

Red Butte Creek Pedestrian Crossing

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S.E.A. 4910.23.02.4



Goal

- Implement a crossing aligned with a potential trail along Red Butte Creek
- This trail will connect the Sunnyside community with the Wasatch Trail System

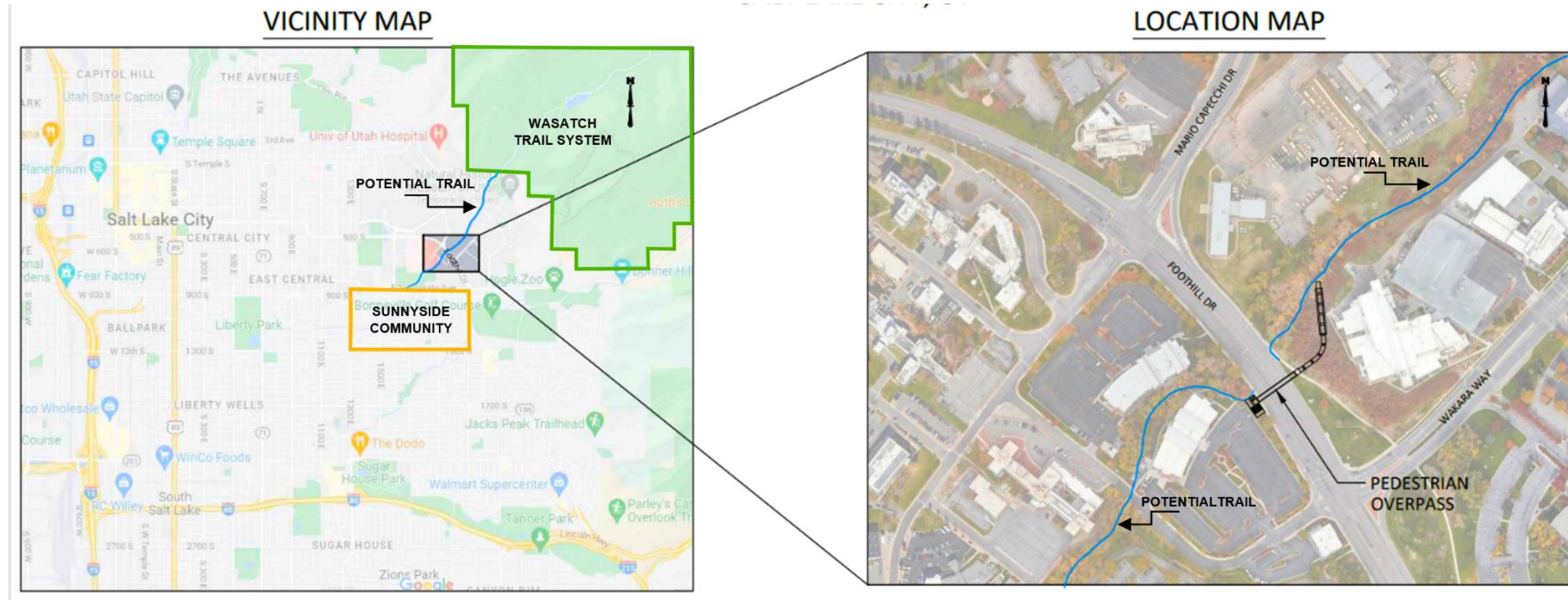
Purpose

- Grade separated crossing over Foothill Drive between Wakara Way and Mario Capecchi
- Increases safety for pedestrians

Project Participants

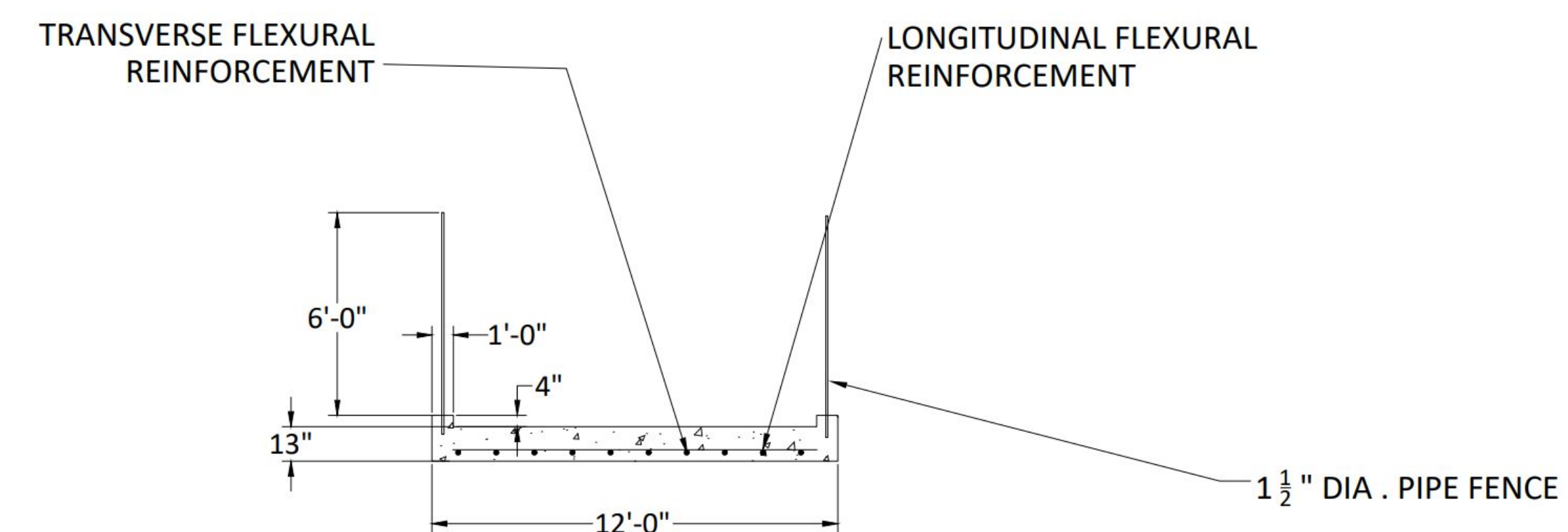
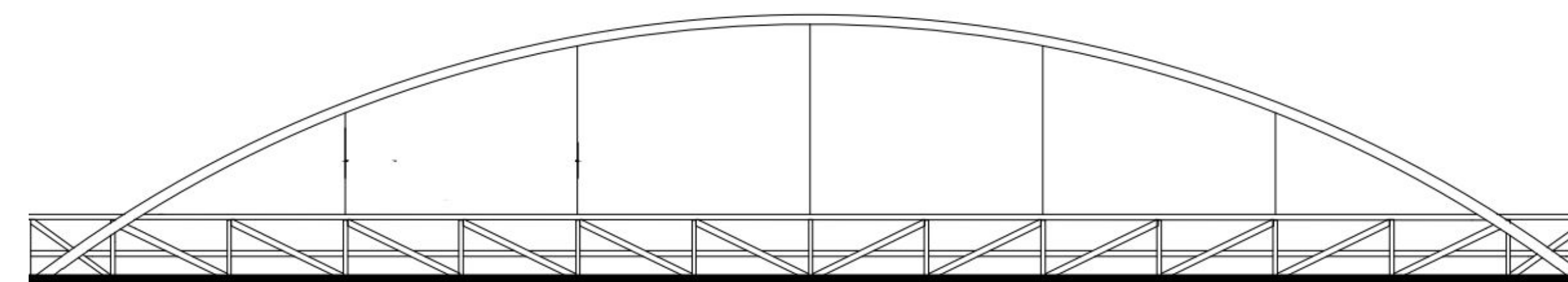
- University of Utah
- Veterans Affairs (VA)
- Salt Lake City

Project Summary



Proposal

- Prefabricated steel truss bridge with a tied arch appearance
- Stairs and elevator on the west side
- Ramp connecting to a future trail on the east side
- Includes site planning for riparian corridor concerns, existing trees and utilities



TYPICAL RAMP CROSS-SECTION

Summary of Criteria

Site Constraints:

- Minimize effects to riparian corridor
- Easy connection to sidewalks and the trail system
- Minimal encroachment on surrounding properties
- Minimize damages to existing infrastructure

Decision Criteria:

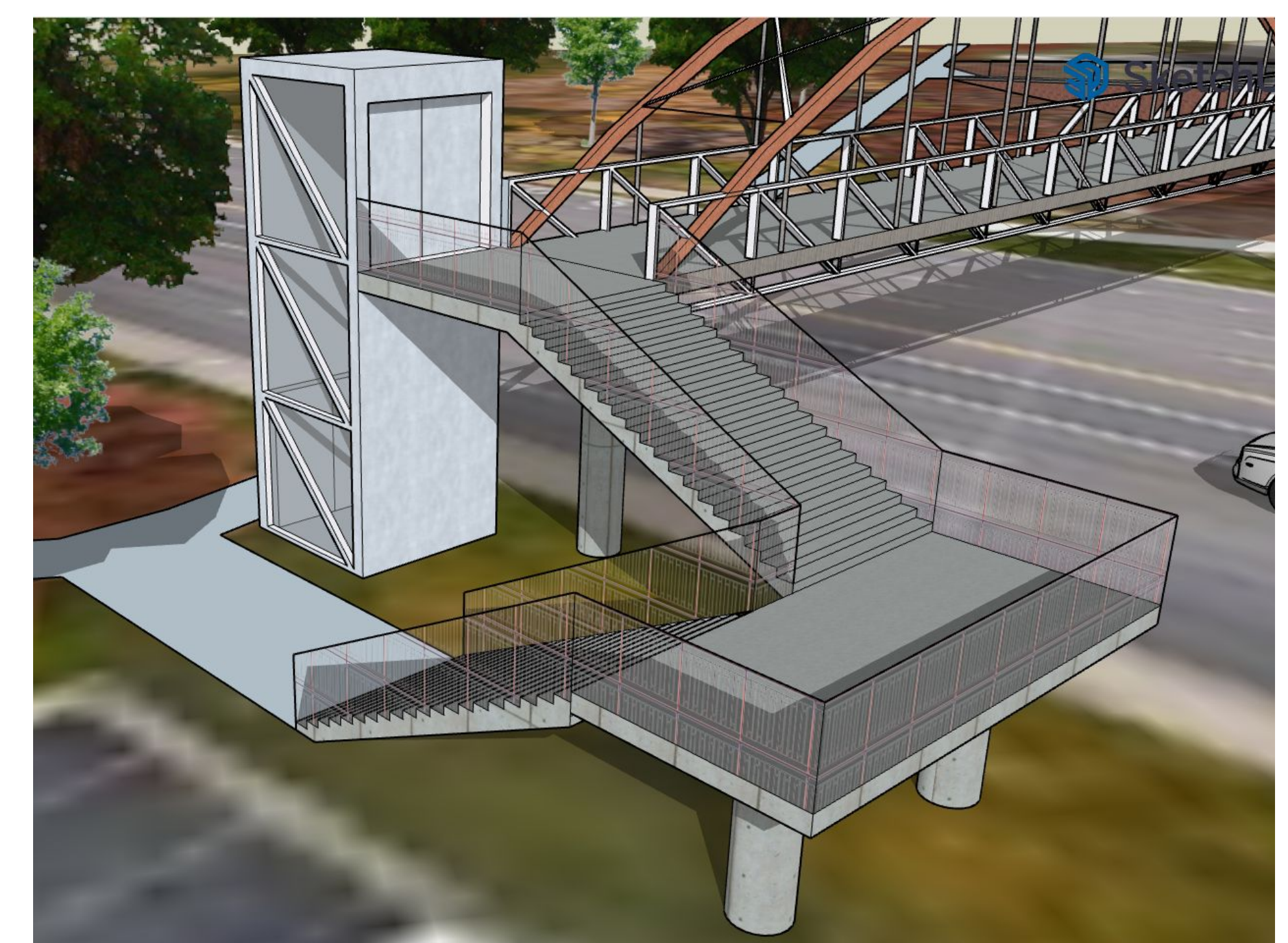
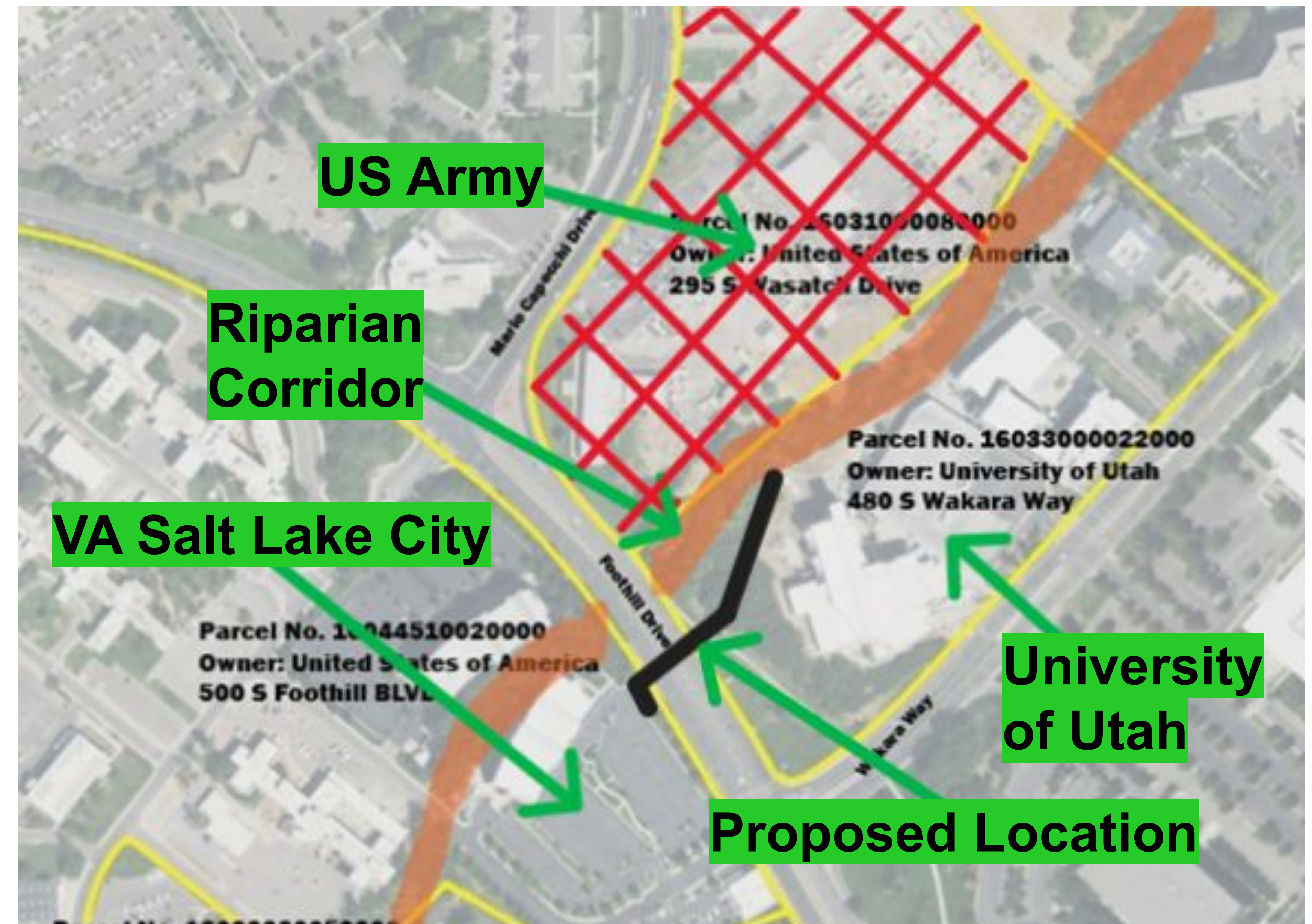
- Ease of construction
- Low maintenance design
- Balance stakeholder needs
- Minimize damages to Red Butte Creek

ADA Requirements:

- 8% maximum grading
- Elevators
- Ramp landings

Design Criteria:

- ASSHTO LRFD
- ACI 318 Structural Concrete



Summary of Alternative and Design Process

Suspension bridge



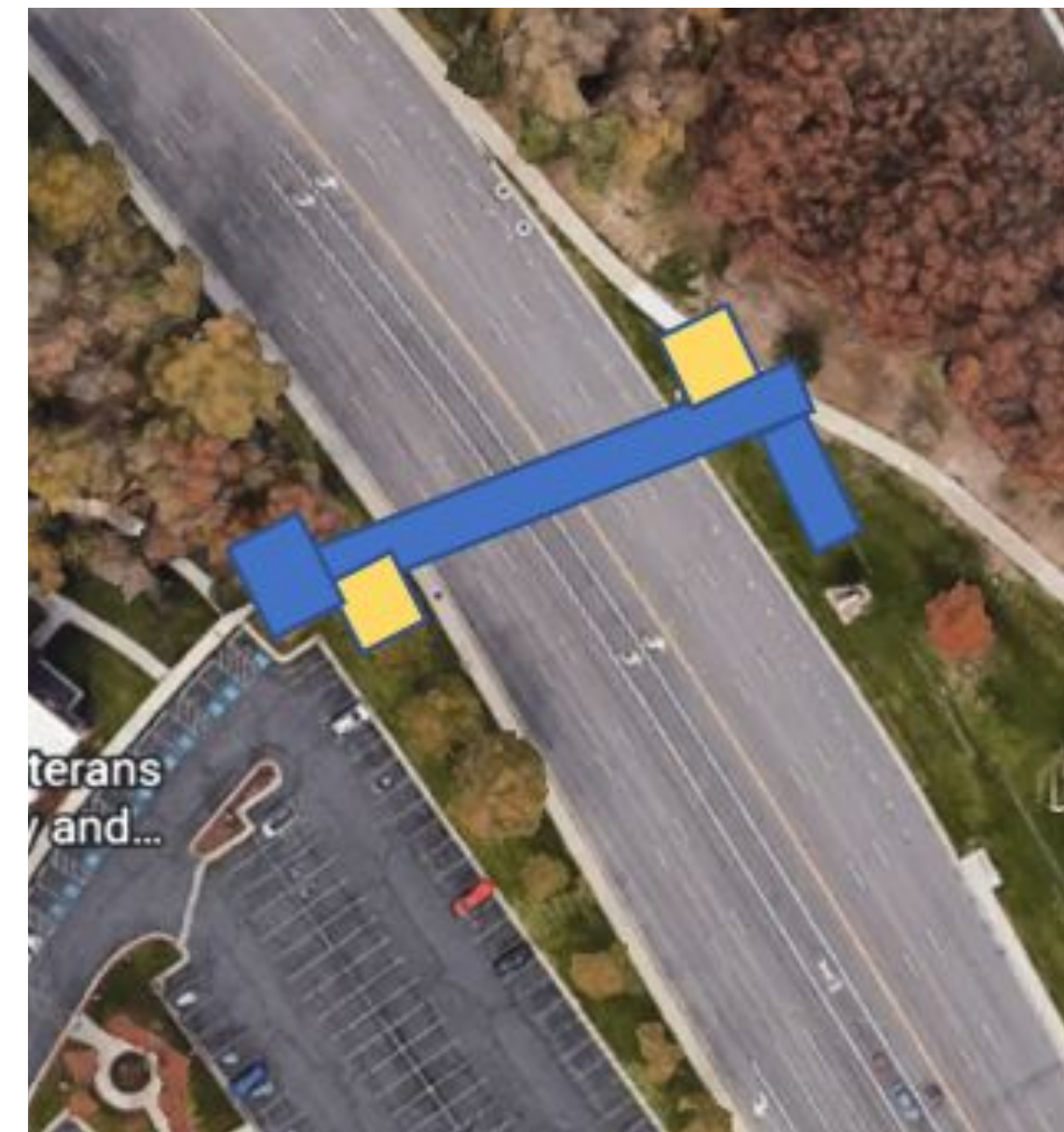
Girder Bridge



Buried Bridge



Alternative 1



Alternative 2



Alternative Design

Shortcomings

- Lengthy construction process
 - Cost
- Disruption to roadways
- Aesthetics

Project Introduction

Project Criteria

- Safe Crossing
- Access for all ability levels
- Economic
- Minimize construction impact
- Legacy

Research and Development

- Universe of Alternatives
- Stakeholder Analysis
- Site Investigation
- Geotechnical Report
- Competitive Analysis

Preliminary Design

Production of a preliminary tied arch bridge with supporting calculations and cost estimate for client review.

Client Feedback

Salt Lake City's review of the preliminary design resulted in multiple changes and adaptations to fully suit the client's needs.

Final Design



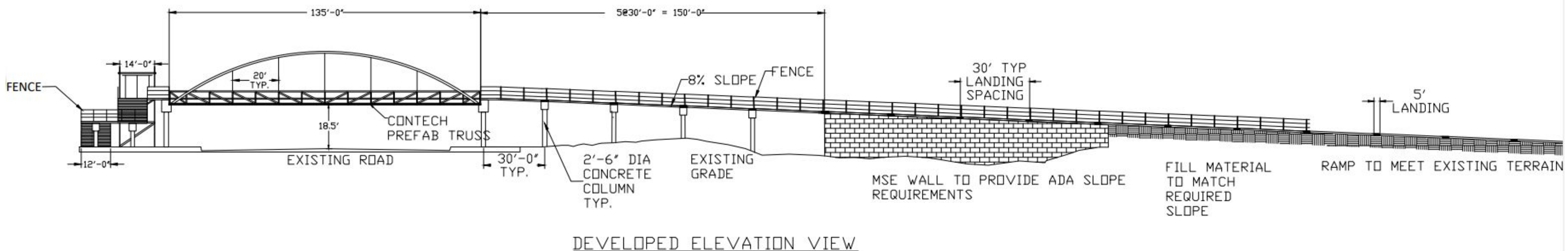
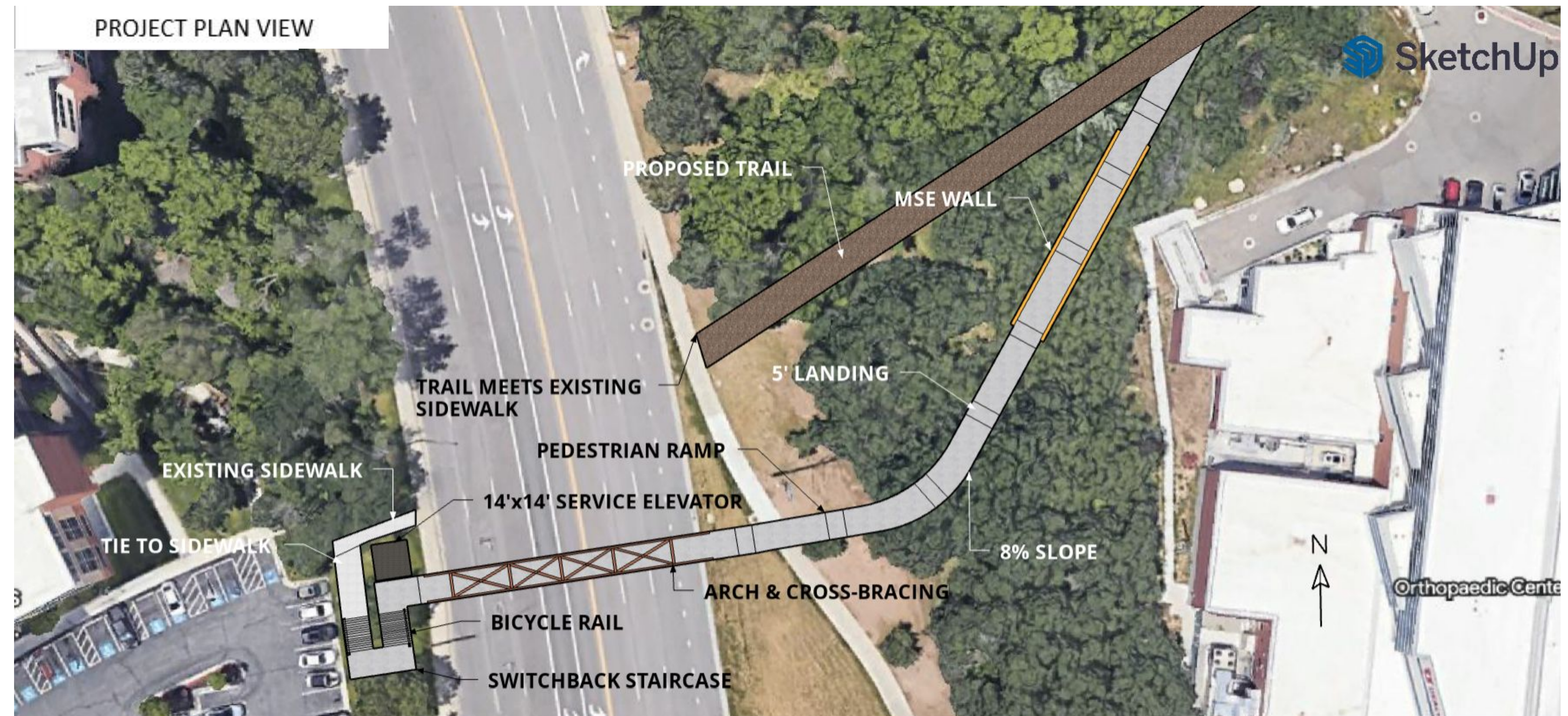
Summary of Selected Design

Bridge:

- 135' Span Prefabricated Truss Bridge
- 2 Tied Arch Ribs with Cables for Architectural Appeal

Impacts:

- Structure avoids Riparian Corridors
- Permit needed for trail tie-in
- Powerline utilities to be relocated



Design Summary of Effectiveness

Placement

- Close to creek, minimizes out of direction travel
- Minimal impact to riparian corridor
- Connections to existing facilities

Safety

- Grade separated crossing
- Removes pedestrian/vehicle conflicts from 51,000 average vehicles per day

Access

- Accessible by all users with integration of ramps, stairs, elevators, bike rails

Cost Estimate

- The total estimated cost for the project is approximately \$4,000,000.
- Includes estimated cost for concrete, steel, environmental controls, utility relocation, earthwork and elevators
- Utilized a recent UDOT pedestrian bridge project for Utah specific price estimation



Legacy Crossing Elevator Image Source: Google Maps

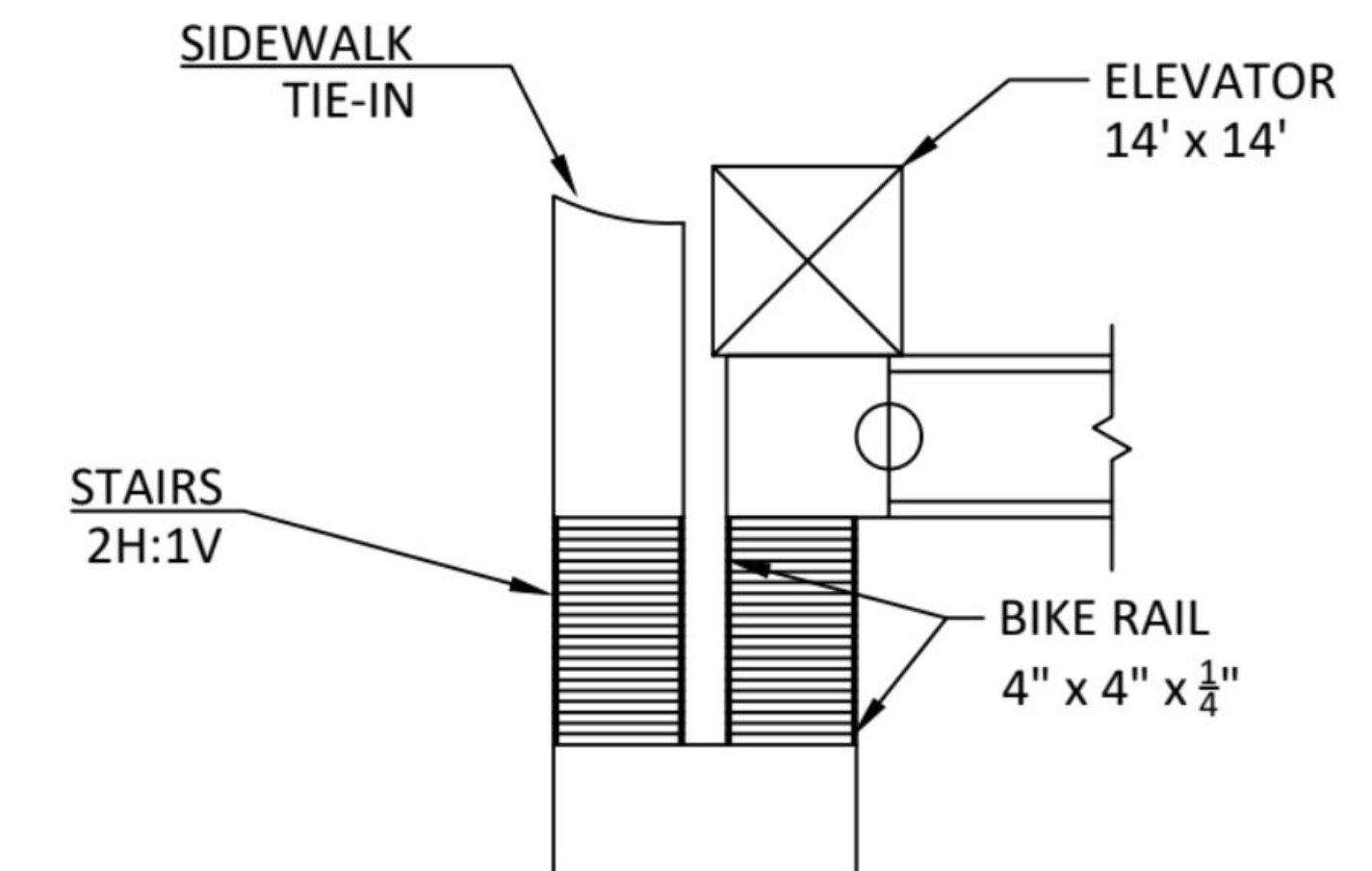
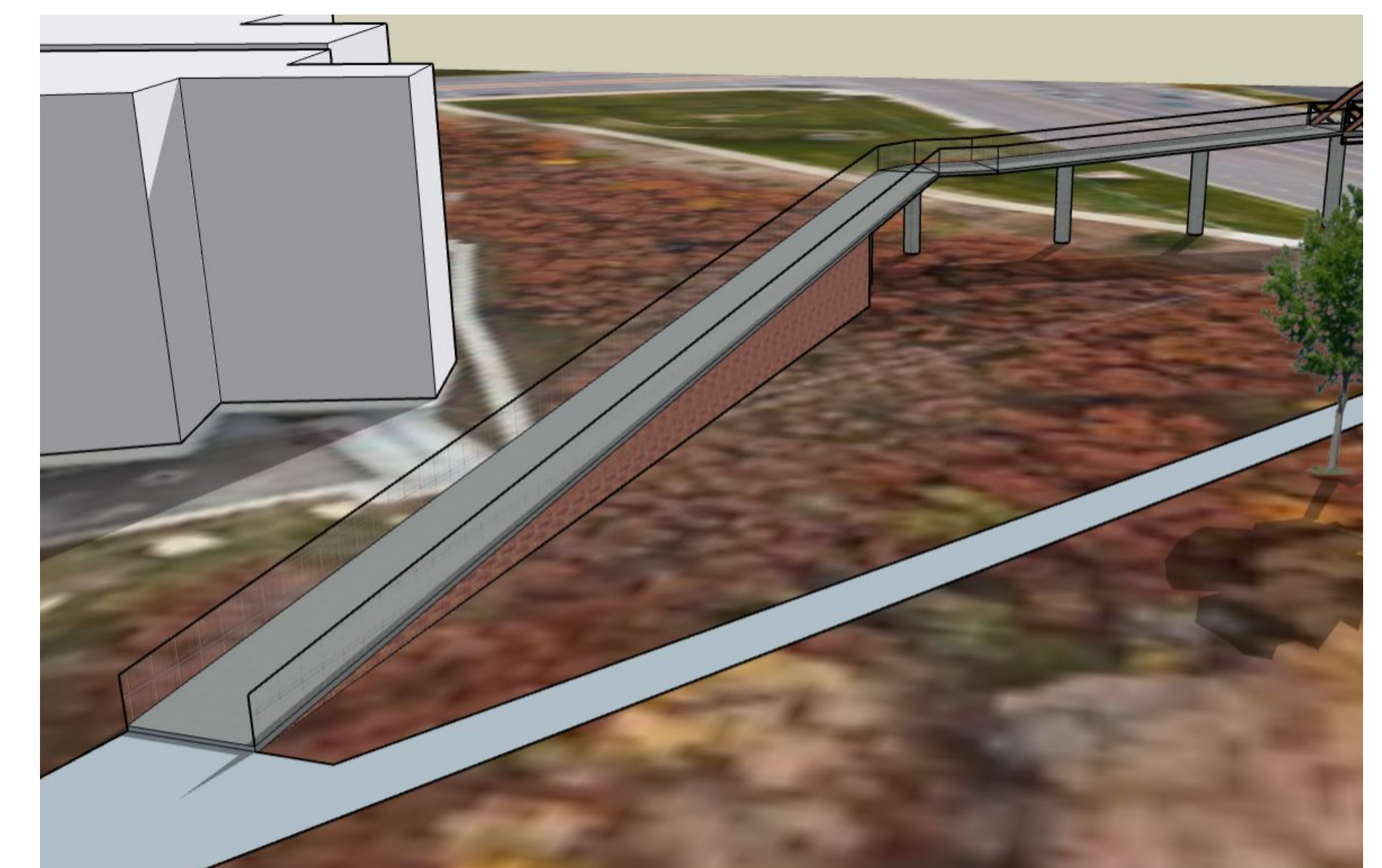


Image Source: <https://www.sarisinfrastructure.com/post/blog-announcing-the-bicycle-access-ramp-a-stairway-for-your-bike>



Rendering that shows west side connection to existing facilities



Rendering that shows east side trail connection