

# 21st Street Complete/Green Street Improvements City of Paso Robles, California



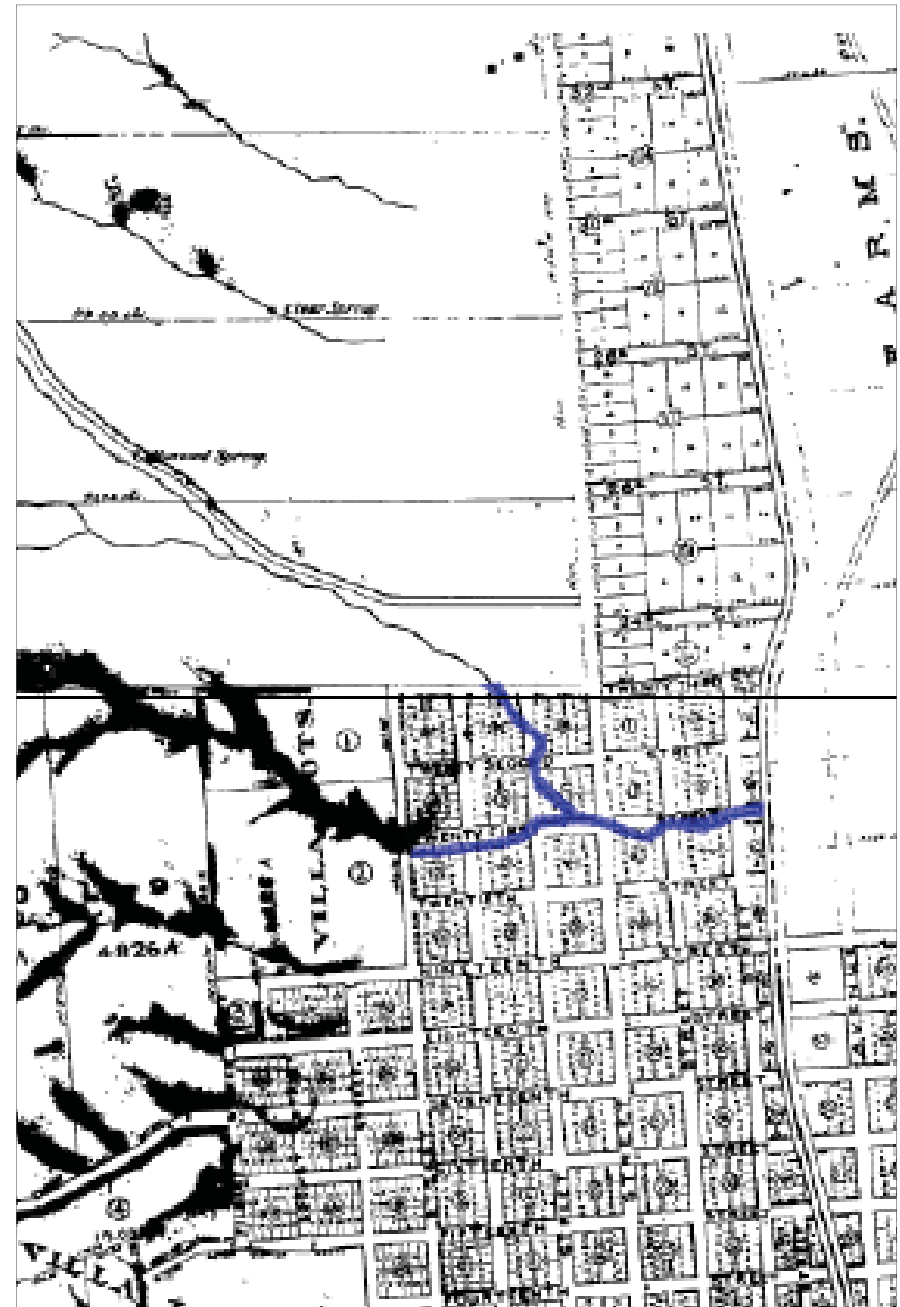
Improvements to 21st Street in Paso Robles, California combine drainage improvements with stormwater treatment and groundwater recharge on land that was once a part of the nearby Salinas River. The Complete/Green Street, the first of its kind in Paso Robles, uses bioretention, pervious pavers, open-channel draining, and infiltration channels to clean and capture runoff while minimizing flooding during storm events and preserving the pavement. The newly designed streetscape also improves the overall experience of using the street by adding trees, traffic-calming features, and bicycle lanes. In a region that is currently experiencing a historic water shortage, the 21st Street design provides a model for flood control, urban runoff treatment, and groundwater recharge.

## Mountain Springs Creek Watershed

Drainage and recharge goals included reducing the frequency and severity of street flooding, increasing groundwater recharge, and improving the quality of stormwater runoff reaching the nearby Salinas River. The watershed in North San Luis Obispo County, California, known as the Paso Robles Basin, has diminished significantly in recent decades.

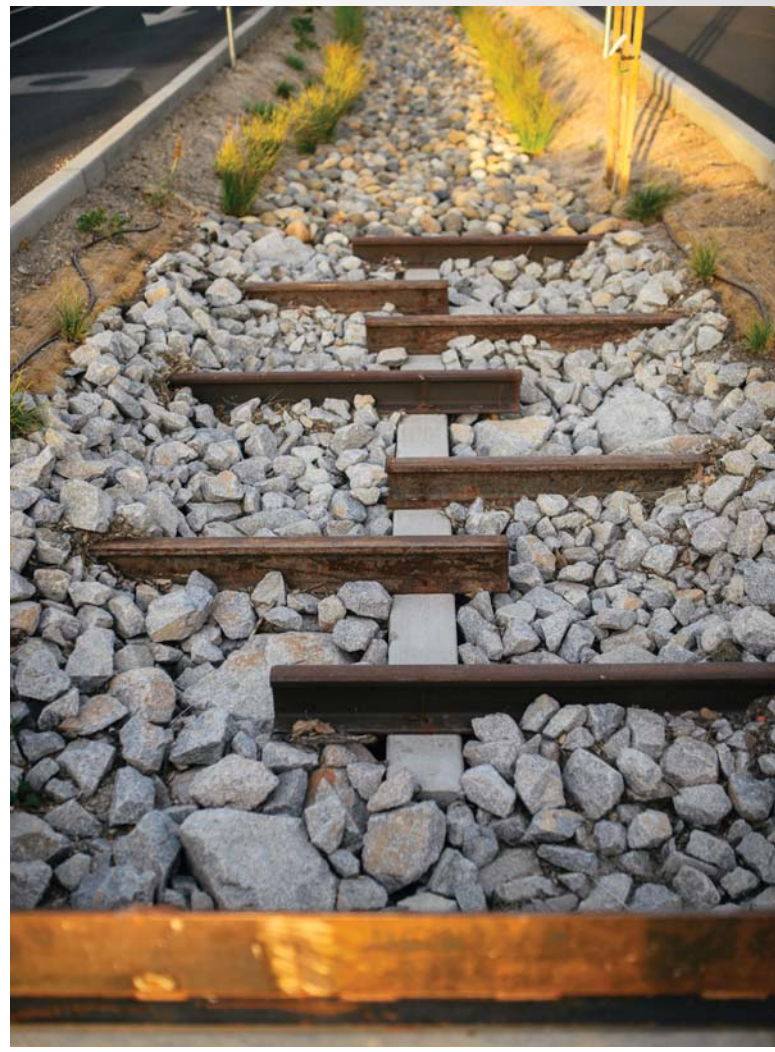
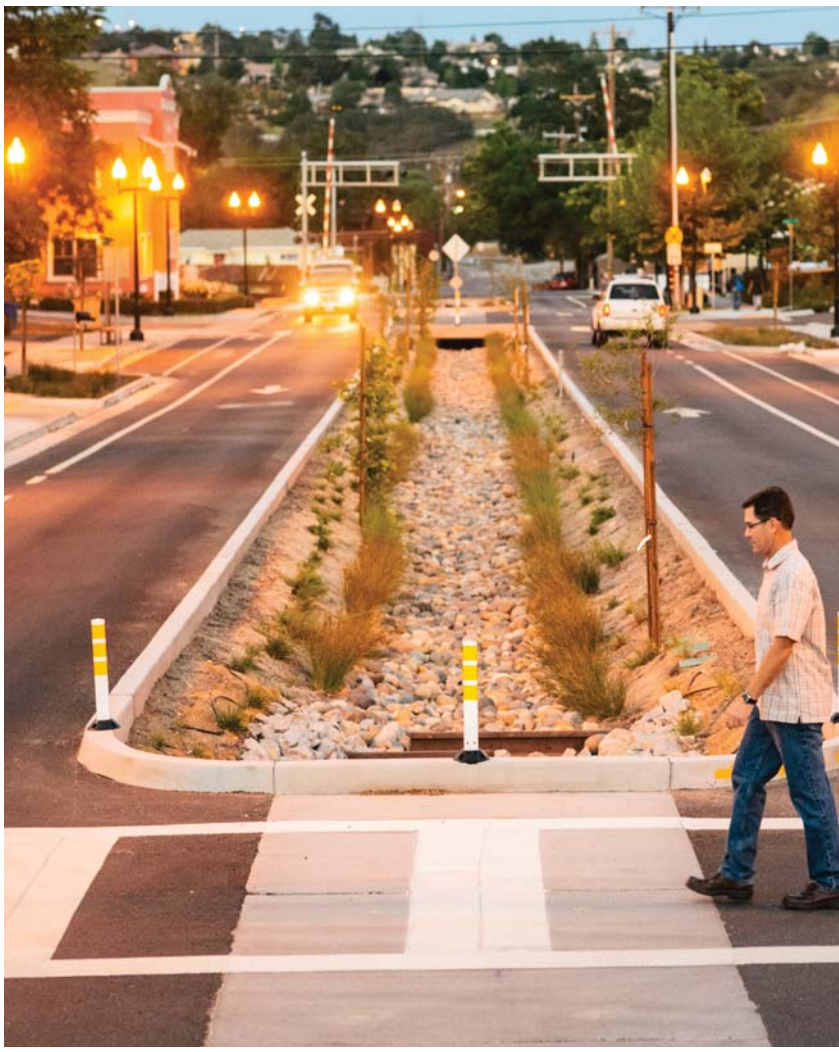
### Flooding

It's no wonder 21st Street flooded every year. This 1887 subdivision map shows 21st Street drawn over the path of Mountain Springs Creek. Redesign of the corridor created an opportunity to direct stormwater flows into a landscaped median channel. Stormwater run-on to 21st Street from the Mountain Springs Creek Watershed is relatively clean. The project provides separation of the clean water from the polluted urban runoff by directing stormwater from the Creek Watershed to the median channel, while directing urban runoff to the bioretention areas.



### Outfall, Overflow, and Energy Dissipation

- structure with corten steel panels
- adjustable outfall grate with overflow
- reclaimed railroad rails provide energy dissipation at outfalls
- check dams create ponding, increasing the project's contribution to groundwater recharge



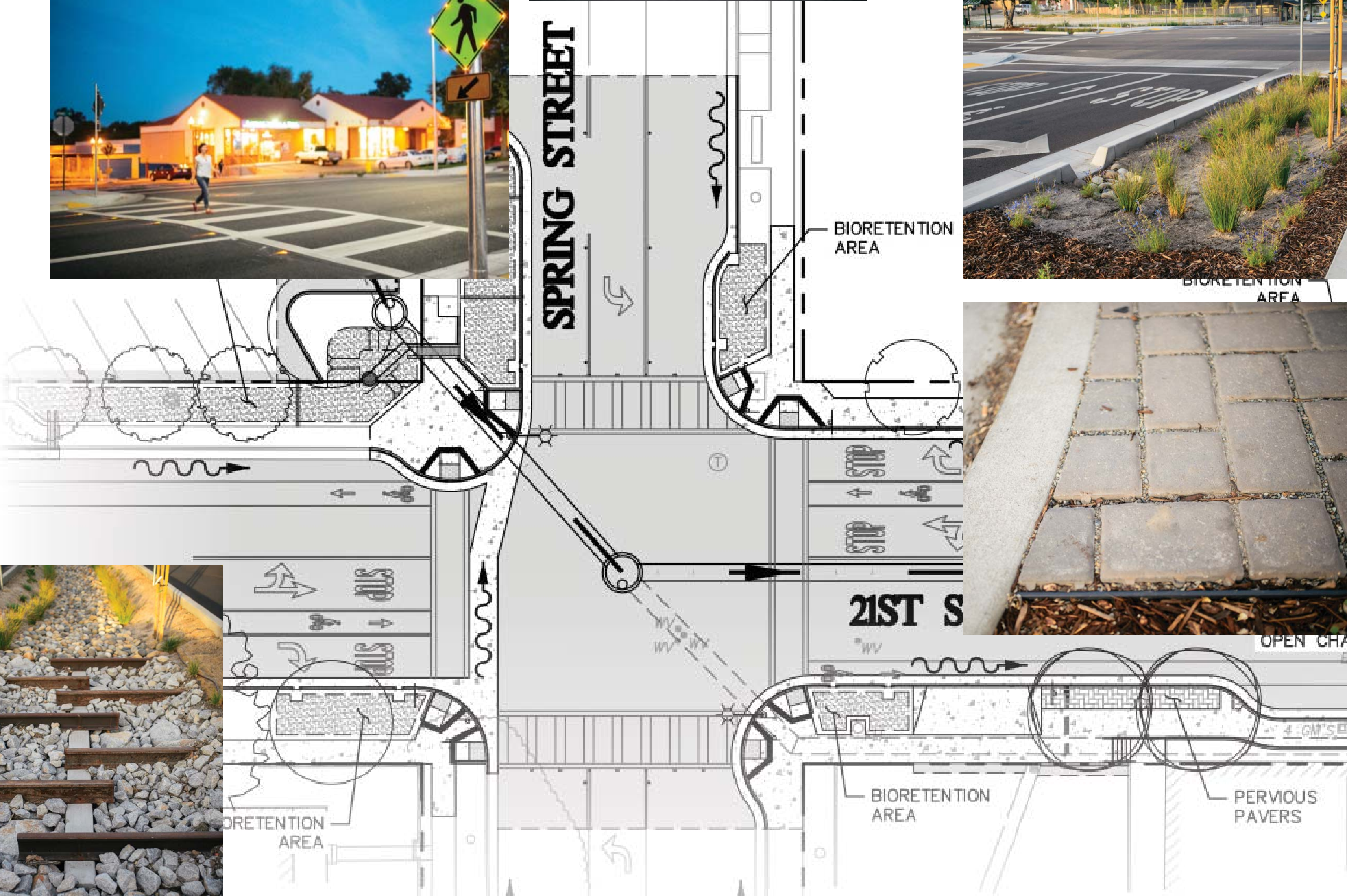
## Complete Street

The Complete Street component of the project aimed to reduce traffic speeds with traffic calming devices, shade the street with trees, provide improved bicycle and pedestrian facilities, and promote infill and redevelopment. The new 21st Street features a narrower roadway in order to calm traffic and de-emphasize vehicles. The design envisioned a street with multiple functions: a place to walk, ride bicycles, do business, control stormwater runoff, and interact with the community.



### Pedestrian Enhancement and Safety

- curb bulb outs
- visible crossings
- flashing in-pavement lights at arterial crosswalk
- added pedestrian amenities



## High Performance Landscape

The 21st Street project takes inspiration from the native landscapes surrounding Paso Robles. Plantings along the corridor do double duty, providing aesthetic benefits, including shading, while also functioning to clean stormwater runoff, reduce flows to creeks, and recharge groundwater.

## Green Street

Intelligent stormwater engineering can improve drainage while also achieving advanced levels of sustainable urban runoff treatment and groundwater recharge. Recent enhancements of 21st Street exemplify the potential to combine drainage and recharge improvement. Improvements to 21st Street were necessary – not only to address usability and improve drainage, but to provide a valuable recharge of the local groundwater supply. In a region that has recently suffered from drastic water shortage, the latter improvement proved especially important.



### Low Impact Development (LID)

- LID features are dispersed across the site
- bioretention areas located strategically to direct street runoff into planters for treatment of first flush
- bioretention areas with check dams pond, allowing infiltration and groundwater recharge
- pervious pavers with built-in gaps, filled with small stones filter and infiltrate stormwater
- the corridor can provide more than 6,000 cubic feet of stormwater treatment during storm events



## Sustainability and Longevity of Materials

The project incorporates locally sourced, long lasting, recycled and reused materials wherever possible.



### Gabion Retaining Walls

- uses concrete fill from demolition
- faced with local Adelaida stone
- incorporates benches

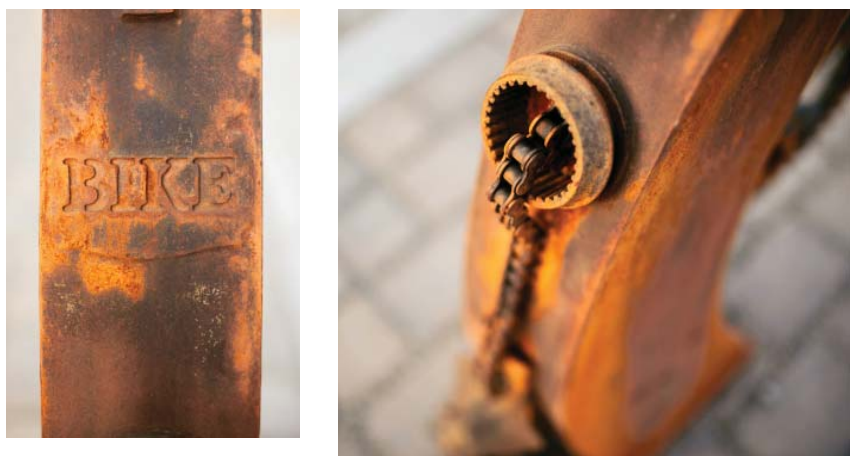
### Seating

- locally fabricated freestanding benches
- sustainably harvested wood bench tops
- benches mounted on gabion walls in select locations



### Bike Racks

- fabricated by a local artist, incorporates recycled salvaged steel material



### Functional Materials

- railroad rails used for check dams in bioretention planter and sign supports
- steel grates provide accessible surfaces over stormwater conveyance channels



### High Performance Landscape

- all plantings, even bioretention areas, are highly drought tolerant - irrigation levels for established plantings will be very low
- most plants are native and chosen to provide food and nectar for native pollinators



### Trees

- protecting existing mature trees
- planted 89 new trees

