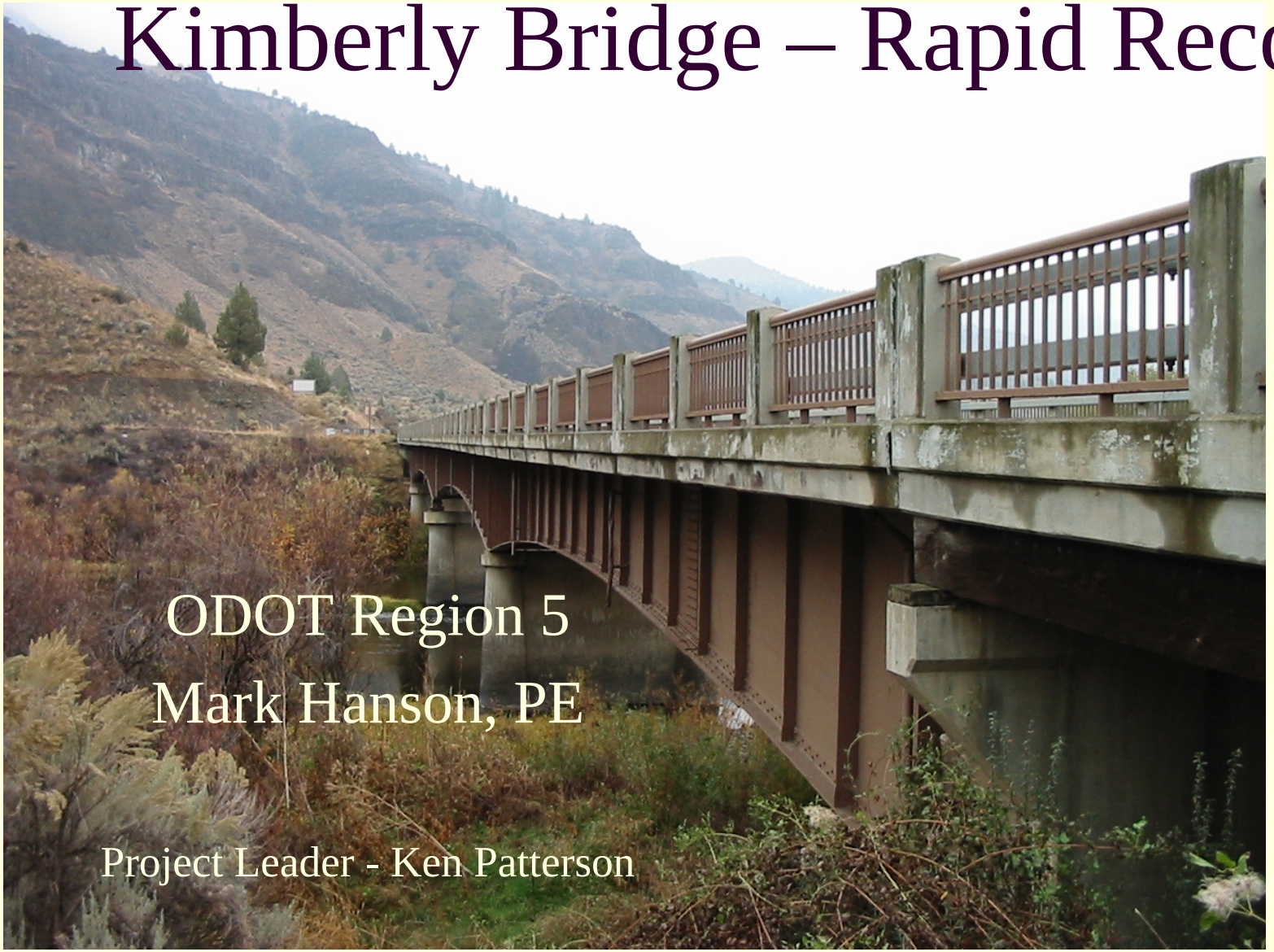
Kimberly Bridge – Rapid Reconst.

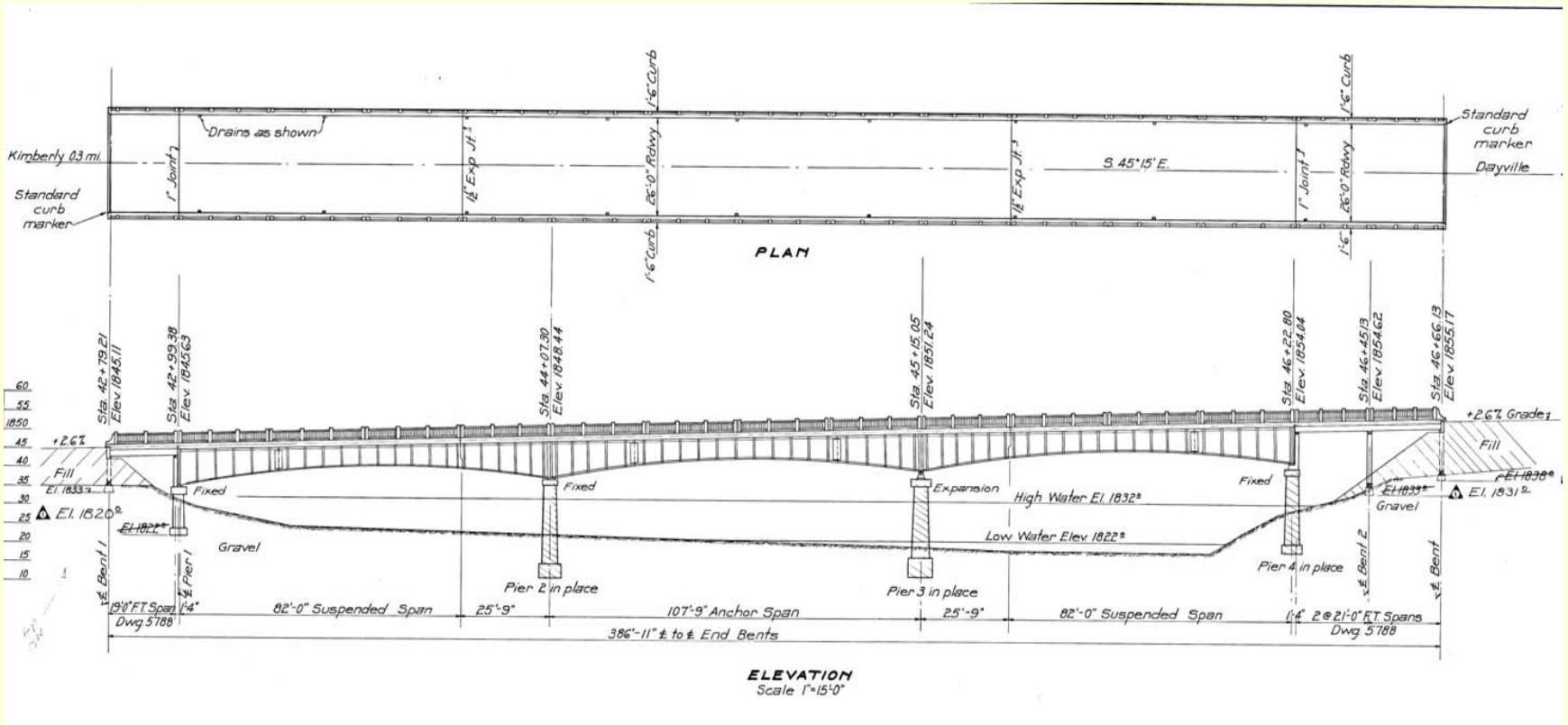


ODOT Region 5
Mark Hanson, PE

Project Leader - Ken Patterson

Oregon Department of Transportation

As built – Existing Bridge



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Spans 5 & 6 - Preconstruction

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Span 1 - Preconstruction

Concrete on Wood Stringers

Rapid Reconstruction

Do your Homework !

- Clear objective (Scope)
- Investigate usage (users and patterns)
- Constraints List
- Solution Formulation
- Evaluate Risks & develop mitigation
- Finalize Solution

Bridge Usage

- School Bus – except June-August
- US Postal Service – year round
- Agriculture operations – Spring/Summer
- Farm to Market – Late June & Sept
- USFS/BLM Fire Suppression – July-Sept
- Emergency Services – year round

Project Constraints

- ADT 240 – Low Traffic
- Very Long Detour – 100 miles
- One Fruit Orchard on both sides of bridge
- Critical farm-to-market transportation
- ESA River
- Long Bridge (and detour bridge) – 400 feet
- Nearest Conc. Batch Plant – 140 miles
- Local commute traffic
- Bridge too narrow for staged construction

Solution Formulation

- Minimal disruption to users
- No disruption to Emergency services
- Seasonal Constraints - Winter
- Detours
- Refinement of repair/replacement work on bridge

Solution Formulation (Cont)

- Minimize cast-in-place concrete
- Avoid Farm-to-market disruption
- What can be done with single lane closure
- What is minimum acceptable condition of bridge & approaches to re-open to traffic

Risks - mitigation

- Local Traffic disruption
  - accommodate Ped traffic during closure
  - USPS & Locals park second vehicle on other side
- Delayed opening
  - Refrigerator truck rental
- Delayed schedule
  - Remove cast-in-place wingwalls
  - Remove MC inlay
- Bridge Rail not complete
  - Open to single lane

Rapid Reconstruction – Kimberly Bridge

Option A - Detour Bridge

(based on STIP estimate - 2002)

PE	349
New Spans	373
Bridge Rail	96
MC O'Lay	187
End Panels	101
Detour Bridge	784
Approach Work	180
TP&DT	430
CE	172
Project Total	2672

Option B- Rapid Reconst.

(Actual expendatures - 2007)

PE	290
New Spans	360
Bridge Rail	190
MC O'Lay	137
End Panels	74
Detour Bridge	0
Approach Work	203
TP&DT	17
CE	79
Project Total	1350

Preferred Solution

- Lower Cost
- Maximize common materials / Methods
- Eliminated Cast-in-place concrete from Critical path
- Eliminated concrete cure time from critical path
- Contingency plan for reducing time and/or extending time on tail end
- Shorter construction time & traffic Disruption
- Provided Pedestrian Traffic

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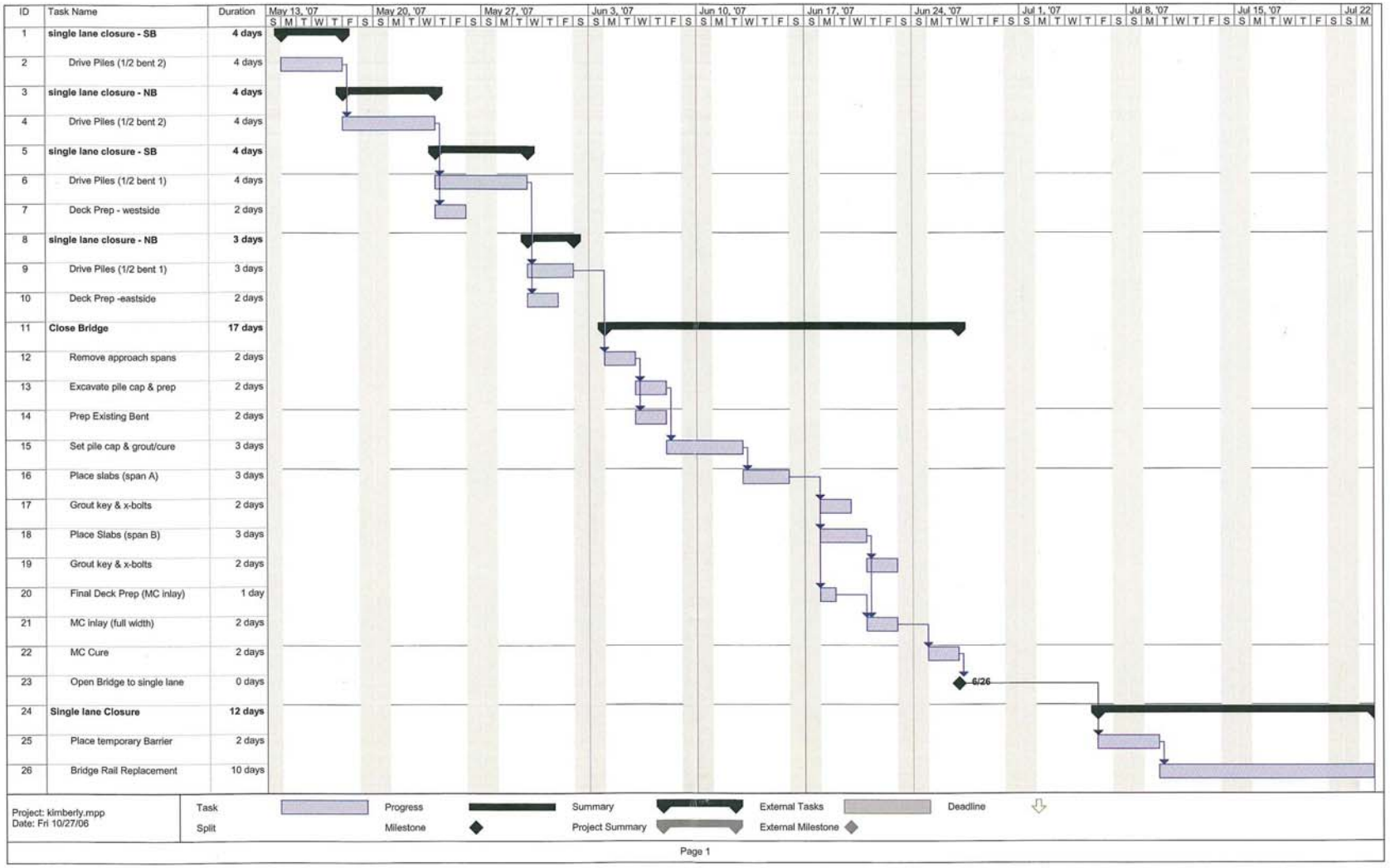
Estimated Schedule



Actual Schedule

Day 0 – Road Closure
Day 1-3 – Span 5 & 6 removal, pile cap excavation
Day 4 – Set pile cap - bent 6
Day 5 – Set slabs Span 5
Day 6-8 – Span 1 removal, pile cap excavation
Day 9 – Set pile cap - bent 1
Day 10 – Set slabs – Span 1
Day 11-14 – Grout keyways, Bridge Rail, Wingwalls
Day 15 – Open to Traffic

Completed 7 days early !

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Pre-Closure : Pile Driving

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Rapid Reconstruction – Kimberly Bridge

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Pile Support Collar

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Setting Grade – Support Collars

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Precast Pile Cap

- Prebore piles
- Tighter pile spacing tolerances
- Pile Driving Template
- Verify pile locations prior to casting pile cap
- Adequate block-out holes to accommodate tolerances

Design Verification

- Independent Review - OTAK
- Constructability Review – PM Level
- Independent Construction consultation –
  - Early in the Design
  - By experienced bridge superintendant
  - On-site meeting – before and after
  - Risk Analysis – formulation contingency
  - Contractor's schedule

Time Savings

- Precast Pile cap
- Pile Collar designed to carry dead weight of pile cap and slabs
- Complete Road Closure
- No Cast-in-place Concrete during closure
- Bridge Rail Curb cast into slab
- No cure times in Critical Path
- Piles driven prior to closure and buried

Rapid Construction is not always quick-n-dirty

Rapid Reconstruction – Kimberly Bridge

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Rapid Reconstruction – Kimberly Bridge