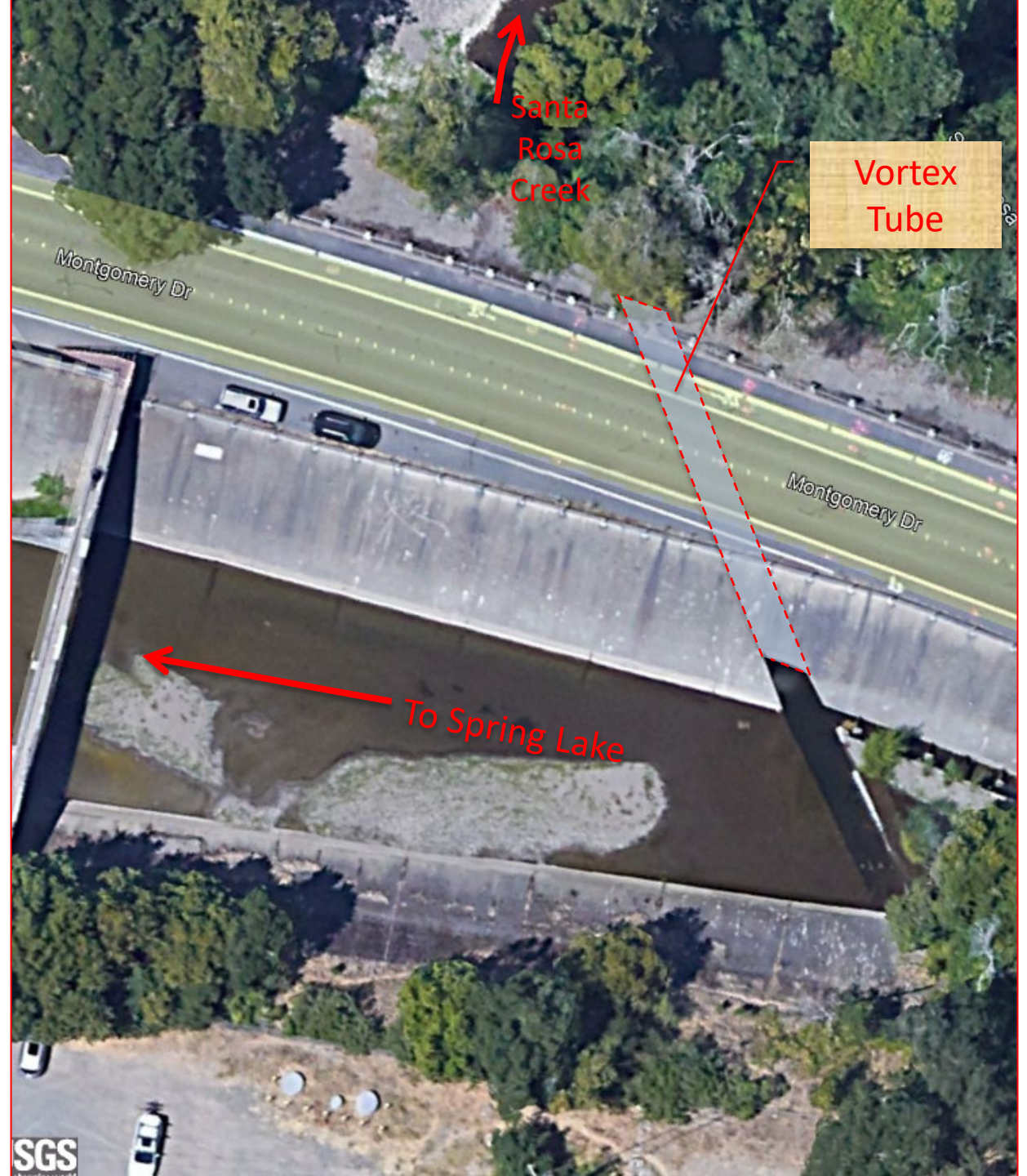
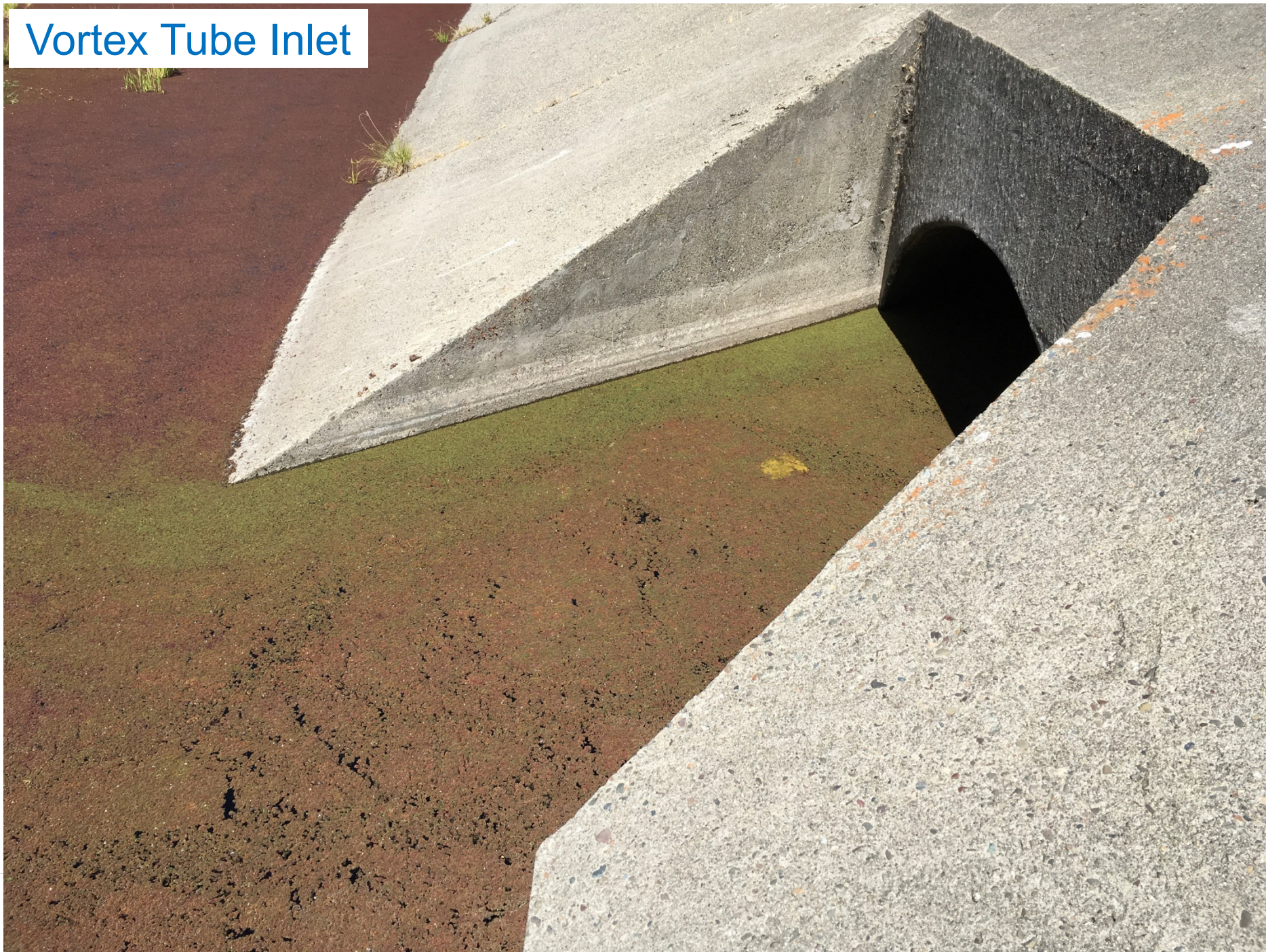


Vortex Tube Repair Santa Rosa Creek

- 8-foot reinforced concrete pipe culvert under Montgomery Drive
- Part of the Santa Rosa Creek Diversion that sends high flows to Spring Lake to prevent severe flooding in Santa Rosa
- Allows and low moderate flows and sediment to remain in Santa Rosa Creek
- Constructed by the Soil Conservation Service (now National Resource Conservation Service) in 1960s as part of the Central Sonoma Watershed Project
- Sonoma Water (then the Sonoma County Flood Control and Water Conservation District) was the local sponsor of the project and responsible for maintenance



Vortex Tube Inlet



Sonoma
Water

Repair Construction

- Examined with underwater camera (diver)
- Material eroded from culvert floor exposing rebar reinforcement
- SW hired BKF Engineering to design repair
- Repair included coating with Fiber Reinforced Mortar and installing a 36" bypass pipe to divert water during construction
- Bypass pipe will also facilitate fish ladder maintenance and sediment removal
- Culvert repaired in Summer 2021 by Granite Construction

Eroded areas



Notable Construction Challenges

- Nesting birds
- Setting up and sealing coffer dams
- Managing groundwater seepage, leaks and weep holes
- Boring the bypass pipe before they could start vortex tube
- Spraying FRM evenly
- Curing time requirement in permits before exposure to Creek

Kent Gylfe and Grant Davis looking at eroded areas after cleaning prior to repair



Upstream Coffer Dam in Creek



Upstream Coffer Dam in Sediment Trench

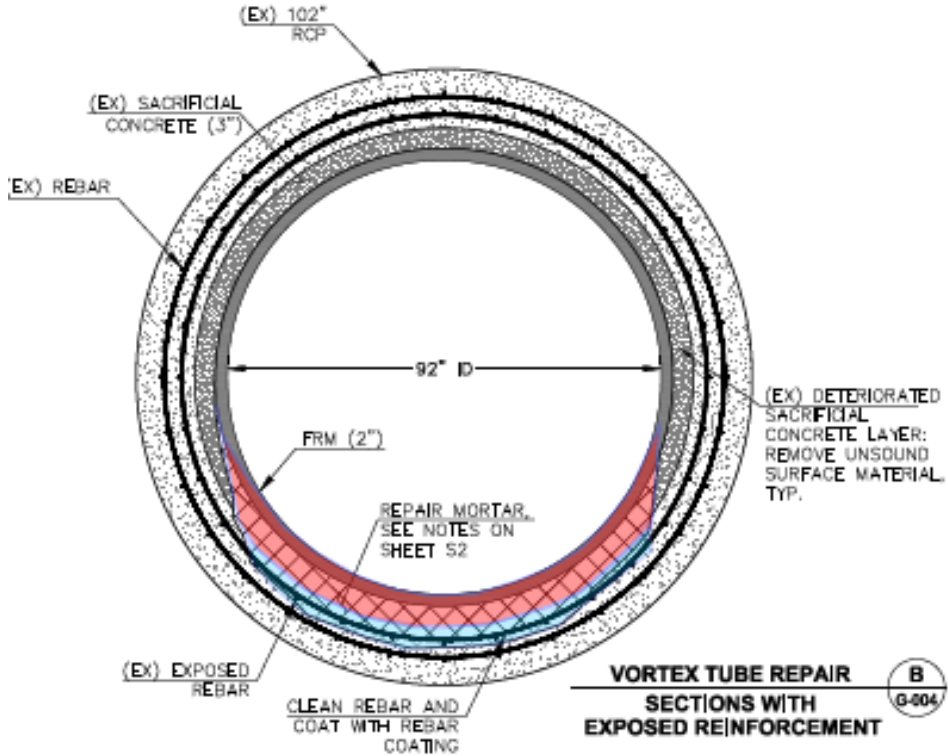
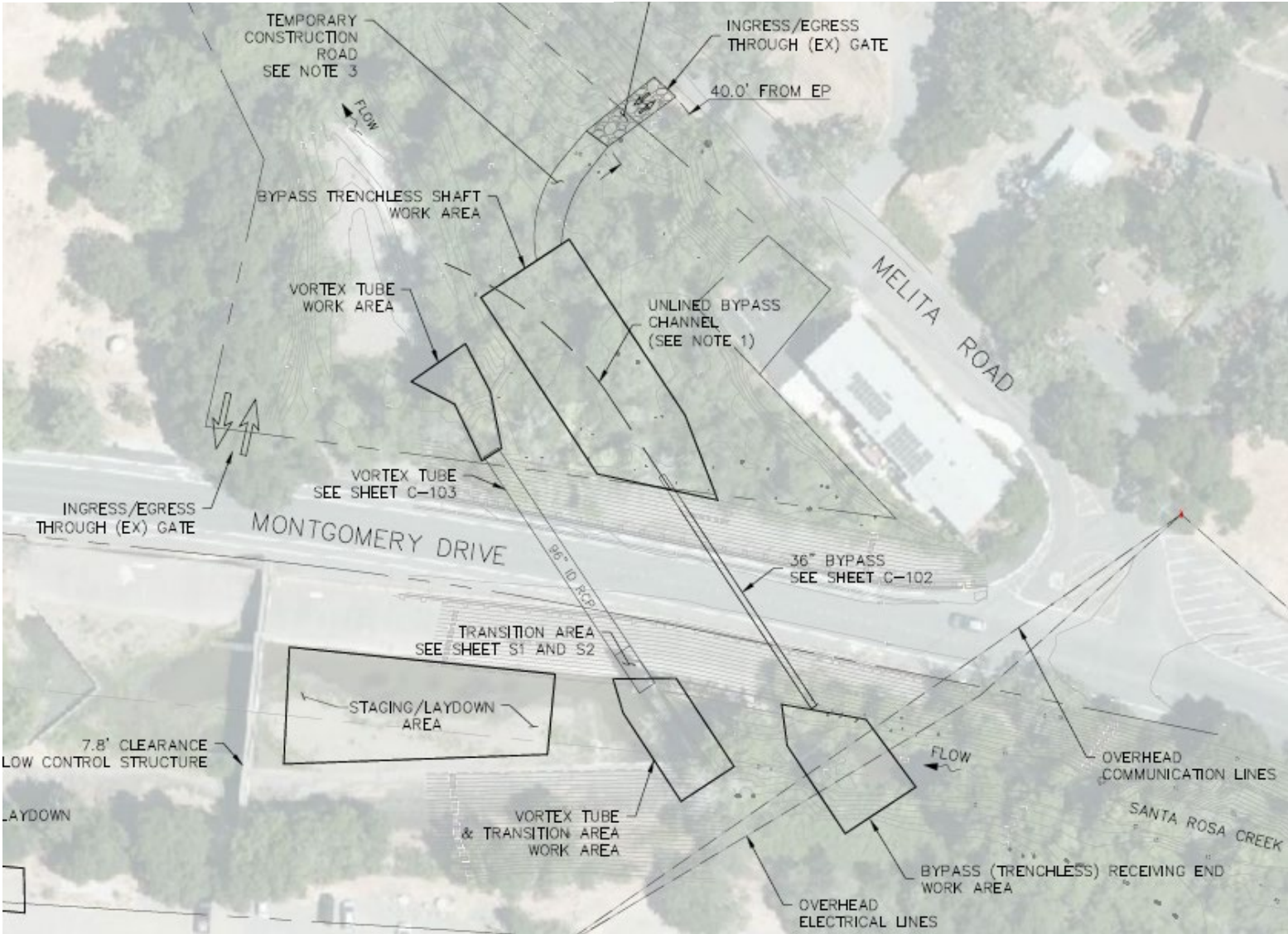


Sonoma
Water

Bypass Pipe Headwall



Access Sheet and Overview



Pipe Repair Plan



Repaired rebar prior to repair mortar



South
West
Water

Repaired seams prior to FRM



Applying FRM



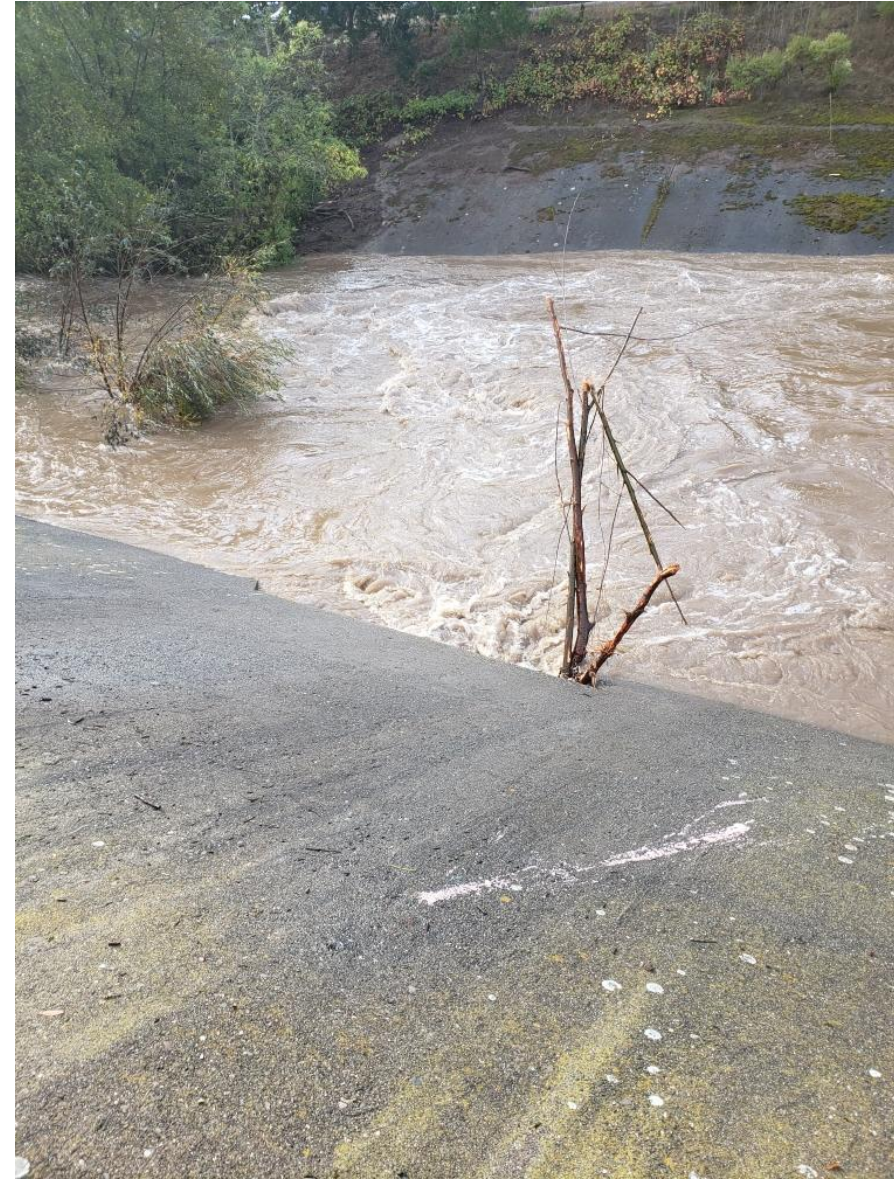
Completed on October 18, 2021



Completed Bypass Pipe Inlet



Tested by October 24, 2021 Atmospheric River



Sonoma
Water

Outlet During Construction



Outlet During October 24th Storm

