Las Virgenes Creek Rehabilitation Project – 18 years later

Nature Based Design as a Scaffolding

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Nature Based Design

- Provides Design Intent and Guidance
- Constraints, Engineering, and Risk Analysis inform Design Details

Project Description/Goals

- Restore 400 feet of trapezoidal concrete channel within an urban setting
- Create a stable channel that:
  - increases the wildlife corridor, and
  - Protects existing infrastructure
  - Maintains current level of flood protection
  - Creates a community amenity

Project Constraints/Issues

- Constraints included;
  - Channel bottom sewer and water supply lines
  - Limited flood Freeboard
  - High design flows
  - Easily erodible soils
  - Significant channel bed slope - 1.7%
  - Right-of-Way boundary constraints


Ventura Freeway
Las Virgenes Road
Rondell Road
County Hwy N1/Las Virgenes Road
Rondell Street/Agoura Road
Agoura Road
Country Creek Lane
Camino del Sol
Cielo Circle
N

Project Design Features

- Utilize compound channel geometry
- Maintain existing right-of-way
- Protect in-place existing utilities
- Use steps or grade breaks to reduce effective channel slope
- Provide long-term lateral and vertical scour protection for bank slope stability

Analysis completed

- Hydrology
- Hydraulic modeling
- Fluvial geomorphic
- Shear stress bed and banks

IO-DEGRADABLE
ROSION CONTROL FABRIC

IGHLY REINFORCED
ROSION CONTROL FABRIC

OMPACTED DIRT
CCESS PATH

OCK WEIR, REVETMENT
R GROIN

/ILLOW PLANTED TRENCH

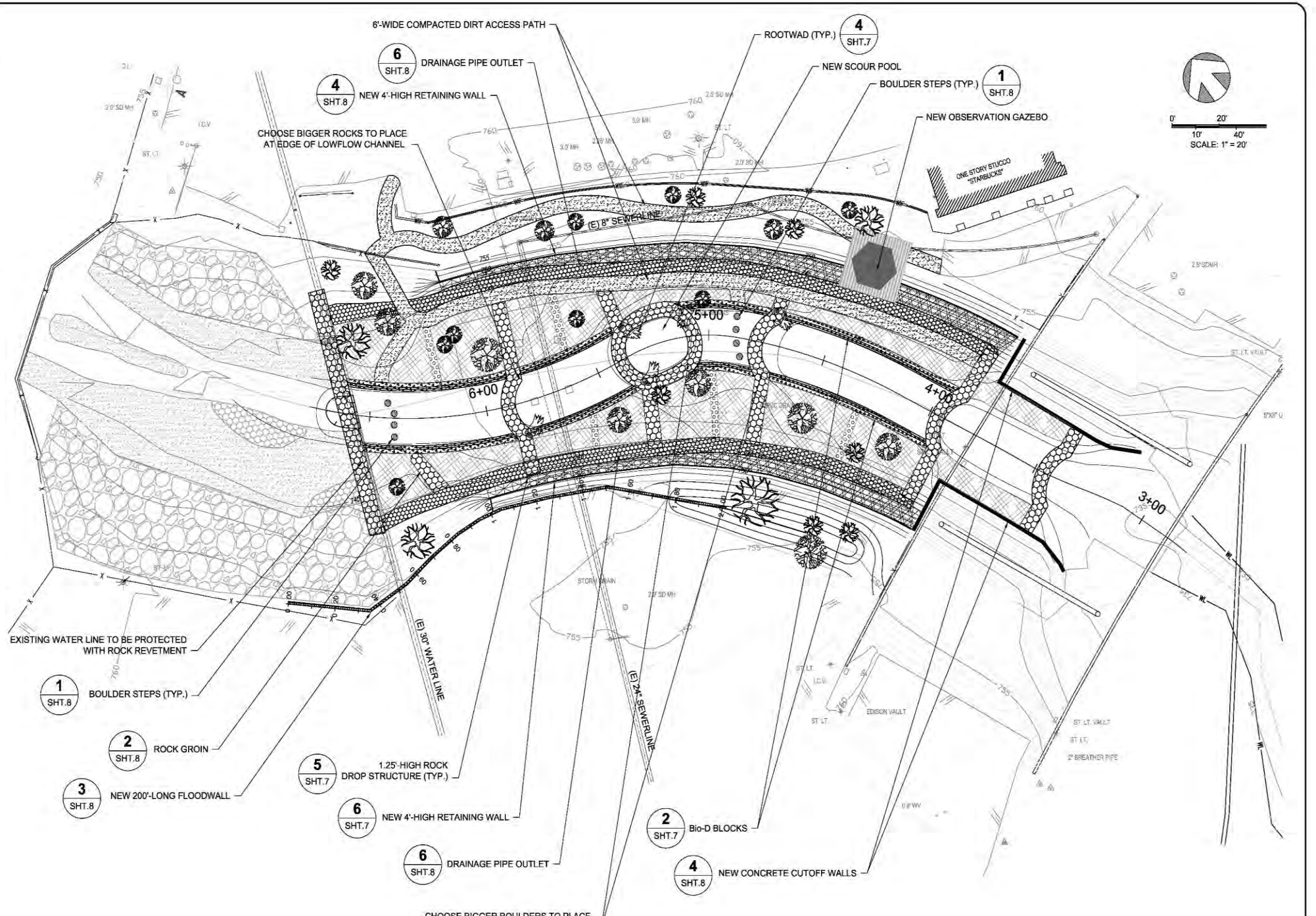
IO-D COIR BLOCK

ETAINING WALL / CUTOFF WALL

LOODWALL

TEPPING BOULDER

OOTWAD



Flood and Erosion Control Features

- Retaining walls used to increase channel cross sectional area (A)
- Flood walls used to provide capitol flood protection and maintain FEMA freeboard requirements

- Channel erosion control
  - Interlocking lateral and vertical rock keyways to provide long term stability

Low Flow Channel design

- Step pools incorporating rock cut off walls/steps
- Biotechnical bank treatments along low flow channel, quickly provides canopy cover
- Planted rock toe scour protection
- Addition of woody debris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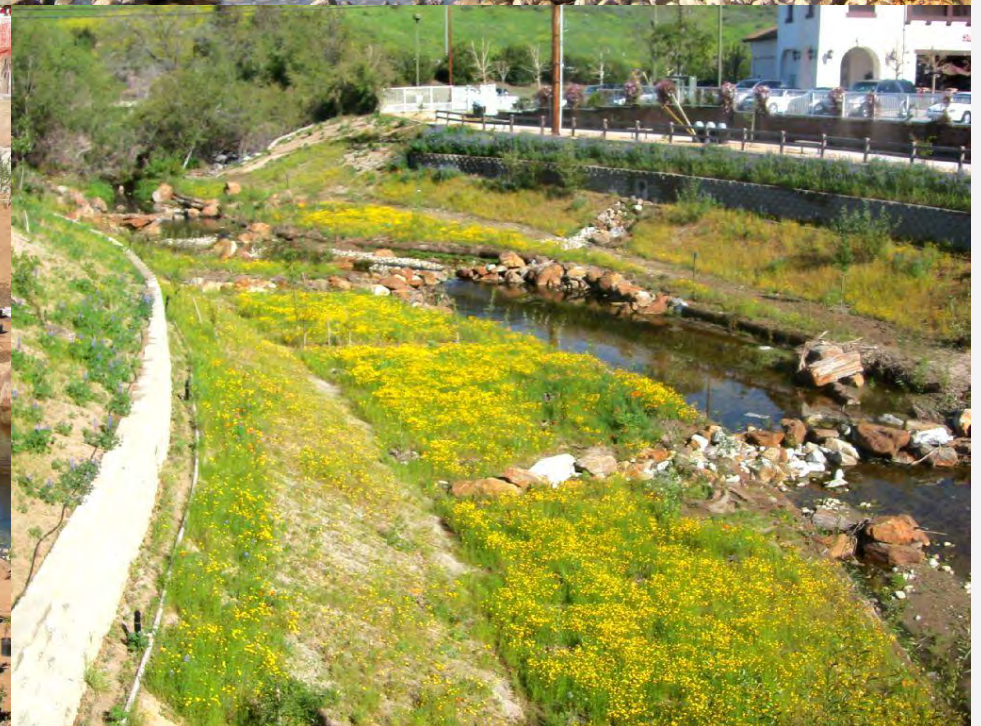


Agoura Rd


Agoura Rd

Maintenance

- Maintenance
  - Reverse maintenance effort
- Maintenance and management Requirements
  - Managing vegetation for Mannings N
  - Tree crown development and pruning
  - Replanting
  - Minor erosion repair

Summary

- Balanced Nature Based design that makes some compromises for:
  - Infrastructure safety
  - Right-of-way constraints
  - Erosion control