SAN JOSE WATER

Infrastructure: Building for the Future

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Agenda

- Introduction & History of SJW Distribution System
- Leak Repairs
- Main Replacement Program
- Planning, Engineering & Construction
- Overview of Stations & Special Facilities
- Special Facilities Improvement Projects
- Q&A

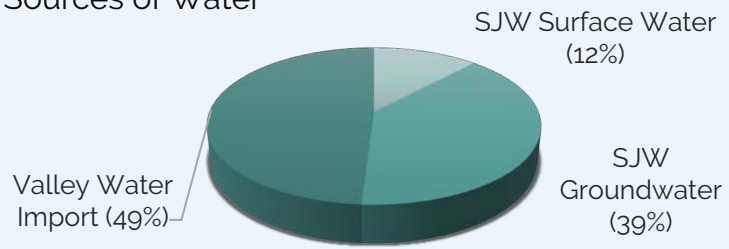
Capital Improvement Program

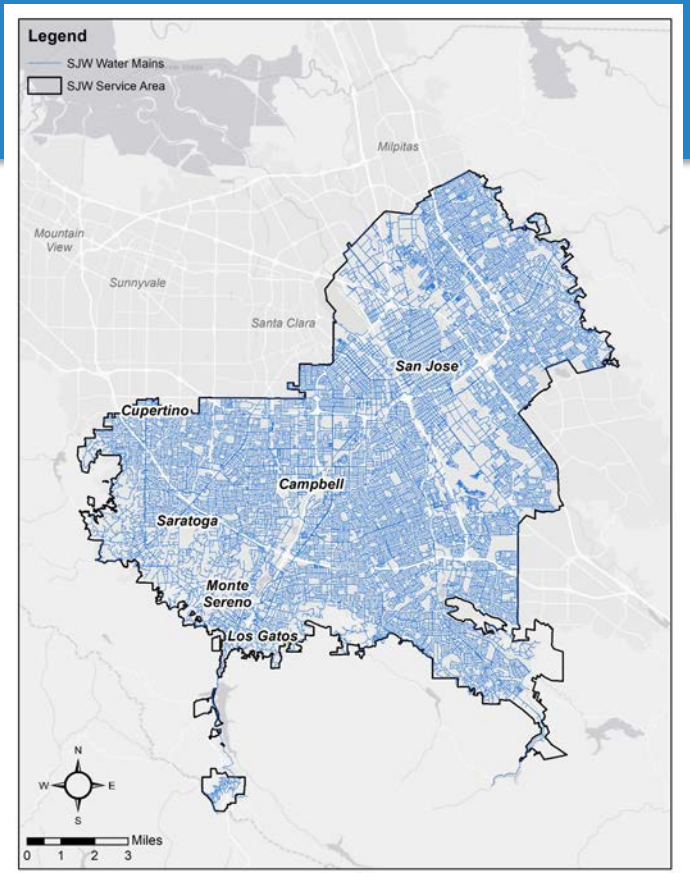
Main Replacement Program

System Overview

- Serving more than 1M customers in the defined service area
- ~2,400 miles of pipes with varying sizes (4”-48”)
- Provides water from several sources
  - *From Valley Water:* Penitencia, Rinconada, Santa Teresa

Sources of Water





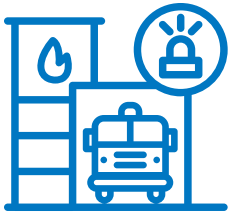
Map of SJW Service Area

Our Customers

Residential

Commercial

Industrial



Fire Protection

Distribution System through History

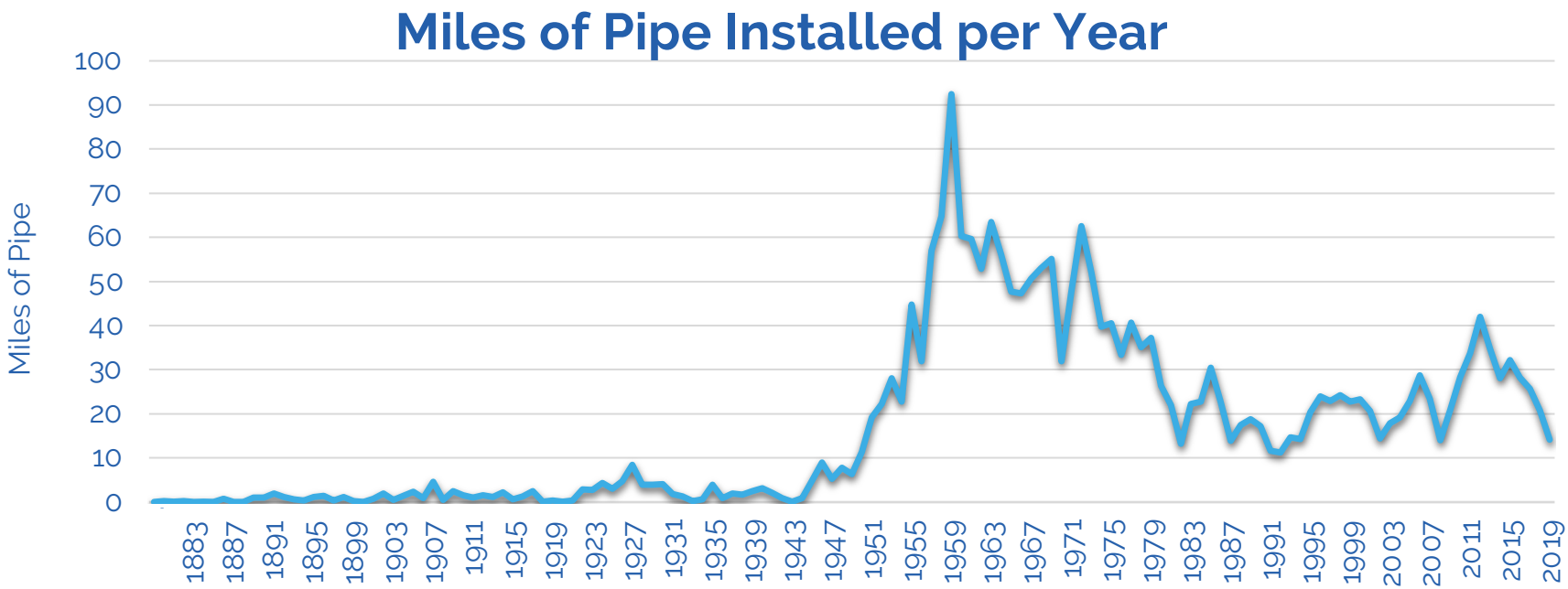
- History of SJW goes back over a century
  - Founded in 1866, served about 400 customers in the Santa Clara and San Jose area
- Some currently functioning parts of our distribution system are more than a century old as well
  - Oldest currently active pipeline is from 1879
- As the area expanded with population growth and economic booms, the SJW system expanded to meet the needs of the growing community

Alum Rock Pipeline, 1927

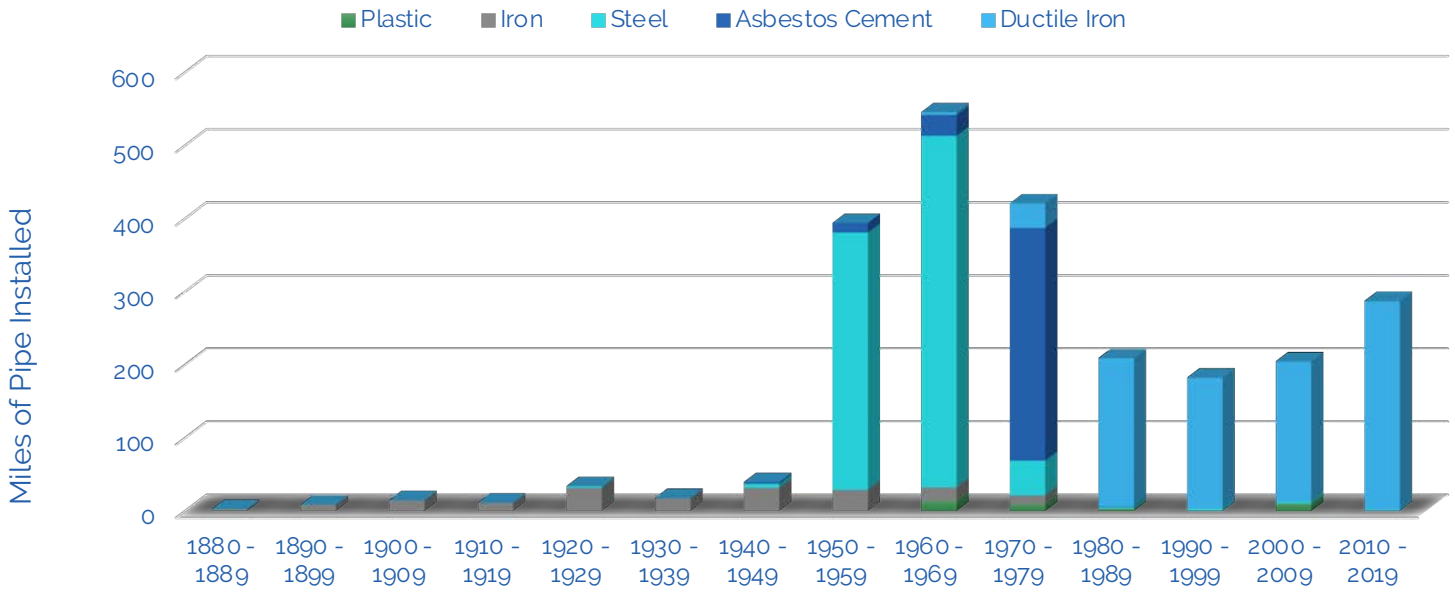
Workers in Pipeline Trench, 1950

Workers with pipe, 1934

Distribution System through History



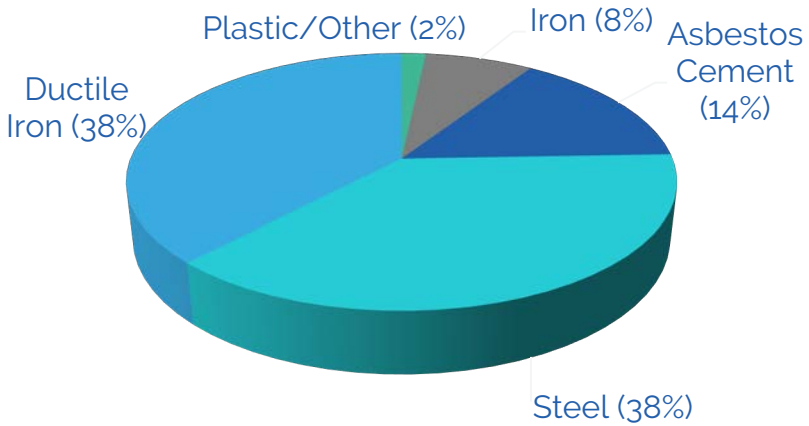
Distribution System through History



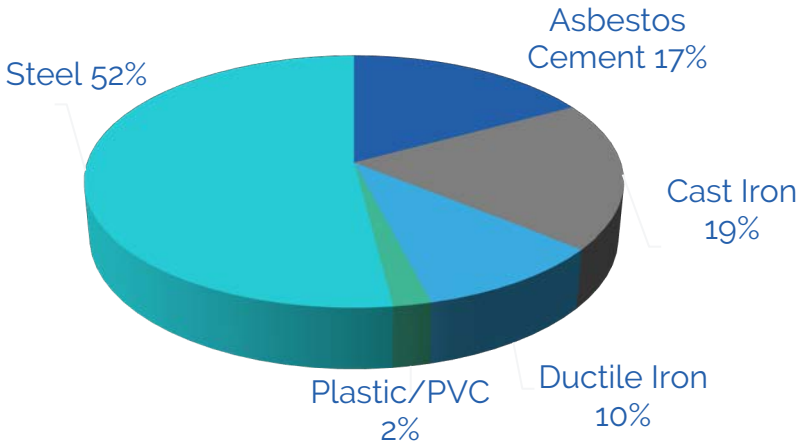
SJW Pipe Type by Decade

Pipe Type Breakdown

Pipe Type Breakdown



Leaks by Pipe Type



When a main breaks…

Leak on a 42-in Steel Pipe

Sinkhole erupts on street

Leak at joint

Leak causes flooding on street

Leak Repairs

- Once a leak is reported, our personnel responds and assesses the situation
- USA 811 is called to notify other agencies and utilities of the plan for excavation and need to mark facilities
- Repair crew works to patch leak to restore water service as quickly and safely as possible
- Depending on leak type, the water main could be at risk of leaking again, requiring a replacement

Why Replace Mains?

- Vital to delivering **safe, clean, reliable water** to our customers
- **Planning ahead** to meet demands of our fast-growing community

Downtown San Jose 1890

Downtown San Jose 2021

Main Replacement Program

- Replaces **24 miles** of pipe, or **1%** of linear infrastructure
- Pipe replacement rate corresponds with a 100 year average pipe lifespan
- SJW has standardized installation of cement-lined ductile iron pipe (DICL) since ~1985
  - Average life expectancy of DICL pipe: approximately 100 years

How Does It Happen?

PLANNING

Which mains do we replace?

SURVEY

What is out there?

ENGINEERING DESIGN

What is the best way to do this work?

PERMITTING AND APPROVALS

Who do we coordinate with to minimize our impact to the surrounding area?

CONSTRUCTION

How do we do this work well, quickly, and safely?

AS-BUILTS AND GIS

How can we keep track of everything that was completed?

Planning

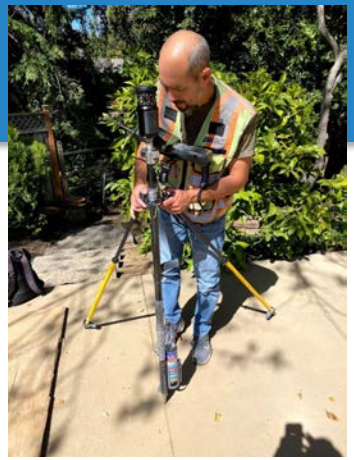
Which mains do we replace?

- Pipeline replacement prioritization is based on a **calculated risk score**
- Score is based on **probability of failure** and **consequence of failure**

Survey

What is out there right now?

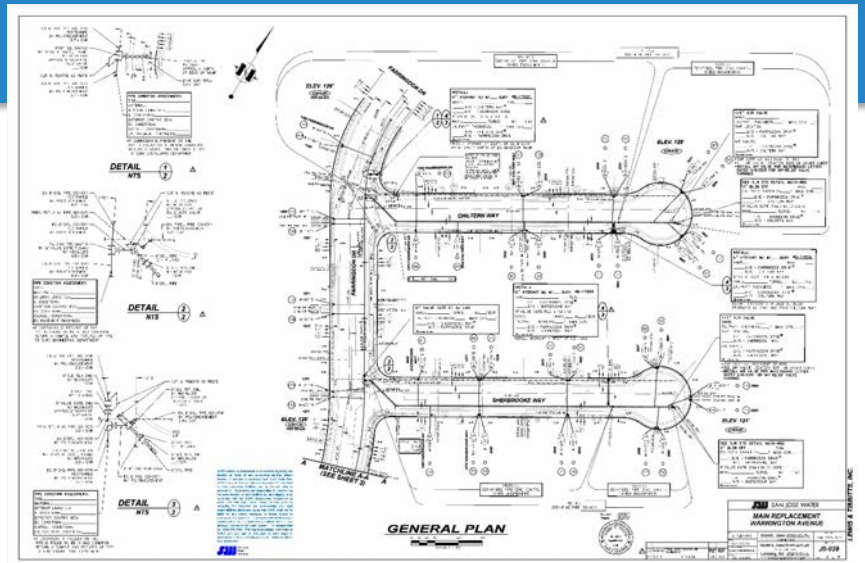
- Captures survey points of **existing features**
- Researches and compiles **related property records**
- Forms the framework for a **project basemap**

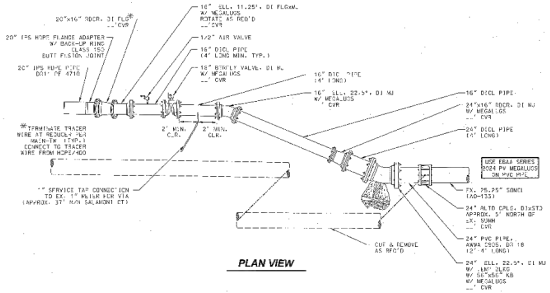


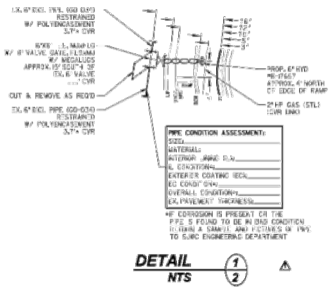
Engineering Design Process

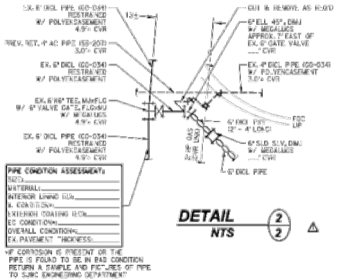
What is the best way to do this work?

- **Researches and identifies existing utilities** above and below ground to develop a comprehensive basemap
- **Evaluates impacts of field conditions** on proposed water main
- **Optimizes design** to meet pertinent regulations, design standards, and health codes









Permitting & Approvals

Who do we coordinate with to minimize our impact to the surrounding community?

- Work with state and local municipalities and agencies to obtain permits
- Coordinate with other utilities to resolve any potential conflicts during design

Construction

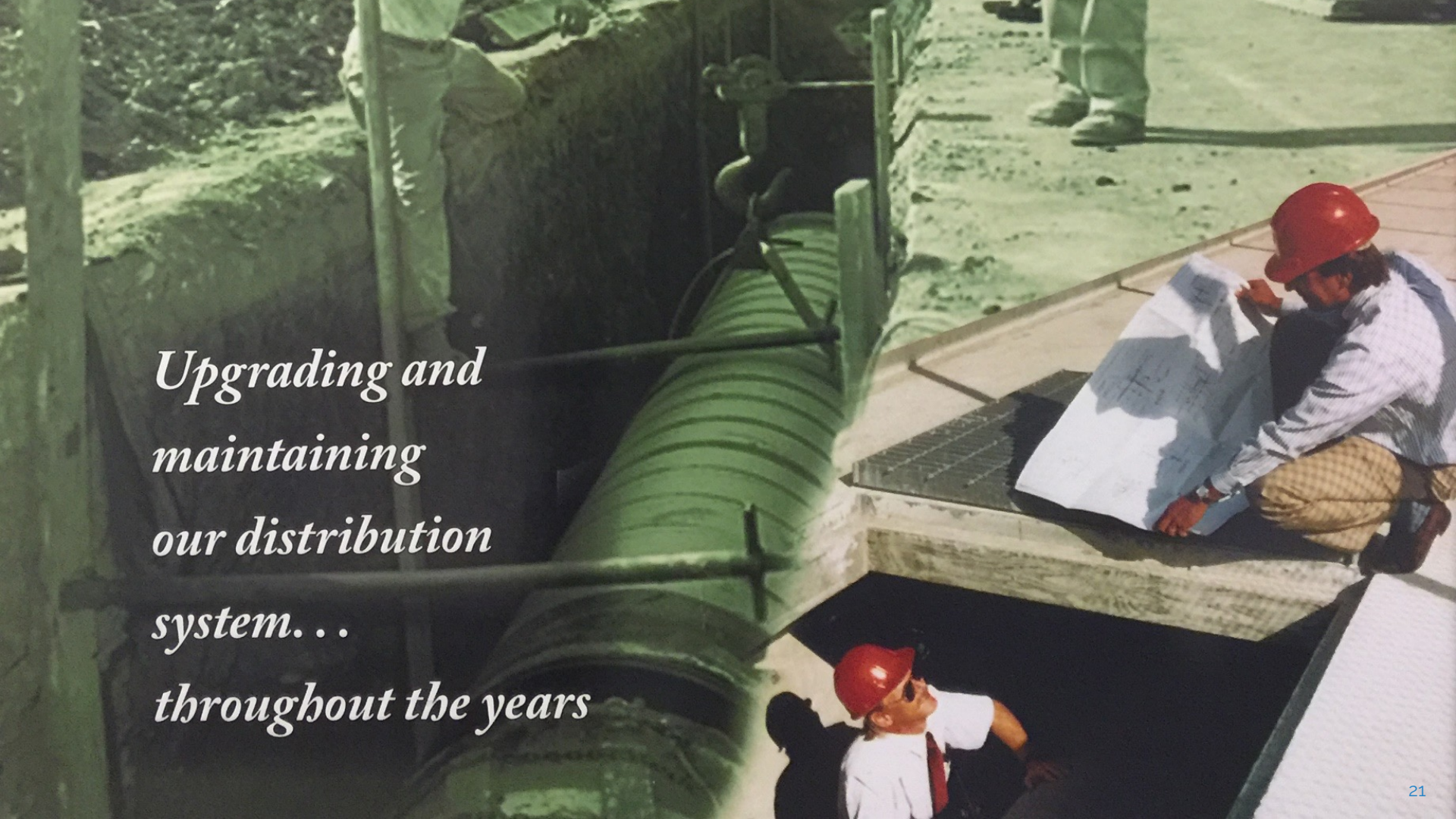
How do we do this work well, quickly, and safely?

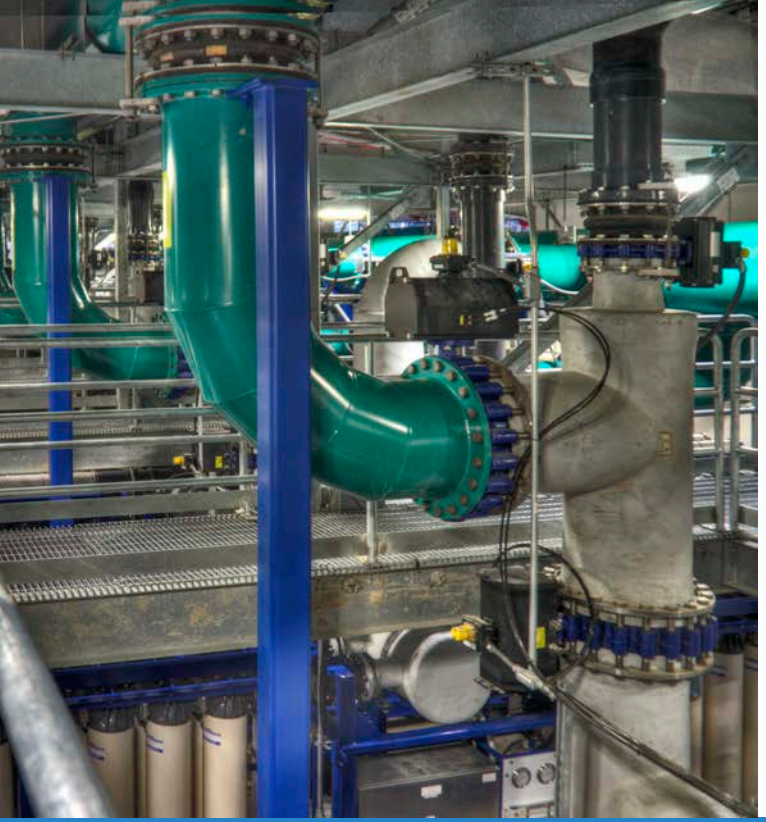
SJW Construction Department and contractors work together to:

- Layout, locate existing utilities, and set up traffic control
- Install water facilities according to design
- Clean, disinfect, and prepare new facilities for connection
- Connect new facilities to the existing distribution system
- Transfer water services to new water main
- Disconnect existing pipes to be retired
- Restore the street surface

As-builts and GIS Updates

- As-built maps
  - Post-project: create maps that reflect what was actually constructed
  - Keep accurate records
- Geographic Information System (GIS)
  - Digitizes completed as-built plans, stores information as online map
  - Gives useful near real-time reference for SJW staff to use and share


Upgrading and maintaining our distribution system. . . throughout the years

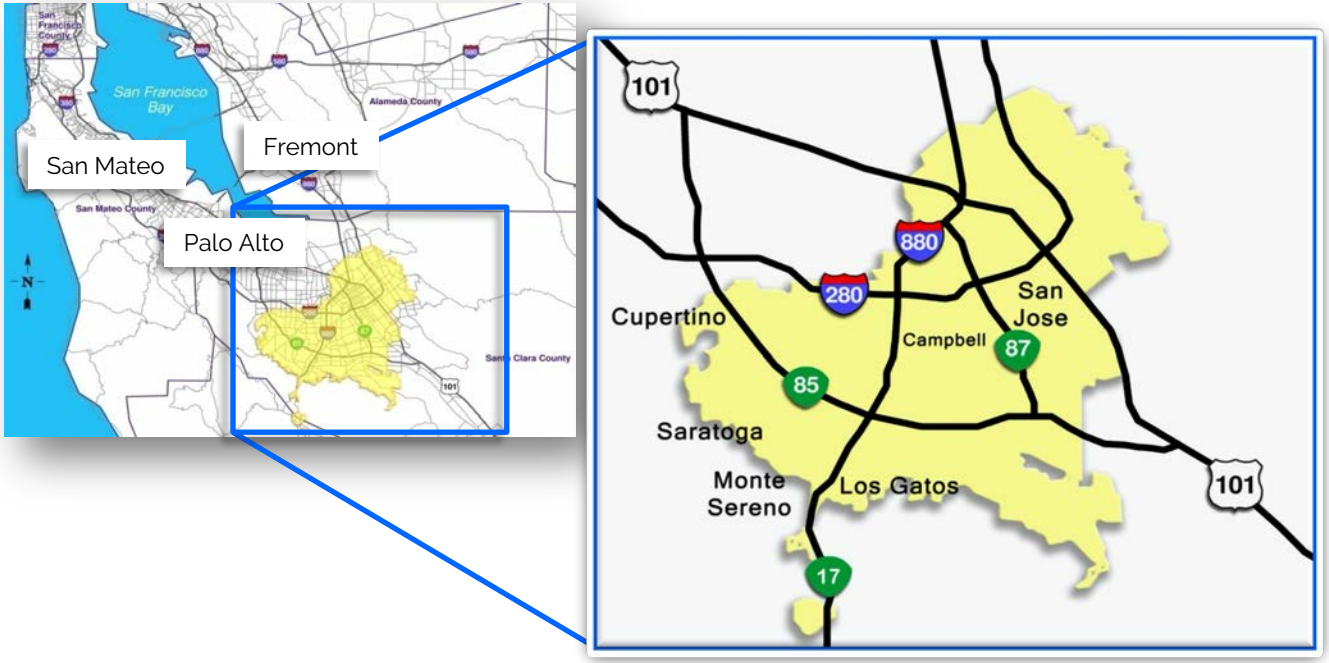


Capital Improvement Program

Stations and Special Facilities

SJW Service Area

San Jose, Los Gatos, Saratoga, Campbell, Monte Sereno, Cupertino and Unincorporated Santa Clara County



SJW Special Facilities Overview

96 Pump Stations with 253 Pumps

92 Wells

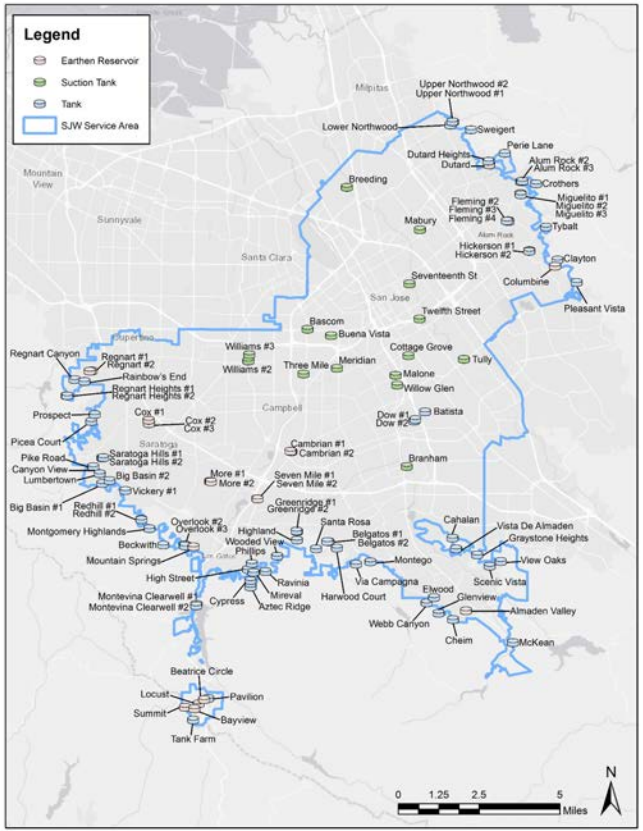
106 Storage Facilities (250 MG Capacity)

3 Treatment Plants

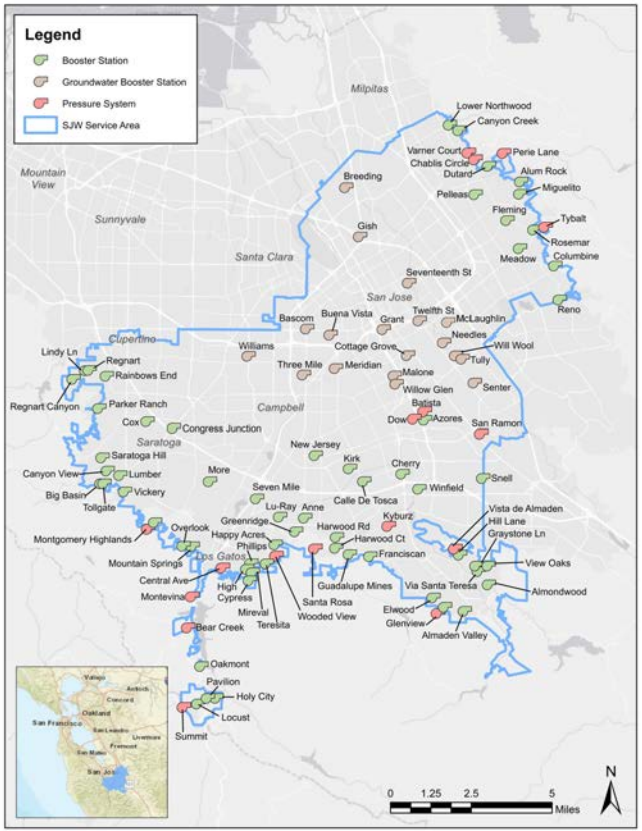
SJW Pressure Zones

97 Pressure Zones

SJW Tanks & Reservoirs



SJW Wells & Pump Stations



SJW Special Facilities

- Storage Tanks and Reservoirs
- Pump Stations
- Groundwater Production Wells
- Yard Piping
- Motor Control Centers (MCC)
- Back-up Power Generators
- Site Security Fencing
- Station Water Treatment

SJW Cypress Station – Pump Station & MCC

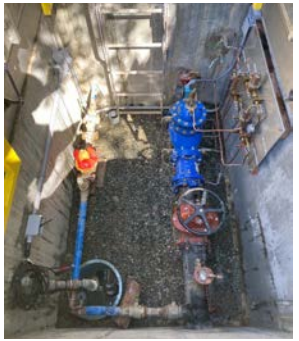
SJW Cambrian Station – Pump House

SJW Dow Station – Welded Steel Tank

SJW Special Facilities

- Building Structures
- Pressure & Flow Control Valves
- Dampening Surge Tanks
- Paving, Grading and Drainage
- Landscape and Irrigation
- Tree Removal / Replacement
- Safety Improvements

SJW McLaughlin Station



SJW Parker Ranch – Control Valve in Vault

Underground Vault – Fall Protection

Project Life Cycle

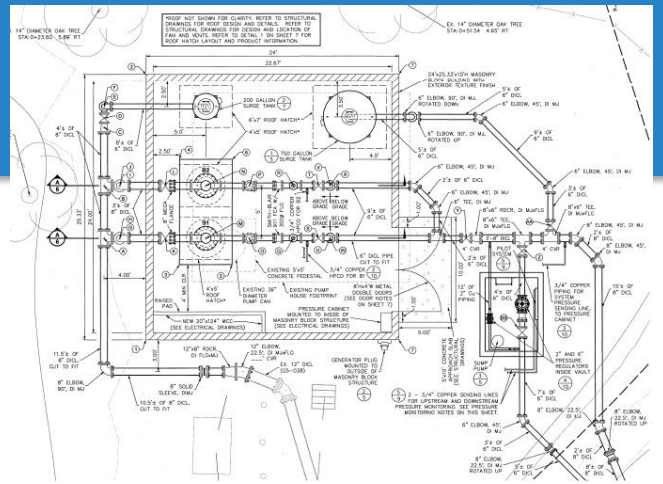
- Planning Level
- Infrastructure Assessment
- Identify and Prioritize Replacement of Infrastructure
- Project Justification
- Project Placed in CIP Budget Year
- Technical Memorandum

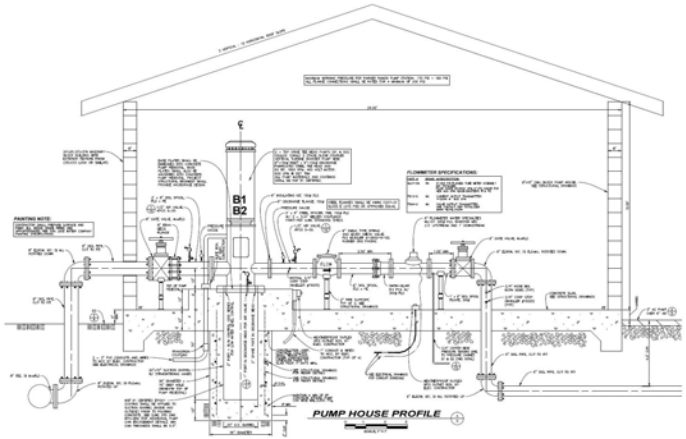
SJW Montego Station – Welded Steel Tank Demolition

SJW Three Mile Station – Booster Pumps

Project Life Cycle

- Technical Memorandum delivered to Special Facilities Design Group
- Existing facilities to remain in service during construction
- Design drawings are prepared
- Coordinate with local municipalities and agencies to obtain permits
- Specifications and construction documents





SJW Special Facilities Improvement Projects

SJW Belgatos Station
Reservoir Replacement Project

Previous Conditions

- Two earthen embankment reservoirs totaling 9.5 million gallons
- Earthen Embankment Reservoir study was conducted
- Service Life – Built in 1956
- Structural Deficiencies

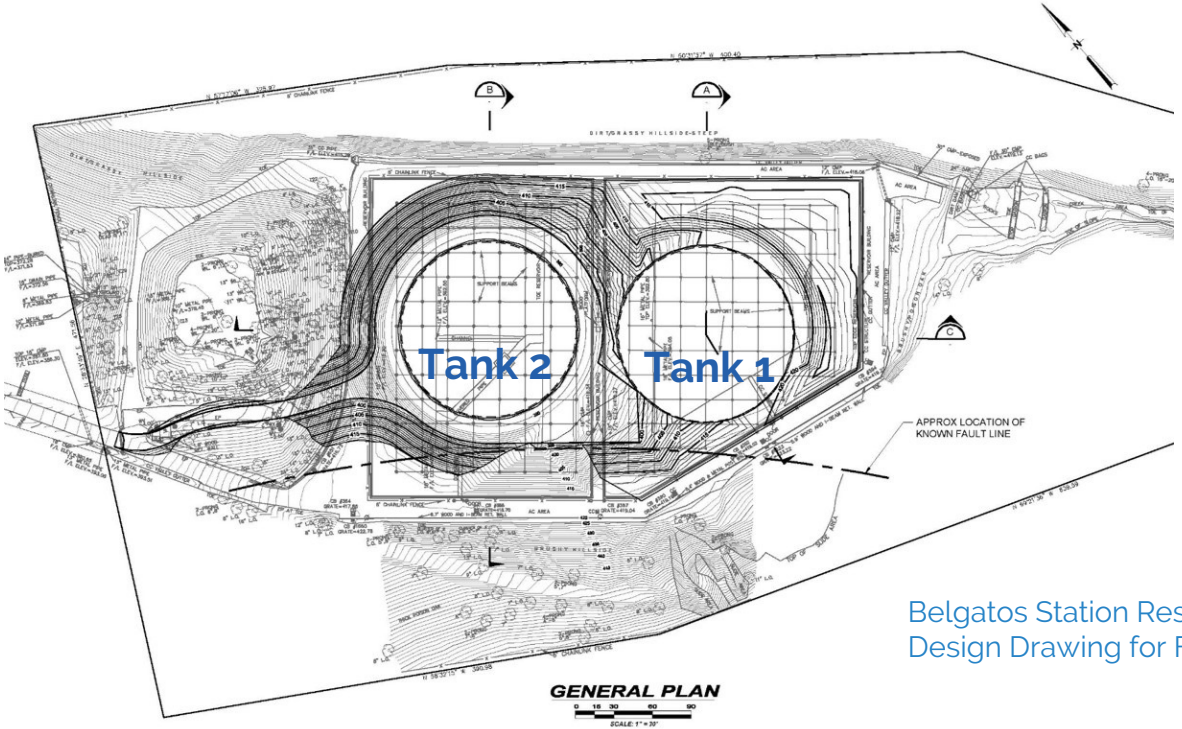
Belgatos Station Reservoirs, Photos Taken in 2017
Prior to the Start of Construction for the New Tanks

Project Description

- Demolish existing reservoirs
- Construct two 2.37M gallon operational AWWA D110 Type I prestressed concrete tanks
- 2 tanks provide operational flexibility
- 3-year project duration
- Construction began in late 2017 and completed in 2020
- More than 100-year service life
- $24M total project cost

Rendering of the New Belgatos Tanks

SJW Belgatos Station
Reservoir Replacement Project



Belgatos Station Reservoir Replacement,
Design Drawing for Final Site Layout

SJW Belgatos Station
Reservoir Replacement Project

Belgatos Station Tanks, Construction Progress Photo Taken in May 2020

SJW Belgatos Station
Reservoir Replacement Project

Belgatos Station Tank 1, Internal Photos

SJW Belgatos Station
Reservoir Replacement Project

Belgatos Station Tanks, On-Site Construction Complete and Both Tanks Online

SJW Columbine Station
Reservoir Replacement Project

Previous Conditions

- Demolish existing reservoirs
- Construct two 2.37M gallon operational AWWA D110 Type I prestressed concrete tanks
- 2 tanks provide operational flexibility
- 3-year project duration
- Construction began in late 2017 and completed in 2020
- More than 100-year service life
- $24M total project cost

Columbine Reservoir Station, Pre-Construction Aerial Photograph

Project Description

- Demolish existing reservoir
- Two 5.07M gallon operational AWWA D110 Type I prestressed concrete tanks
- 2 tanks provide operational flexibility
- Tank mixing systems
- 3-year project duration
- Construction began in 2020
- More than 100-year service life
- $37M total project cost

Aerial Drone Photo Taken Earlier this Year After Demolition of the Existing Earthen Embankment Reservoir

SJW Columbine Station
Reservoir Replacement Project

Construction Progress Photo Taken in March 2021 After Demolition of the Existing Earthen Embankment Reservoir and Phase 1 Grading Activities for Tank 1 Construction

Q & A