Laguna Creek Restoration & Flood Control

Town of Moraga

BKF Engineering

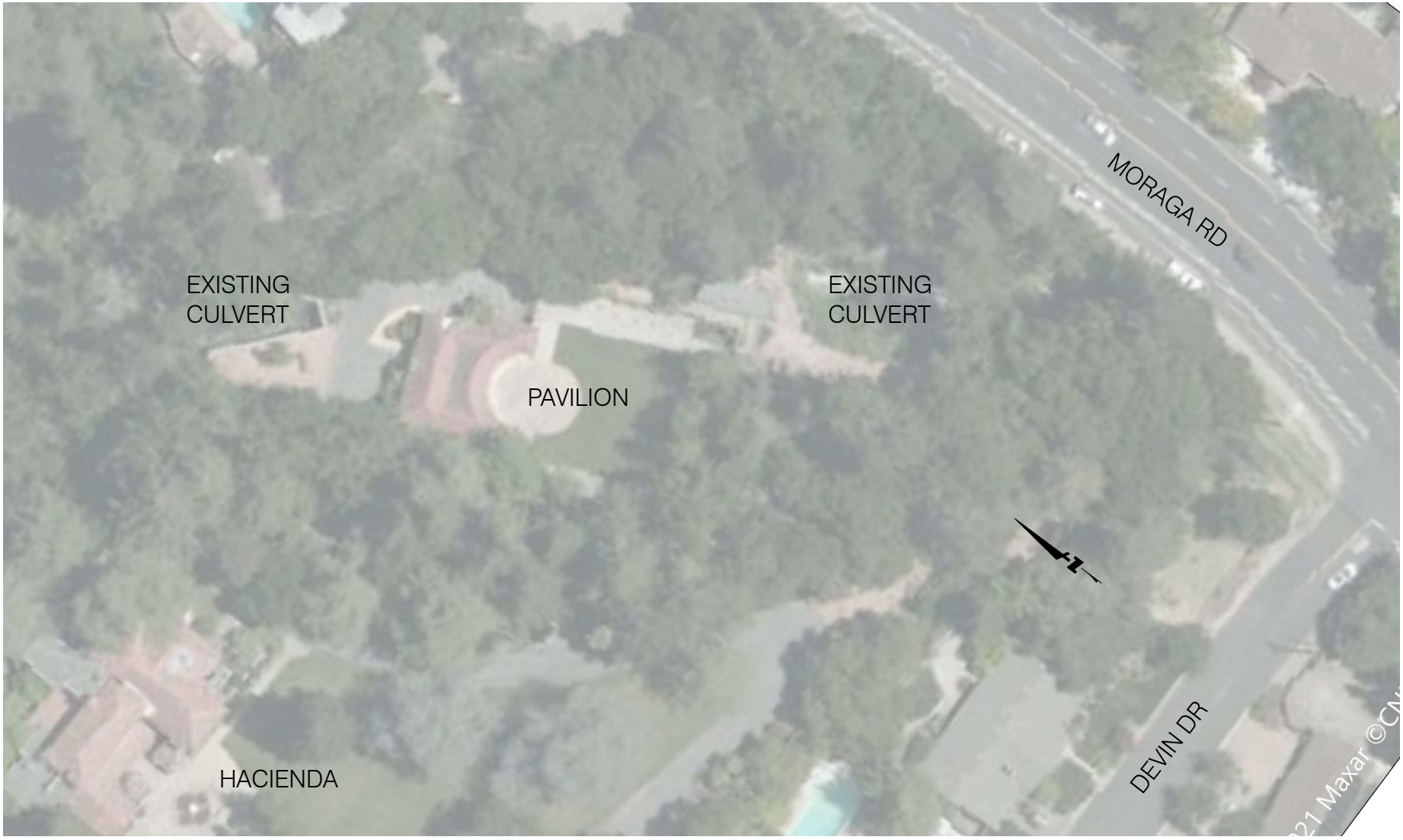
Restoration Design Group

Engineering & Design

Sravan Paladugu | BKF Engineering

- Engineering and Design Team
  - BKF and RDG
- Site Conditions
  - Pavilion built over historic channel
  - Steep banks
  - Existing retaining walls
  - Creek in an undersized pipe
- Analysis and Studies
  - Channel design: 100yr flood and sustainable geomorphology (the shape of the creek)
  - Sewer alignment – Central Contra Costa Sanitation District Coordination

WHERE IS THE LAGUNA CREEK PROJECT?



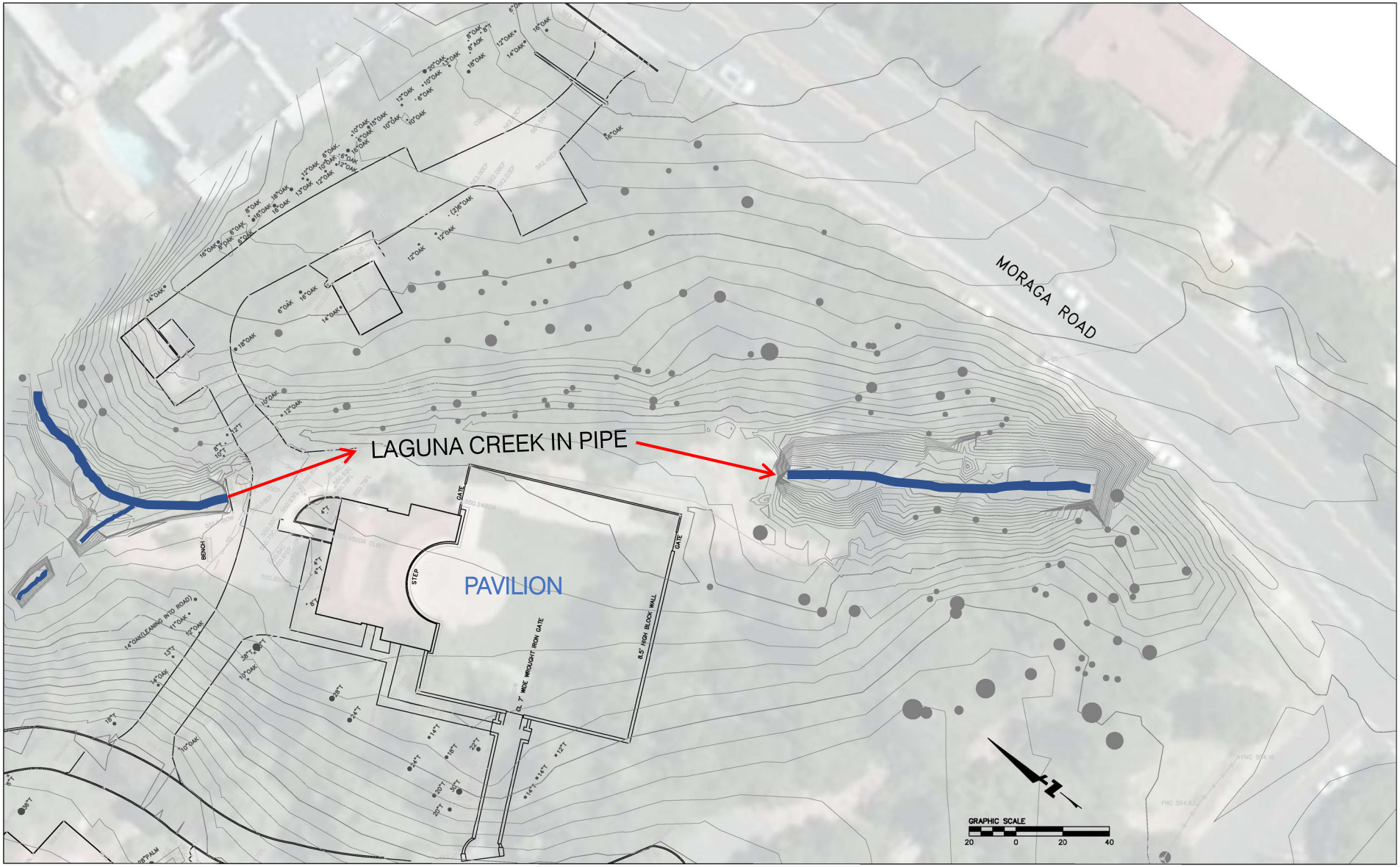
PROJECT CONTEXT


PAVILION


HACIENDA GATE

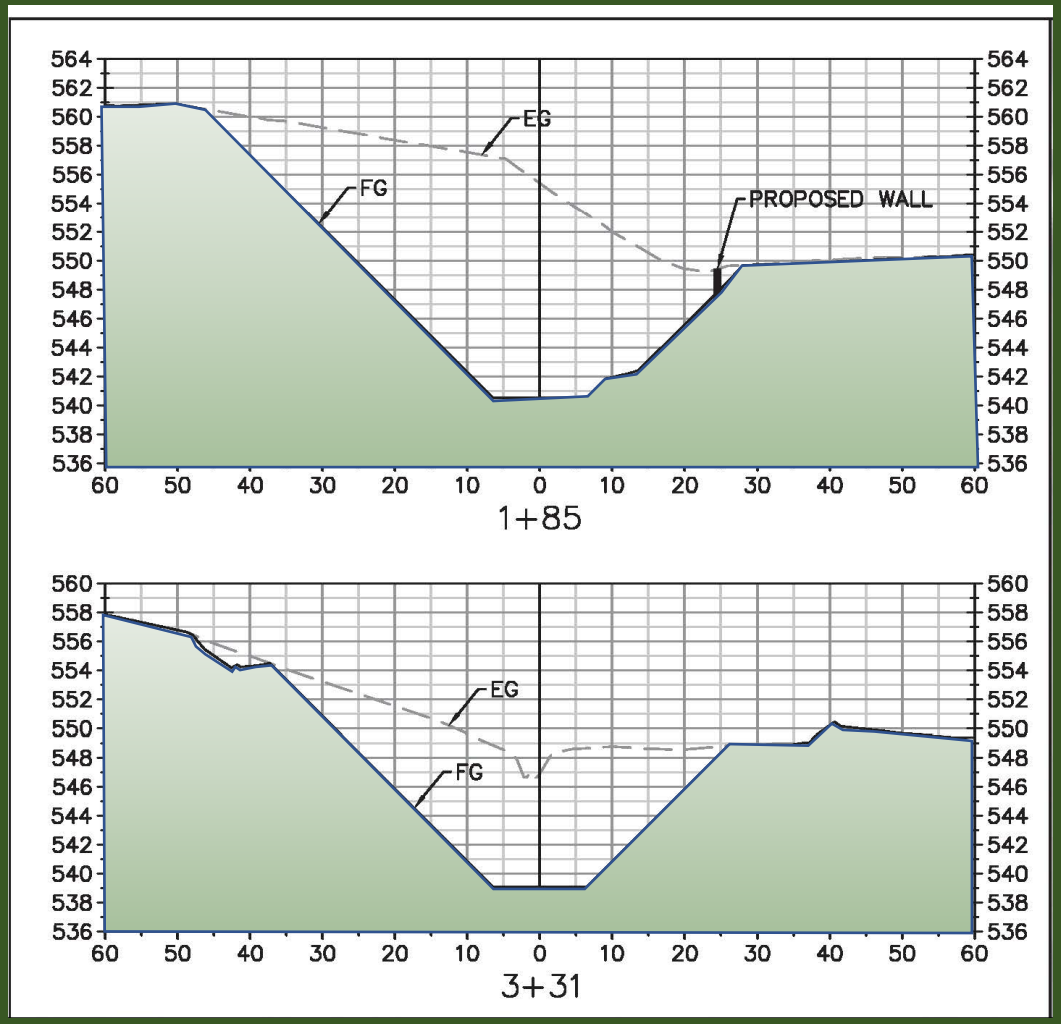

EXISTING CULVERT AND RETAINING WALL

EXISTING SITE CONDITIONS



DAYLIGHTING LAGUNA CREEK:
Excavating the Creek to let it spread out and interact with plants and soil, not pipes.

0 in both sections = the centerline of the daylit creek

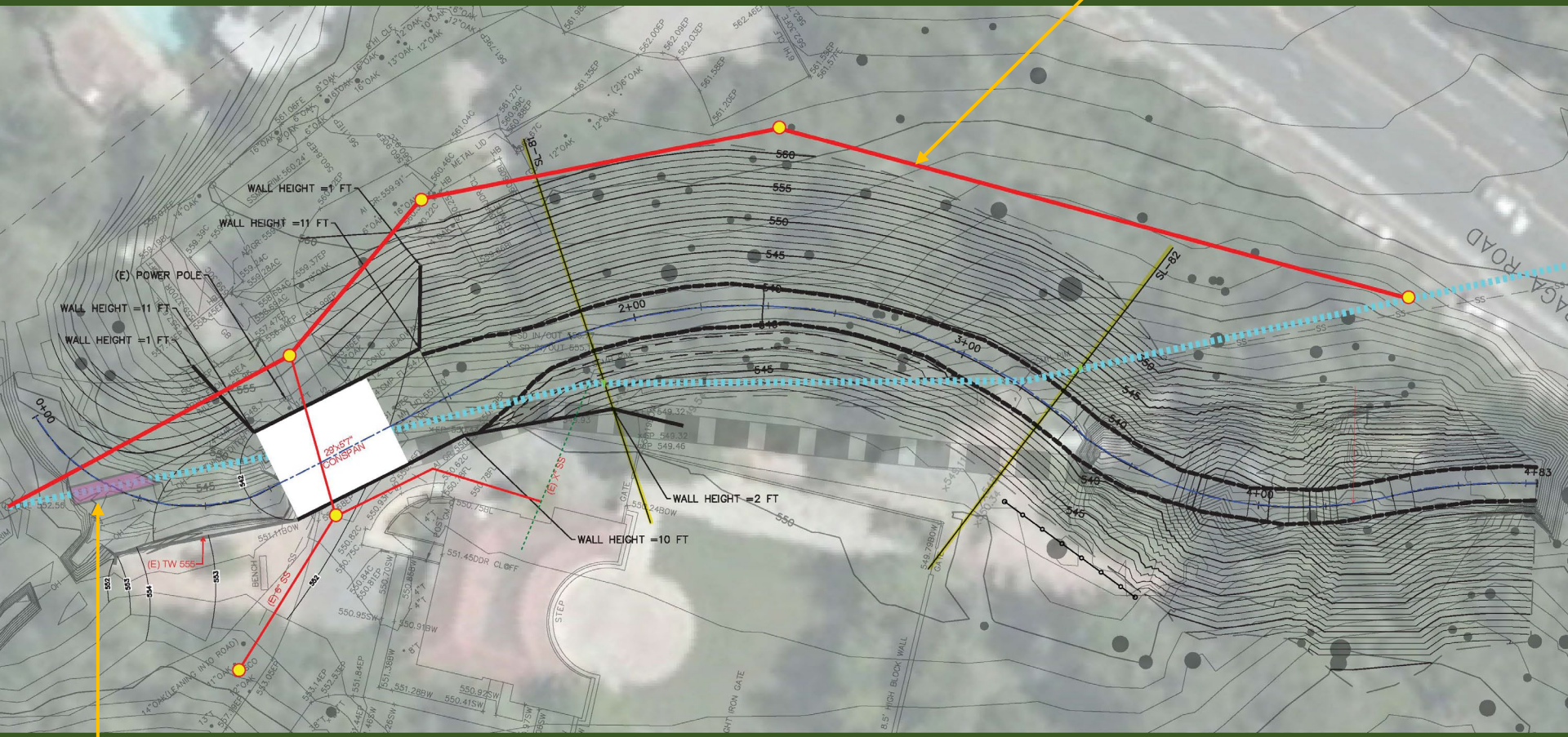


EG = existing grade or the current shape of the ground

FG = finished grade or the proposed shape of the ground

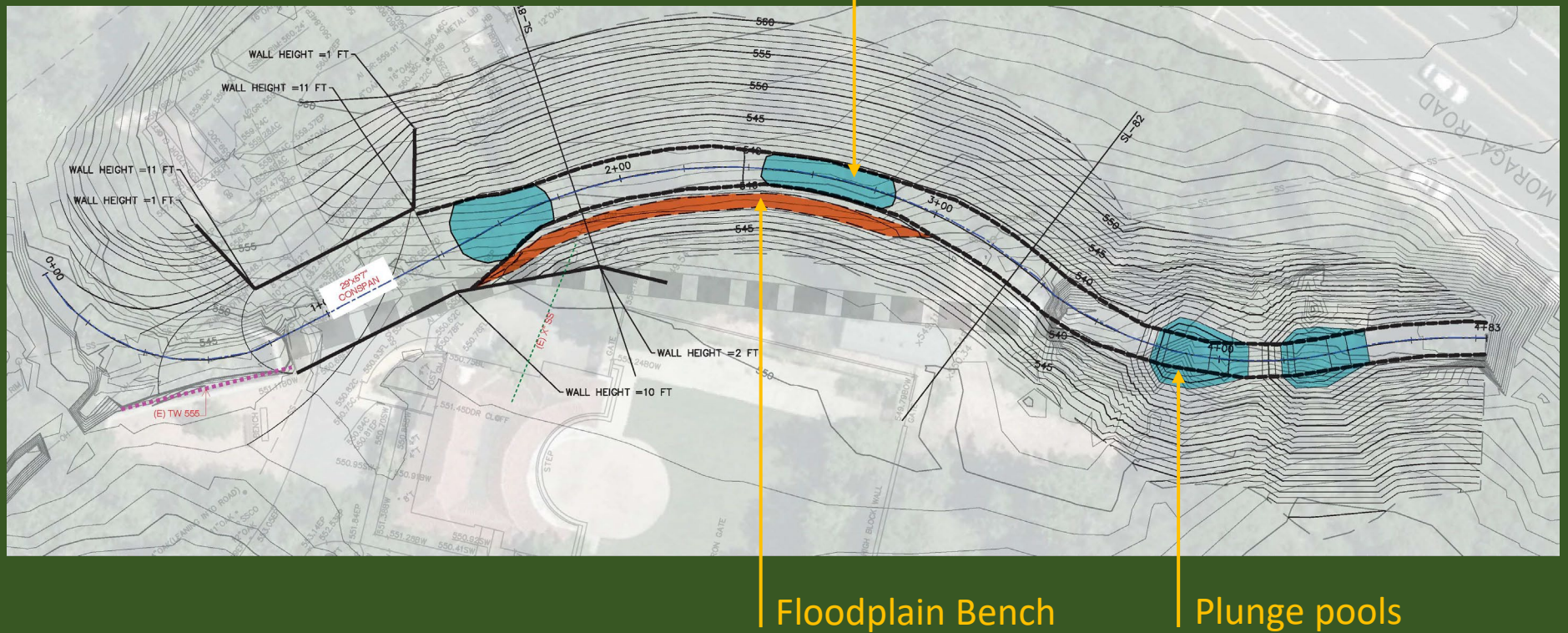
SANITARY SEWER REALIGNMENT

The existing sewer line needs to be relocated and coordinated with the Central Contra Costa Sanitation District



CHANNEL DESIGN FOR HABITAT

In addition to excavating the creek bed and laying back the banks, the money for the project is tied to habitat creation



ConSpan Bridge Examples

KYTC687 - Clay County, Kentucky

Tessera on Lake Travis - Lago Vista, Texas

Stream Valley - Franklin, Tennessee

Duanesburg - Churches Road - Duanesburg, New York

Engineering & Design

Anneke Swinehart | Restoration Design Group

- Grant Requirements & Project Goals
- Design Alternatives
  - Bridge Sizing tied to ADA parking
- Design Preferences
  - Public Path Surfacing
  - Guardrail aesthetics

Grant Requirements & Project Goals

- Restore 242 linear feet of Laguna Creek
- Restore 4,250 square feet of aquatic habitat (pools)
- Restore 22,550 square feet of riparian habitat
- Realign a portion of the existing Hacienda Trail along the restored Creek
- Provide new habitat for native wildlife and the California Red-Legged Frog
- Contain FEMA's 100 year flood to avoid damage to the Pavilion

Project Challenges

- Space for restored channel is limited by pavilion and steep banks
- Pavilion built within Creek's historic channel
- Ideal Geomorphic section (shape of the cross section) for Laguna Creek not within the scope of budget for this project (would require more walls than feasible or relocating Pavilion)
- Goals of project can largely be met, although compromises need to be acknowledged to stay within Grant mandated budget
- Rocks and walls will be necessary in places to allow for the widest and most natural channel possible

Design Alternatives

Given the physical limitations of the site, the two alternatives are very similar. Further grading studies by BKF may increase the differences (and cost savings) between them, but at 15% design level, the primary differences are:

- WIDTH AND SCALE OF THE BRIDGE
- LOCATION OF ADA PARKING SPACE AT THE PAVILION

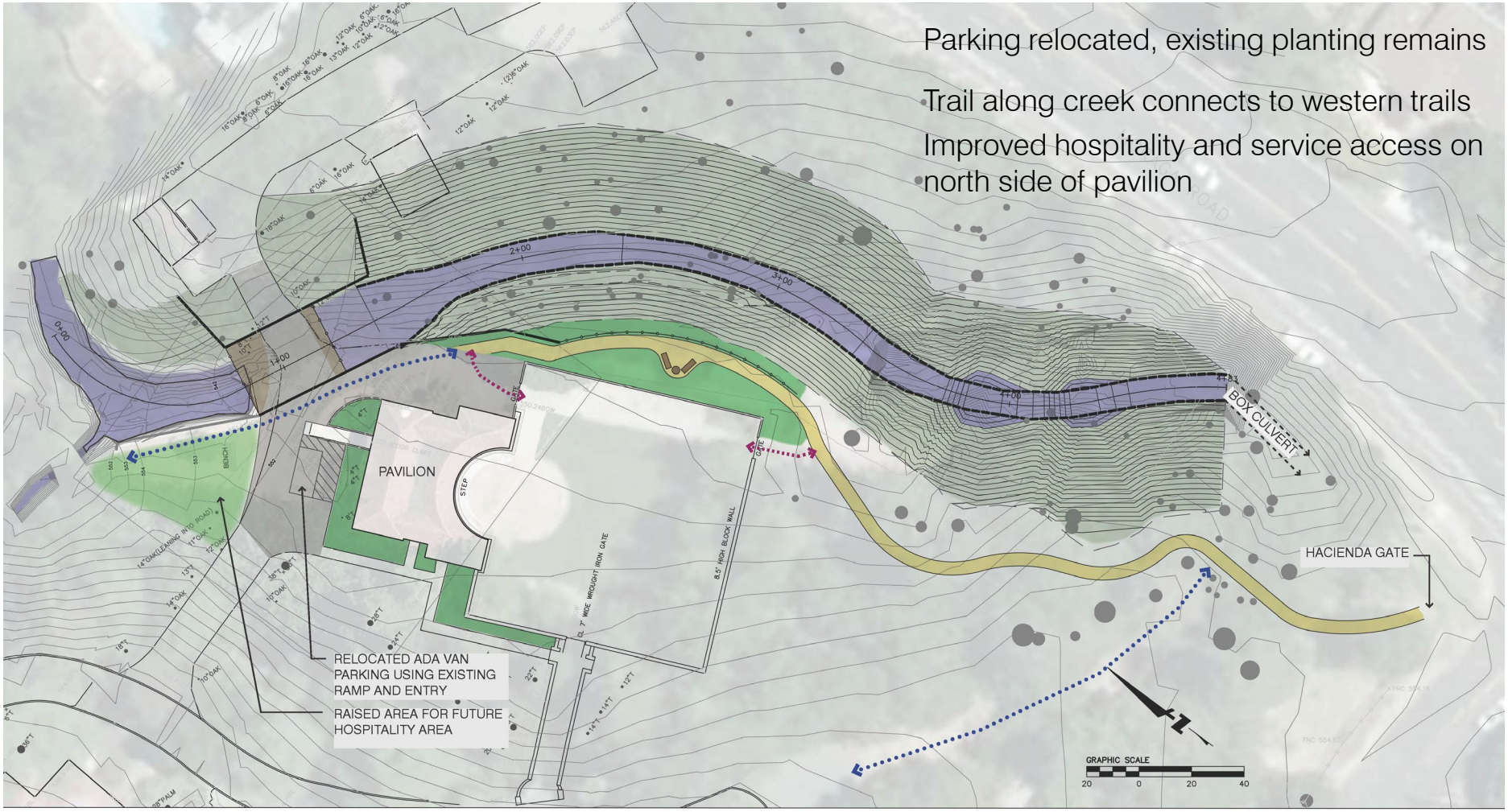
Alternative 1

35’ wide conspan bridge

Parking relocated, existing planting remains

Trail along creek connects to western trails

Improved hospitality and service access on north side of pavilion



NATIVE ORNAMENTAL PLANTING BUFFER

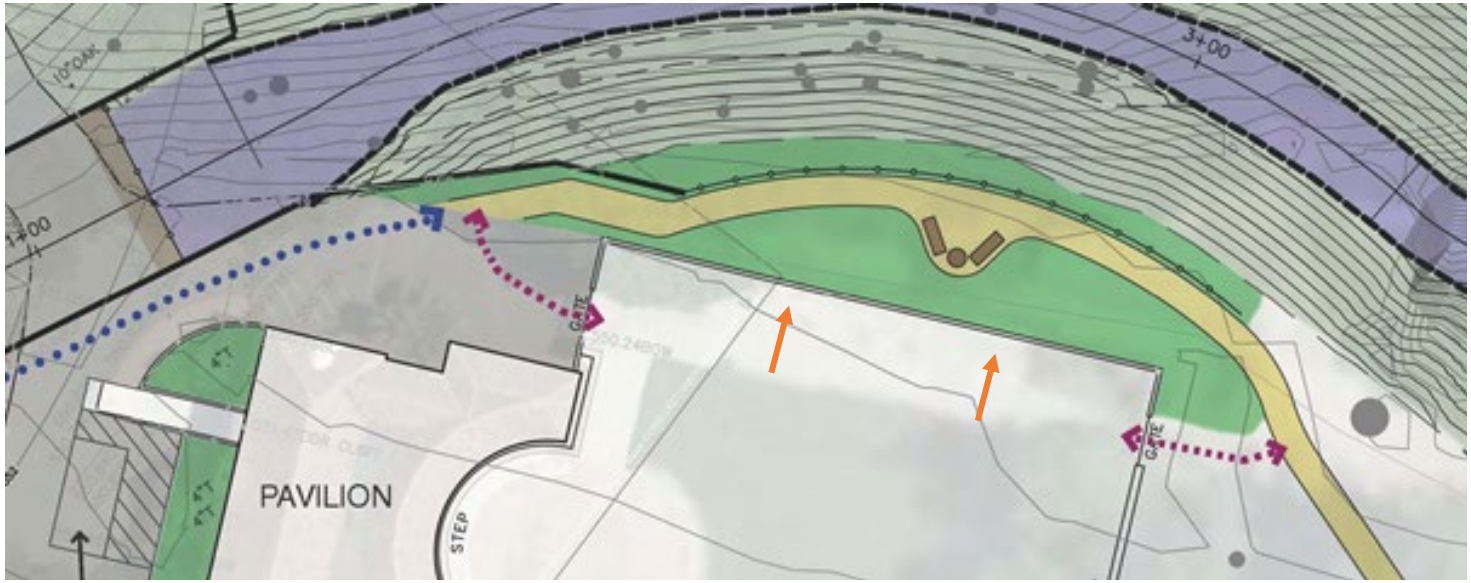
RIPARIAN WOODLAND PLANTING, NATIVE OAKS

NEW 5’ WIDE MINIMUM TRAIL - MULCH OR D.G.

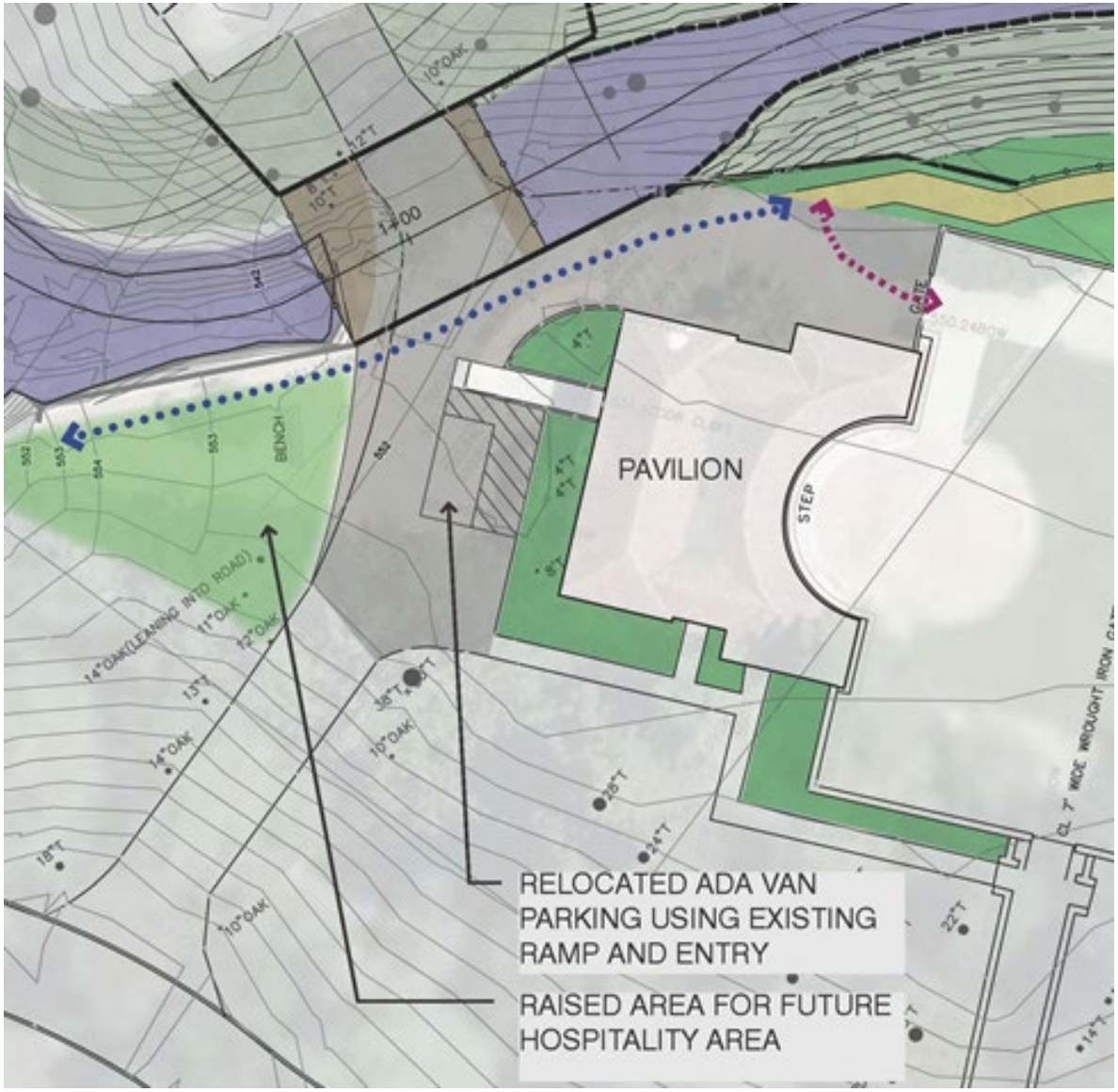
ASPHALT PAVING - VEHICULAR CIRCULATION

PAVILION CIRCULATION

TRAIL CIRCULATION



Ornamental planting buffer between latticed pavilion wall and creek trail



ADA parking moves to front, using existing ramp and entrance. Sidewalk that dead ends into retaining curb for ramp removed.

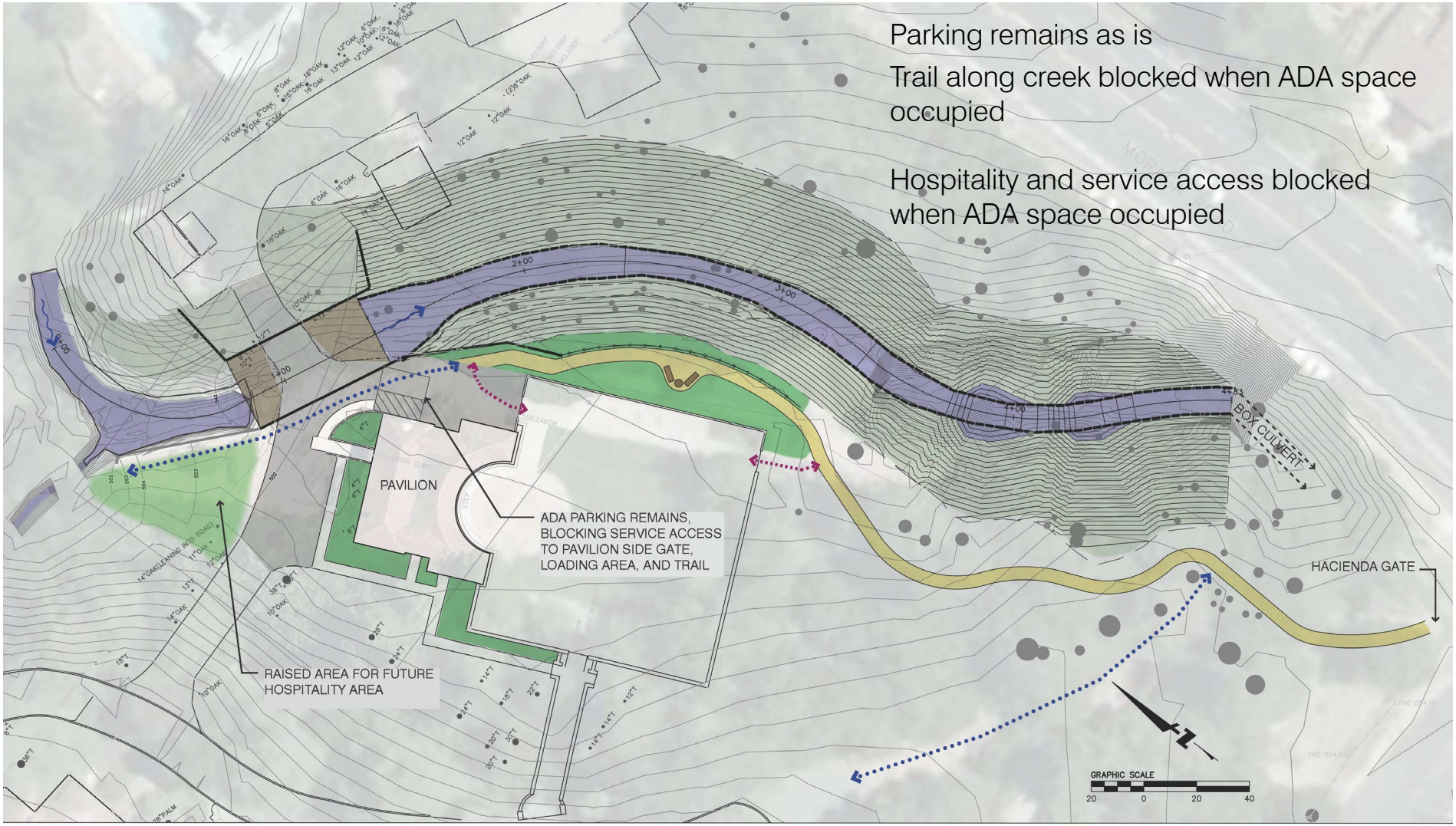
Alternative 2

55’ wide conspan bridge

Parking remains as is

Trail along creek blocked when ADA space occupied

Hospitality and service access blocked when ADA space occupied

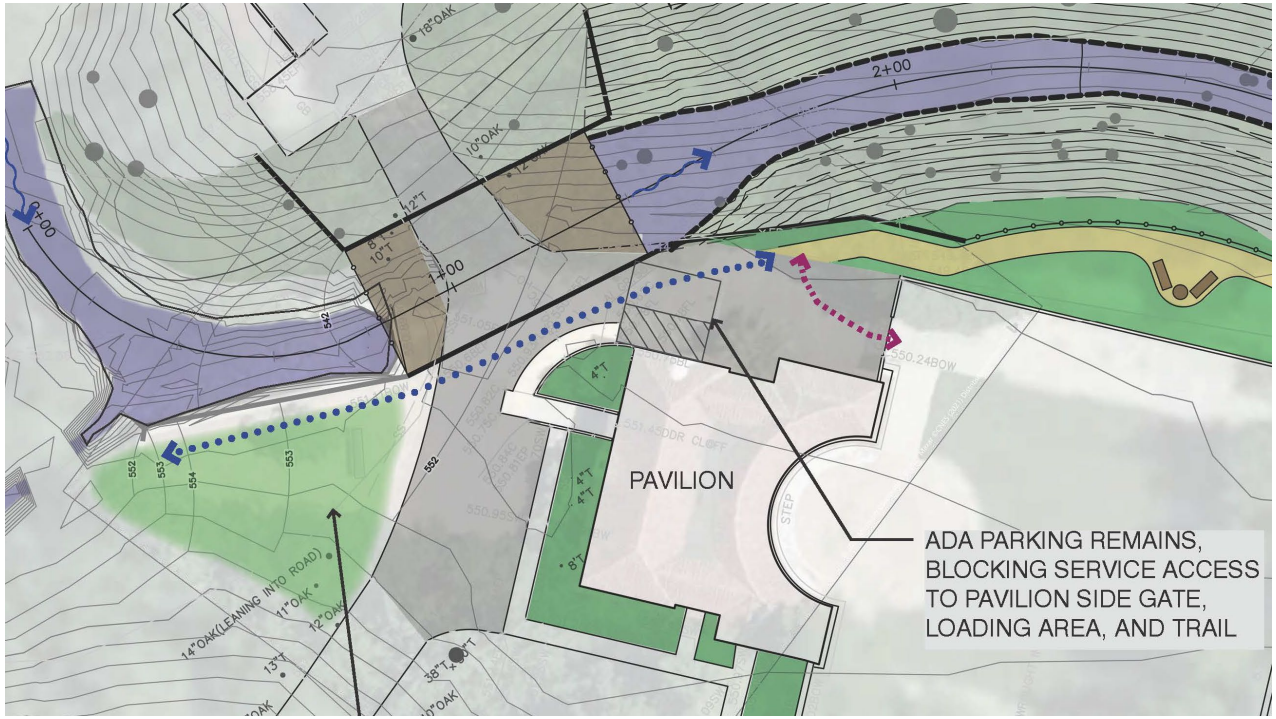


Existing ADA parking at service entrance side of Pavilion.

Larger Bridge required to provide back-up space for ADA spot onto bridge

Trail and Service access blocked when ADA space occupied

No change to front of pavilion



Trail Surfacing

Stabilized Decomposed Granite – upgrade with minor cost impact, but many benefits

Existing trail network informal, mulched

Guardrail Aesthetics (bridge)

Mesh Panels/Wood Rub Rail

Vertical Picket/Pipe Handrail

DISCUSSION

&

COMMENTS