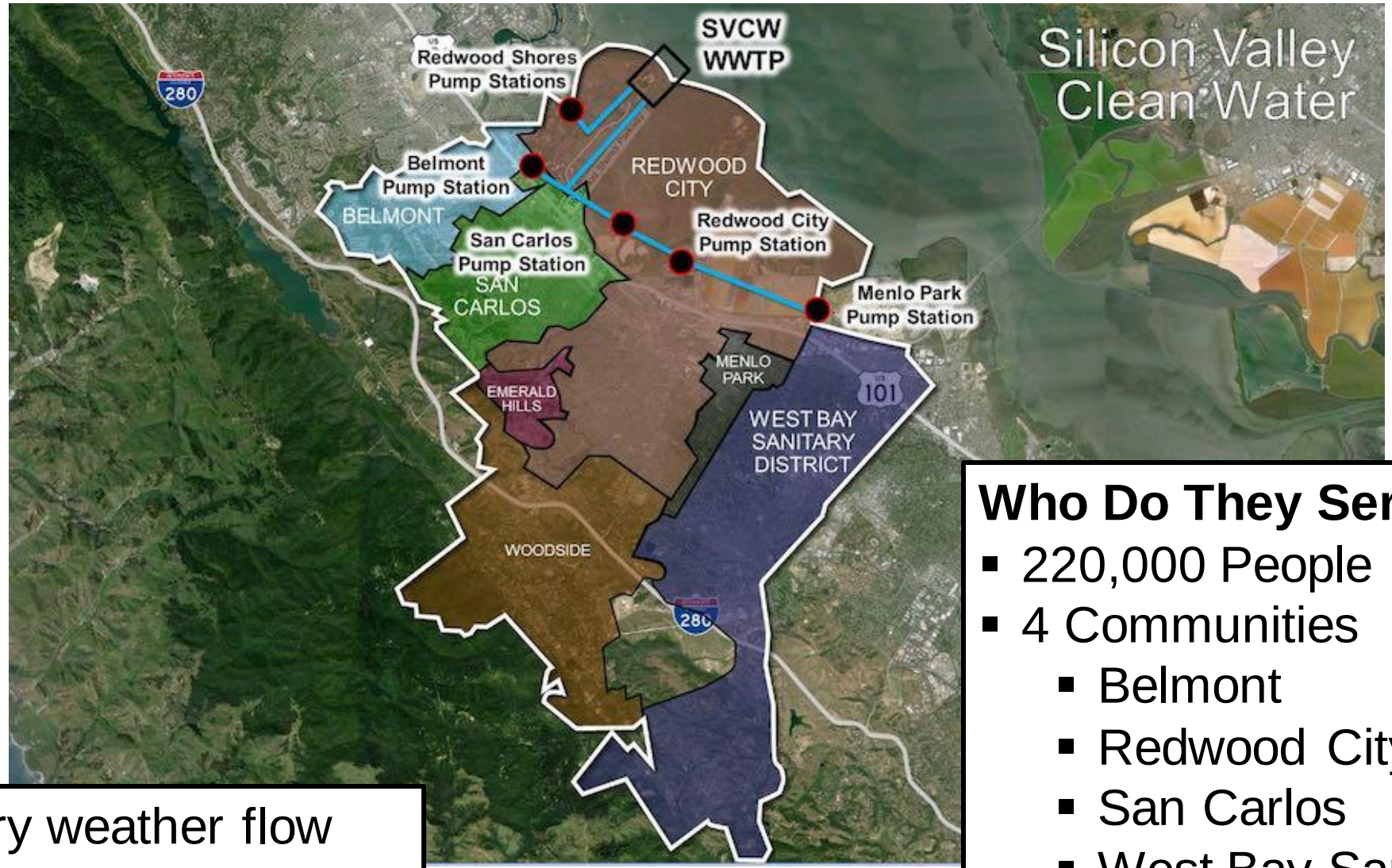
- Silicon Valley Clean Water
  - Investigation
  - Analysis
  - Design and repair




- City of San Jose – Santa Clara Regional Wastewater Facility
  - Condition Assessment Program
  - Future projects




# SILICON VALLEY CLEAN WATER

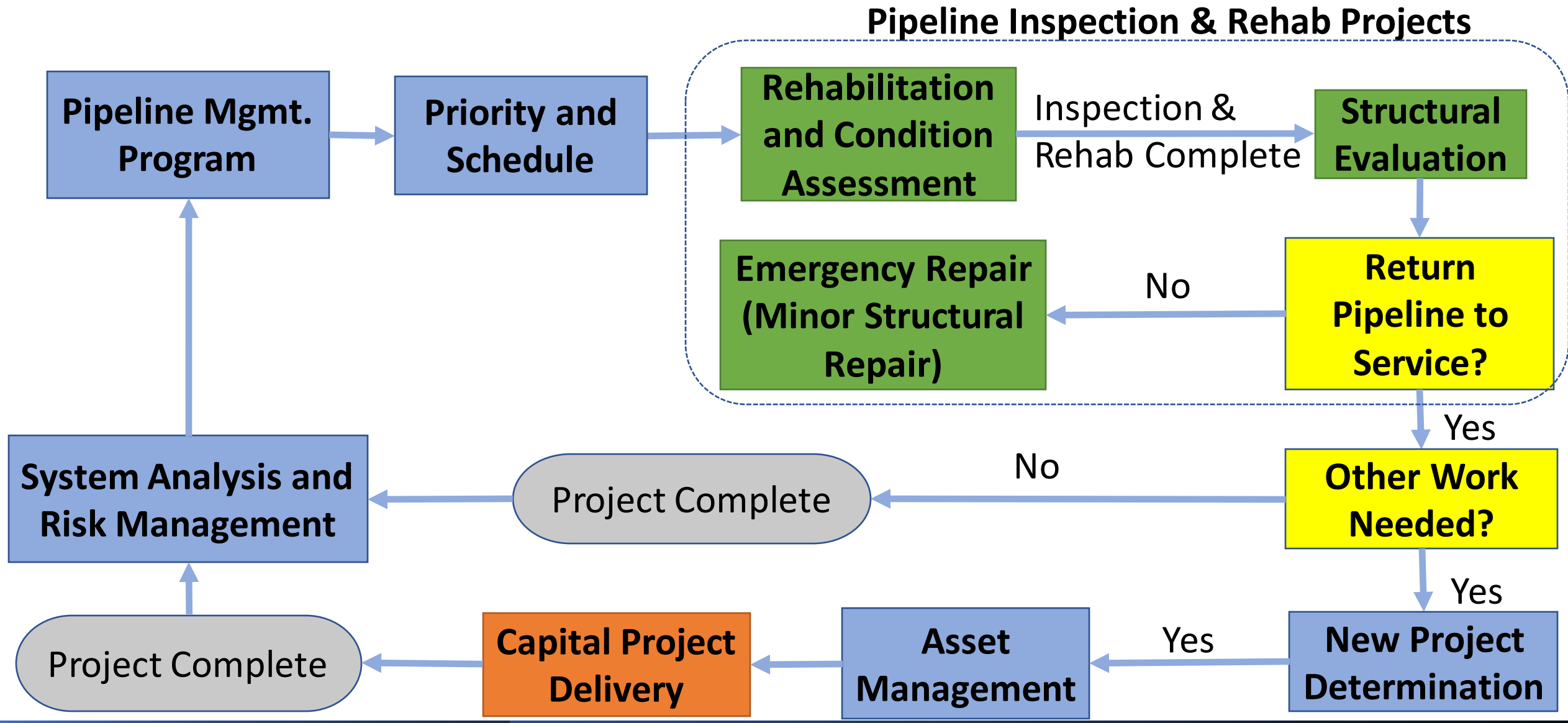



**Who Do They Serve:**

- 220,000 People
- 4 Communities
  - Belmont
  - Redwood City
  - San Carlos
  - West Bay Sanitary District

Average dry weather flow permitted capacity: 29 MGD

# PIPELINE MANAGEMENT PROGRAM



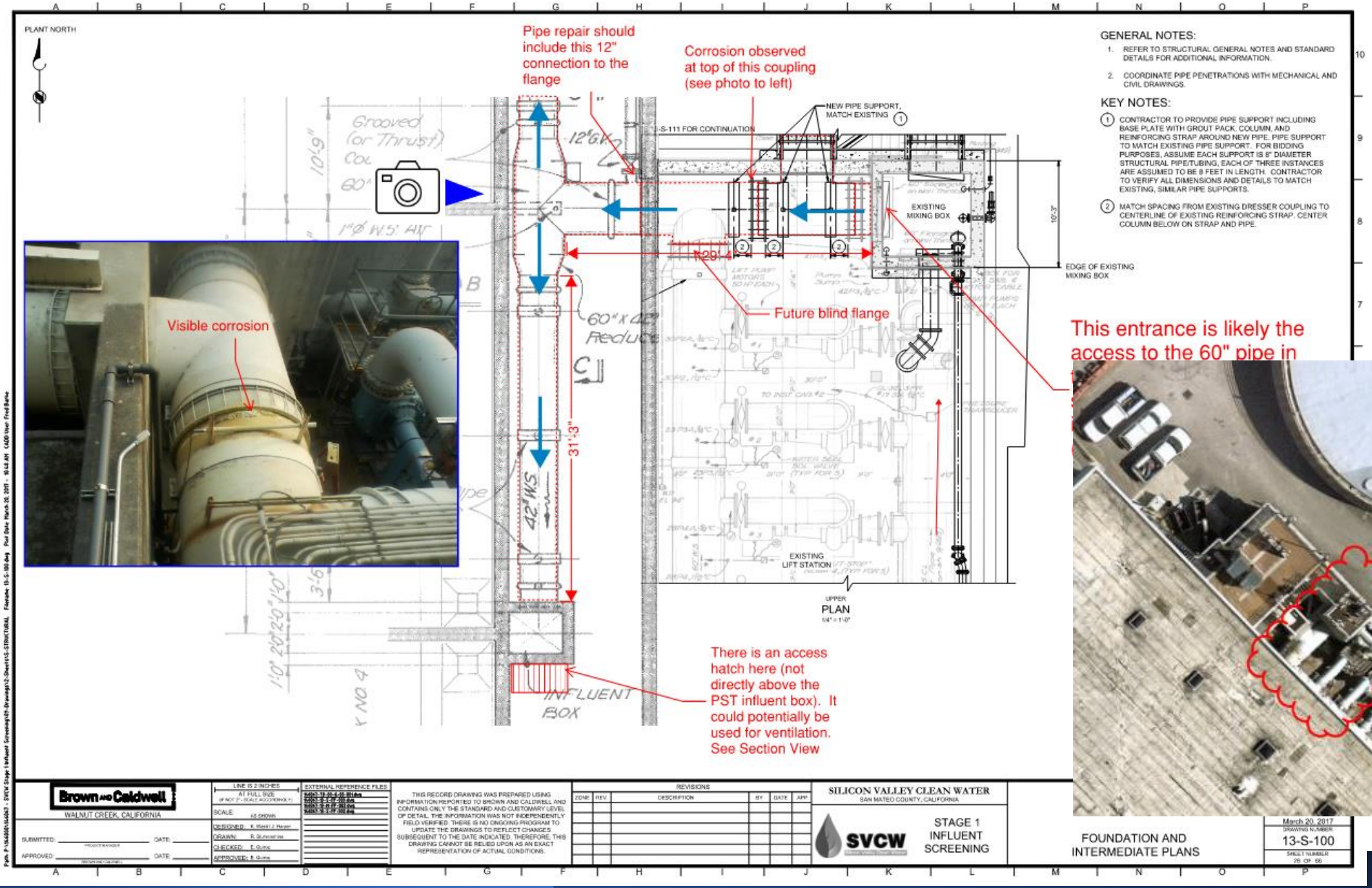
# Silicon Valley Clean Water WWTP Pipe Corrosion

- Investigation of visible corrosion on multiple segments of pipe led the Owner to engage a consultant, Brown & Caldwell, for condition assessment and rehabilitation recommendations
- Brown & Caldwell contacted Structural Technologies for assistance with scoping the project
- Structural Technologies engaged in evaluation of products appropriate for rehabilitation

SVCW Silicon Valley Clean Water

Brown AND Caldwell

# Silicon Valley Clean Water WWTP Pipe Corrosion

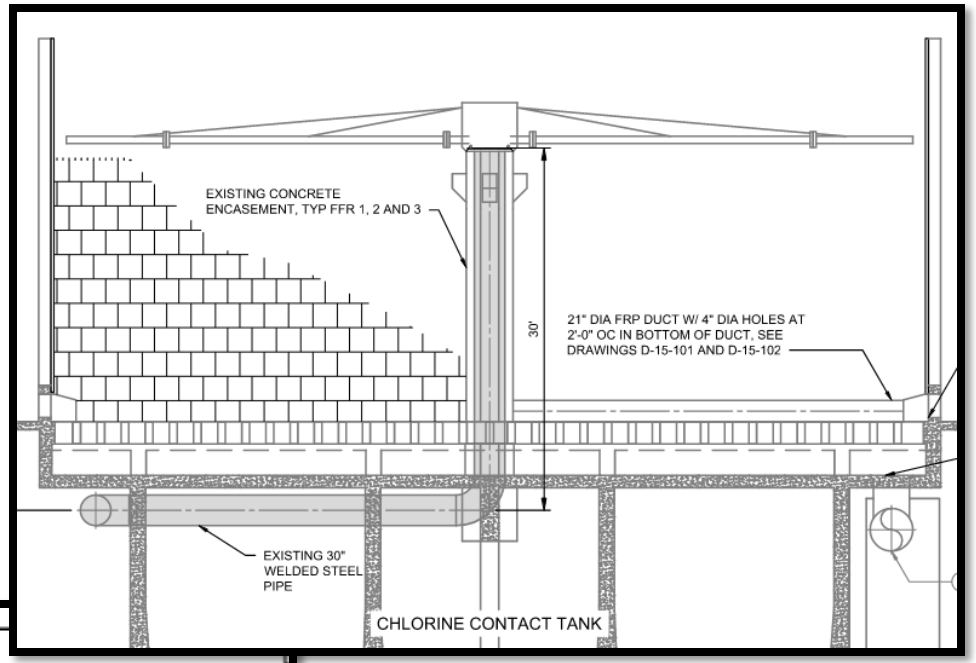


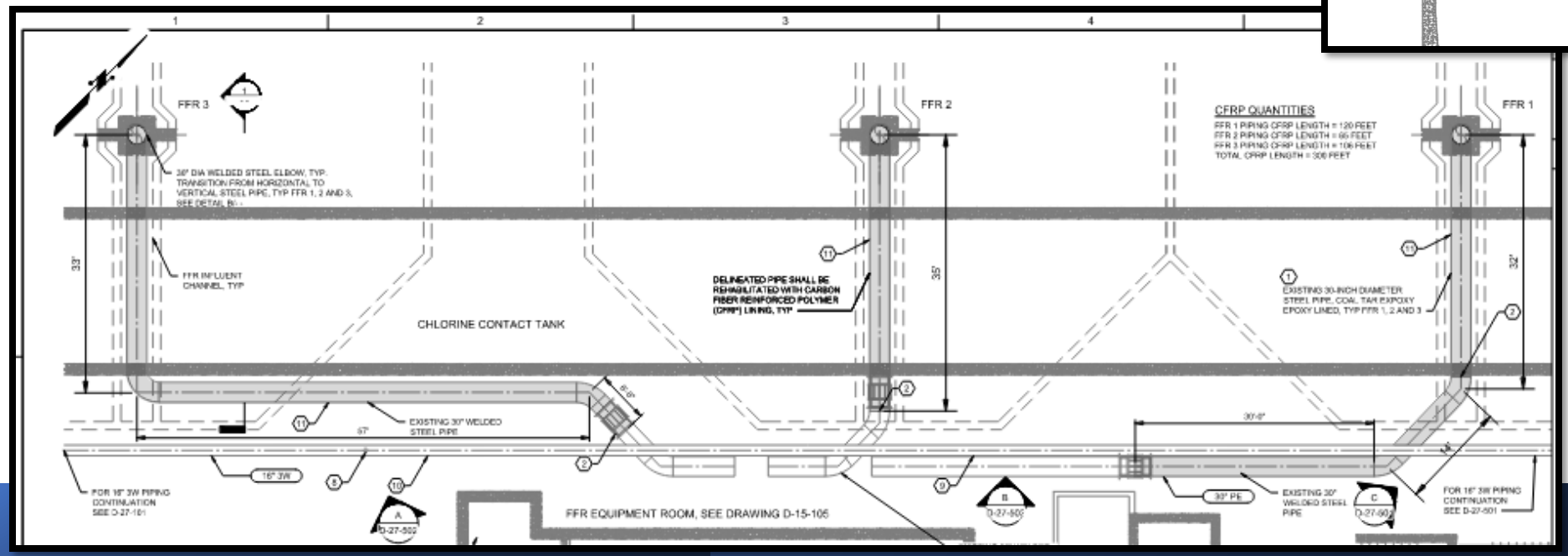
# Silicon Valley Clean Water WWTP Pipe Corrosion

- We were able to support Brown & Caldwell with specification development and operational planning
- Including the importance of qualifications for this type of specialty application work
- Project was completed in 21 days after initial mobilization

# Silicon Valley Clean Water WWTP Pipe Corrosion

- Since the completion, Structural has recently bid and procured the Fixed Film Reactor Project
- Three Phased Project (2024-2025) consisting of 290 LF of 30“ welded steel pipe
- 30 LF descent through a 24in cage for manual entry

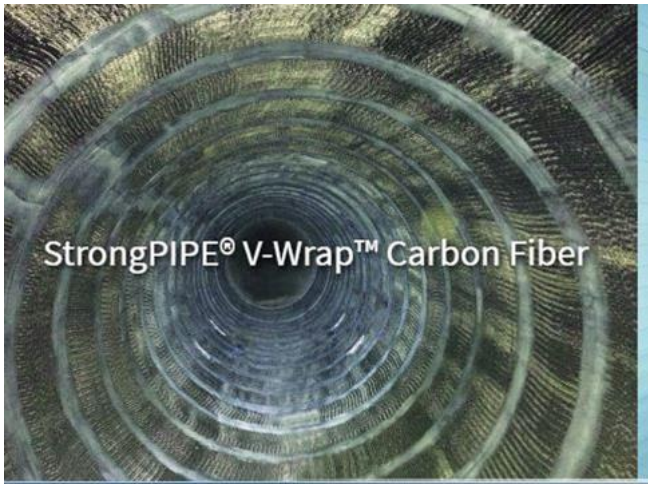


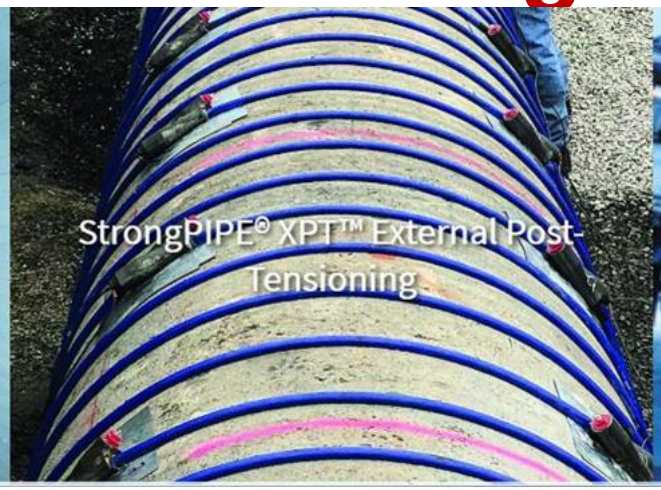
# Silicon Valley Clean Water WWTP Pipe Corrosion

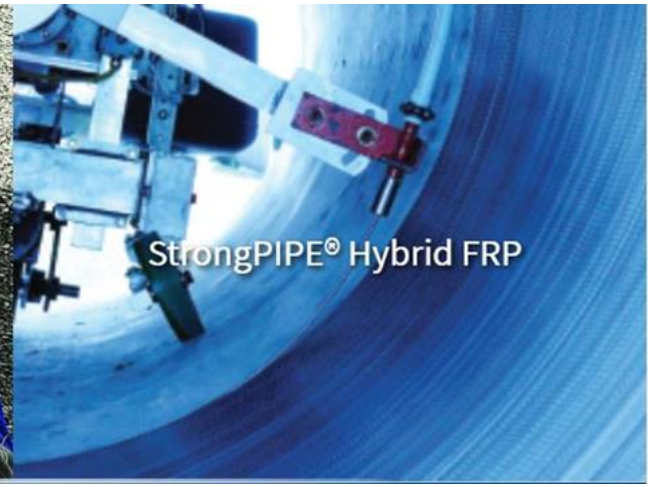
- 3 additional projects (30” – 60” diameters) have been identified by the Owner for renewal using CFRP for interior and exterior wrapping

# StrongPIPE® Technologies








## V-Wrap™ CFRP System

- Standalone design
- Internal / external
- Gravity / pressurized
- No hydraulic impact
- Odd geometries & bends

## PALTEM Flow Ring System

- Standalone design for gravity pipelines
- Internal
- Odd geometries & bends

## XPT External Post-Tensioning

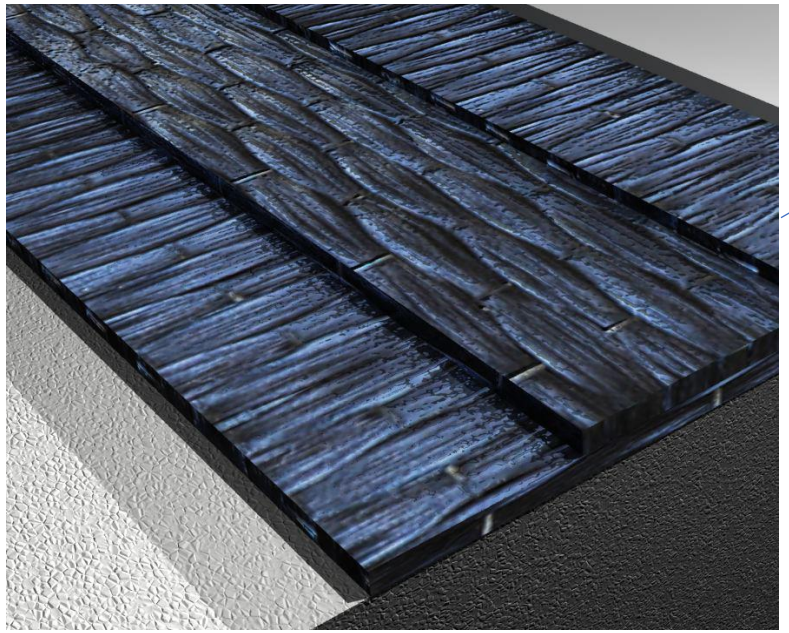
- Structural capacity upgrade for pressurized PCCP
- External
- Localized repairs

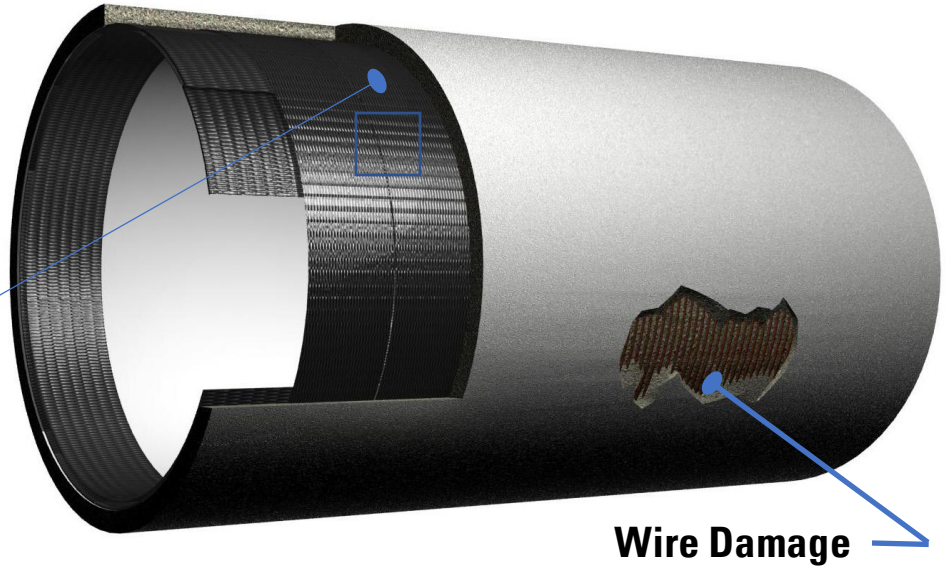
## SCL Hybrid FRP

- Standalone design
- Mechanically Installed Internally
- Helically wound wire embedded in polymer
- Long runs of Straight Pipe

# StrongPIPE® V-Wrap™ Carbon Fiber Reinforced Polymer (CFRP)

- Structural Technologies supported CFRP per AWWA C305 a full standalone Class 4 rehabilitation






**Benefits:**

- No excavation – Use existing point of access
- Industry accepted

**Considerations:**

- Control of temperature and humidity
- Joint crossings
- Noise abatement

# StrongPIPE® V-Wrap™ Carbon Fiber Reinforced Polymer (CFRP) - Installation Steps

Dewatering


Surface Preparation


Adhesion Testing

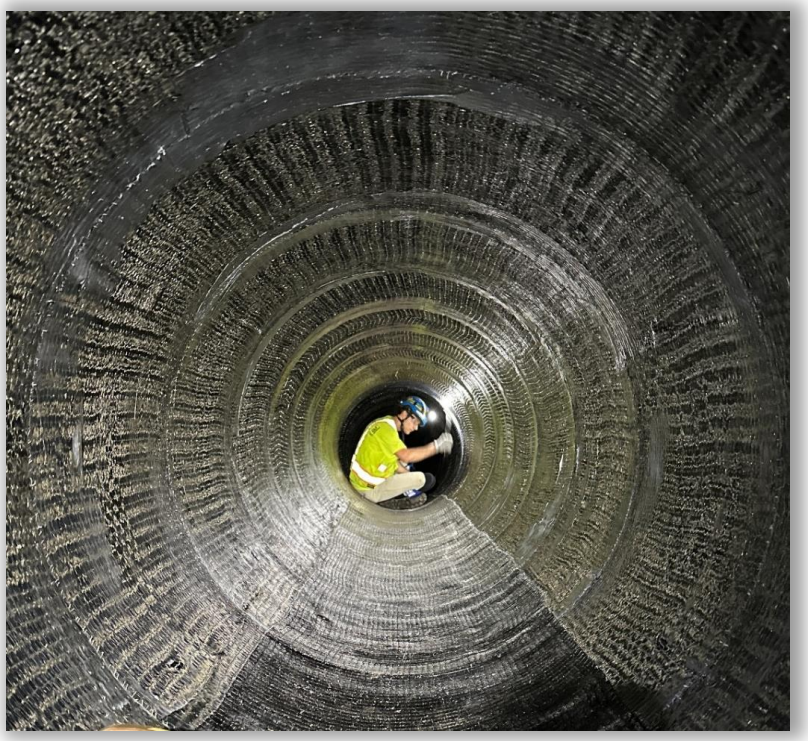
# StrongPIPE® V-Wrap™ Carbon Fiber Reinforced Polymer (CFRP) - Installation Steps

Fabric Saturation

Weight Ratio Test - Verification

Fabric Installation

# StrongPIPE® V-Wrap™ Carbon Fiber Reinforced Polymer (CFRP) - Installation Steps

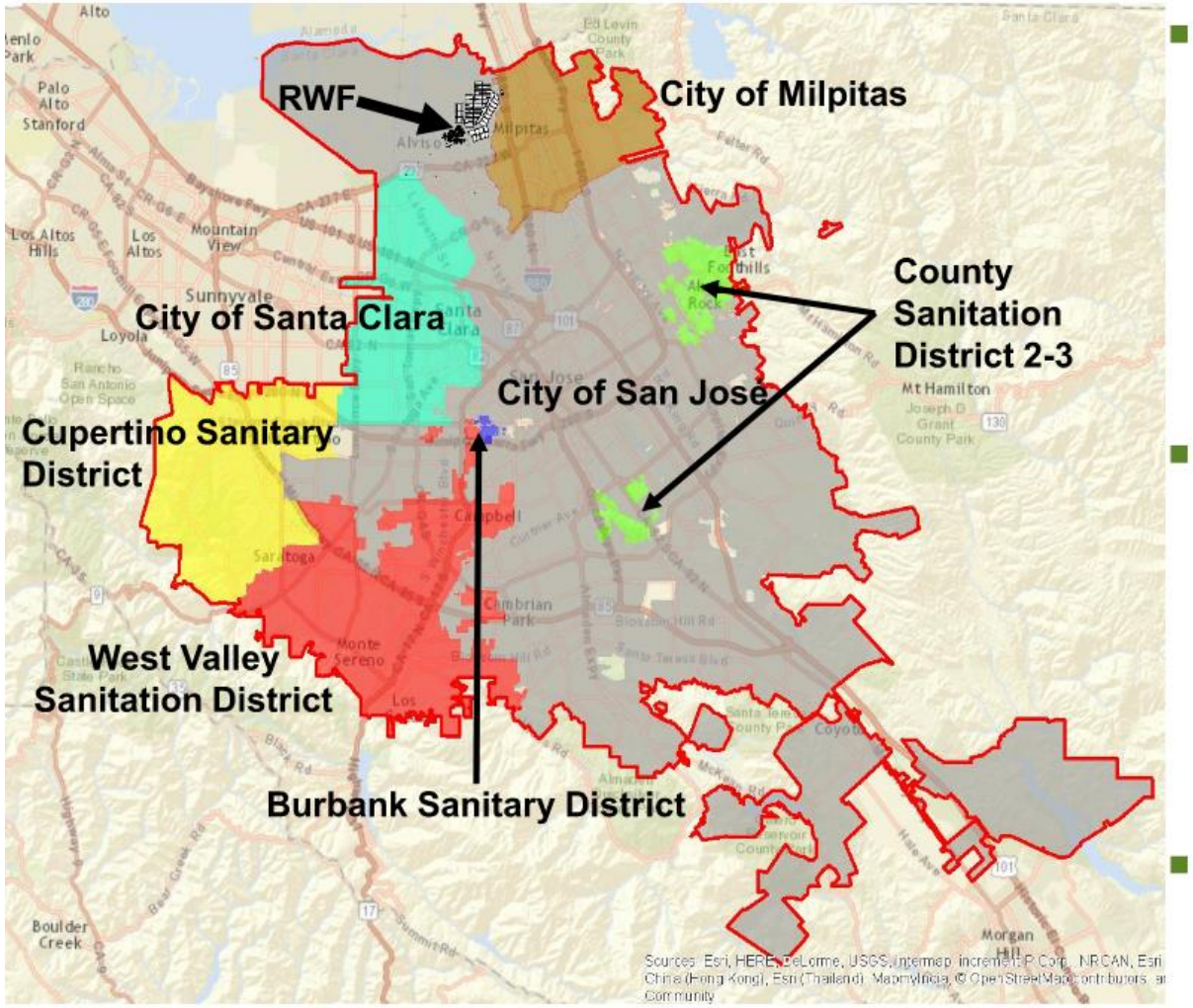


Testing for Voids

Compression Ring Installation at Terminations

Final Walk Through – QA/QC

# CITY OF SAN JOSE – SANTA CLARA REGIONAL WASTEWATER FACILITY




- Largest advanced wastewater facility on the West Coast
  - 167 MGD capacity
  - 2,600 acre site
- Serves
  - 1.4 million people
  - 17,000 businesses
  - 8 cities & County areas
- Continually operating 24/7 since 1956

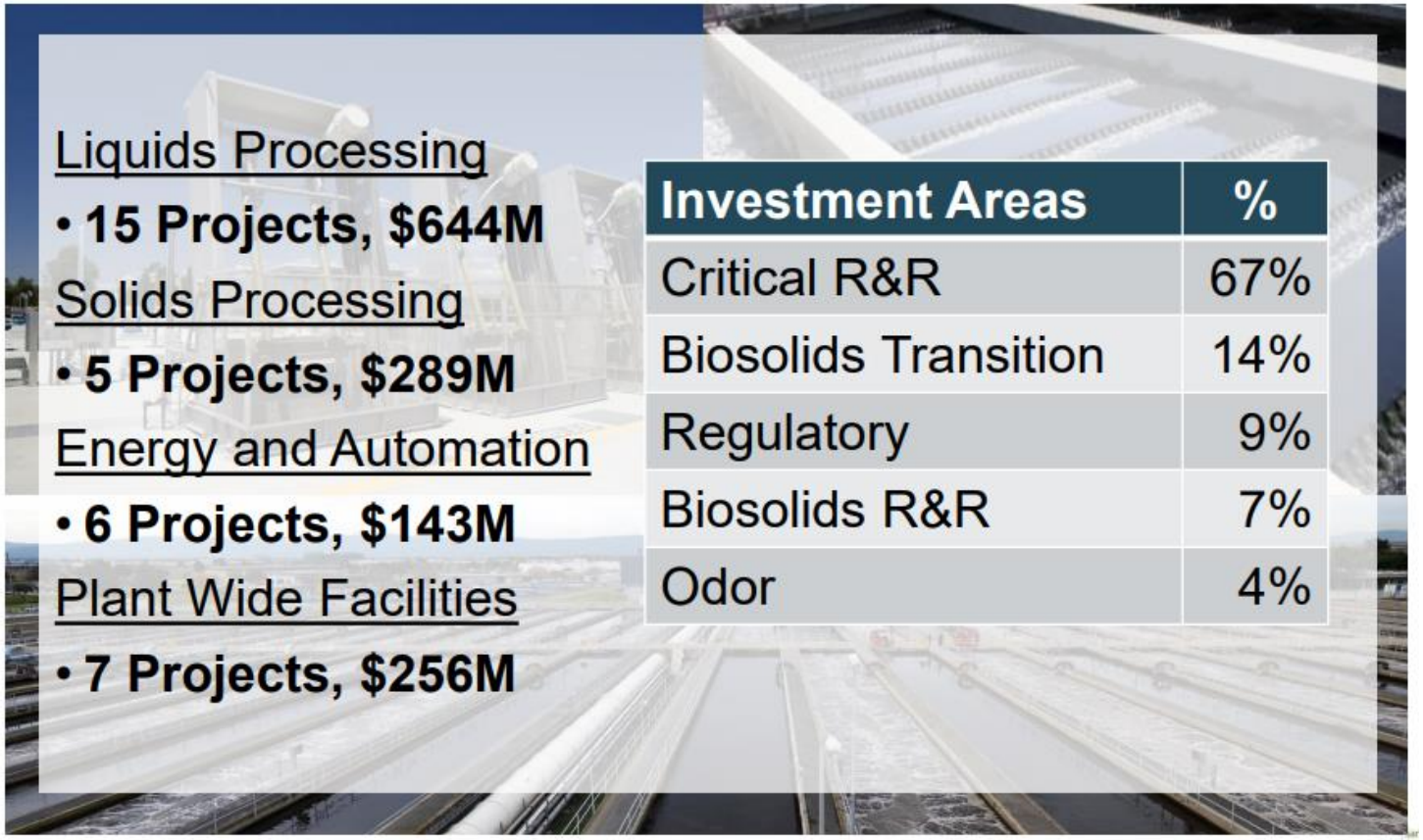
San José-Santa Clara Regional Wastewater Facility

# CITY OF SAN JOSE – SANTA CLARA REGIONAL WASTEWATER FACILITY

- 30-year Capital Improvement Program (2010-2040)
- Issues:
  - Aging infrastructure, lots of concrete!
  - Seismic upgrades.
  - High groundwater - salty water.
  - Large diameter pipes in bad condition.

# CITY OF SAN JOSE – SANTA CLARA REGIONAL WASTEWATER FACILITY

## CIP Organized into 4 Work Packages



Liquids Processing
- **15 Projects, $644M**

Solids Processing
- **5 Projects, $289M**

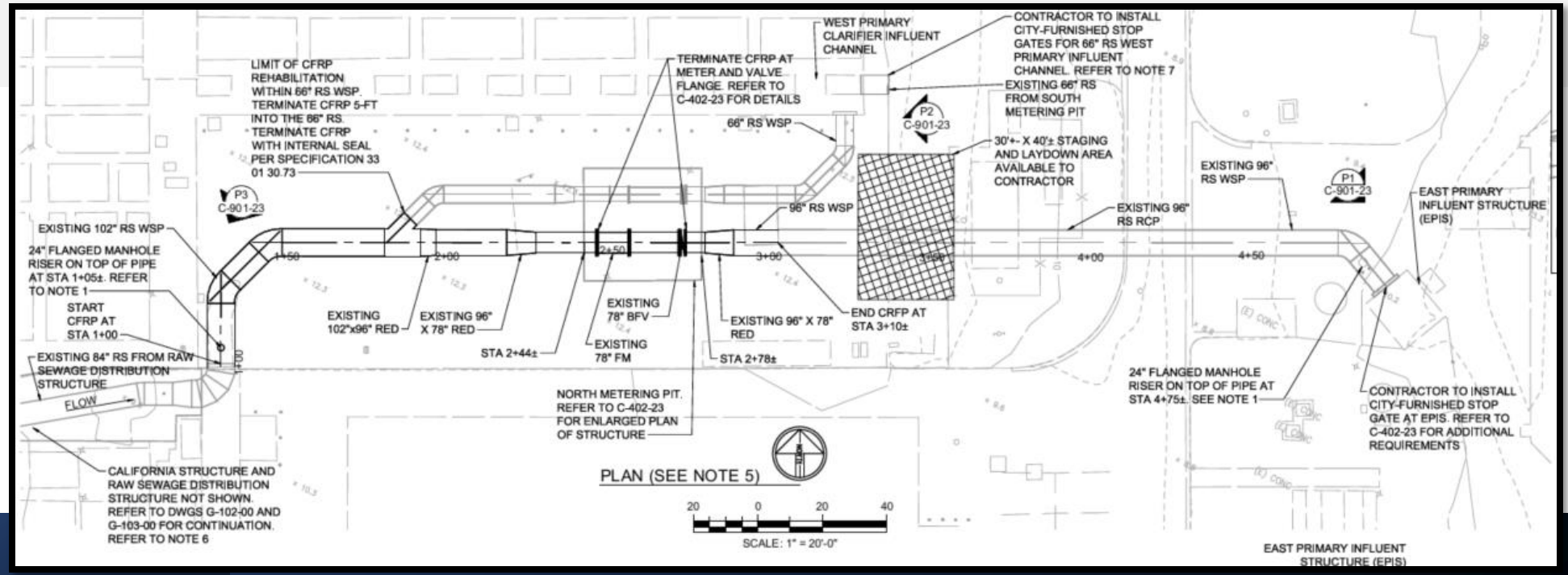
Energy and Automation
- **6 Projects, $143M**

Plant Wide Facilities
- **7 Projects, $256M**

| Investment Areas | % |
|---|---|
| Critical R&R | 67% |
| Biosolids Transition | 14% |
| Regulatory | 9% |
| Biosolids R&R | 7% |
| Odor | 4% |

# CITY OF SAN JOSE – SANTA CLARA REGIONAL WASTEWATER FACILITY

- City of San Jose – Santa Clara Regional Wastewater Facility to move forward with a similar rehabilitation approach for their deteriorated pipeline infrastructure.
- Project 9850 – Yard Piping Improvements, Phase 2 consists of approximately 200 LF of 102”, 96” and 78” corroded steel pipe.
- The project is scheduled for July 2024 and CFRP is planned for 5 weeks of construction.



# Thank You!

# Questions?

structural TECHNOLOGIES