

# Strawberry Creek Culvert Maintenance Project

January 7, 2025  
Community Meeting



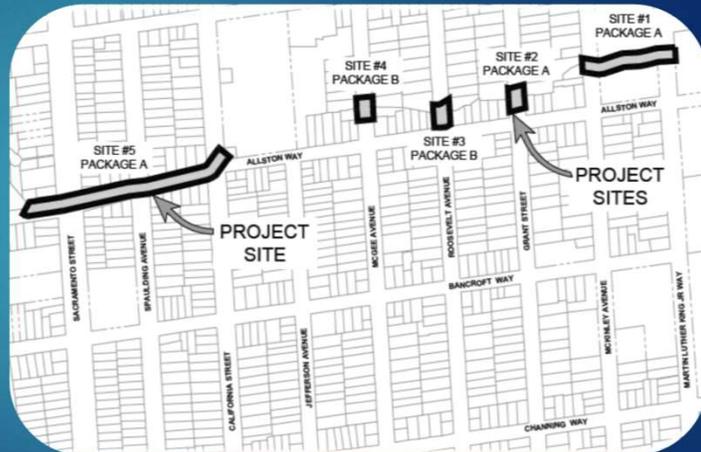
- ▶ Project Summary
- ▶ Strawberry Creek Watershed
- ▶ Culvert Assessment Efforts
- ▶ Rehabilitation Approach
- ▶ Environmental Considerations
- ▶ Impacts to Community
- ▶ Project Schedule

AGENDA

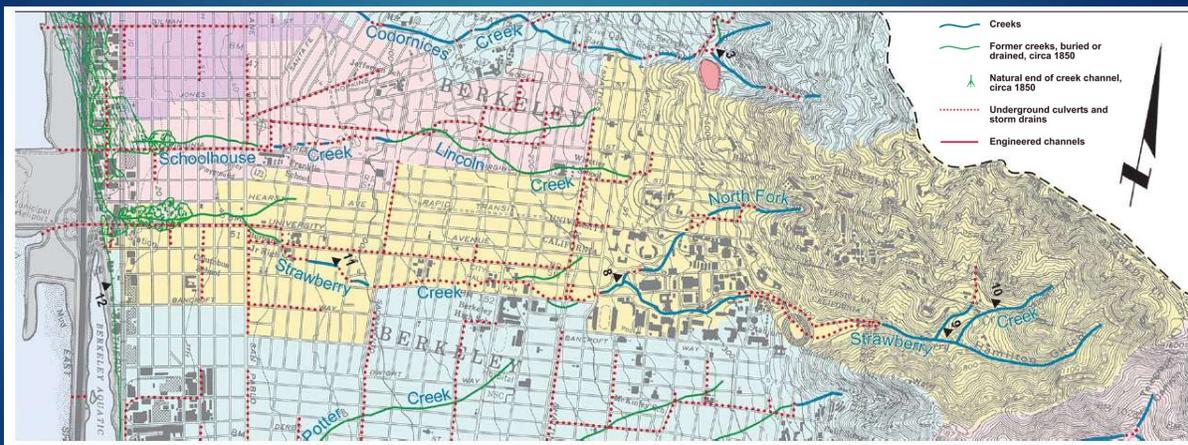


## Project Description

- ▶ Rehabilitates deteriorated, City-owned culverted sections of Strawberry Creek.
- ▶ Project developed following a structural assessment of Strawberry Creek culverts initiated following the 2021-22 wet season.
- ▶ Phase 1 of rehabilitation focuses on extending useful life of culverts showing highest degree of deterioration.



## Strawberry Creek Watershed

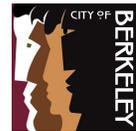


<https://explore.museumca.org/creeks/1140-OMStrawberrySchoolhouse.html>

## Strawberry Creek Watershed

- ▶ Drainage Area: Approximately 3 square miles (2.2 miles in Berkeley)
- ▶ Active Creek Length\*
  - ▶ Open Channel – 1,500 feet (1,000 feet downstream of UCB)
  - ▶ Culverted – 1.5 miles (1.27 downstream of UCB)

\*Estimated from City GIS. Does not include creek length within UCB campus or Lawrence Berkeley National Laboratory



## Culvert Assessment

- ▶ **Culvert Tunnel Survey & Topo Mapping (09/2022 – 10/2022)**
  - ▶ Surveyed and mapped sections of Strawberry Creek culverts from Oxford Street to Browning Street
  - ▶ **Outcome:** Accurate horizontal and vertical location of the culvert tied to City of Berkeley datum.
- ▶ **Initial Structural Inspection (09/2022 - 10/2022)**
  - ▶ Visual inspection
  - ▶ Non-destructive testing
    - ▶ Sounding
    - ▶ Surface penetrating radar
  - ▶ **Outcomes:**
    - ▶ Identified 26 distinct culvert sections between Oxford and Browning.
    - ▶ Summarized existing conditions for each section



## Culvert Topographic Survey



Culvert entrance east of Oxford



Survey work inside culvert



Confined space entry at Roosevelt Ave

## Culvert Visual Assessment



Rebar markings on culvert wall



Structural inspector at work

## Culvert Assessment – Typical Conditions



Floor Failure



Longitudinal Cracking at culvert crown



Concrete Spalling

## Culvert Assessment

- ▶ **Material sampling and laboratory testing (06/2023 – 07/2023)**
  - ▶ Concrete coring performed on City-owner portions of culvert
  - ▶ Lab testing to determine concrete characteristics
  - ▶ **Outcome:** Provided data to inform detailed structural analysis
- ▶ **Structural Assessment Report (06/2023 – 12/2023)**
  - ▶ Structural calculations
  - ▶ **Outcome:** Structural repair recommendations. Basis of design for culvert rehab project.



## Rehabilitation Approach

- ▶ **Passive flow diversion w/ cofferdams and bypass pipe**
- ▶ **Structural repairs**
  - ▶ Floor repairs
  - ▶ Crack filling
- ▶ **Geopolymer mortar lining**
  - ▶ Provides structural rehabilitation
  - ▶ Mixed on-site
  - ▶ Spray applied
  - ▶ Approx. 1.75 inches thick
  - ▶ High strength, fast cure material



## Rehabilitation Approach



Typical geopolymer lining operation



Typical liner application in confined environment

## Rehabilitation Approach



Liner application w/ bypass visible

## Other Rehabilitation Solution Considered

- ▶ **Shotcrete lining**
  - ▶ Spray applied concrete mortar
  - ▶ Well-established technology that's been used for over 100 years
- ▶ **Disadvantages in creek culvert application**
  - ▶ Requires steel reinforcement for structural applications
  - ▶ Thicker section required would significantly reduce hydraulic capacity of culvert
  - ▶ Longer cure time required before finished surface can be exposed to creek flows



## Environmental Considerations

- ▶ **Water pollution control BMPs**
- ▶ **Work area to be isolated using cofferdams**
- ▶ **Ecotoxicity testing of geopolymer leachate**
  - ▶ Testing required by RWQCB
    - ▶ *Selenastrum capricornatum* (green algae)
    - ▶ *Ceriodaphnia dubia* (water flea)
    - ▶ Rainbow Trout
- ▶ **Dust control requirements**



## Impacts to Community

- ▶ **Traffic control plan implementation**
  - ▶ Bicycle and pedestrian safety
  - ▶ "No Parking" signs
- ▶ **Noise generation**
- ▶ **Equipment staging** - Limited overnight equipment staging on streets
- ▶ **Bypass cofferdams within private property**



## Project Schedule, Cost, Next Steps

### ► Phase 1 of Project

- Bids Opened December 2024
- Construction to begin following the 2024-25 wet season.
- Work expected to be completed by October 2025
- Approximate Cost: \$1,600 – \$2,100 per LF
- **Future phase(s) of project to rehabilitate City-owned creek culverts will be considered in future years as funding becomes available.**
- **City will begin the planning phase of similar creek culvert assessment work in other watersheds in 2025.**

### Project Team:

City of Berkeley Project Manager: Ricardo Salcedo

Contact info: [rsalcedo@berkeleyca.gov](mailto:rsalcedo@berkeleyca.gov)

Civil Engineering and Survey: CSW Stuber-Stroeh Engineering.

Visual Inspection: Voss Laboratories, Inc.

Structural Engineering: Cornerstone Structural Engineering Group

Material Testing: Inspection Services, Inc.

### Additional Resources:

- City project webpage :  
<https://berkeleyca.gov/your-government/our-work/capital-projects/strawberry-creek-culvert-maintenance-project>

