



# Oregon's Realignment of US20 Slides Back Into Construction

Jordan Pelphrey

MSCE, EIT, Knife River – Western Oregon Division



# Outline

---

---

- Project Overview
  - Key numbers
  - Project location
  - Project characteristics
- Bridge Construction – The Precast Way

# Project Overview

- Contract Awarded to Yaquina River Constructors
  - Contract executed July 2005
  - Initial Amount: \$129,900,000
  - Current Estimate: \$190,000,000
- Scheduled completion date: October 31, 2009

# Project Overview

- Key Numbers
  - ~ 4,000,000 CY of earth movement
  - ~ 25,000 LF of new roadway
  - (8) Precast Girder Bridges



Photo courtesy of ODOT

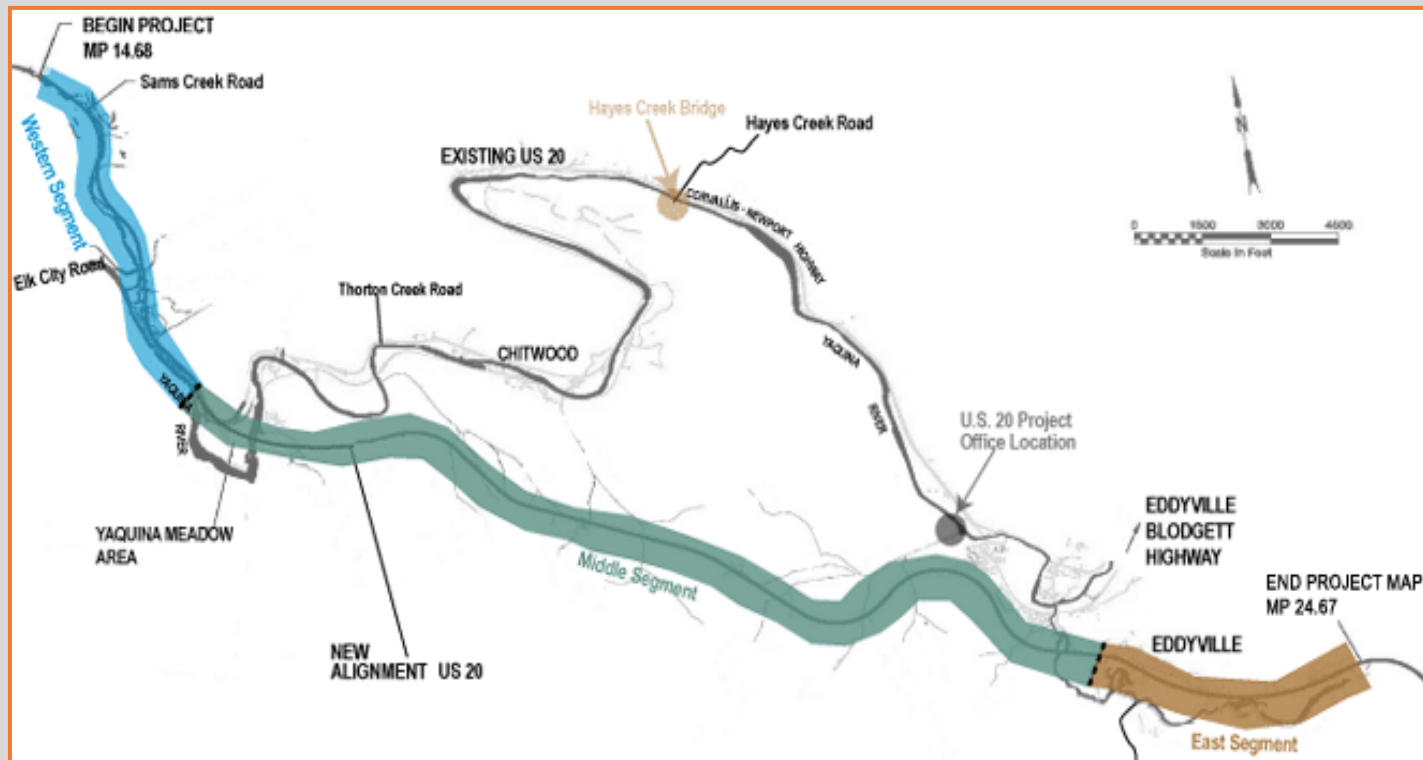
# PME Project Location

- On US20 between Corvallis and Newport, OR



# PME Project Location

- 10 miles to 6 miles



Map courtesy of ODOT

# PME Project Location

Photo courtesy of ODOT

July 25, 2007

View to West from Eastern  
end of PME Project

To Newport

Eddyville

..... 10 miles  
- - - - 6 miles



# PME: Project Characteristics

---

---

## Existing Alignment:

- Substandard roadway geometry
- No passing opportunities
- High accident rate
- High volume of truck and RV traffic
- State bicycle route with no shoulders for bikes



# PME: Project Characteristics

## PME Project:

- Final US20 segment between Interstate-5 and Central Oregon Coast
- Standard travel lanes & shoulders
- 6 miles new alignment, replaces 10 miles existing alignment
- Serves as a “life-line” route to coast

# PME: Project Characteristics

## Challenges To The Project:

- Constructing new alignment through Coast Range
- Unstable slopes with steep grades
- Average about 80" annual rainfall
- 27 waterways cross project site
- Cut slopes over 200' vertical, embankments over 180' vertical



# PME: Project Characteristics

## Challenges To Bridge Construction:

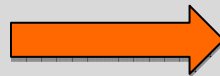
- Steep and unstable slopes with steep grades
- The new alignment provides access to new bridges
- In Water Work Period of July 1<sup>st</sup> to September 15<sup>th</sup> for Fish Protection
- Uncommon girder erection techniques
- On site erection & handling equipment potential



Photos courtesy  
of ODOT

# PME: Project Characteristics

- Project Delays
  - Multiple R/W delays
  - Archaeological site
  - Ancient landslides



# PME: Project Characteristics

- Project Successes
  - Landslide & archaeological site mitigation
  - Contract resolution between owner and contractor



Photos courtesy of ODOT



# Ancient Landslides

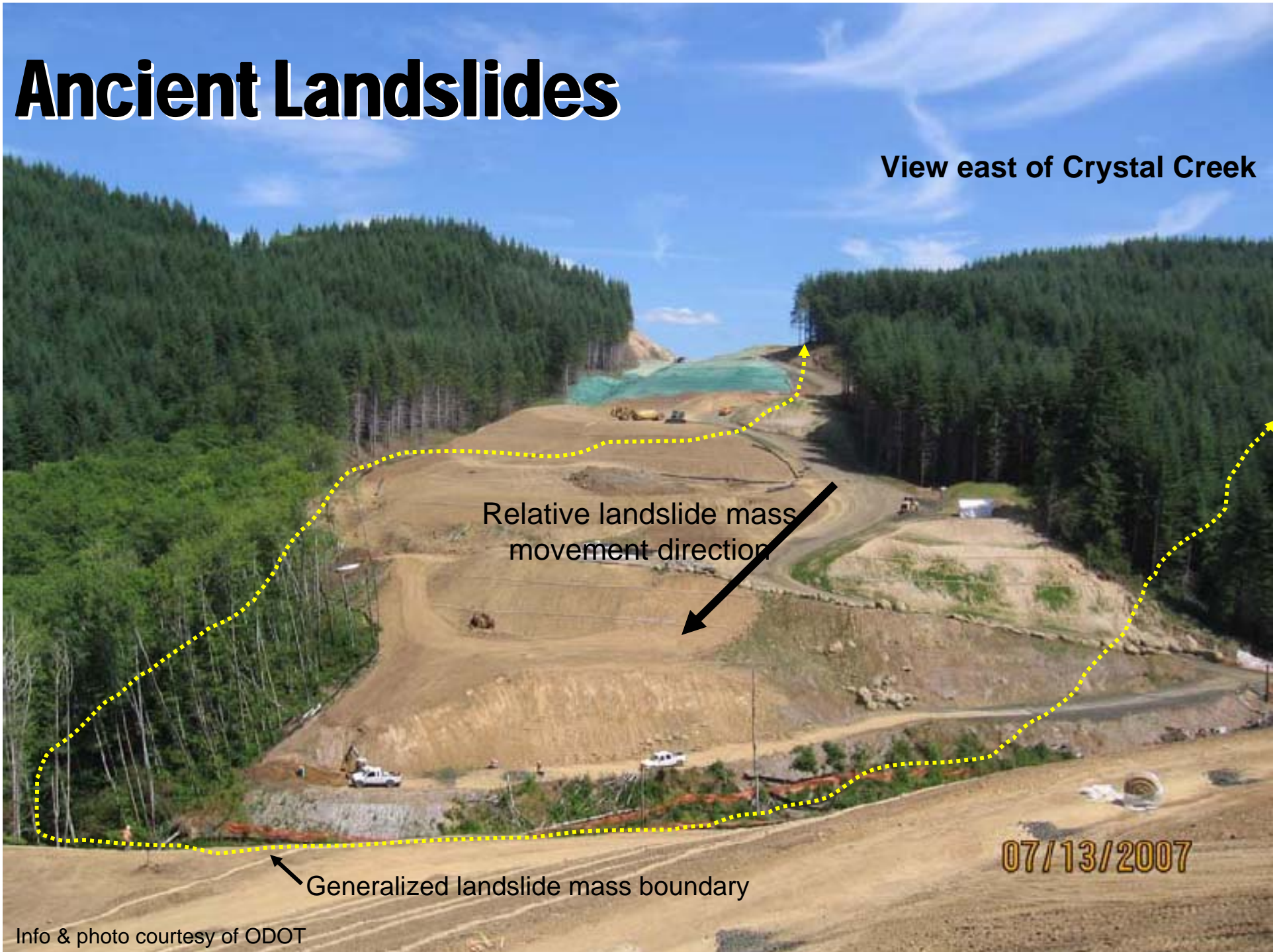
View east of Crystal Creek

Relative landslide mass  
movement direction

Generalized landslide mass boundary

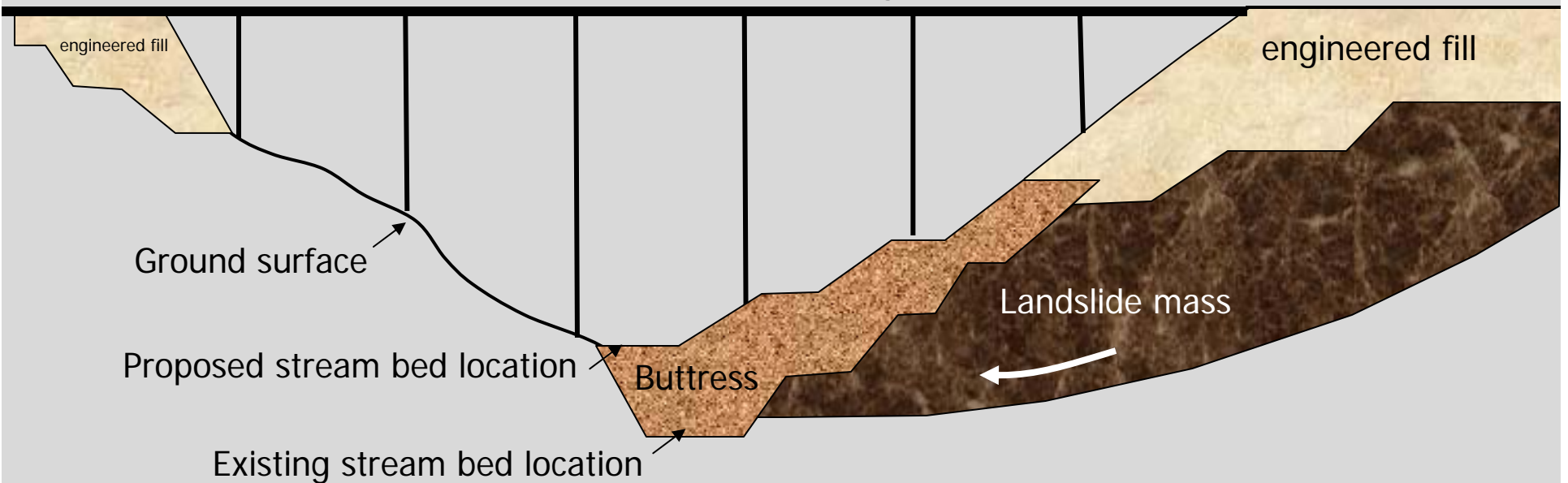
07/13/2007

Info & photo courtesy of ODOT



# Landslide Mitigation

Idealized Bridge



Conceptual landslide mitigation by buttressing

Not to scale

# Landslide Mitigation





# Bridge Erection

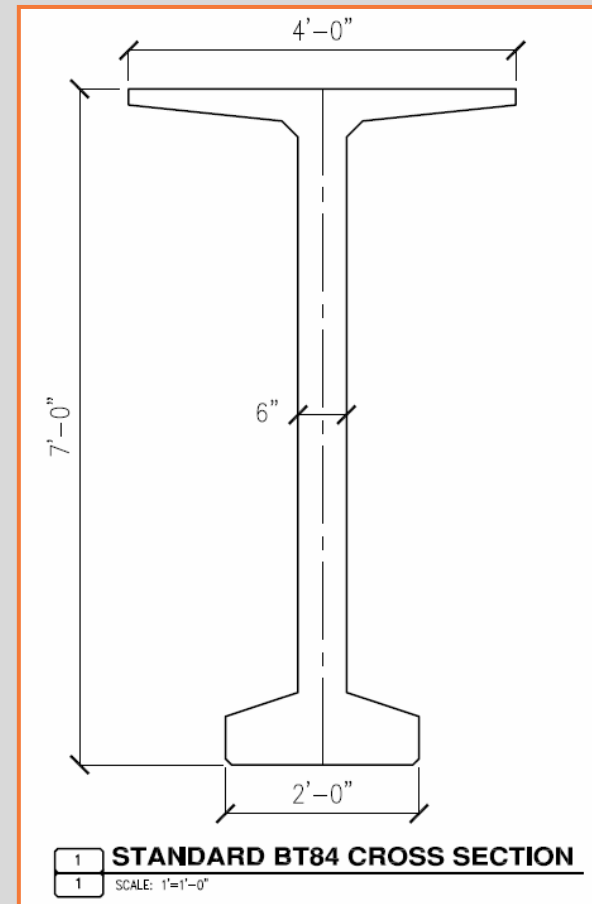
---

---

## Bridge Construction The Precast Way

# The Precast Way

- The Precast Solution
  - Bridge designer → TY Lin
  - Bridge contractor → Hamilton Construction
  - Precast girder selection
    - BT84 Cross Section
    - Span Lengths ~ 150'



# The Precast Way

- (8) BT84 Bridges

Bridge	No. Spans	Total No. Girders	Bridge Length
Little Elk Creek	1	6	140'
Hwy 33 over UPRR	1	10	150'
Yaquina River	3	18	380'
Trapp Creek	2	14	310'
Cougar Creek	4	28	600'
Eddy Creek C	4	28	600'
Eddy Creek B	5	35	750'
Crystal Creek	7	49	1050'

# Bridge Erection

---

---

## Little Elk Creek Bridge

# Little Elk Creek Bridge

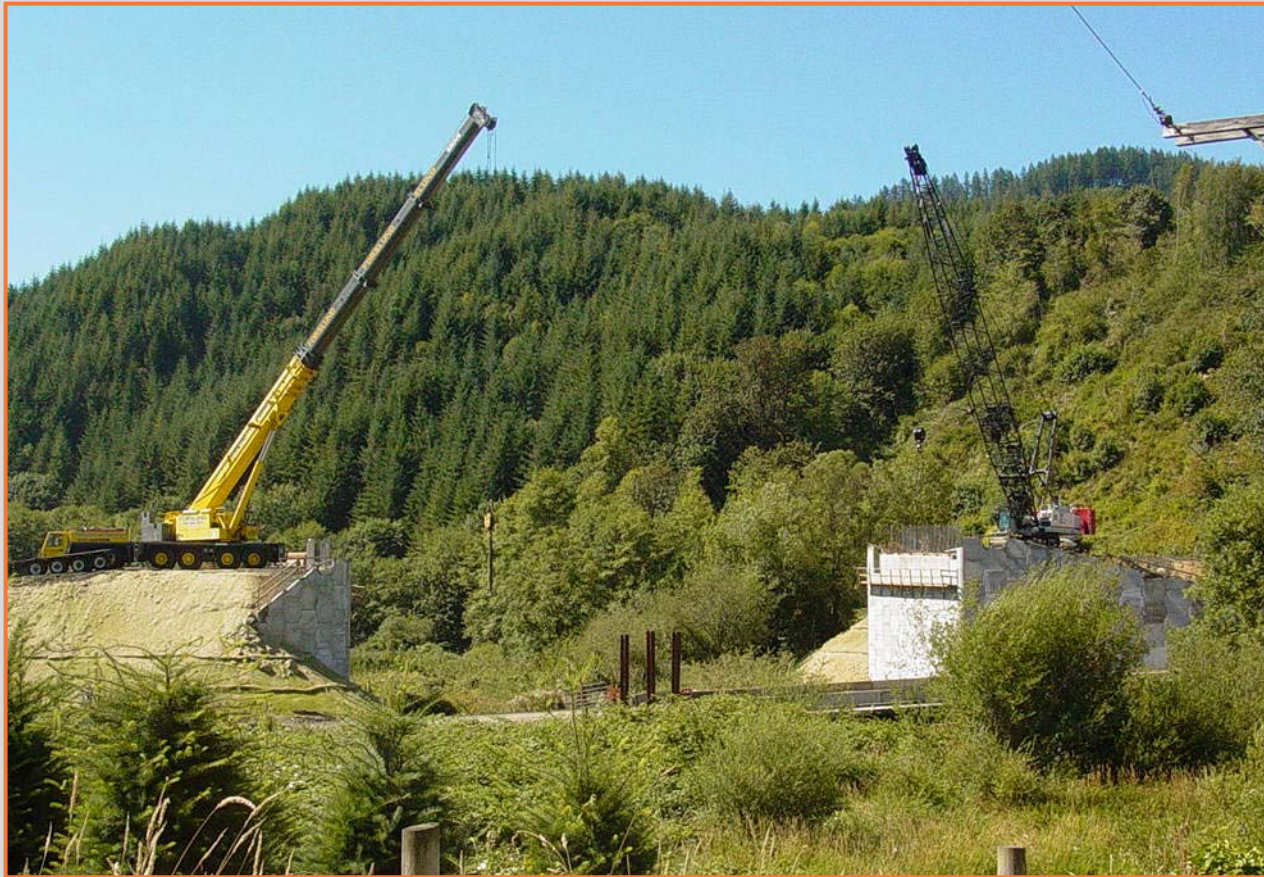


Photo courtesy of ODOT

# Little Elk Creek Bridge

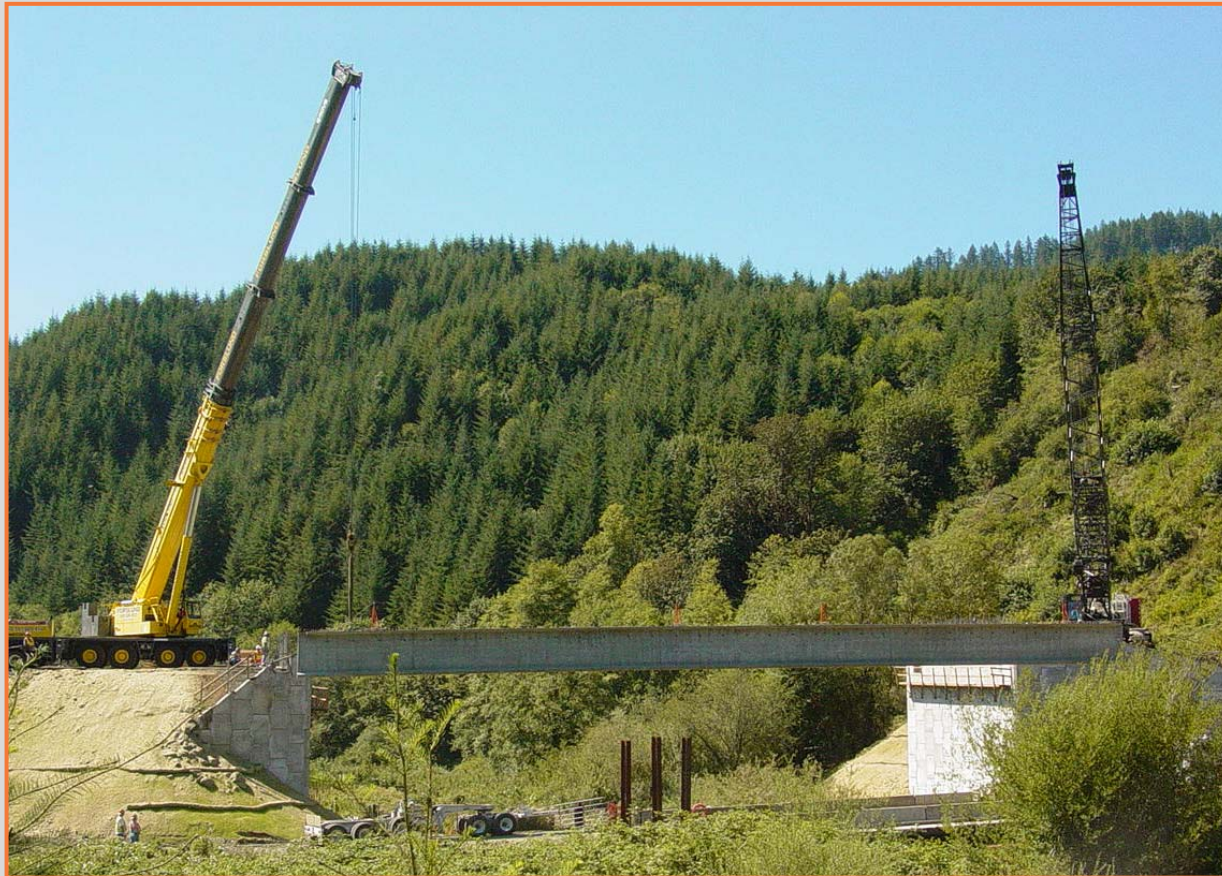


Photo courtesy of ODOT

# Little Elk Creek Bridge



Photos courtesy of ODOT



# Little Elk Creek Bridge



Photo courtesy of ODOT





# Bridge Erection

---

---

## Yaquina River Bridge

# Yaquina River Bridge

- Yaquina River Bridge
  - 3-Span Bridge → 112' – 155' – 112' (C-C Span Lengths)
  - (6) 84" Bulb Tee Girders Per Span
  - (60) ½"Ø Strands In Span 2 Girders
  - $f'_{ci} = 7000$  psi
  - $f'_c = 9000$  psi

# Yaquina River Bridge



Photo courtesy of ODOT

# Girder Delivery



# Install Tapered Bearing Plate



# First Pick - Release Rear Unit



# Remove Rear Unit



# Secure Girder To Dolly On Launcher





# Back Up Girder and Attach Crane



# Pull Girder Along Launcher



# Attach 2nd Crane



# Lift Girder and Reposition Dolly



# Pull Girder and Reposition Crane



# Exchange Load Between Cranes



# Position Girder For Single Pick



# Transfer Load





# Disconnect Crawler Crane



# Single Pick Moving Into Position



# Progress....



# Near Touch Down



# Touch Down at Bent #3



# Touch Down at Bent #4



# Bracing Installed..



Photo courtesy of ODOT



Photos courtesy of ODOT



# Deck Steel



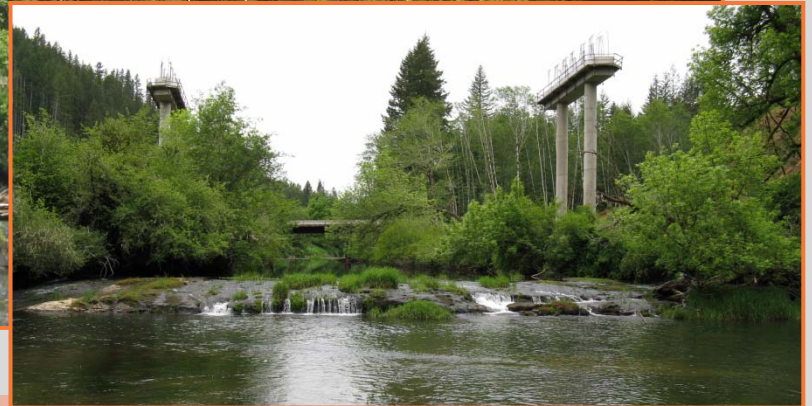
Photo courtesy of ODOT

# Deck Casting



Photo courtesy of ODOT

# Yaquina River Bridge



Photos courtesy of ODOT

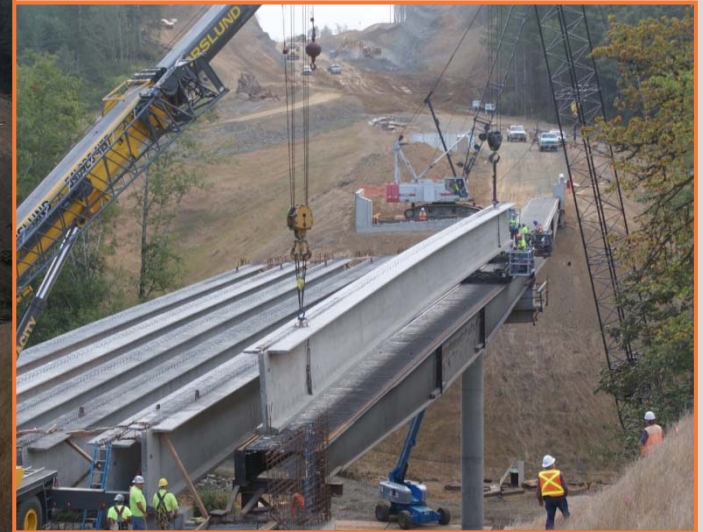
# Bridge Erection

---

---

## Trapp Creek Bridge

# Trapp Creek Bridge



# Trapp Creek Bridge



# Trapp Creek Bridge



# Remaining Bridges

---

---

- Bridge Remaining To Be Constructed:
  - Cougar Creek Bridge
  - Crystal Creek Bridge
  - Eddy B Bridge
  - Eddy C Bridge



# Eddy Creek B Bridge

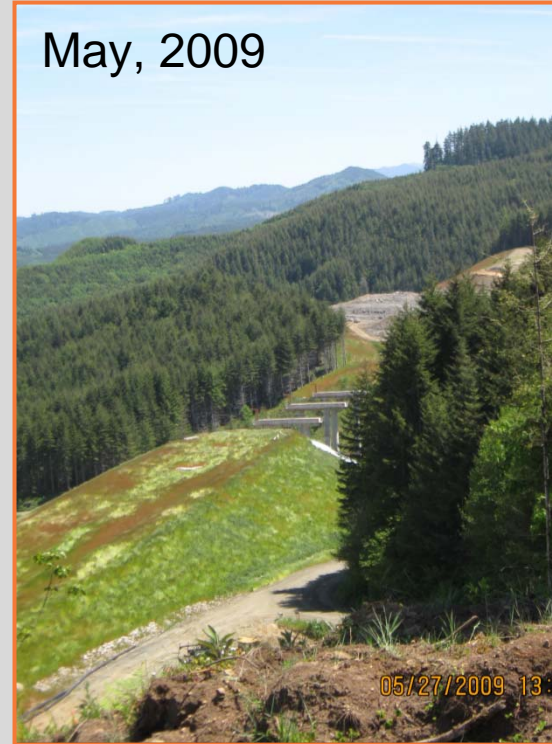
May, 2007



August, 2008



May, 2009



Photos courtesy of ODOT

# Summary

- Recap
  - PME Overview
  - The Precast Solution!



Photo courtesy of ODOT

# Pioneer Mountain to Eddyville

---

---

- Special Thanks to:
  - Joe Squire – ODOT – PME Project Manager
  - Eric Knapp – ODOT – PME Assistant Project Manager
- The End!