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Title: Los Alamos Canyon Bridge Upgrades Project

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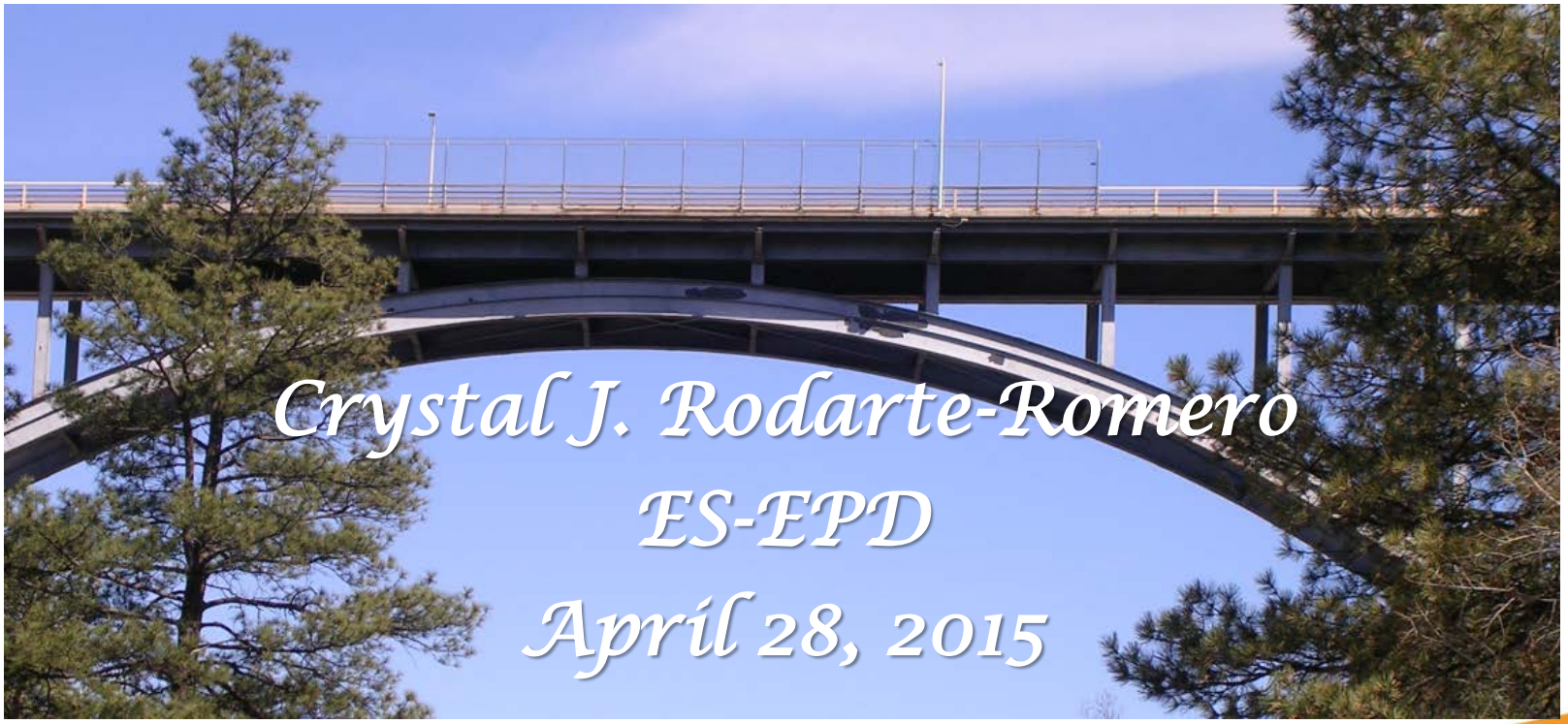
Los Alamos Canyon Bridge Upgrades Project



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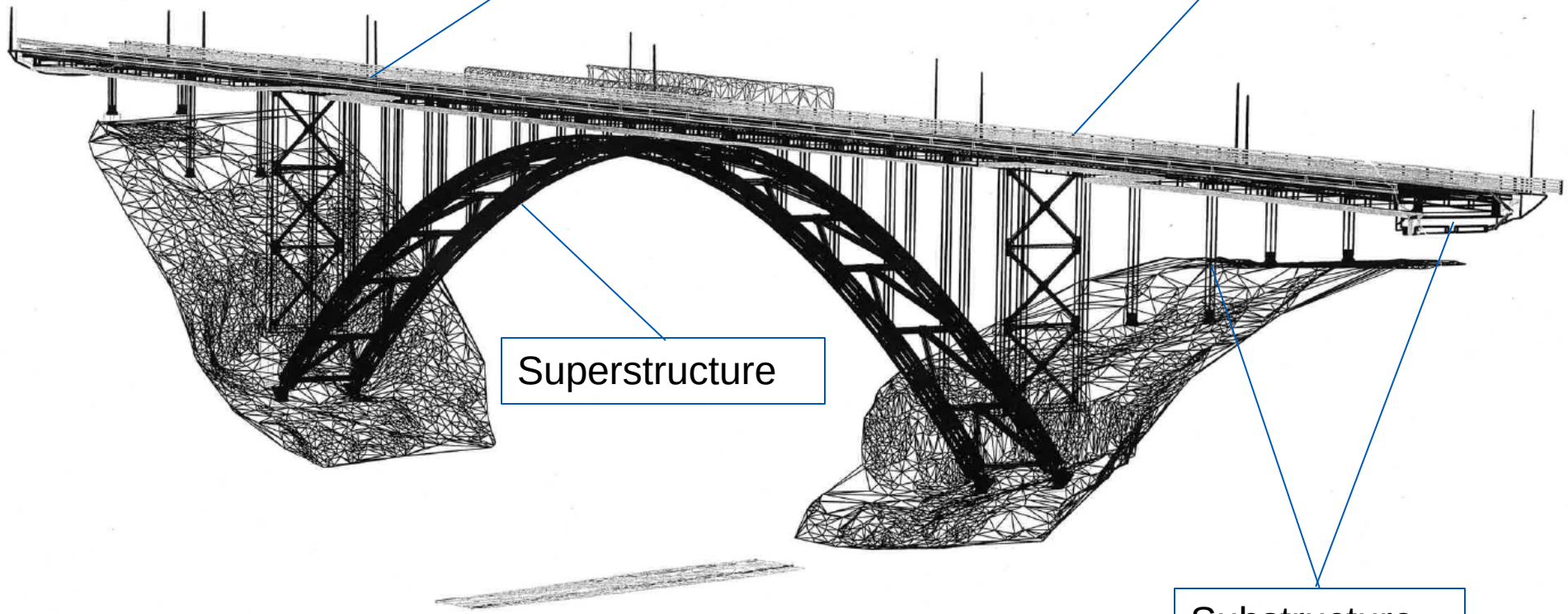
Overview

- Bridge Structure
- Bridge Ratings
- Maintenance
- Line Item
- Questions
- Frequently Asked Questions

Bridge Structure



Bridge Structure

- **Deck**
  - Wearing Surface
  - Expansion Joint
  - Curbs/Sidewalks
  - Bridge Rails
  - Deck Drains

Bridge Structure

- **Superstructure**
  - Arch ribs
  - Spandrel girders
  - Floorbeams
  - Stringers
  - Bearings
  - Coating System

Bridge Structure

- **Substructure**
  - Abutments
  - Piers
  - Foundations
  - Slope Protection
  - Coating System

Bridge Ratings

Inspection Year	Deck Rating	Superstructure Rating	Substructure Rating
FY-2010	Good (7)	Fair (5)	Good (7)
FY-2011	Good (7)	Fair (5)	Good (7)
FY-2012	Good (7)	Fair (5)	Fair (6)
FY-2013	Fair (6)	Fair (5)	Fair (6)
FY-2014	Fair (6)	Fair (5)	Fair (6)

- FY-2012: Substructure Rating Reduction
  - Piers and Abutments – Concrete (Degradation and Cracking)
- FY-2013: Deck Rating Reduction
  - Deck – Concrete (Delamination and Spalling)

Deck Maintenance

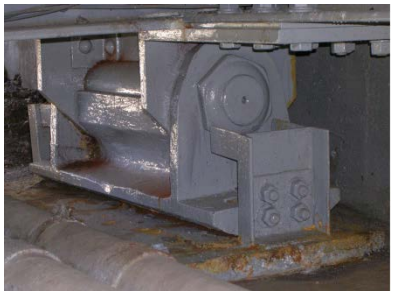
- **Concrete Patching**
  - Delamination
  - Maintenance, Yearly
- **HMWM Sealant**
  - Seal Cracks
  - Previous Maintenance, FY-2002
  - Next Maintenance, FY-2014
- **Expansion Joints**
  - Alleviate Superstructure Deterioration
  - South
    - Previous Maintenance, FY-2012
    - Next Maintenance, FY-2014
  - North
    - Previous Maintenance, FY-2011
    - Next Maintenance, FY-2017

Superstructure Maintenance

- **Steel Structure Painting**
  - Corrosion Protection
  - Previous Maintenance, FY-2002
  - Next Maintenance, FY-2015

Substructure Maintenance

- **Piers**
  - Epoxy Injection of cracks
  - Fiber Reinforced Polymer
  - Previous Maintenance, FY-2003
  - Next Maintenance, FY-2016
- **Abutments**
  - Concrete Replacement (6” to 12” Deep)
  - Previous Maintenance, FY-2003
  - Next Maintenance, FY-2016
- **Keeper Plate**
  - Re-set bearing units
  - Previous Maintenance, FY-2012
  - Next Maintenance, FY-2014



Line Item – Quad Chart

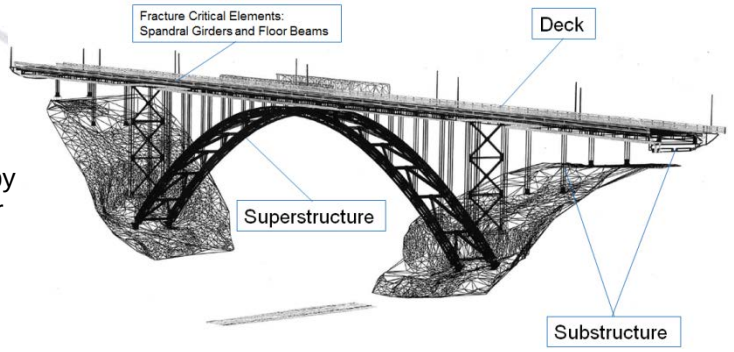
Mission Gap/Project Need

Reinvestment in the Los Alamos Canyon Bridge (LACB) deck, superstructure, and substructure, ensures continued access between Los Alamos National Laboratory (LANL) and the Los Alamos County (LAC) town site; as well as maintains emergency response qualifications to/from the Los Alamos Medical Center (LAMC). The operability of the LACB is critical to the institution and with the evolving oversight from the Federal Highway Administration (FHWA), Department of Energy (DOE) Headquarters, and National Nuclear Security Administration (NNSA); it is imperative safety of the infrastructure is sustained. The Los Alamos Canyon Bridge is

- 60 plus years old (typical bridge design life of 50 years)
- a fracture critical structure (no girder redundancies)
- with an average daily traffic in excess of 13,000 vehicles/day (primary route for LAC commuters)
- deteriorating (decreasing code ratings, per inspection)
- Last major rehabilitation project (1992)
- Maintains access for fire evacuations (Cerro Grande, Las Conchas)

Benefits

- Extends the service life of the LACB
- Reduces average maintenance costs by $0.5 M to $2.8M, per year
- Compliance with current code requirements



Alternatives (pros and cons)

- Alternative 1. No Action: Increasing facility maintenance costs with decreasing level of safety confidence leading to closure.
- Alternative 2. Upgrade Omega Road: Road has significant design challenges (i.e. grade, geometrics, and widening inabilities, as a portion of the existing road is carved into the mountain/shelf).
- Alternative 3. Reinvestment: Preferred. Extends the serviceability of the LACB. Reduces maintenance costs. Corrects deficiencies.
- Alternative 4. Replacement: Upgrade to meet current seismic and other code requirements. Costly.

Profile (proposed funding and schedule)

- Estimate Total: $21.6M
- Estimate Range: - 20% + 40%

Year 1	Year 2	Year 3	Year 4	Year 5
CD-0/1	CD-2	CD-3		CD-4
$ 500K	$ 3M	$ 7.5 M	$ 10.1M	$ 500K

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Line Item - Scope

- **Deck**
  - Deck Concrete Replacement
  - Metal Railing Corrosion Sealant
  - Metal Railing Replacement
  - North Expansion Joint
  - South Expansion Joint
  - Asphalt Roadway Vertical Alignment
- **Superstructure**
  - Corrosion Sealant (Painting)
- **Substructure**
  - South Piers Epoxy Injection
  - South Piers Fiber Reinforced Polymer
  - North Abutments
  - South Abutments
  - North Slope Erosion
  - South Slope Erosion
  - Keeper Plate
- **Other**
  - South Pedestrian Walkway Erosion
  - South Guardrail Replacement
  - Inspection





Questions

- Bridge Tour

Frequently Asked Questions

- **What is the official name of the bridge?**
  - Los Alamos Canyon Bridge, Omega Road passes under the Los Alamos Canyon.
- **What is the average daily traffic (ADT) for the Los Alamos Canyon Bridge?**
  - Based on 2011 traffic count data, the ADT is 13,195 vehicles/day.
- **What are the industry codes the bridge is inspected to?**
  - National Bridge Inspection Standards (NBIS), 2004 edition; and Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, 1995 edition.
- **What can be done to keep the bridge rating from dropping below Fair?**
  - Continued maintenance (projects that extend the life of the bridge)
    - Deck – HMWM Sealant
    - Superstructure – Steel Structure Painting
    - Substructure – Piers Epoxy Injection/Fiber Reinforced Polymer and Abutments

Frequently Asked Questions

- **Deck inspection?**
  - This item describes the overall condition rating of the deck.
  - Concrete decks should be inspected for cracking, scaling, spalling, leaching, chloride contamination, potholing, delamination, and full or partial depth failures.
  - The condition of the wearing surface/protective system, joints, expansion devices, curbs, sidewalks, parapets, and bridge rail shall not be considered in the overall deck evaluation. However, their condition should be noted on the inspection form.
- **Superstructure inspection?**
  - This item describes the physical condition of all structural members.
  - The structural members should be inspected for signs of distress which may include cracking, deterioration, section loss, missing rivets, and malfunction and misalignment of bearings.
  - The condition of bearings, joints, paint system, etc. shall not be included in this rating, except in extreme situations, but should be noted on the inspection form.
  - Fracture critical components should receive careful attention because failure could lead to collapse of a span or the bridge.

Frequently Asked Questions

- **Substructure inspection?**
  - This item describes the physical condition of piers, abutments, piles, fenders, footings, or other components.
  - All substructure elements should be inspected for visible signs of distress including evidence of cracking, section loss, settlement, misalignment, scour, collision damage, and corrosion.

Frequently Asked Questions

- **Condition ratings descriptions?**
  - N – Not Applicable
  - 9 – Excellent Condition
  - 8 – Very Good Condition (no problems noted)
  - 7 – Good Condition (some minor problems)
  - 6 – Satisfactory Condition (structural elements show some minor deterioration)
  - 5 – Fair Condition (all primary structural elements are sound but may have minor section loss, cracking, spalling or scour)
  - 4 – Poor Condition (advanced section loss, deterioration, spalling or scour)
  - 3 – Serious Condition (loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
  - 2 – Critical Condition (advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
  - 1 – Imminent Failure Condition (major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service)
  - 0 – Failed Condition (out of service and beyond corrective action)
    - Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridge, 12/1995, Errata Sheet for Coding Guide 06/2011.