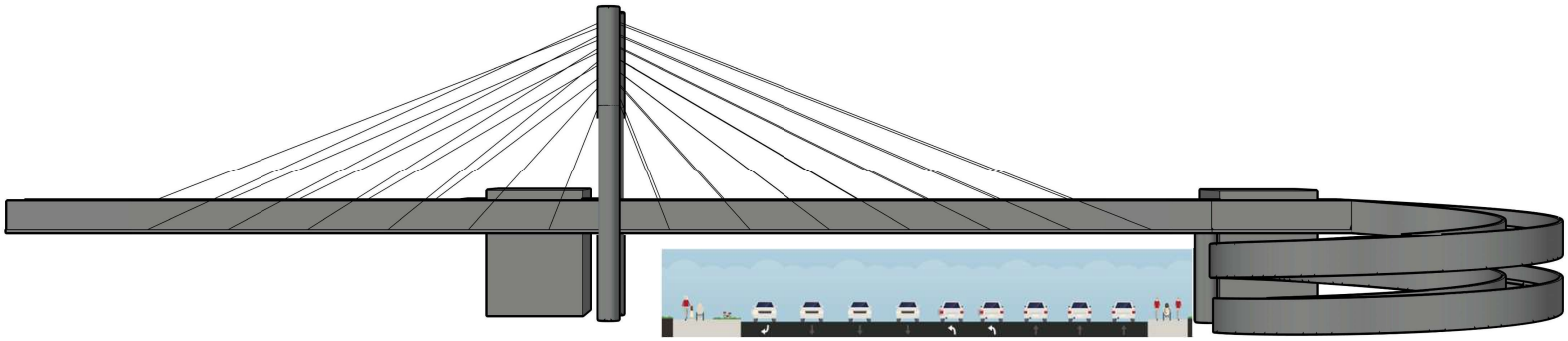
Cable Stay Pedestrian Bridge, Red Butte Creek

Project #4910.23.01.05

#1



Proposed Cable Stay Bridge Over Foothill Drive
North View of the Bridge Model, With Streetmix Road Model

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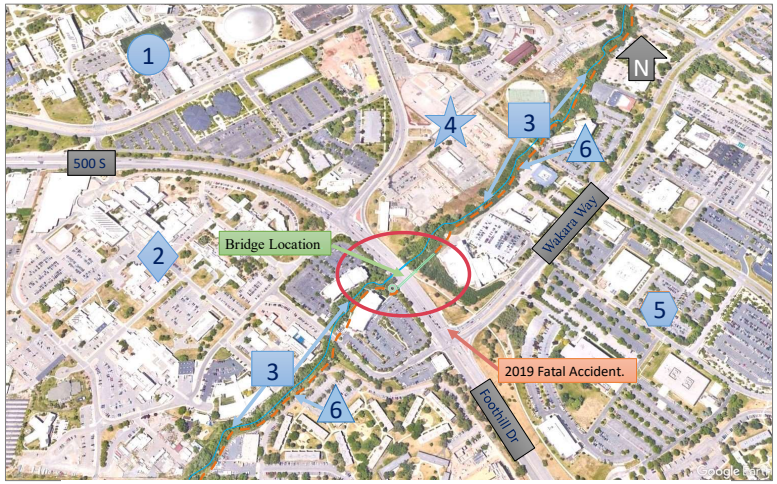
Project Purpose

1. Future Trail Crossing
2. Public Health & Safety
3. Address Dangerous Sidewalks & Crosswalks
4. Connection to Proposed Trail System
5. Alternative Transportation

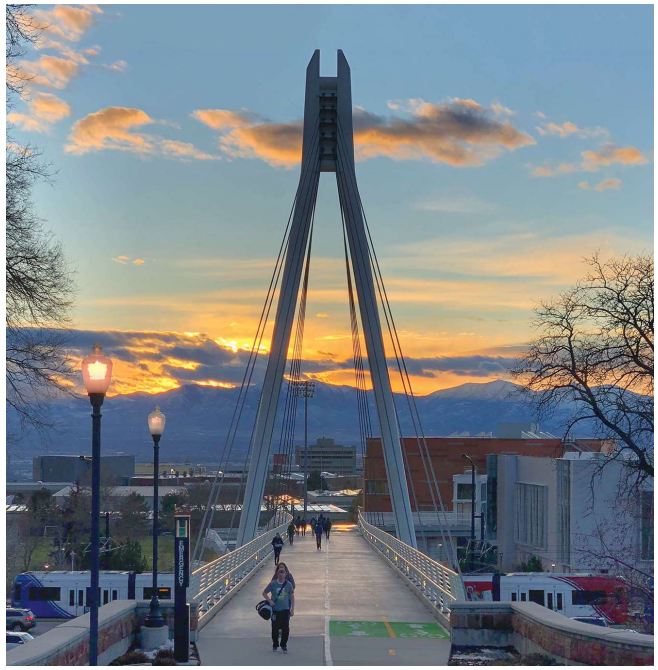


Fatal Auto-Pedestrian Accident Location & Location for the Bridge.

1. University of Utah
2. V.A. Hospital
3. Red Butte Creek
4. Fort Douglas
5. Research Park
6. Trail (Location TBD)

Summary of Criteria

Homogenous Community Aesthetic



Design Criteria

1. Enable Various Modes of Transportation (Cyclists, Pedestrians, Strollers, etc.)
2. Accessibility and Safety
3. Natural Environment Protection
4. Aesthetic Appeal
5. Sustainable Manufacturing

Safety Equity, Diversity, Inclusion, and Accessibility

Modes of Transportation

Stakeholder Interest's

SLC Municipality

Equity and Accessibility

SLC Trails

Connect to Future Trails

Sunnyside Neighborhood

Direct Passage Across Foothill

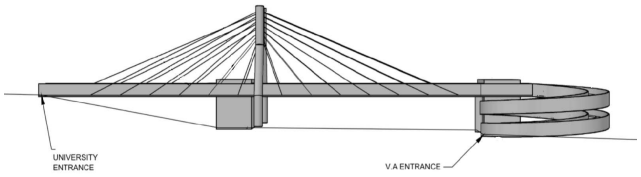
Utah Department of Transportation

Improve MOT and preserve Foothills right of way

Design Alternatives

UVU Pedestrian Bridge

U of U Legacy Bridge



Foothill Dr. Pedestrian Overpass

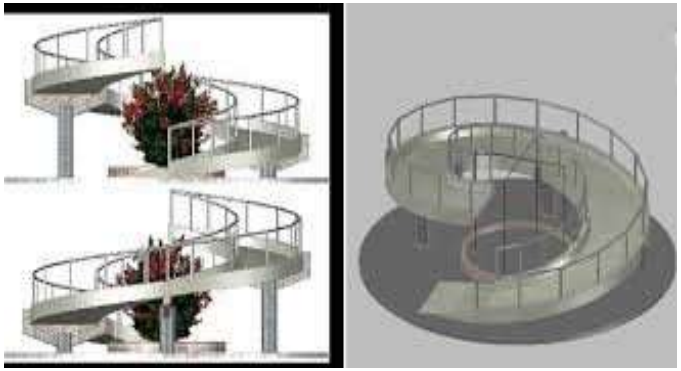
Define Scope → Establish Criteria → Identify Alternatives → Compare using ISI Envision and Criteria → Element Selection → Preliminary/Final Design

Elements:

1. **Support Type**
   Precast concrete archway, Cable Stayed, and Beam
2. **Pedestrian Ascension**
   Switchback stairs, Long stairwell, spiral ramp, and Earth slope
3. **Foundations**
   Shallow (Spread and Mat), and Deep (Piles and Drilled Shafts)
4. **Location**
   Stakeholder Restraints and feasibility
5. **Environmental Considerations**
   Materials, low impact construction, and Maintenance

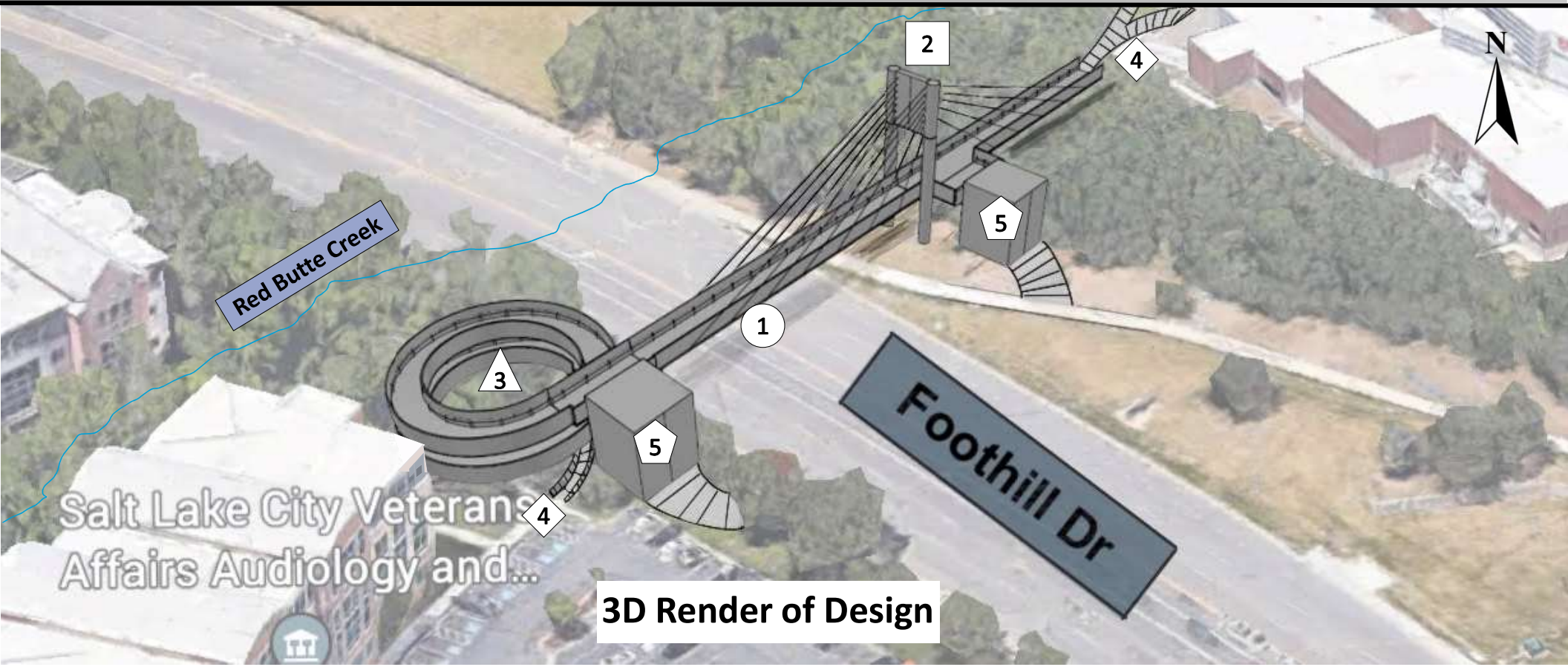
Long Ramp Ascension

U of U Legacy Bridge Ascension



Foothill Dr. Pedestrian Ascension

Summary of Design



3D Render of Design

1 150’ LONG SPAN, 15’ WIDE PATH, 18.5’ ROAD CLEARANCE

2 77’ TALL CABLE-STAYED MAST

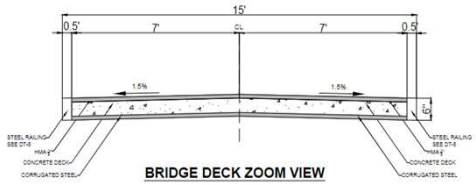
3 55’ DIAMETER SPIRAL ACCESS RAMP, 13’ WIDE PATH

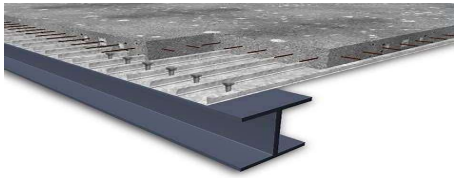
4 CONNECTION TO FUTURE TRAIL SYSTEM

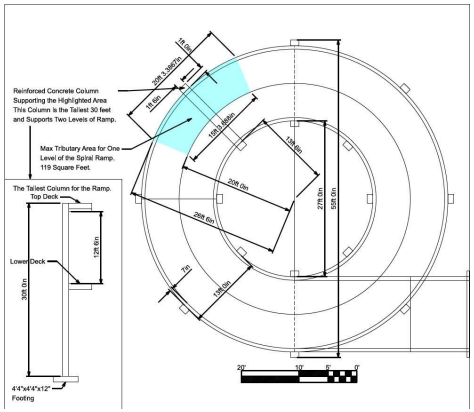
5 SPACE FOR POTENTIAL ELEVATOR INSTALLATION (SPECULATIVE)

Summary of Design

Deck Design

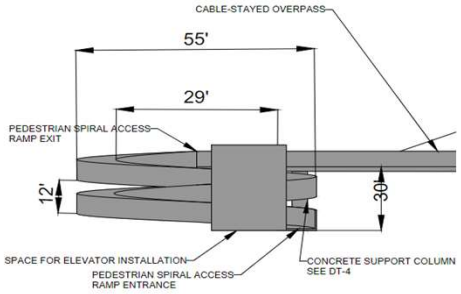




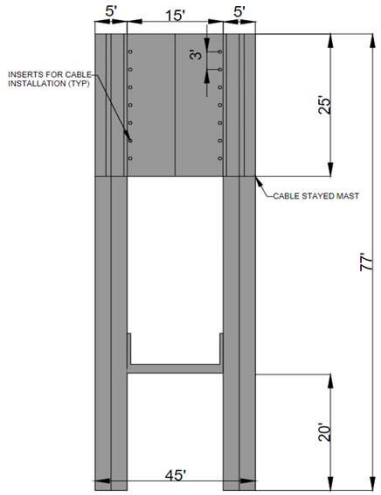


- **The bridge deck** thickness is 6" (4" thick concrete on top of a 2" metal deck). Using a metal deck will help make the overall deck use less material (instead of just using concrete)

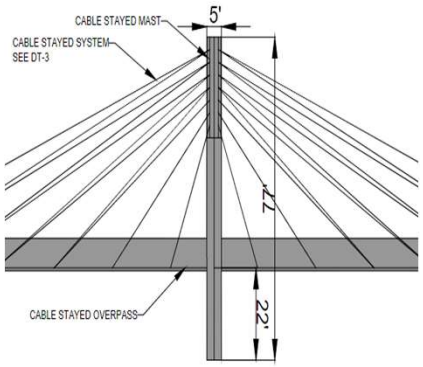
- **The spiral ramp** was proposed with the intent of an aesthetic appeal vs a switch back ramp. If the elevator shown is used, the spiral ramp does not need to meet all ADA requirments.



Cable-Stay Design



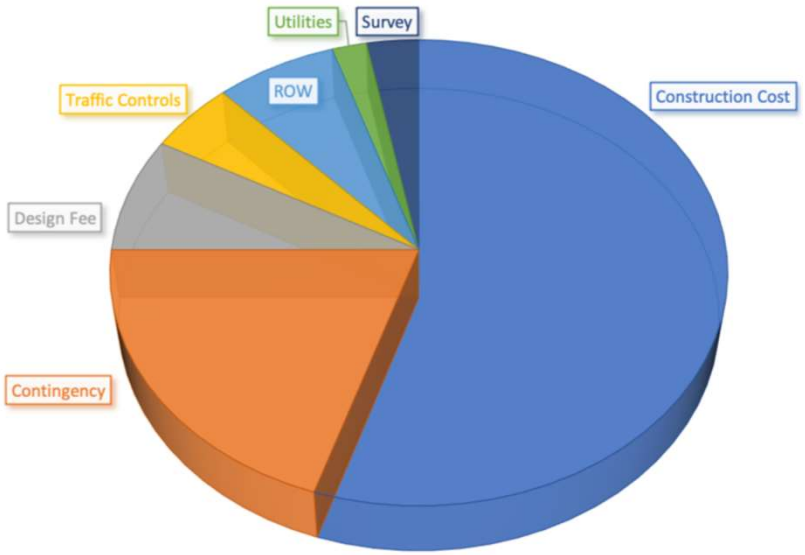
- **The mast** was influenced by the legacy bridge. The distance of bolts was meant to minimize the eccentric loading caused by the cables. The 20ft clearance is to meet code



- **The cables** were meant to be evenly spaced throughout the span length (1st and last cables were spaced 15ft from the ends and the rest evenly spaced 20ft)

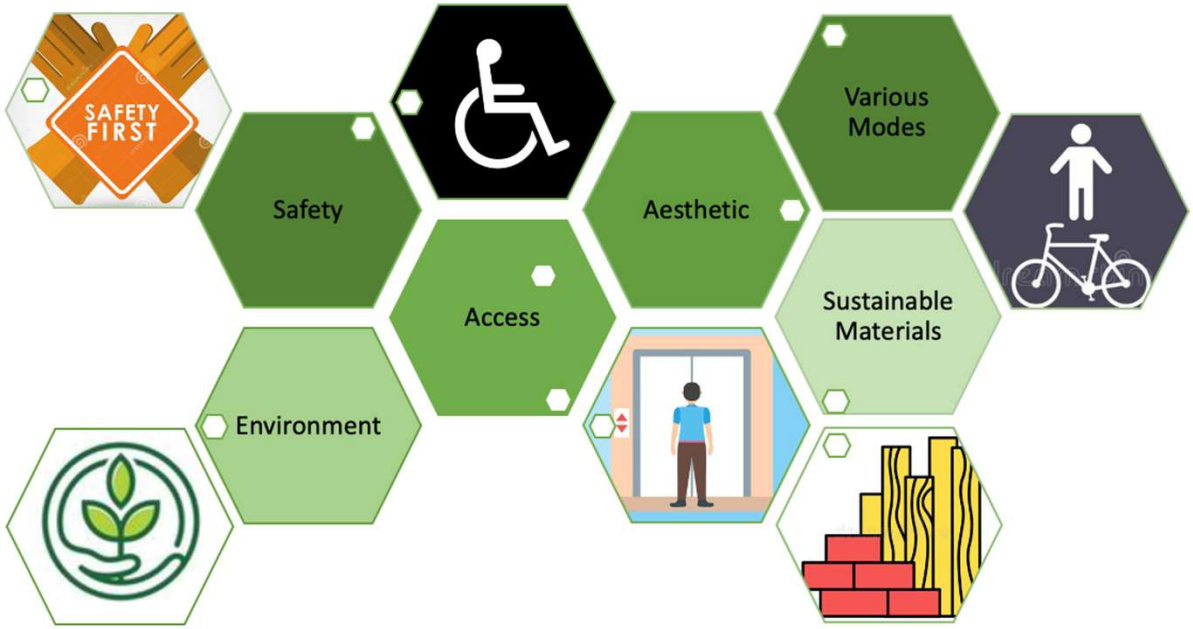
Design Summary Effectiveness

Cost Estimation



Total Cost: **$8.5 Million**

Design Effectiveness



Design Effectiveness of Criteria (%)

0% 50% 100%

Design Achievements:

- Safe and Accessible for Many Different Pedestrians
- Compact and Aesthetically Pleasing Design
- Allows Simple Integration into Potential Trail Systems
- Protects Natural Environment of Red Butte Creek