





# I-5 Dunsmuir Gap CMGC Project

Project Case Study: Benefits of CMGC Project Delivery for Structures Projects



# Project Location: I-5 City of Dunsmuir Siskiyou County District 2

\$140,630,444

Start: 4/17/23

Finish: 12/15/25

### **Project Description**

- 02-1H480
  - SB I-5 replace bridge deck, railing, approaches
- 02-3H320
  - NB I-5 replace 10 miles of JPCP all lanes
  - NB I-5 grind PCC paving 3.3 miles, 0.1 ft polyester concrete overlay

May-November work window



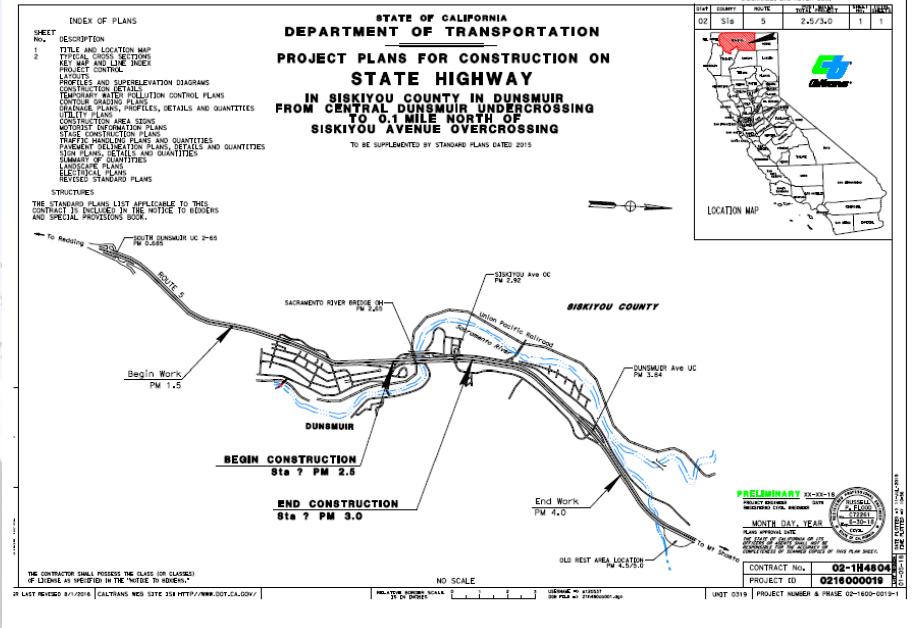




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# Project Location: I-5 City of Dunsmuir Siskiyou County District 2

\$140,630,444

Start: 4/17/23 Finish: 12/15/25 SHEET NO. DESCRIPTION

TITLE AND LOCATION MAP

DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON

STATE HIGHWAY

IN SYSKIYOU COUNTY IN AND

NEAR DUNSMUIR FROM SACRAMENTO

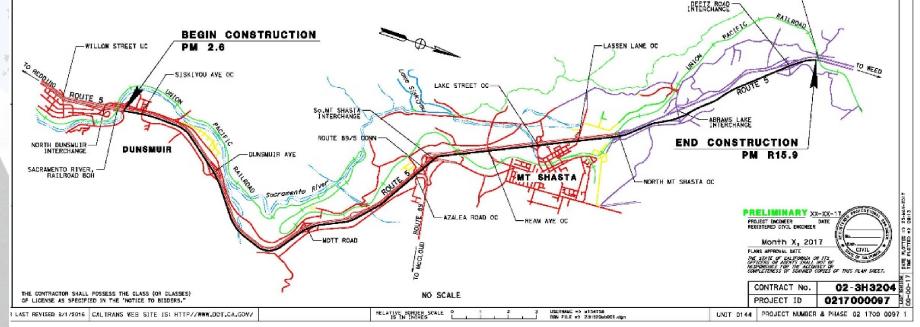
RIVER BRIDGE OVERHEAD TO

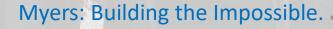
BLACK BUTTE OVERHEAD

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2015



BLACK BUTTE OH-











### Why CMGC

- 2 overlapping projects, combine into one
- Constructability
  - Limited work window
  - Local community
  - RR
- Optimize
  - Construction techniques
  - Materials
  - Means and methods
  - Cost
  - Schedule
- CCO & design change avoidance









# Why CMGC

### Permits & ROW

 UPRR, City of Dunsmuir, USACOE 404, RWQCB, 401, Dept. of Fish & Wildlife, NPDES

### Utility relocations & coordination

- 14" waterline connecting upper & lower Dunsmuir
- Local community
- RR

### Early construction activities during PS&E

Schedule savings

### CMGC Tools

 Design & constructability reviews, risk management, innovations, cost and schedule development, phasing, staging, sequencing, stakeholder management







### **CMGC Goals**

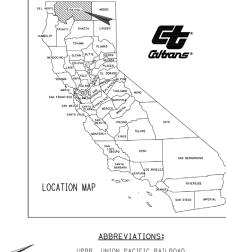
- Safety
- Mobility
- Quality
- Public Interaction
- Environmental Compliance
- Project Delivery
- Innovation



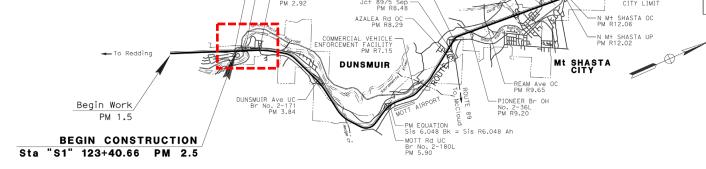


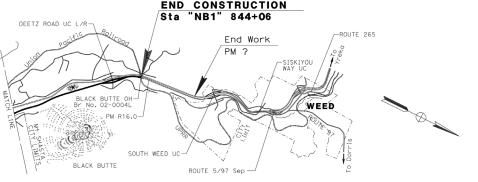


- Challenge: Winter Work Moratorium
  - Reason: Seasonal work volume, restoration of traffic
  - Solution: Optimized phasing, access, design, constructability during PS&E



2.5/R15.9





Myers: Building the Impossible.

02-3H32U4 0221000164

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES)

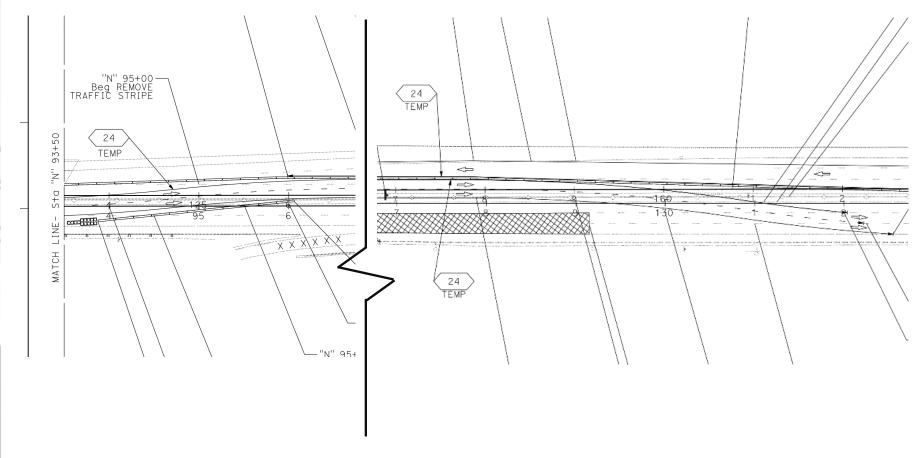












"Crossover" MOT strategy









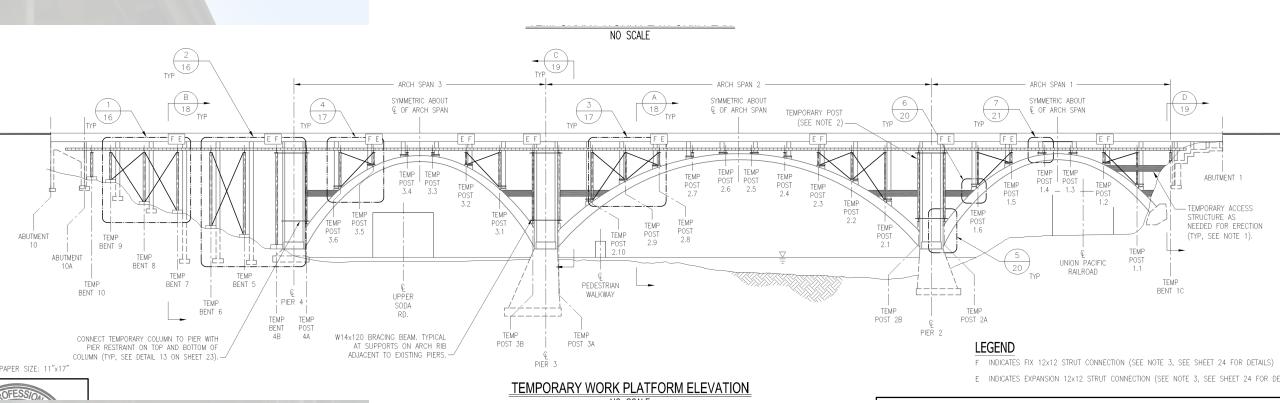
- Challenge: Maintain existing structure integrity / temp platform design
  - Reason: Temp. loading conditions for arch spans
  - Solution: Final temp. support design, demo / reconstruction sequence

Season 1		218	30-May-23	15-Apr-24	15-Apr-24, Season 1
Falsework		218	30-May-23	15-Apr-24	15-Apr-24, Falsework
1S.1000	Clear/Grub Areas at Abutments	5	30-May-23	05-Jun-23	■ Glear/Grub Areas at Abutmer is
1S.1010	Install Falsework/Temporary Work Platform (Bent 10 - Bent 4B)	25	13-Jun-23	18-Jul-23	Install Falsework/Temporary Work/Platform (Bent 10 - Bent 4E)
1S.1020	Install Falsework/Temporary Work Platform (Bent 4A - Bent 3.3) [Road Closure]	15	19-Jul-23	08-Aug-23	Install Falsework/Temporaly/Work Platform (Bent 4A Bent 3.3) [Rodd Closure]
1S.1030	Install Falsework/Temporary Work Platform (Bent 3.2 - Bent 2.3)	40	09-Aug-23	04-Oct-23	Install False with emporary Work Platform (Bent 3.2 Bent 2.3)
1S.1040	Install Falsework/Temporary Work Platform (Bent 2.2 - Bent 1C) [Over RR]	43	05-Oct-23	08-Dec-23*	Install False work Temporary Work Platform (Berti 2 2 - Bent 1 C) [Over F
1S.1050	Relocate Existing 14" Water Line onto Temporary Work Platform	10	02-Apr-24*	15-Apr-24	Reliccate Existing 14" Water Line on Temporary Work Pla
1S.1060	Remove Existing Gas Line	3	02-Apr-24	04-Apr-24	Remipve Existing Gas Line
Season 2		259	02-Apr-24	16-Apr-25	<b>7 3</b> 6-Apr-2 <b>5</b> , \$eason 2
Span 2		82	02-Apr-24	27-Jul-24	27-Jul-24, Span 2
2S.2000	Readjust Falsework/Temporary Work Platform	4	02-Apr-24*	05-Apr-24	Readjust Falsework Temporary Work Platform
2S.2010	Demo Existing Bridge Barrier and Deck	5	16-Apr-24	22-Apr-24	Demo Existing Bridge Barrier and Deck
2S.2020	Demo Existing Floorbeams and Portion of Columns	5	23-Apr-24	29-Apr-24	Demo Existing Floorbeams and Pertion of Columns
2S.2030	Form Floorbeams	12	30-Apr-24	15-May-24	►1 Form;Floorbearns
2S.2040	Place Rebar for Floorbeams	12	16-May-24	03-Jun-24	Place Rebar for Floorbeams
2S.2050	Prep and Pour Floorbeams	5	04-Jun-24	10-Jun-24	Prep and Pour Floorbeams
2S.2060	Form Bridge Deck	15	11-Jun-24	01-Jul-24	Form Bridge Deck
2S.2070	Place Rebar for Bridge Deck	15	21-Jun-24	12-Jul-24	□ ₩ lace Rebar for Bridge Deck
2S.2080	Prep and Pour Bridge Deck	3	15-Jul-24	17-Jul-24	Prep; and Pour Bridge Deck
2S.2090	Deck Cure Time	10	18-Jul-24	27-Jul-24	Fig. Dedk Cure Time





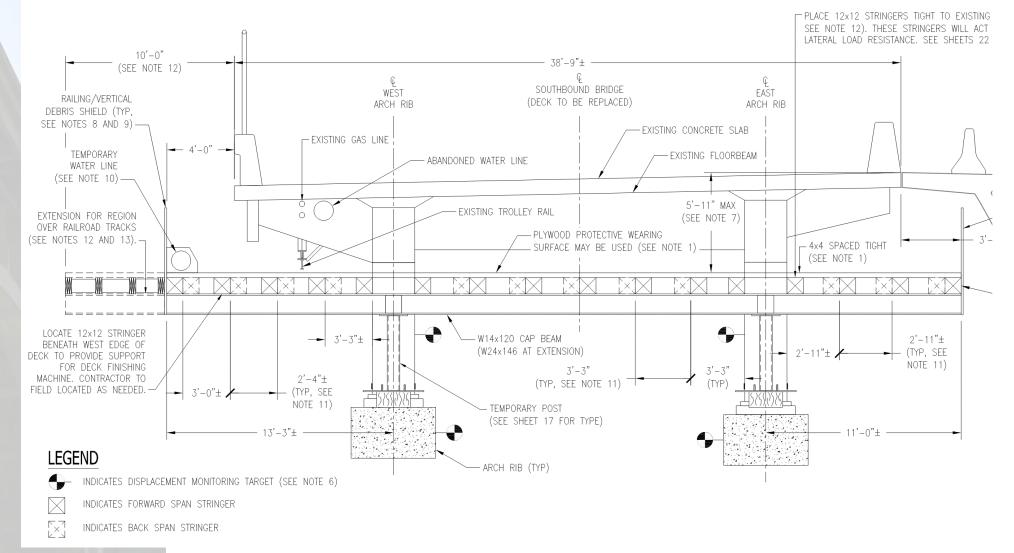








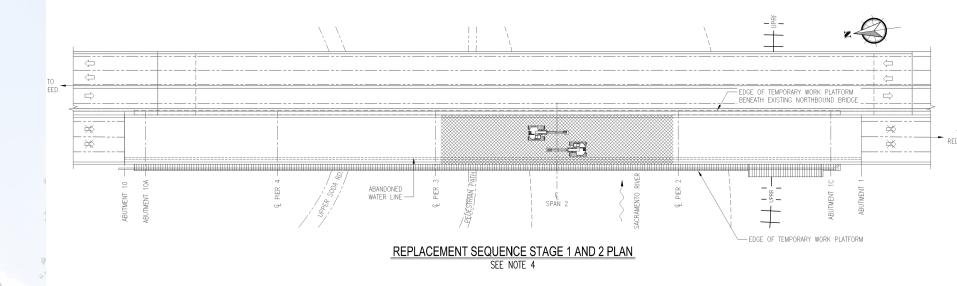


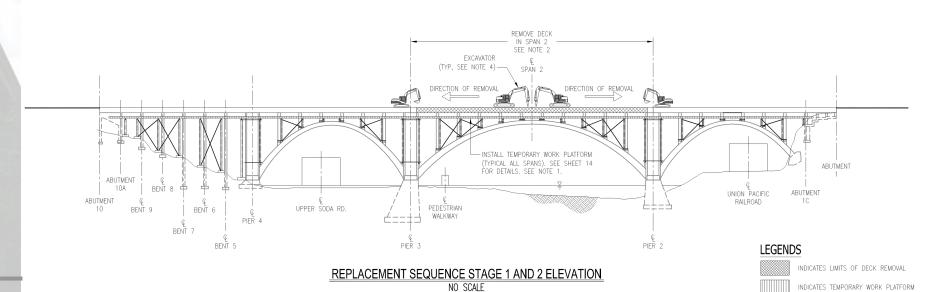


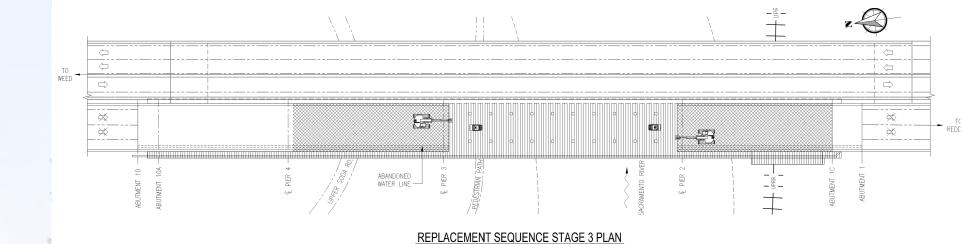


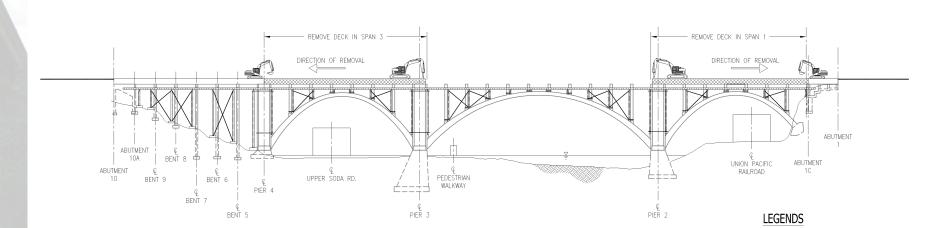








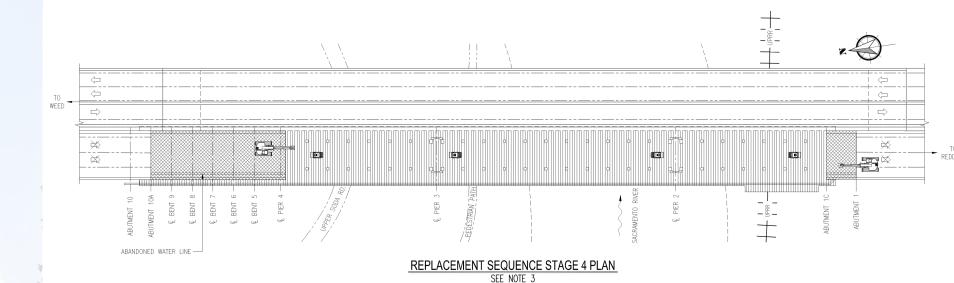


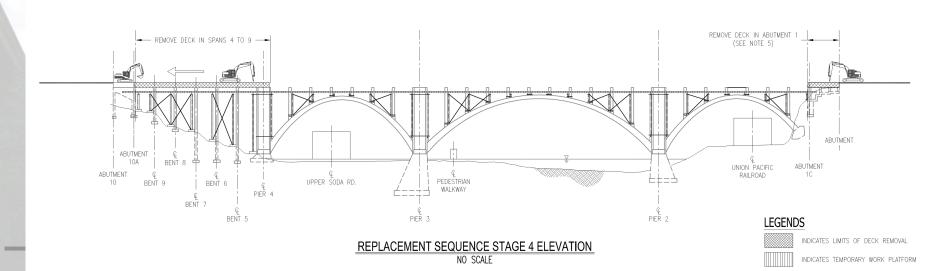


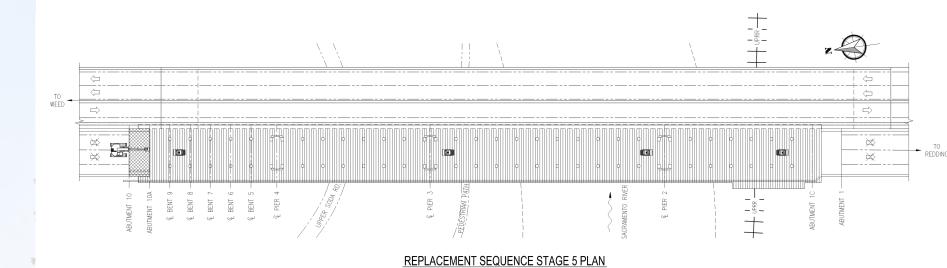
REPLACEMENT SEQUENCE STAGE 3 ELEVATION

INDICATES LIMITS OF DECK REMOVAL

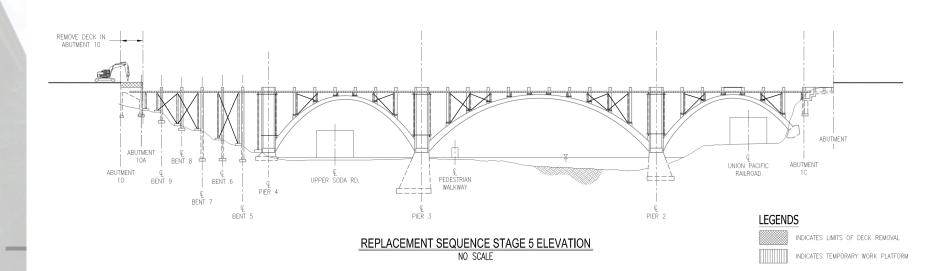
INDICATES TEMPORARY WORK PLATFORM

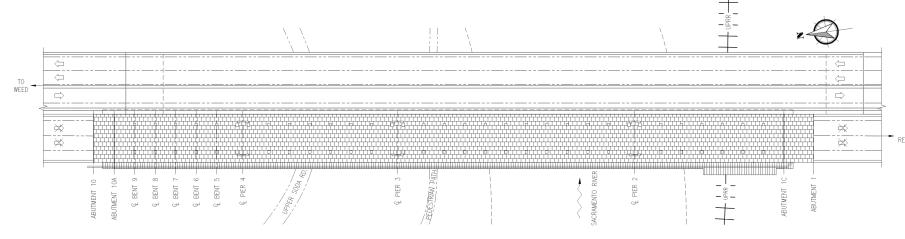




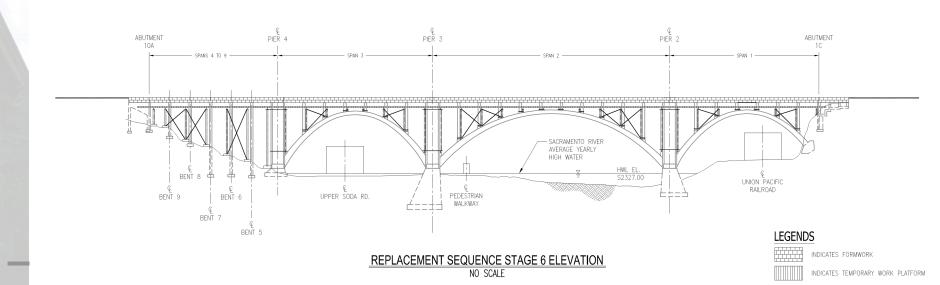


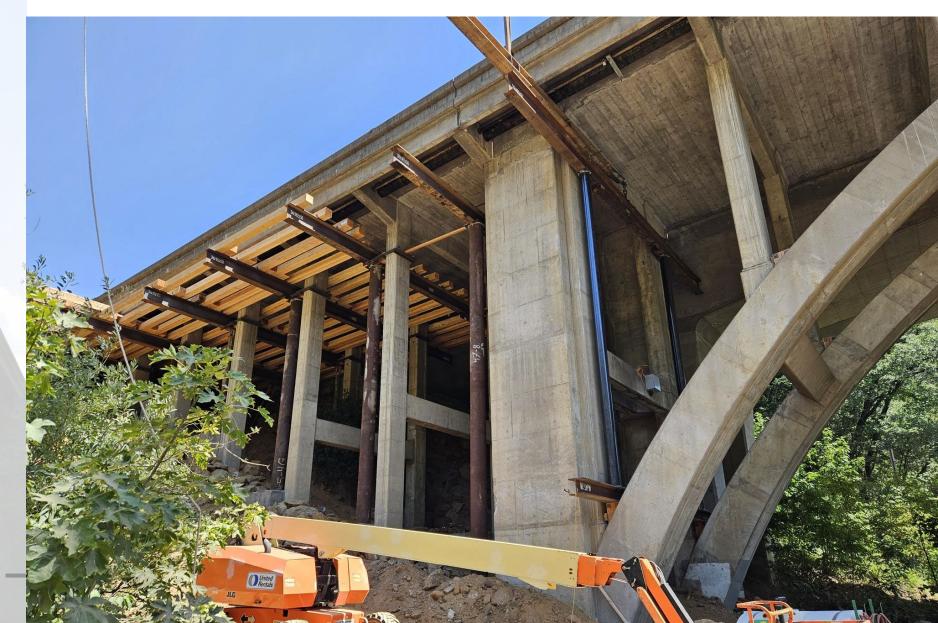
NO SCALE





### REPLACEMENT SEQUENCE STAGE 6 PLAN



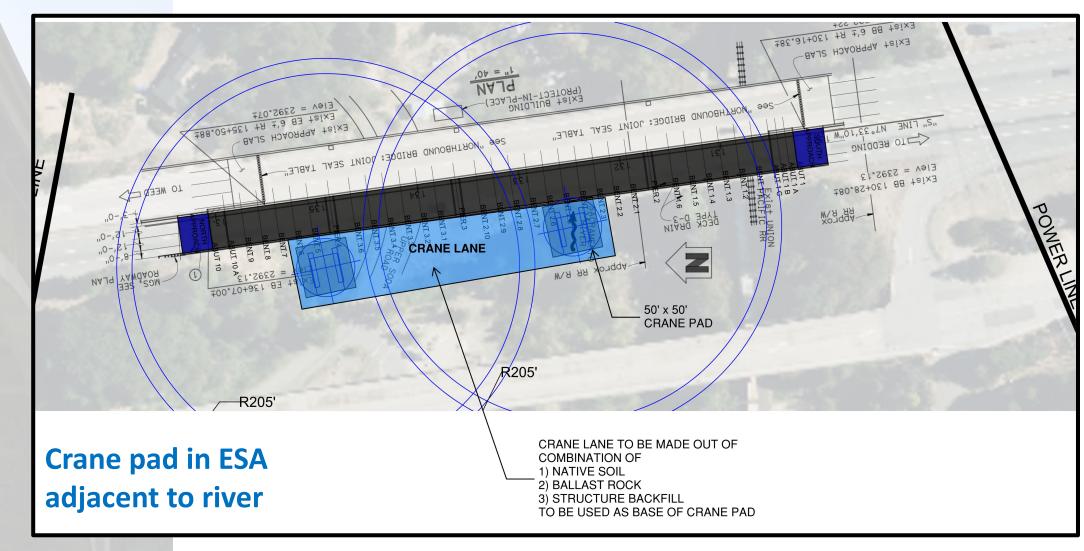


- Challenge: Environmental Permitting
  - Reason: Application/approvals highly dependent on constructability strategies (cost/schedule)
  - Solution: CMGC Process: permanent & temp. designs, phasing/staging, access, regulatory compliance





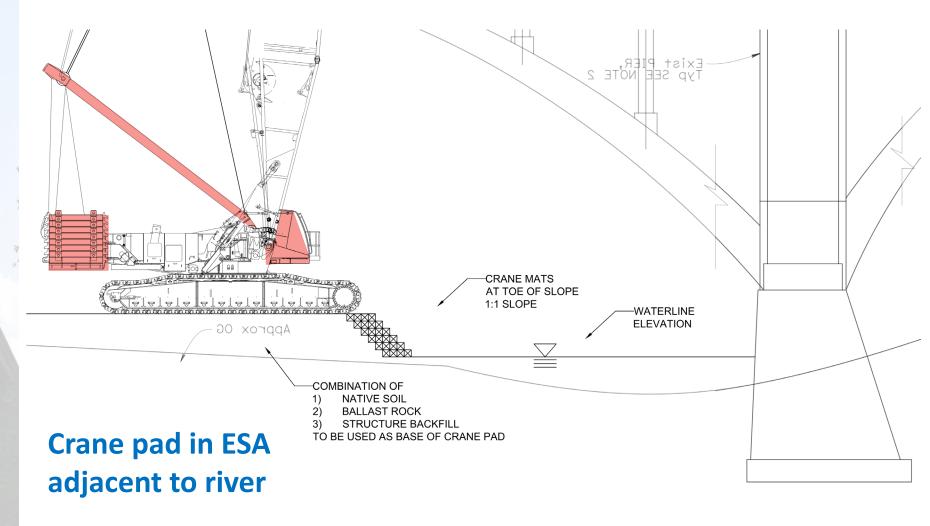




















### 3 & 4. Path along the river & Fishing access

Path along the river will be maintained. Due to the diminishing return of public safety, pedestrian crossing adjacent to Pier 3 will be closed and traffic directed to area adjacent to Pier 4 before they are re-directed back to the trail underneath the existing structure.









- Challenge: Difficult Construction Access
  - Reason: River, existing bridges, RR, city park, ESA
  - Solution: Crane selection, erection plan, avoid river diversion or trestle



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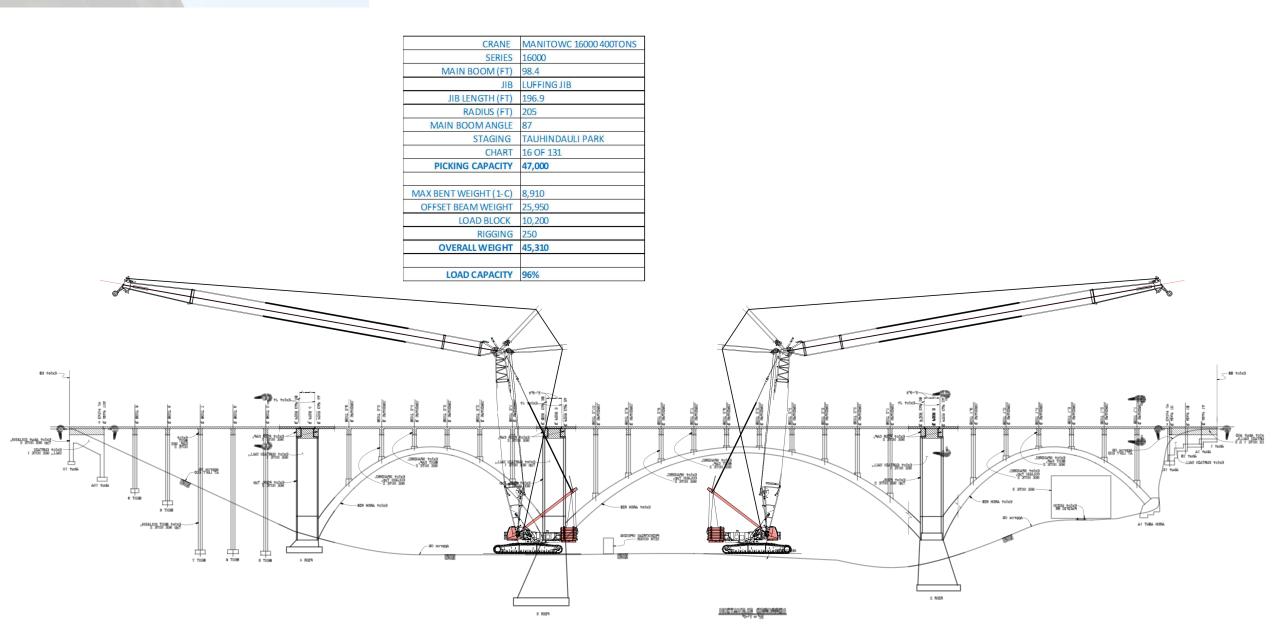


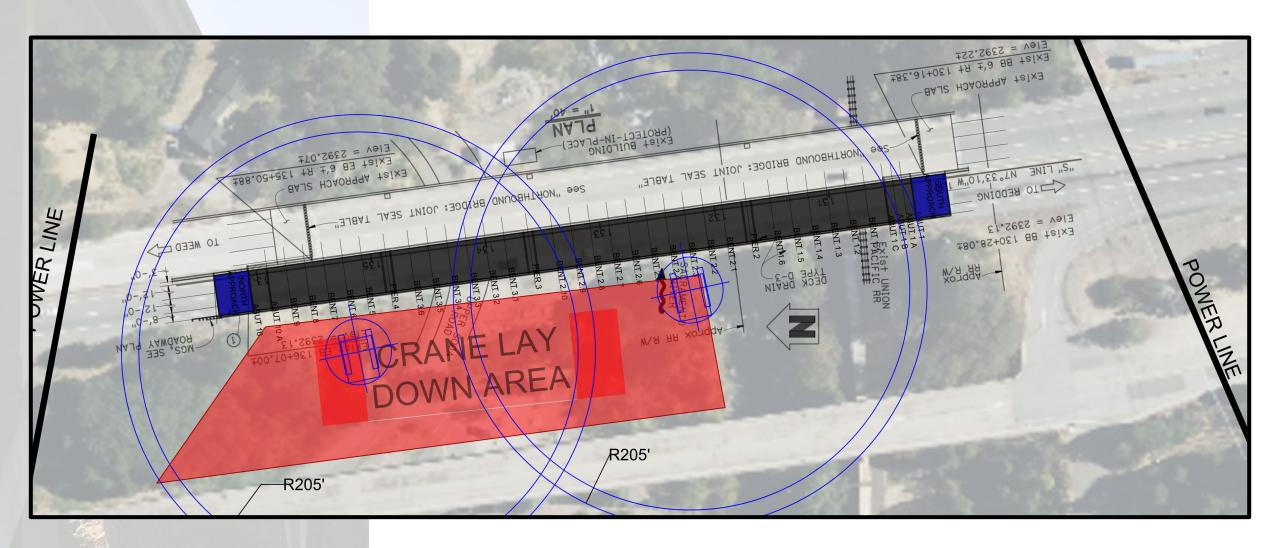
Arch bridge deck replacement adjacent to box girder bridge

















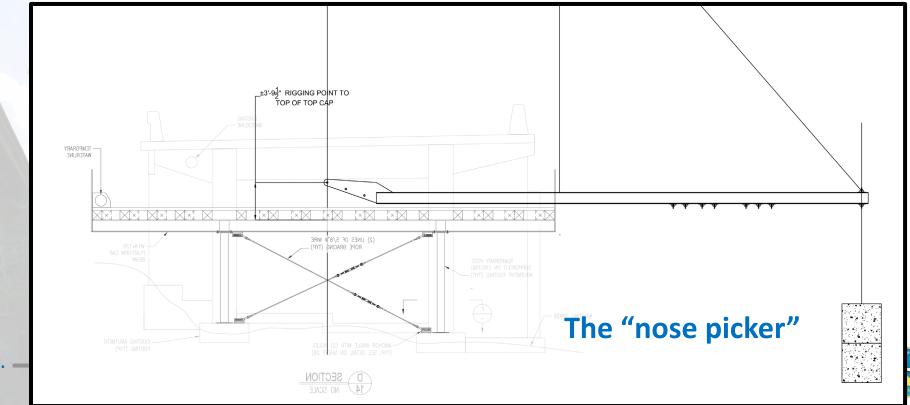
Challenge: Mobilization / setup of 440T crane

Reason: Large crane, narrow access roads, tight corners, limited staging area

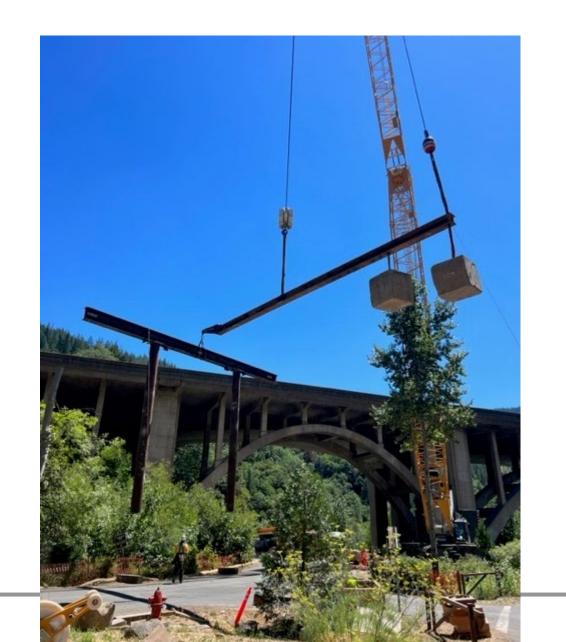




- Challenge: Work platform erection under existing bridge
  - Reason: No way to set up for traditional falsework erection
  - **Solution**: (1) Right-sized crane and positioning, (2) the "nose-picker"



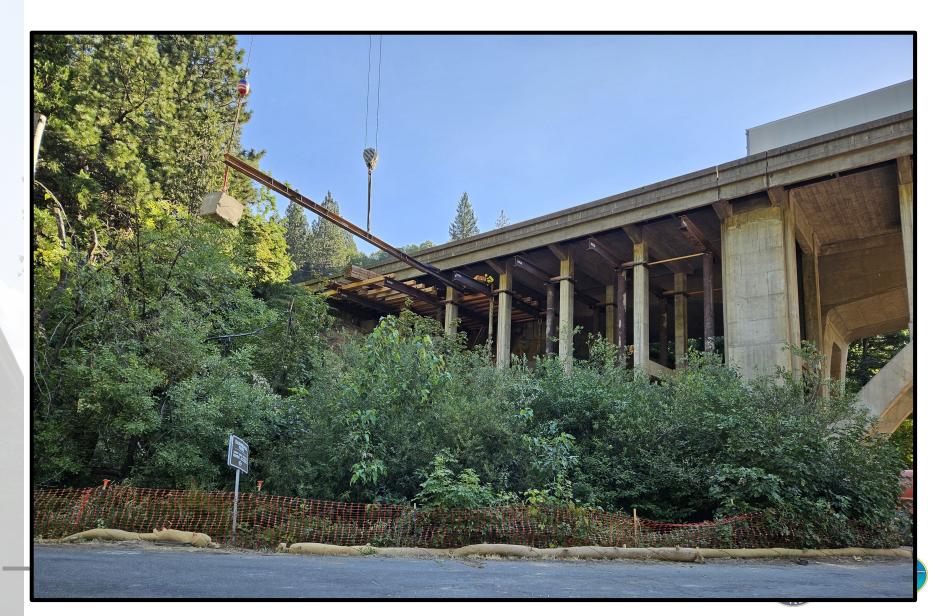
# Myers: Building the Impossible.





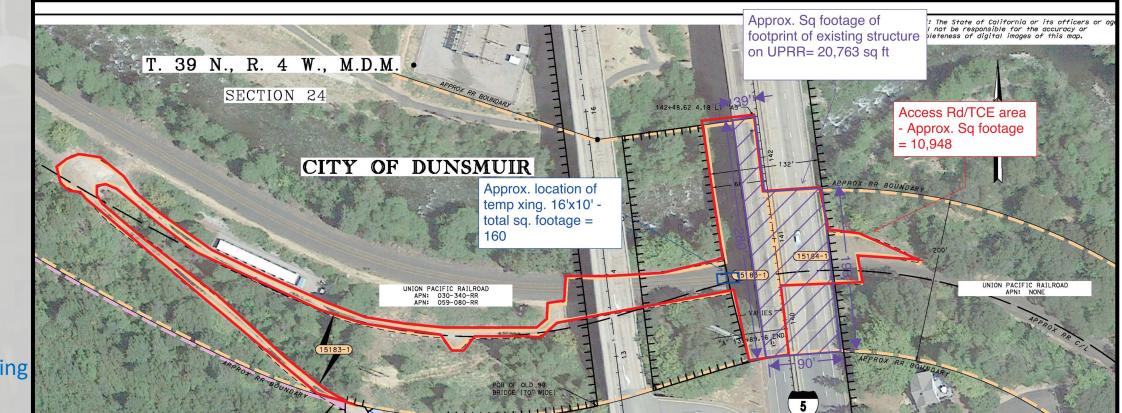








- Challenge: UPRR TCE, new RR grade crossing
  - Reason: Use of existing UPRR access road, new RR crossing for access
  - Solution: Contractor input for PS&E coordination with UPRR



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