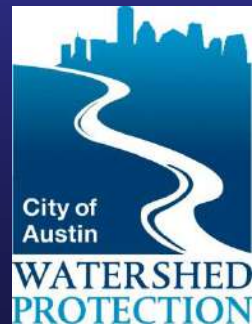




Restoring Shoreline at Emma Long Metropolitan Park



Andrew Clamann
WPD, ERM
7/17/2019 Environmental Commission

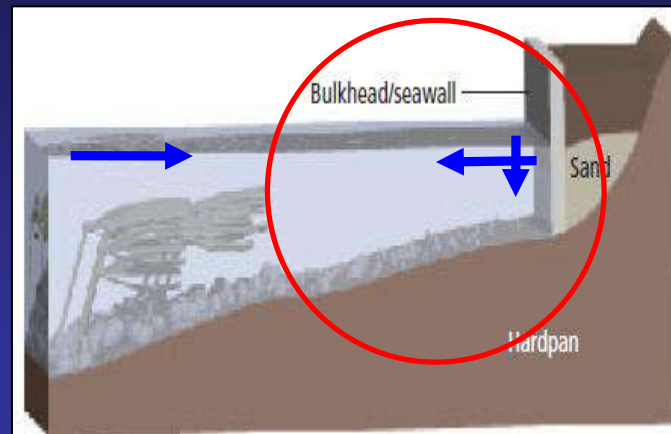




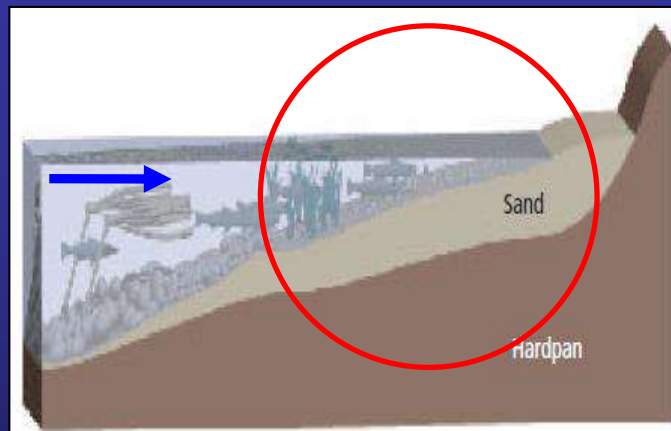
Project area:
140 ft shoreline between piers
at the boat ramps

Problem: The old wood bulkhead wall was failing, and vertical walls are no longer compliant





**Vertical walls
erode
the lake bed**



**Natural slope
absorbs
wave energy**



LDC requirements

- Slope ($\leq 45^\circ$ in the wave action zone)
- Vegetation ($\leq 10\text{ft}$ of the shoreline)
- Scour protection (toe, overtop, flanking)
- Natural materials (exterior)

Project considerations

Stabilize shoreline

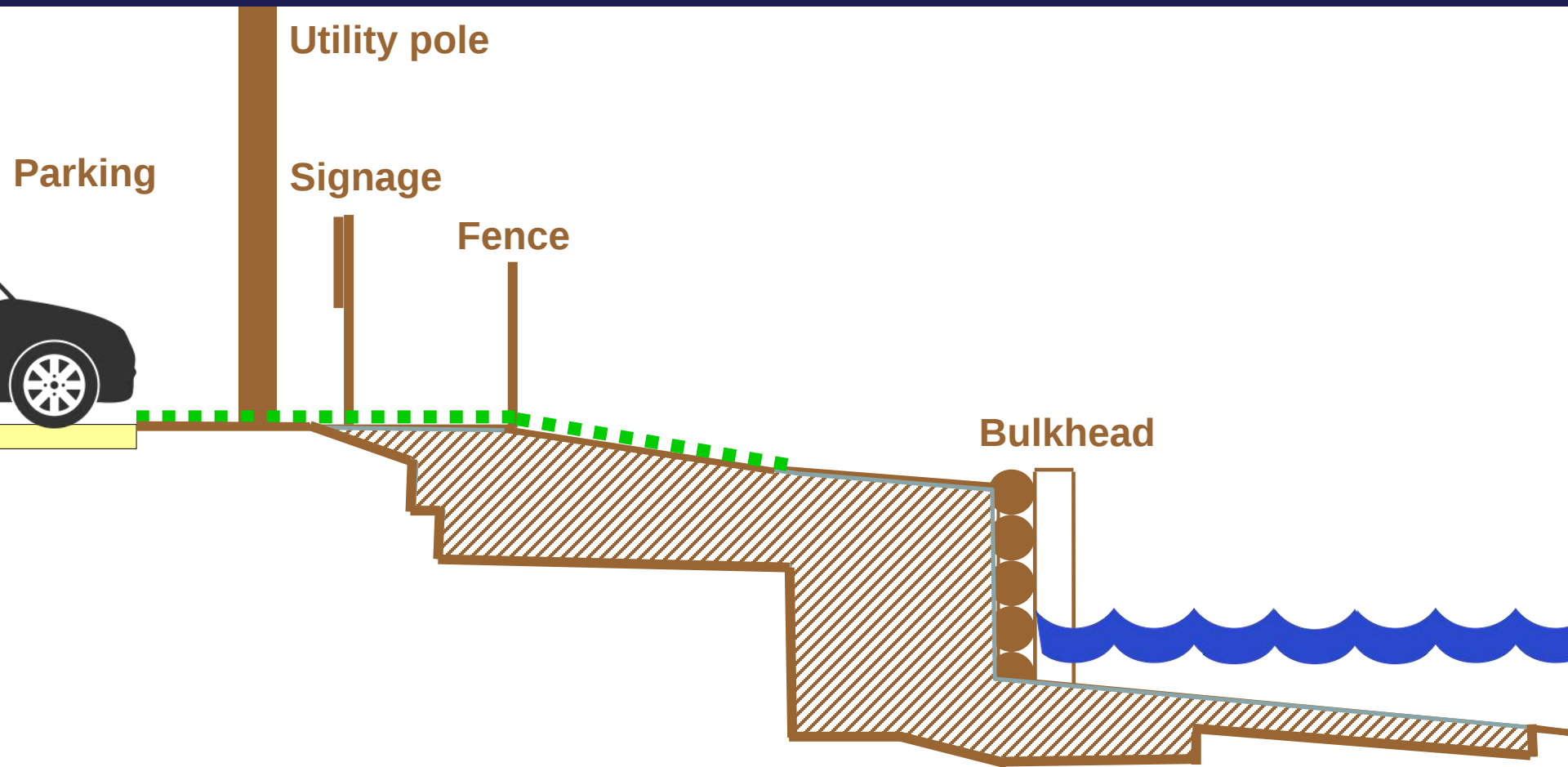
Absorb waves

Restore riparian function

Code compliance

Narrow workspace





Utility pole

Parking

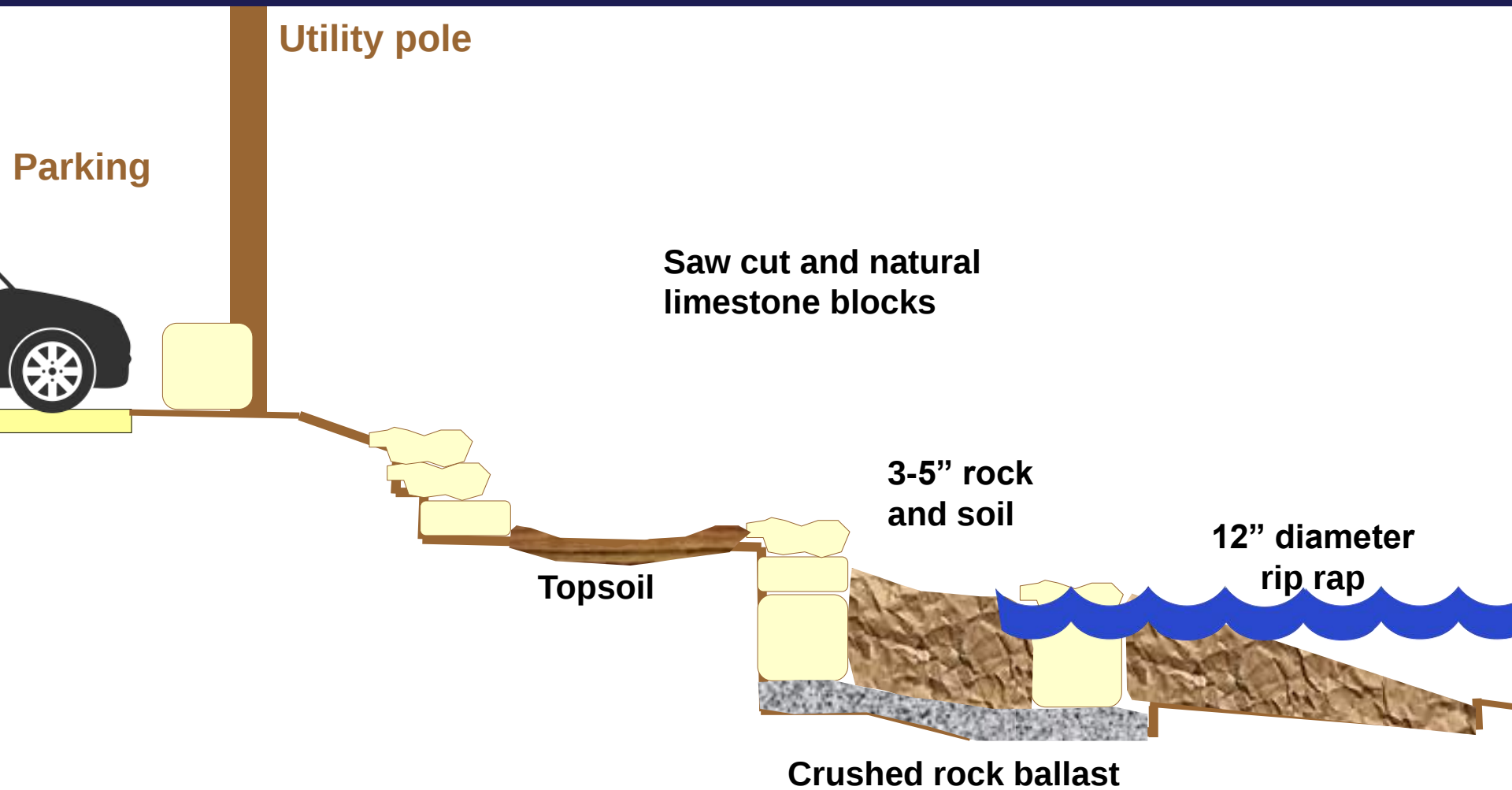
Signage

Fence

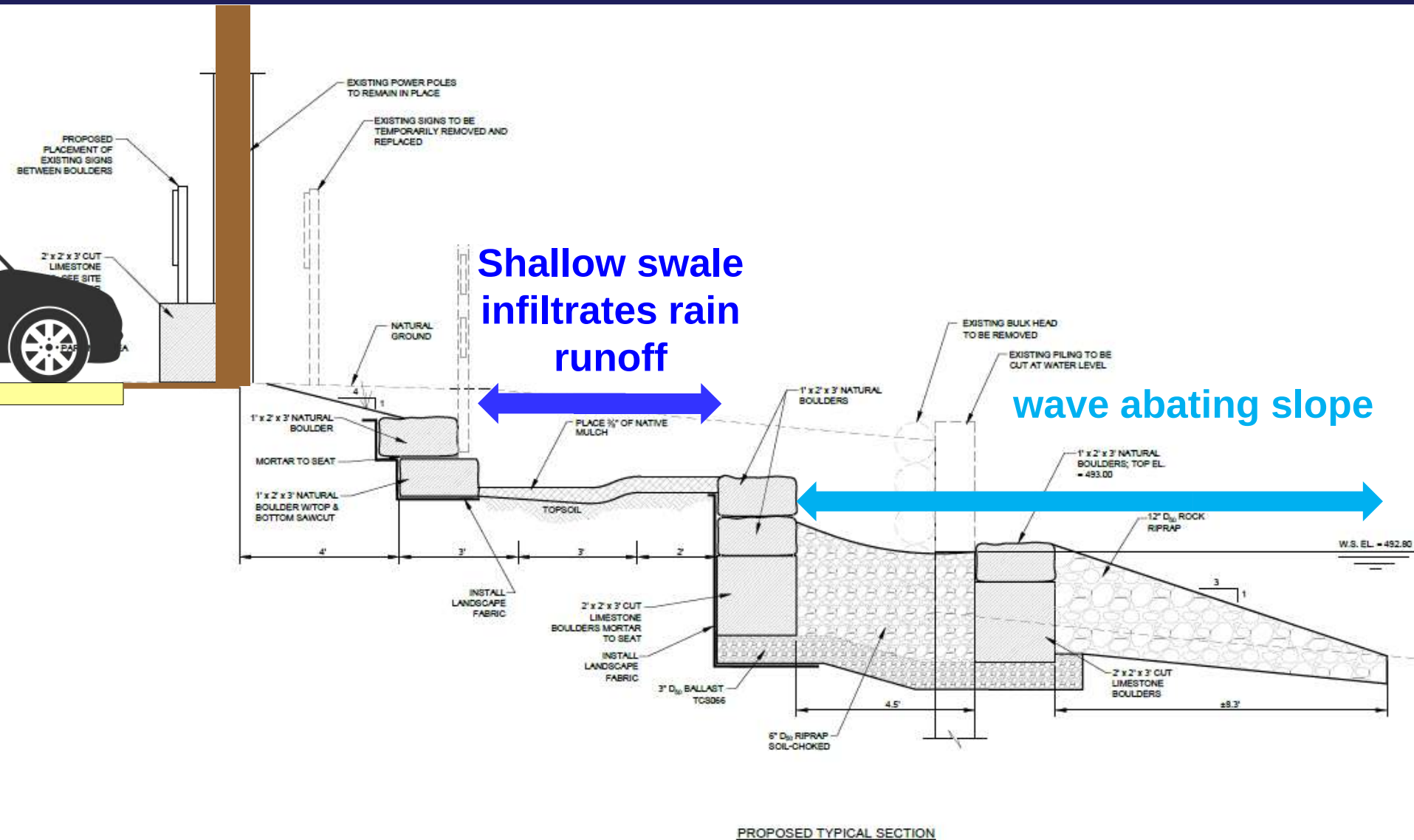
Bulkhead

Excavate

Demo



Water quality and wave abatement features



“Before”



12 Jan 2017

lake
drawdown

excavate toe





embedded
rip rap toe

Silt boom

temporary silt fence

**backfill
ballast
footer**

**2' x 2' x 3'
chopped boulders**





**backfilled with
native soil and rock**





natural ledgestone
over the
cut boulders

rip rap was
soil “choked”

**backfill
top soil**

**silt fence removed
in anticipation
of lake refilling**



turbidity
contained
after a storm



**Install third
boulder wall**



Third row of
ledgestone



Large boulders
as bollards



Stage mulch

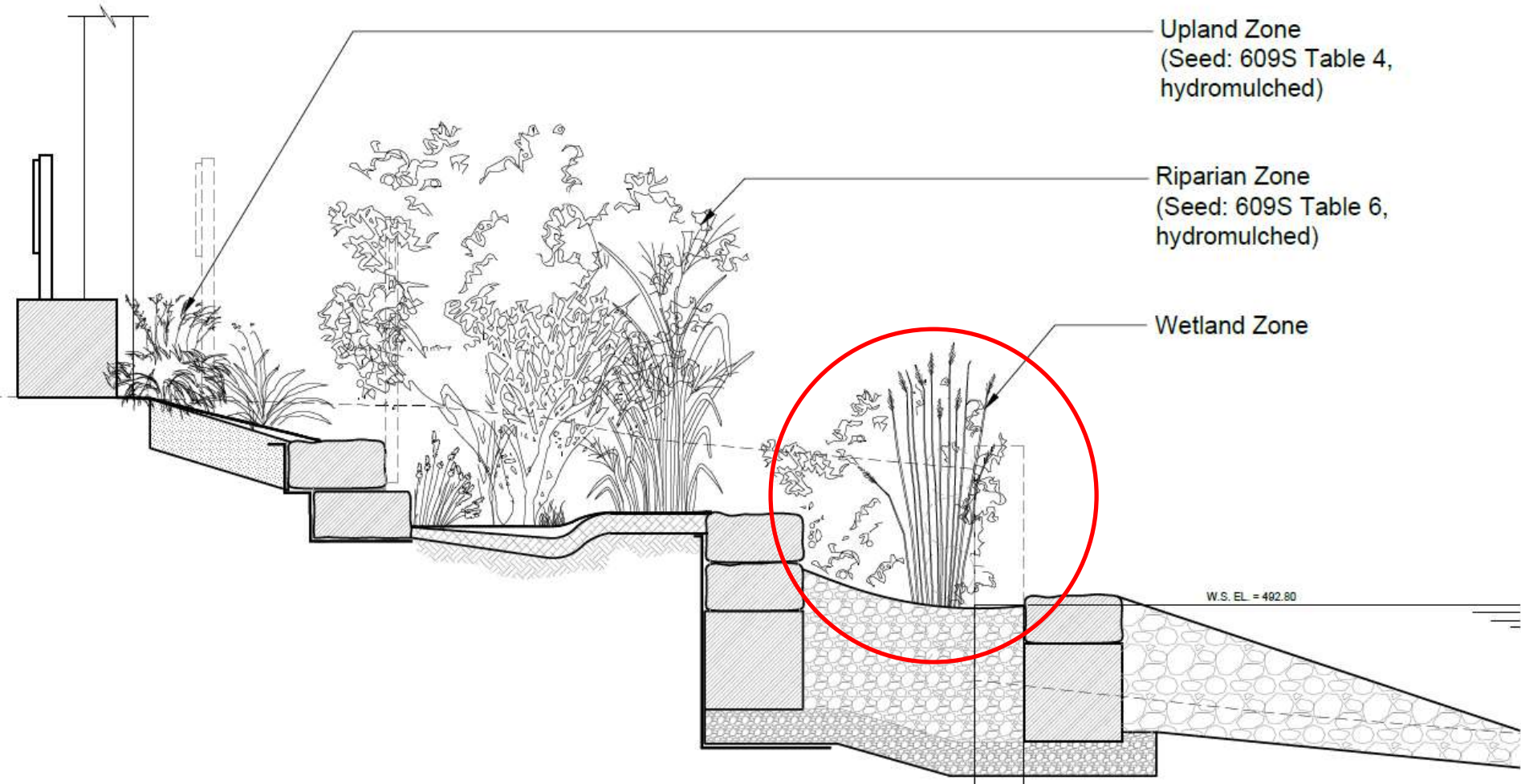
re-install signage

10 Mar 2017





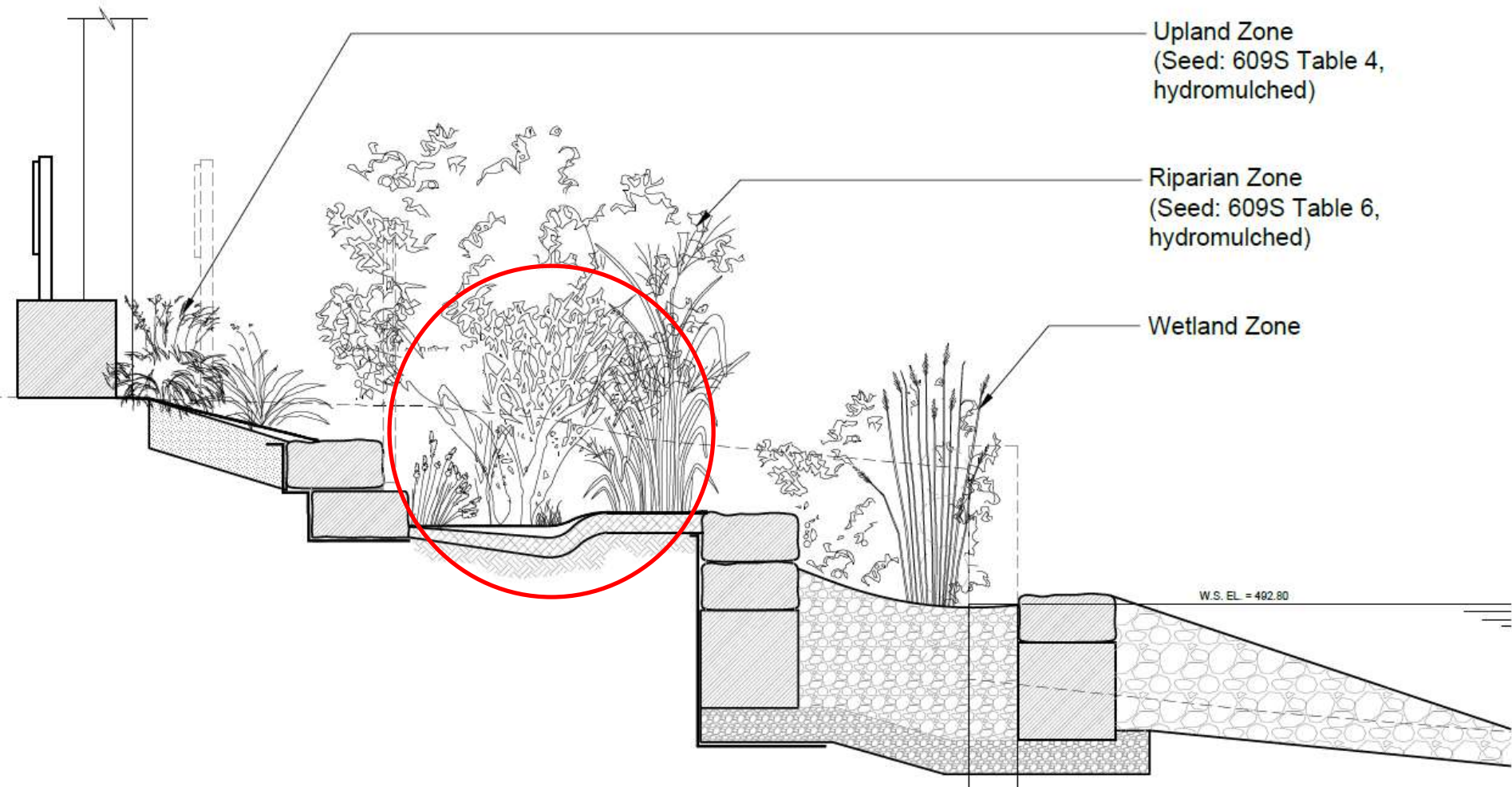
Wetland



sawgrass buttonbush false indigo water-willow giant cutgrass pickerelweed horsetail spikerush



Riparian



possumhaw

yaupon holly

roughleaf dogwood

buckthorn

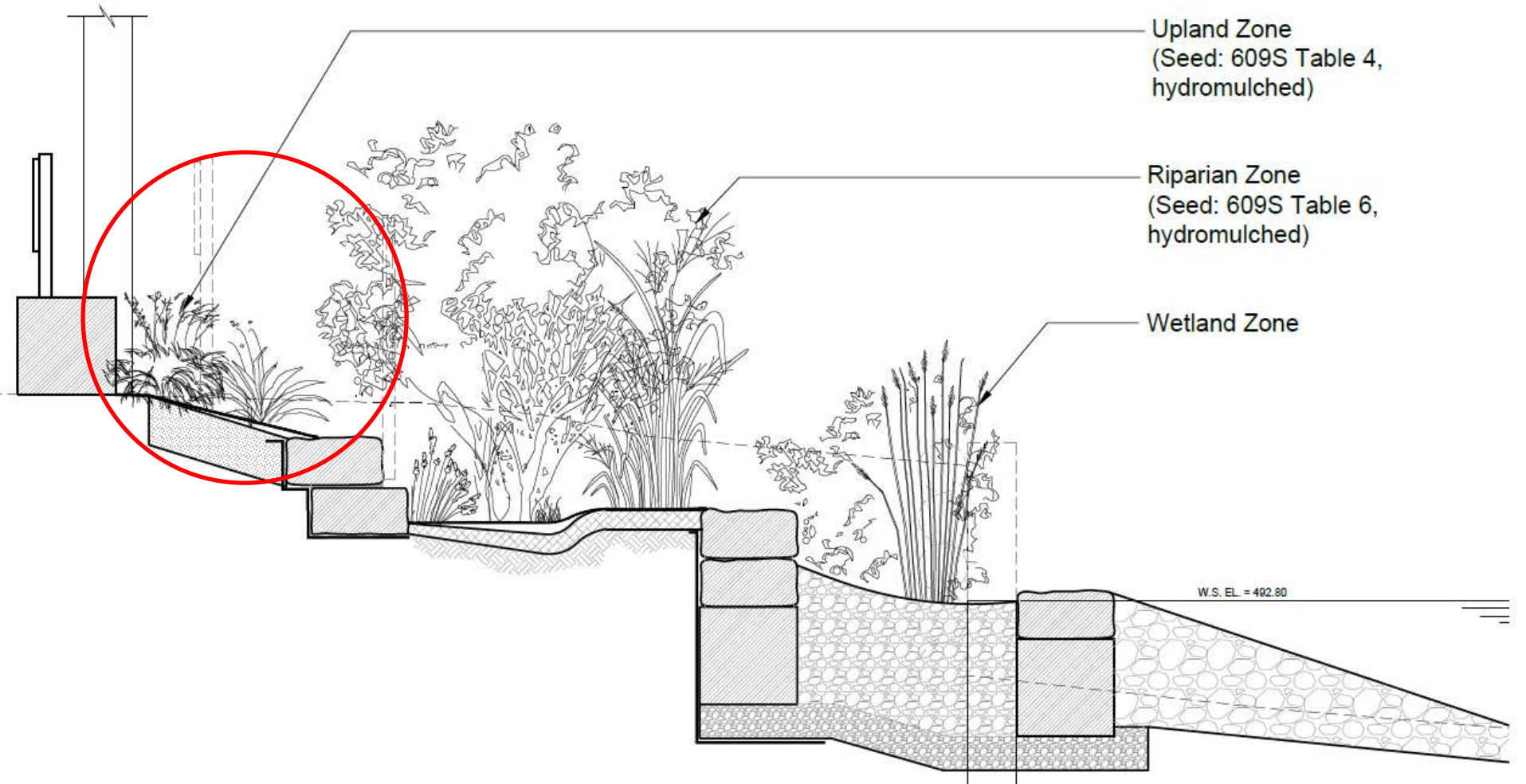
cardinal flower

gamagrass

bushy bluestem



Upland



agarita big muhly nolina cenizo cactus mt laurel twist leaf and red yucca



March 2017



June 2017



May 2018



Jun 2019



Approximate Cost \$77,500 (\$554 per linear ft)

Funding: Capital Improvement Project

Design & Permitting: WPD – Environmental Resource Management Division

Construction: WPD – Field Operations

Revegetation: Environmental Survey Consultants

Costs

Permitting site plan:	\$ 5,918.96
Turbidity Curtain (reusable):	\$ 2,562.92
Rock (boulder, riprap, gravel):	\$ 54,573.04
Revegetation:	\$ 14,363.26



June 2019



Questions?

