

4TH STREET BRIDGE

Pueblo, Colorado

Contractor Pre-Bid Meeting

July 18, 2007

Pueblo Convention Center
Fortino Grand Hall



Welcome & Introductions

- **CDOT**
- **Consultants**
- **Attendees**

Conference Details

- **Sign In / Sign Out**
- **Agenda**
- **Microphones**
- **Tables, Displays, and Materials**
- **Refreshments**
- **Comment/Question Cards**
- **Site Walk (optional)**

Design Team

- **Colorado DOT Region 2**
- **Lead Federal Agency - FHWA**
- **Design Consultants**
 - **FIGG** Project Management & Bridge Engineering
 - **PBS&J** Civil, Roadway, Traffic, Utilities, Environmental
 - **Ayres Associates** Hydraulics & Drainage
 - **Goodson/MWWA** Geotechnical, Geology
 - **The Szynskie Group** Lighting & Electrical Design
 - **EDAW** Urban Design & Landscape Architecture
 - **Abel Engineering** Survey & ROW Support
- **Other Stakeholders:**
 - **City, Railroads, Conservancy, Property Owners, Utilities**



Construction Team

- **Resident Engineer and Administration**
 - CDOT Region 2 – Dean Sandoval
- **CEI**
 - Design Office Support: FIGG Team
 - Onsite Services: PBS&J Team
 - Segmental Bridge Inspection Services - FIGG



Project Timeline

- **Advertisement** July 5, 2007
- **Contractor Pre-Bid Conference** July 18, 2007
- **Bid Opening** August 30, 2007
- **Construction Duration** (1278 calendar days)
3.5 years approx

Project Overview

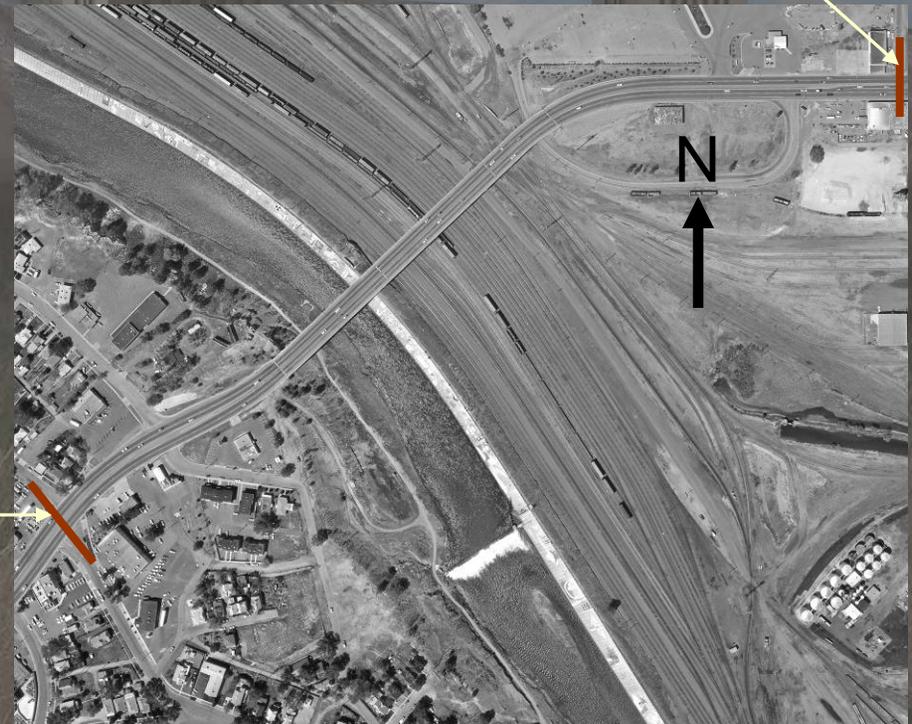


Project Description

Construction Limits
Midtown Circle to Corona Ave.

Midtown Circle Dr.

Corona



Site Photo



West End Features



Bluff
Arkansas River
Trail
Fishing Pier
Kayak Course



Bridge



Bridge

- General Layout
- Superstructure
- Substructure and Foundations
- Construction
- Demolition
- Staging / Access



General Layout

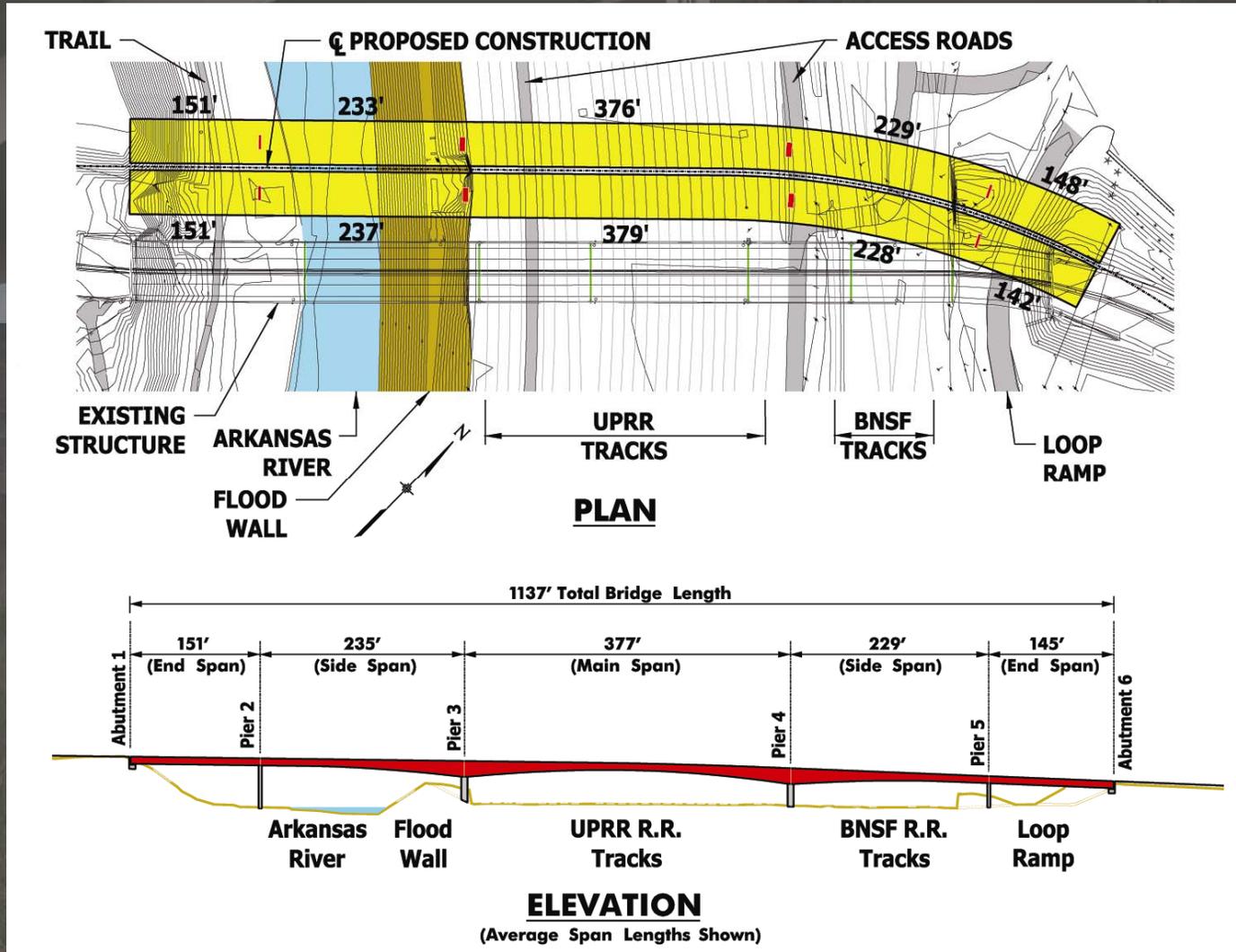


Proposed Alignment

North Alignment



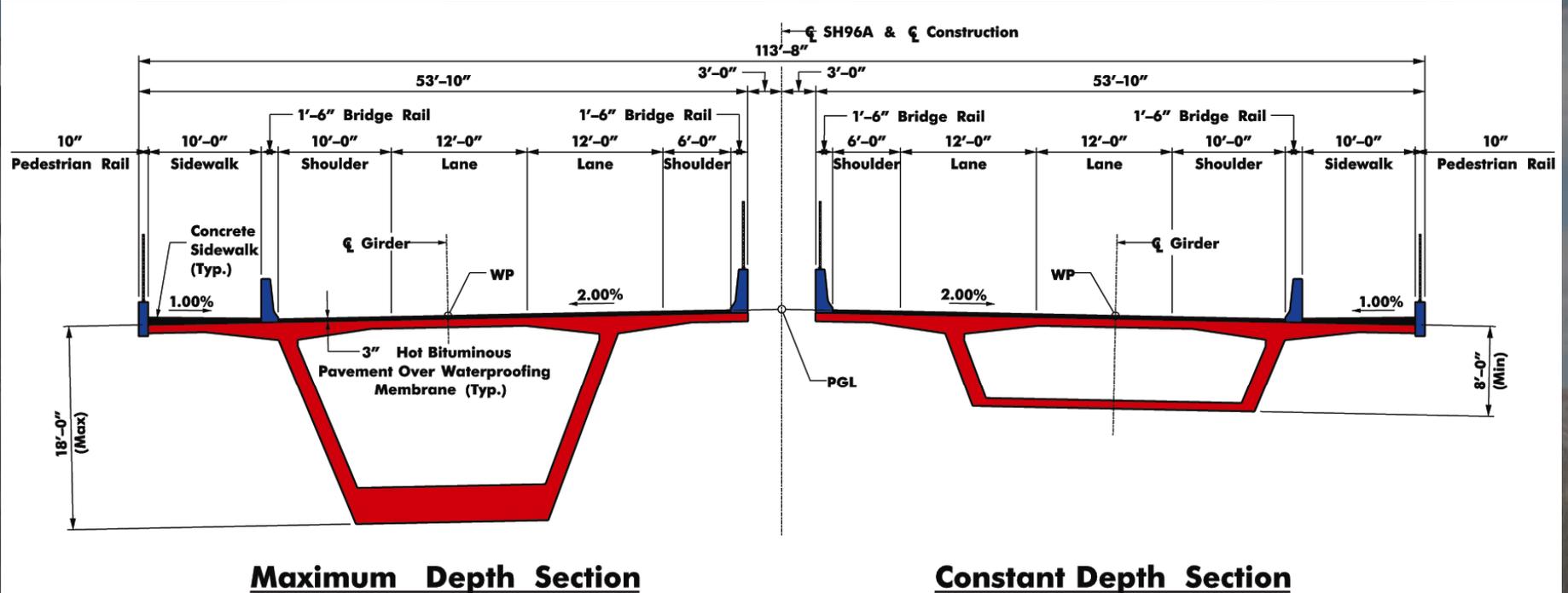
General Layout



Alternate Design

- Two Bid Schedules
 - Alternate 1: Default Bridge
 - Alternate 2: Alternate Bridge
- Mandatory pre-bid qualification already completed.
 - All bridges have same pier layout.
 - All bridges have haunches at Piers 3 and 4.
 - All alternatives still need to receive railroad approvals
- Need to submit approved proposal number on the bid schedule.
- Contractor's Engineer has to have experience with type of bridge proposed.
- Same number of contract days for combined design and construction.

General Layout



TYPICAL SECTIONS

4-Lane Stripe / 6-Lane Future Capacity
Overlay: 3" HMA over Waterproofing Membrane

Bridge Renderings



Superstructure

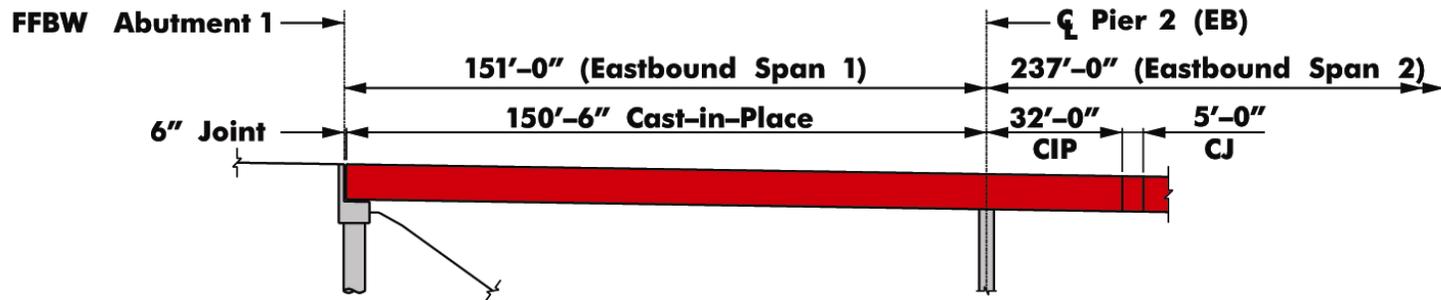


Superstructure

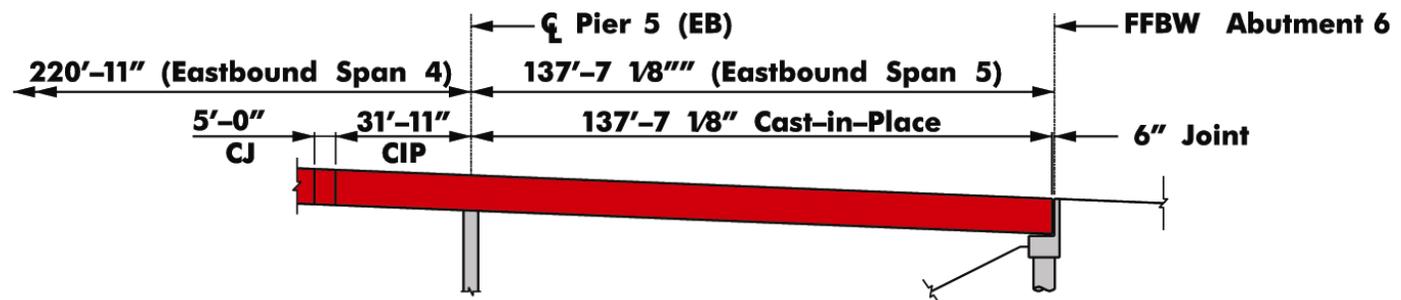
- **Cast-in-Place Post-Tensioned Concrete Box**
- **End Spans on Falsework**
- **Main Span (w/ Side Spans)**
 - CIP Balanced Cantilever Segmental from Above with Form Travelers
 - Over River, Floodwall, UPRR Yard, BNSF Yard
- **Integral Piers**
- **Class S40 Concrete w/ Fly Ash (Class F)**
- **Epoxy Coated Reinforcing**

End Span Layout

CIP on Falsework (EB Shown)



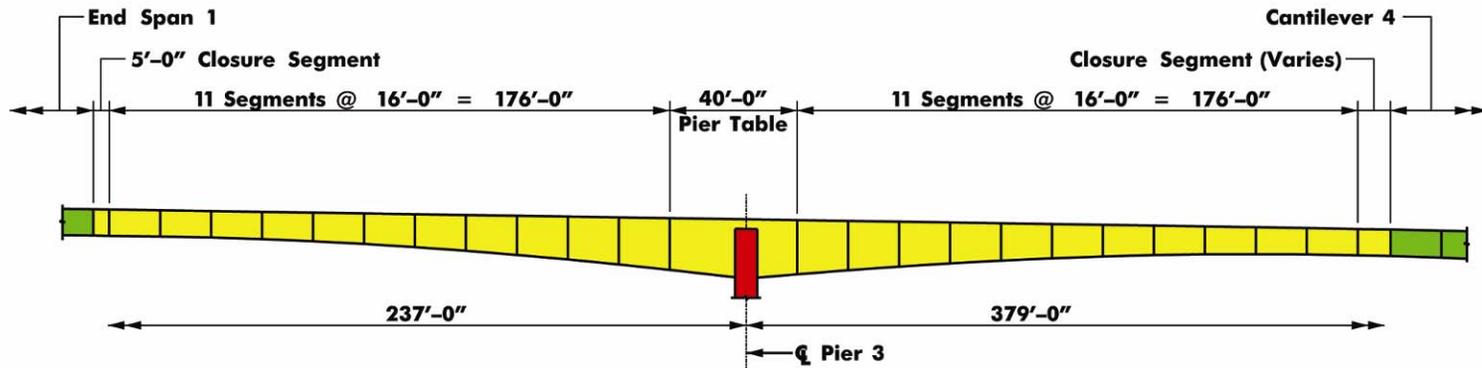
ELEVATION - END SPAN 1 (EB)



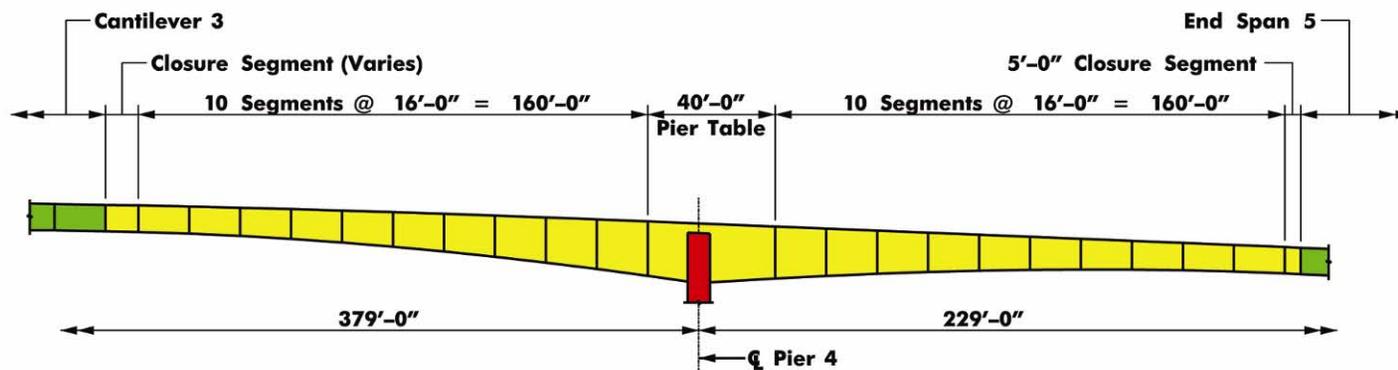
ELEVATION - END SPAN 5 (EB)

Balanced Cantilever Segmental Layout

Typical Segment Layout

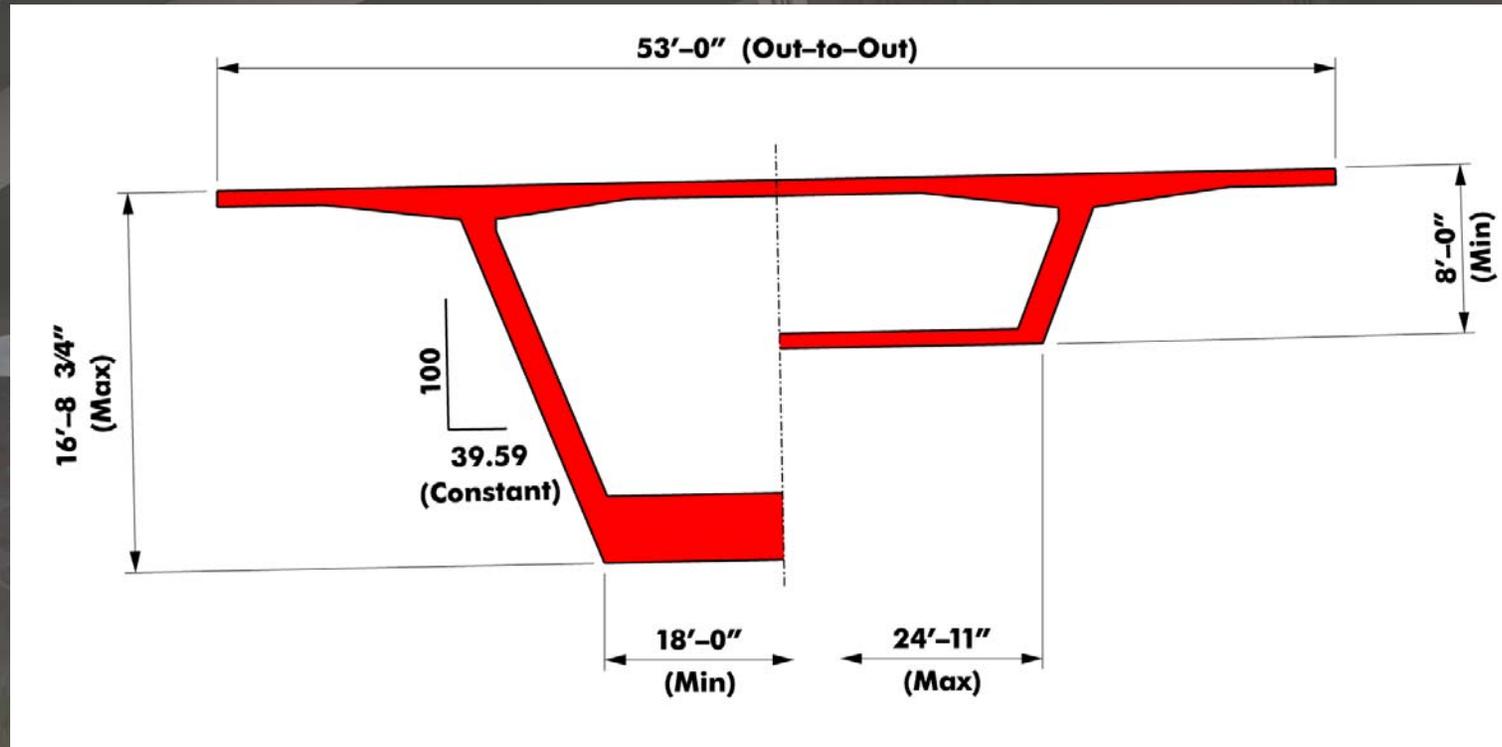


ELEVATION - CANTILEVER 3



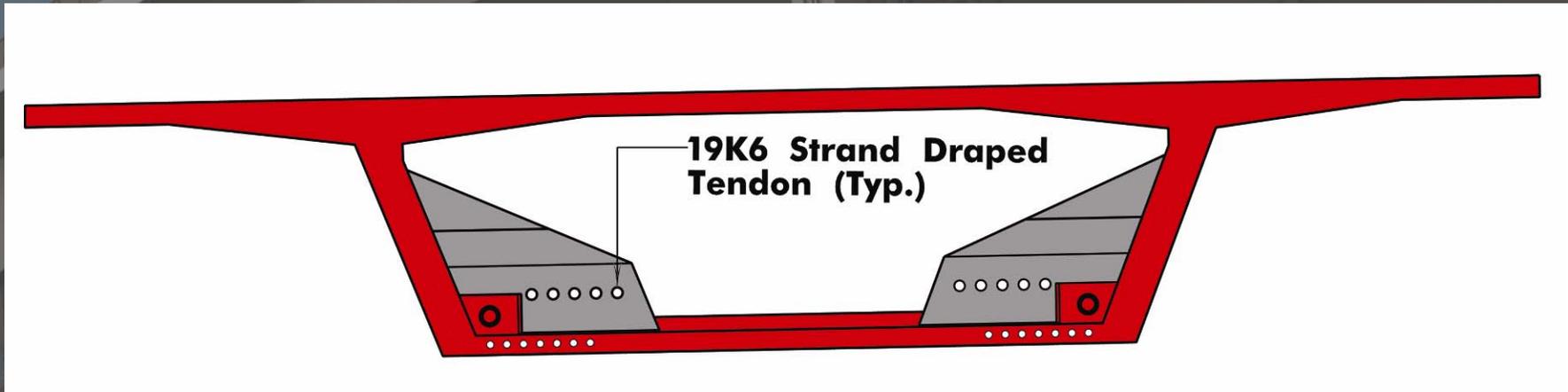
ELEVATION - CANTILEVER 4

Typical Segment Cross Section



- Depth Varies from 8' to 16'-8 3/4"
- Width = 53'-0"
- Constant Web Angle
- Variable Bottom Slab Width

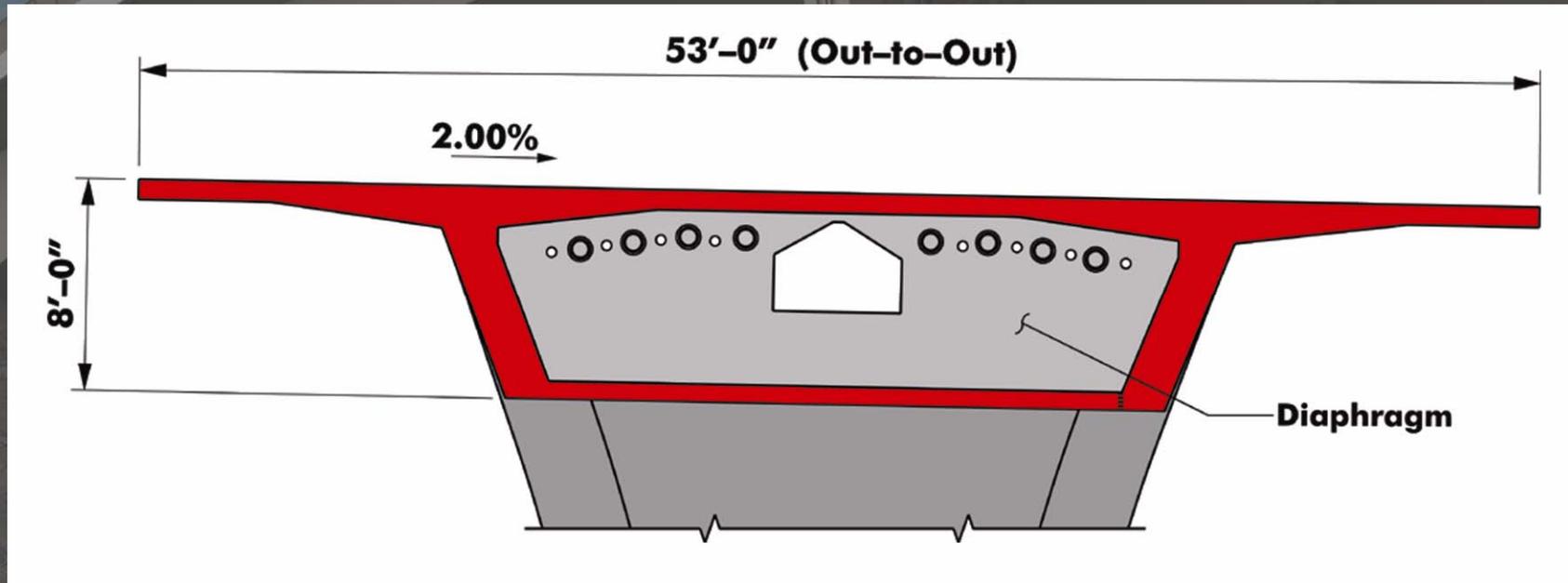
Tendon Deviation Diaphragms



Three Types

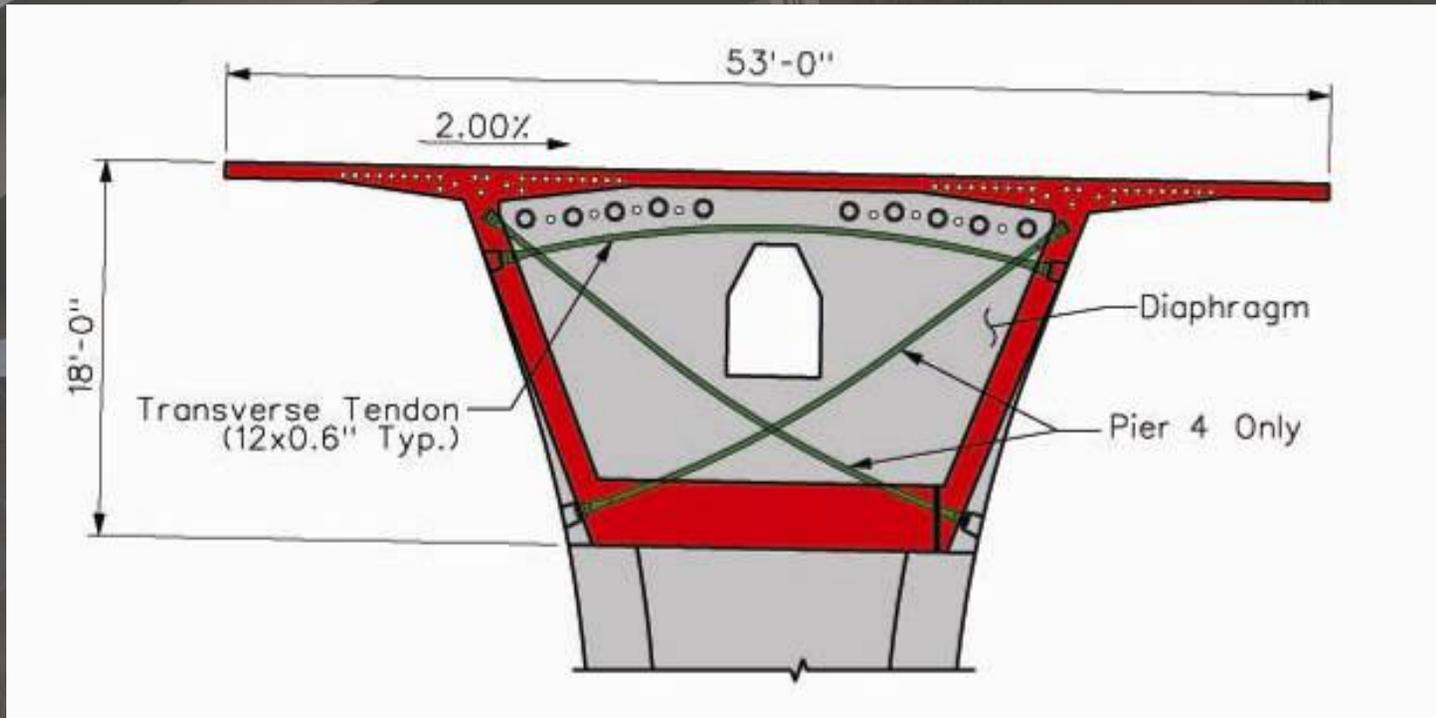
- Type IA (Constant Depth Section w/ Blister)
- Type IB (Variable Depth Section w/ Blister)
- Type II (Variable Depth Section w/o Blister)

Pier Diaphragms 2 and 5



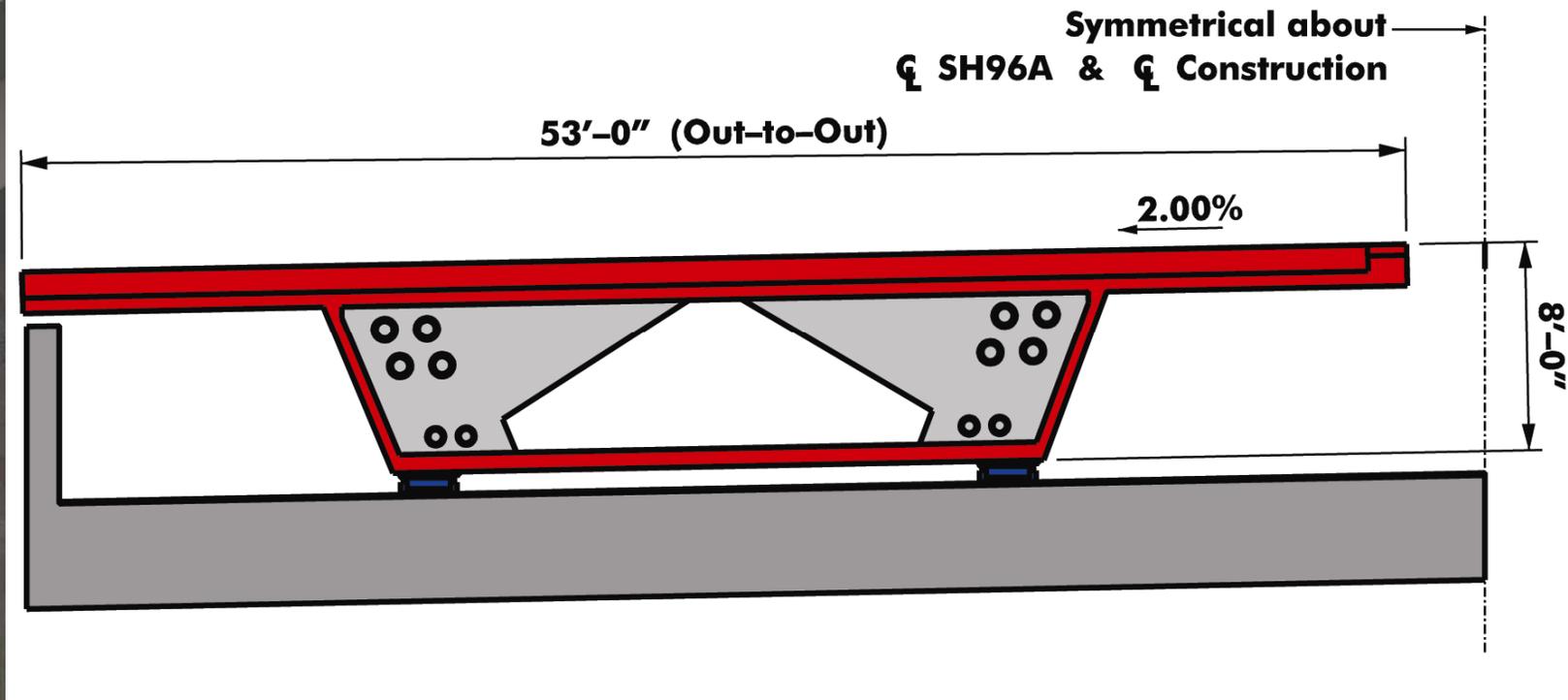
- 5'-6" Thick, w/ Access Hole
- Girder Webs Thickened to 1'-9" near Diaphragms
- Integral Connection with Piers

Pier Tables 3 and 4



- “Platform” for Balanced Cantilever Construction
- 8'-0" Thick, w/ Access Hole
- Integral Connection w/ Piers
- Transverse Post-Tensioning

Abutment Diaphragms 1 and 6



- 6'-0" Thick, w/Access Opening
- Support Expansion Joints
- Constructed on Pot Bearings

Superstructure Post-Tensioning

ASTM A-416, Grade 270 Low Relaxation, 7-wire strand



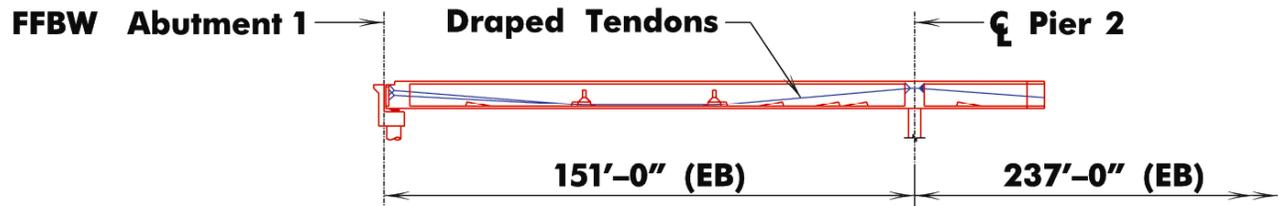
Longitudinal Post-Tensioning - End Spans

12x0.6in



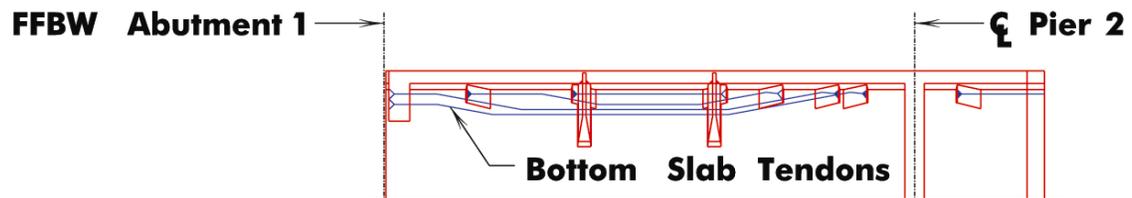
PARTIAL PLAN - END SPAN CANTILEVER TENDONS
Span 1 (EB)

19x0.6in



PARTIAL PLAN - END SPAN DRAPED TENDONS
Span 1 (EB)

12x0.6in



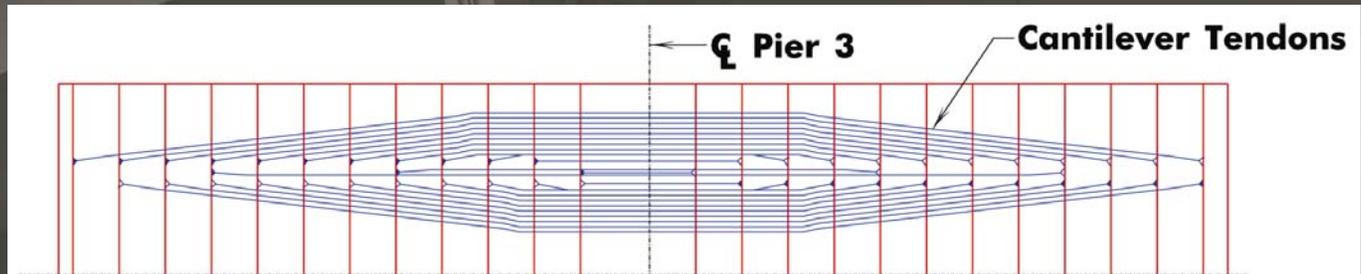
PARTIAL PLAN - END SPAN BOTTOM SLAB TENDONS
Span 1 (EB)

Longitudinal Post-Tensioning – Cantilevers

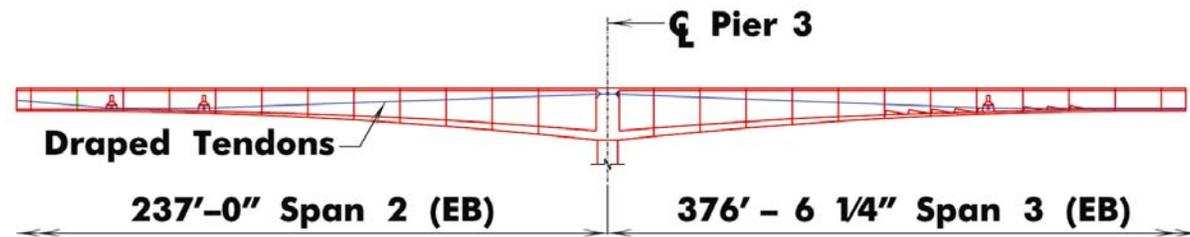
12x0.6in

19x0.6in

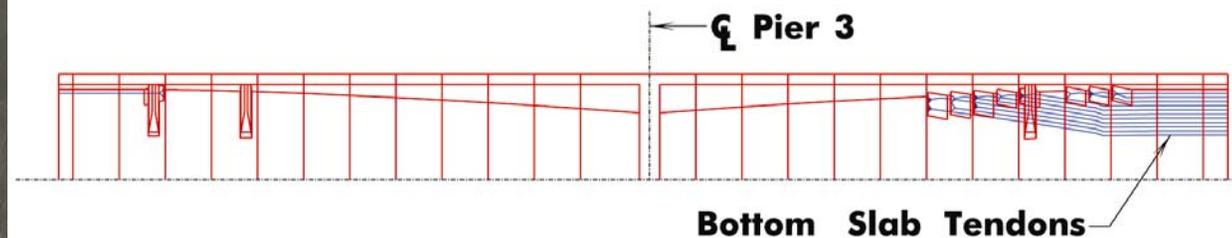
12x0.6in



PARTIAL PLAN – CANTILEVER TENDONS
Cantilever 3 (EB)

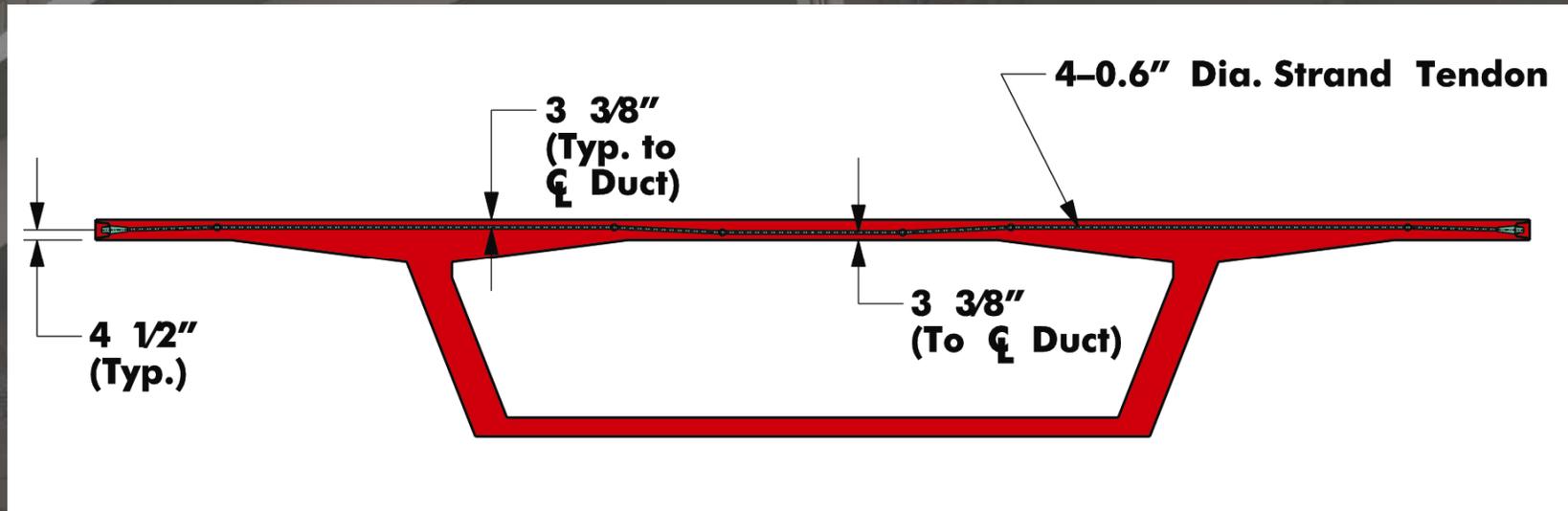


ELEVATION – DRAPED TENDONS
Cantilever 3 (EB)



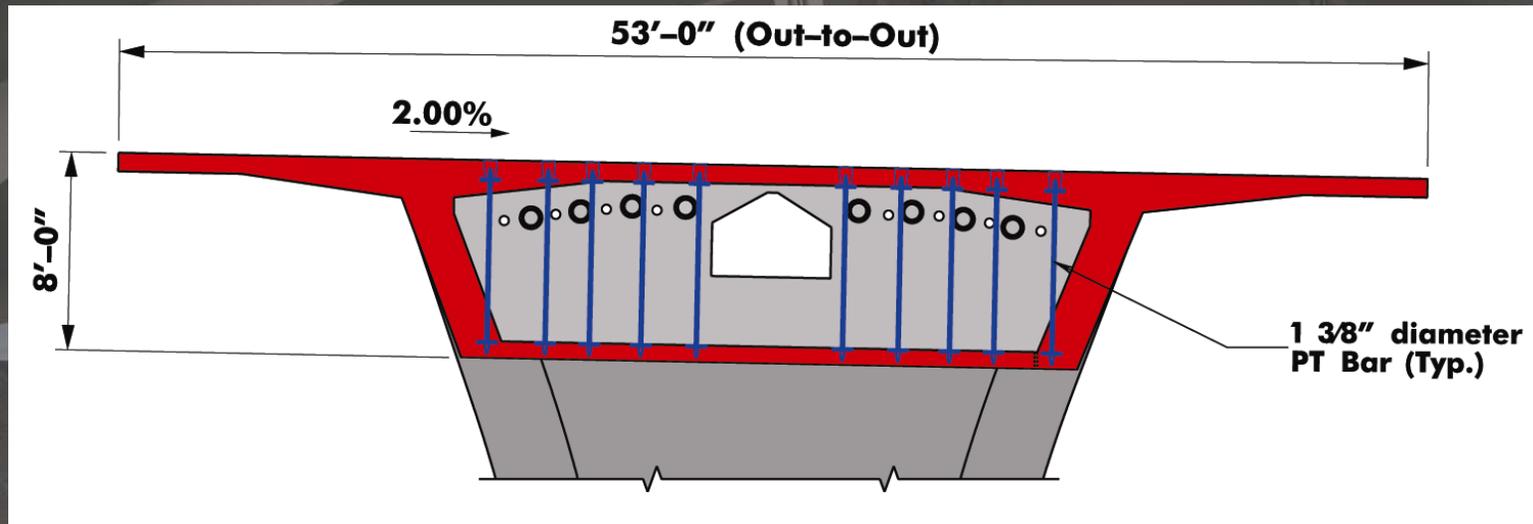
PARTIAL PLAN – BOTTOM SLAB TENDONS
Cantilever 3 (EB)

Transverse Post-Tensioning



- **Size & Spacing**
 - 4x0.6" Strand
 - Typical Spacing = 3'-3"
 - Spacing Varies in Other Regions (3'-3" maximum)

Vertical Post-Tensioning

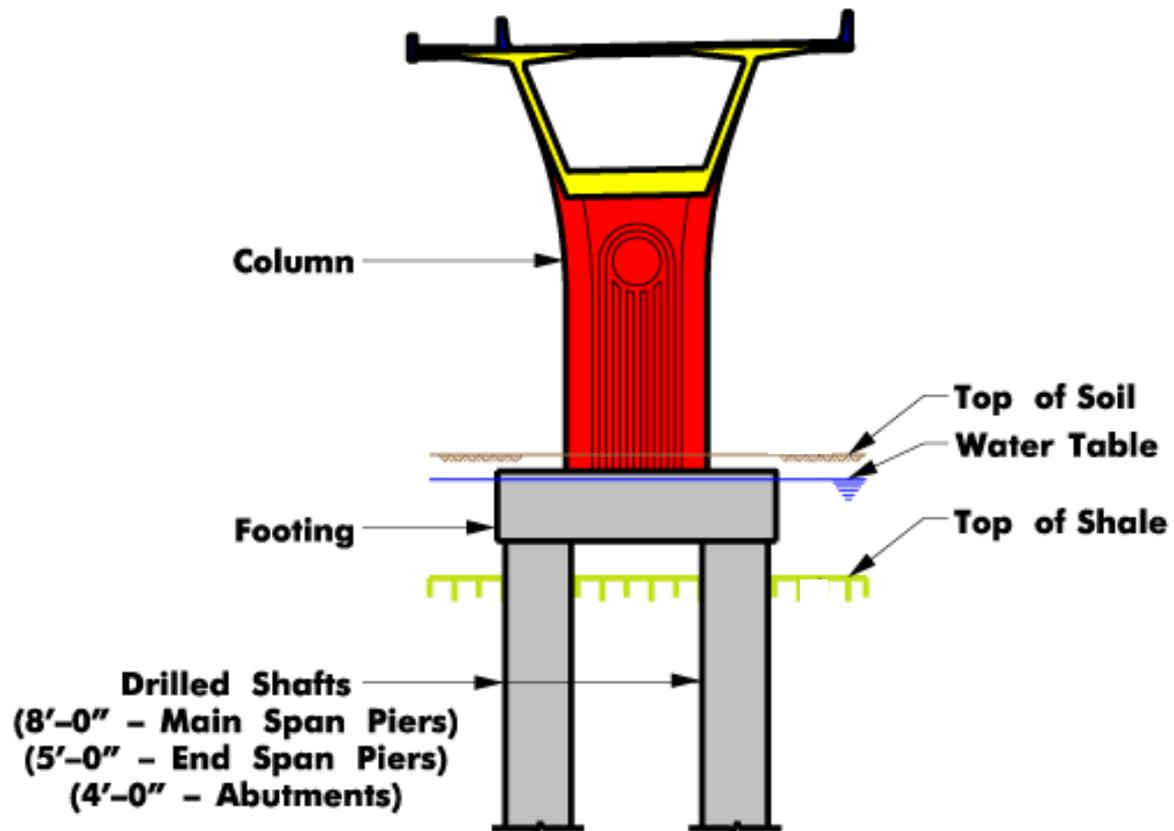


- Diaphragm & Pier Table Reinforcing
- 1 3/8" Diameter Bar
- Uncoated Deformed Thread Bar
- ASTM A-722, Type II, Grade 150

Substructure

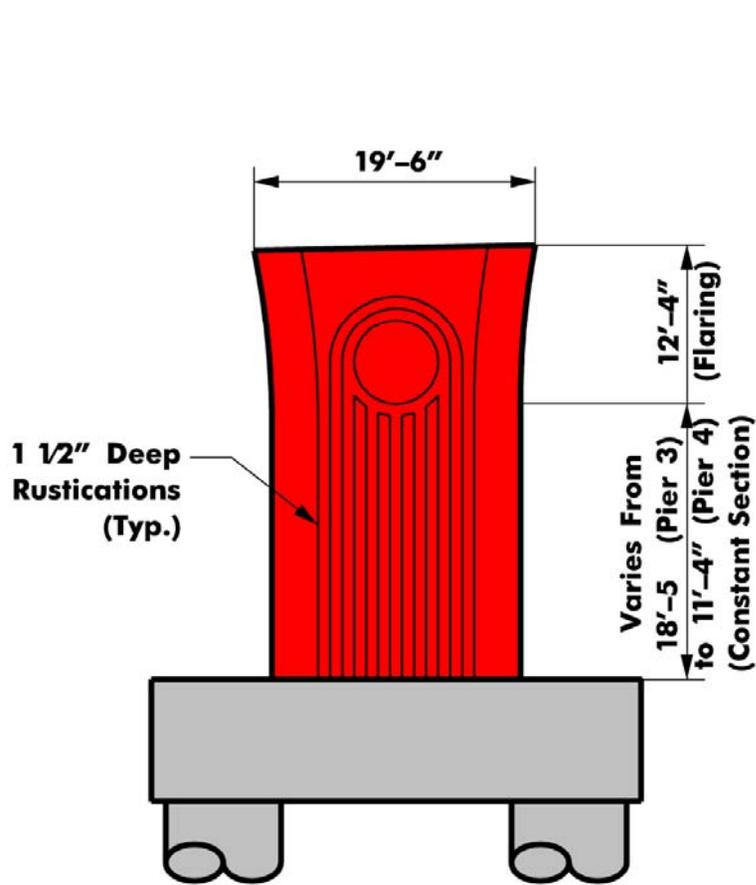


Substructure Schematic

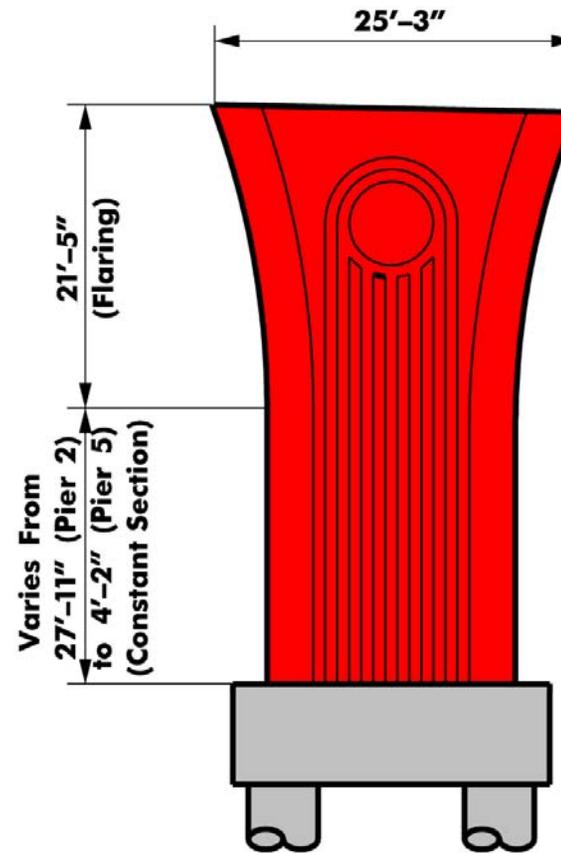


SECTION
(Pier 4 Shown)

Piers



PIERS 3 AND 4
(Looking Upstation)



PIERS 2 AND 5
(Looking Upstation)

Abutments

Class 1 Structural
Backfill – Mech.
Reinforced

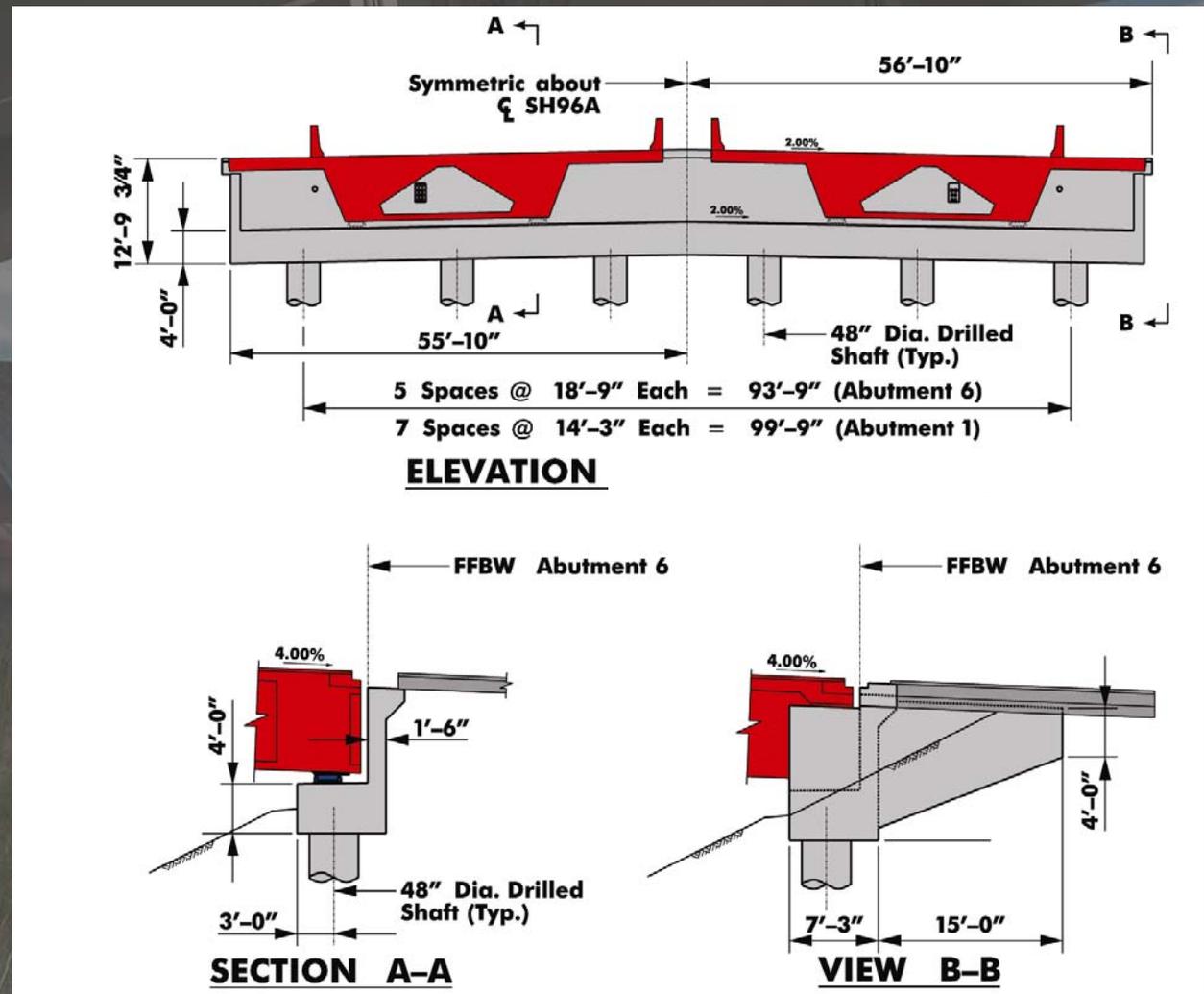
East End (Phased)

- Decorative Slope Paving

West End

- 12" Riprap

Backwall Phasing



Drilled Shaft Foundations

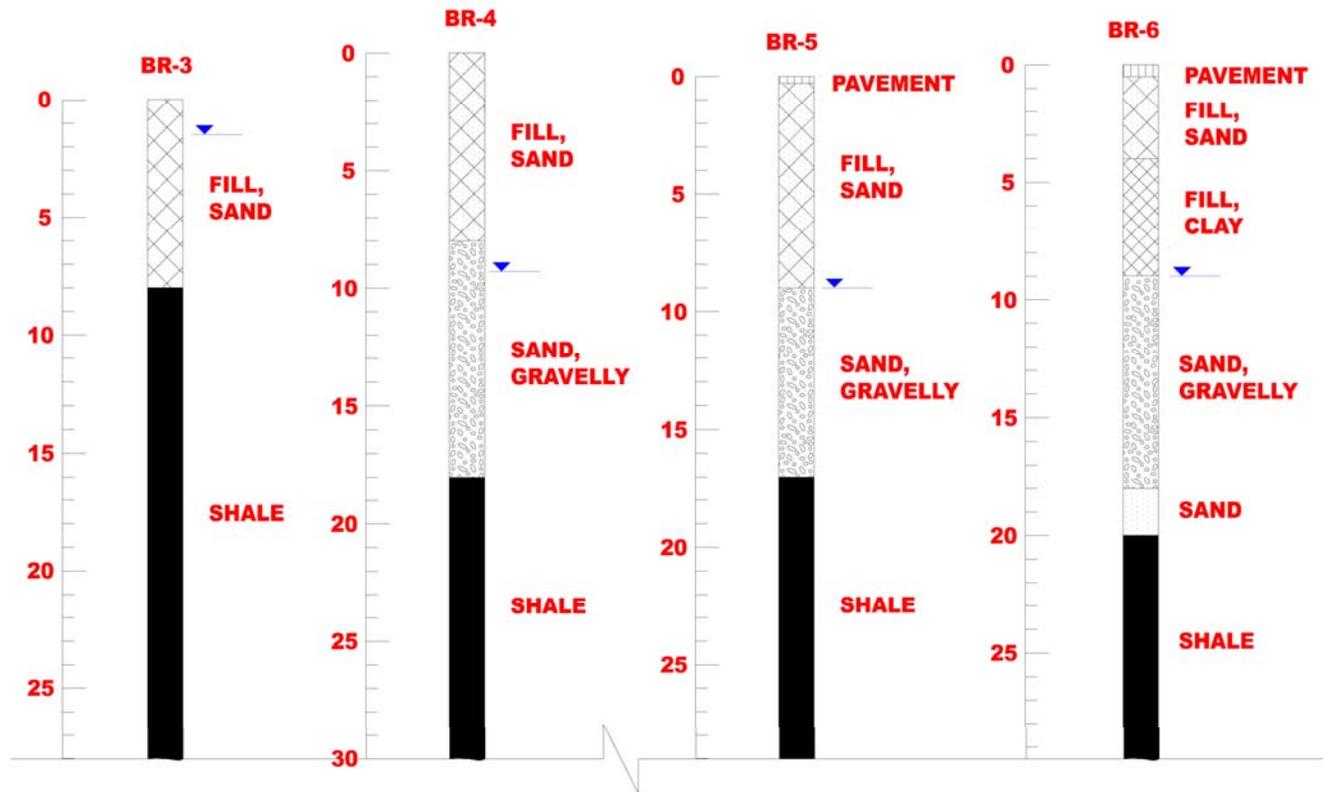
- **Min. Shale Sockets: 25'-43'**
 - Monument Pedestals: 12'-20'
- **Construction Considerations**
 - Arkansas River Level
 - Groundwater Level
 - Temporary Casing to Shale
 - Cross Hole Sonic Logging
 - Material Capture and Disposal

Subsurface

Bridge Piers

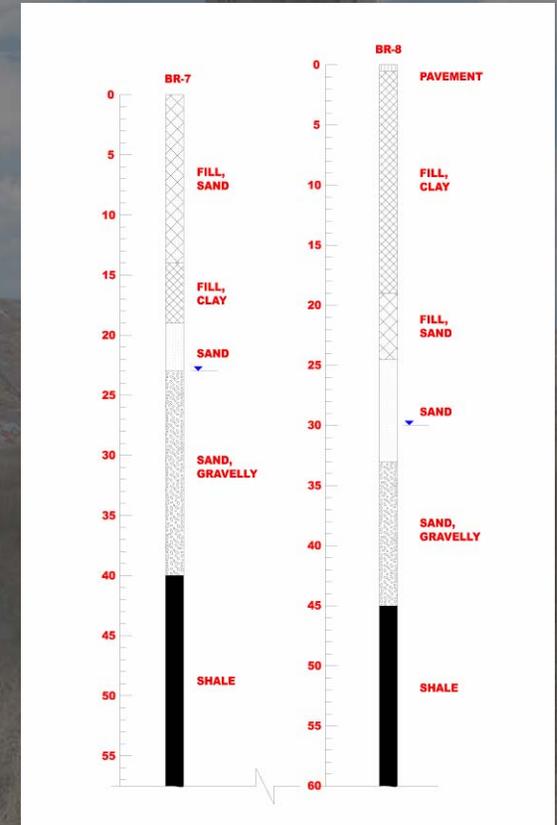
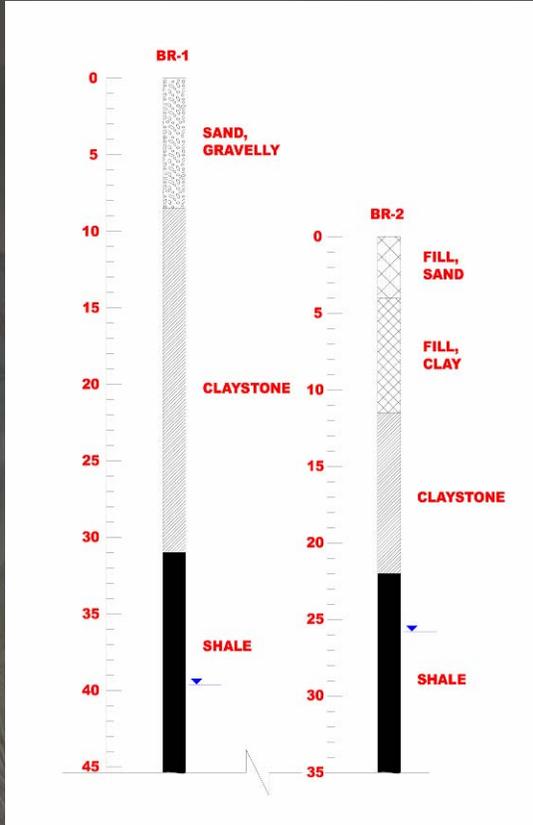
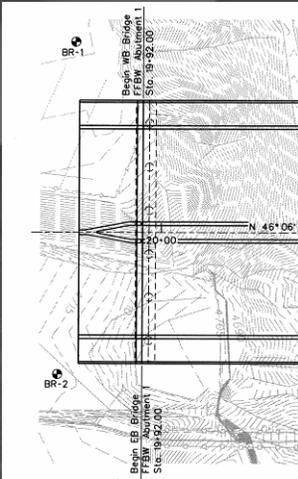
River Pier: 8' Fill Sand Over Shale

Others: 8 to 10' Fill, 8-12' Sand (gravelly), Shale



Subsurface

Abutments



Sand (gravelly) or Fill, Claystone, Shale

20 to 25' Fill, 15-20' Sand (gravelly), Shale

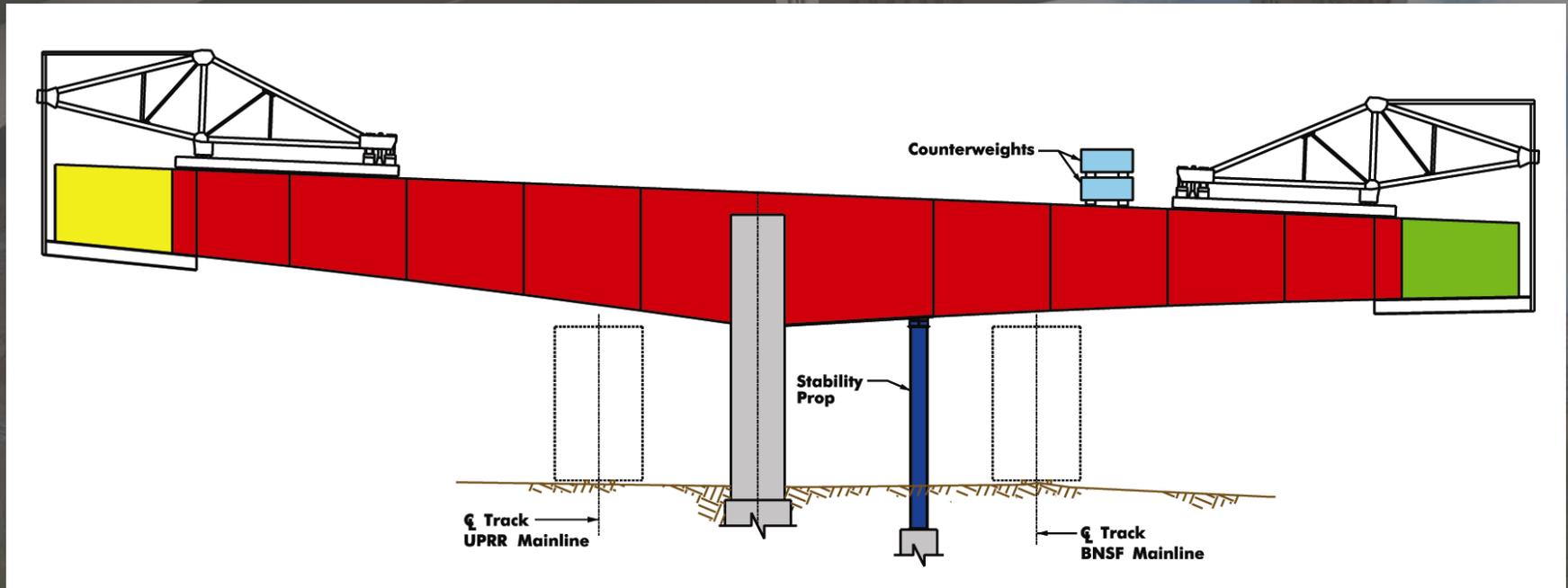
Bearings & Joints

- **Piers**
 - Integral Piers
 - No Bearings
- **Abutments**
 - 8 Pot Bearings (2/girder)
 - 4 Guided Expansion
 - 4 Non-Guided Expansion
 - Max Axial: 1234 kip (Service)
 - Max lateral: 76 kips (service)
 - Modular Expansion Joints

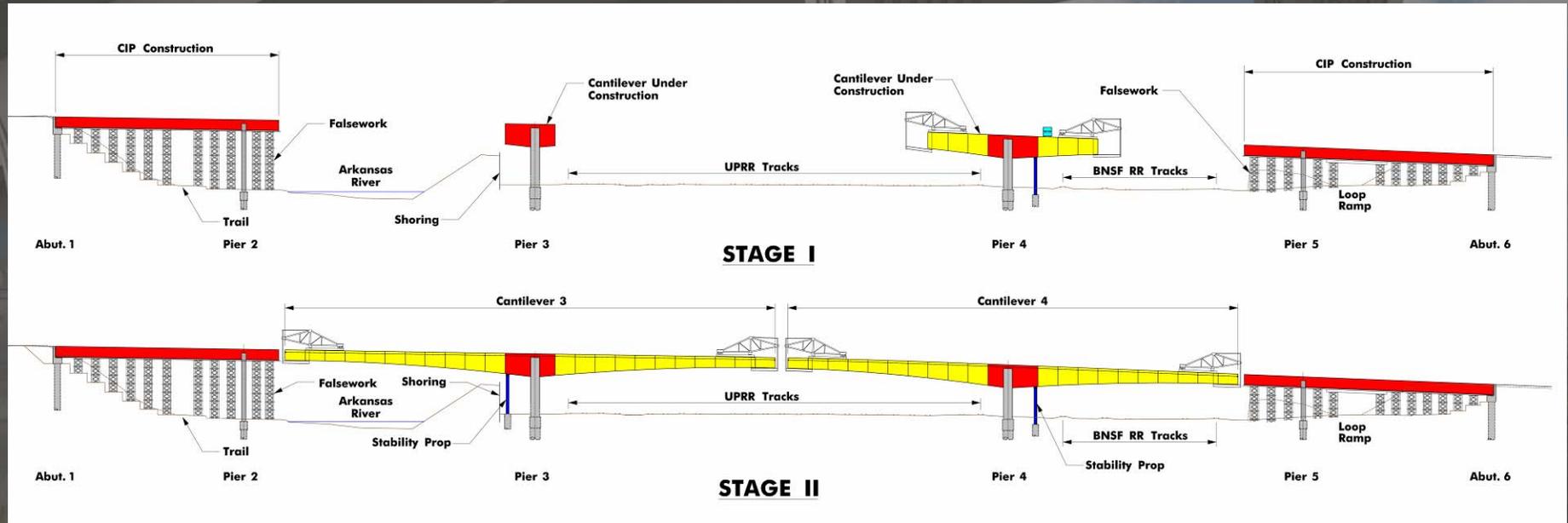


Superstructure Erection

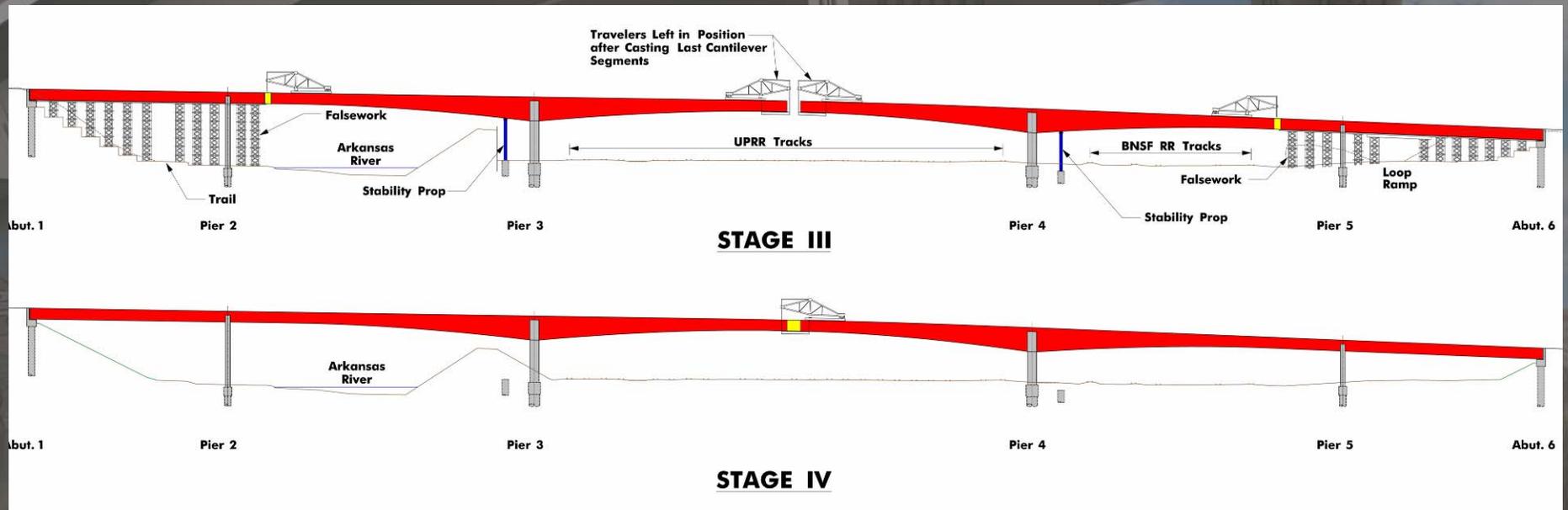
Segment Casting and Temporary Prop



Bridge Construction Overview



Bridge Construction Overview



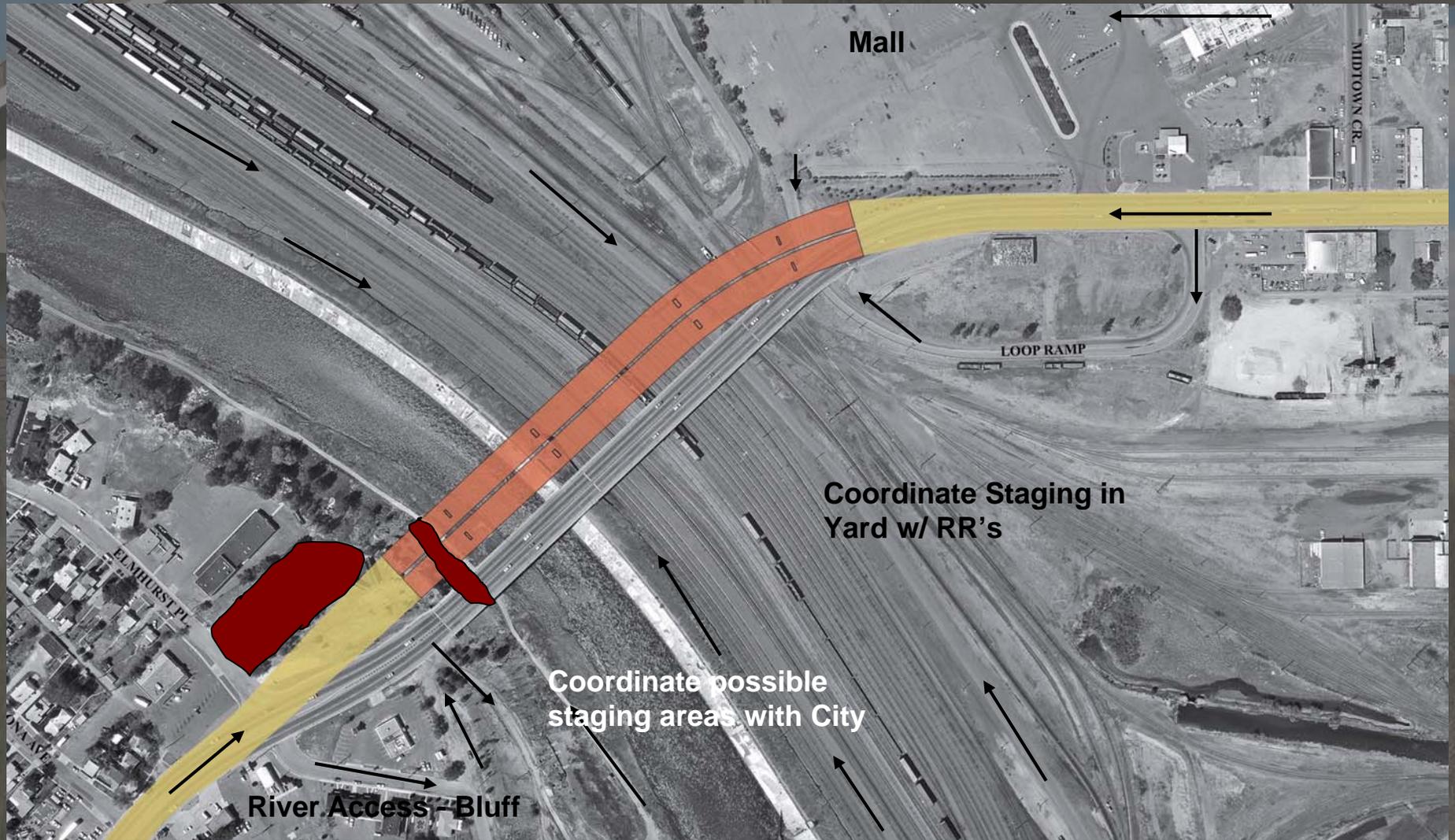
Traffic Control

- **Suggested Phasing Per Plans**
- **Deviation requires Engineer Approval**
- **No Lane Closures – 7 to 9 am, 4 to 6 pm**
 - except noted in incentive/disincentive specification
- **Maintain access to businesses, roadways, driveways**
 - Unless approved otherwise by Engineer
- **Keep Loop Ramp Open (except Phase IA)**
- **Maintain Mall access at all times**
- **Maintain Pedestrian Access**
 - (except per incentive/disincentive specification)
- **Pedestrian Detour and Public Involvement Plan**
- **Other requirements per Special Provisions**

Incentive / Disincentive

- **One way traffic each direction**
 - Phases IA, IB, IC, 2A
 - Maximum total duration – 162 days
 - \$ 10 K / day, \$ 90 K maximum
- **No Pedestrian Access across Bridge**
 - Phase II
 - Maximum total duration – 320 days
 - \$ 500 / day, \$ 10 K maximum

Possible Access & Staging Areas



Yard Access - 'B' Street



Schedule

- **Allowable Project Duration – 3.5 years**
- **Assumptions**
 - Single pair of form travelers
 - No delays from utilities relocations
 - No environmental or access delays
 - No railroad imposed delays
 - Eight week initial traveler assembly
 - Two segments cast every 5 to 6 days with an initial 8 day learning curve
 - Span 1 EB and WB concurrent
 - No work over BNSF in 4th Quarter
 - No work stoppages
 - Lost days built into schedule
 - **Alternate bridge has same number of calendar days for design and construction**

Demolition & Misc. Removals



Bridge Demolition

- **Superstructure and Piers (Per RR)**
- **Existing Abutments**
 - Full East End w/ Partial Pile Removal (Staged)
 - Partial West End to below Finished Grade
- **Anticipated Phasing:**
 - Constructed as much as possible “off-line”
 - Begin Demolition Once Traffic is Relocated to New WB Bridge
 - Remove Spans 1 & 2
 - Finish Spans 4 & 5 of new EB Bridge, while Completing Demolition of Existing Bridge (Spans 3-7)
- **Include Bridge/Floodwall Stairs**

Miscellaneous Removals

West End



Miscellaneous Removals

East End



Building Demolition

- **Building Demo**
 - Bluff Residence
 - Commercial Building within Loop Ramp
- **Billboards**

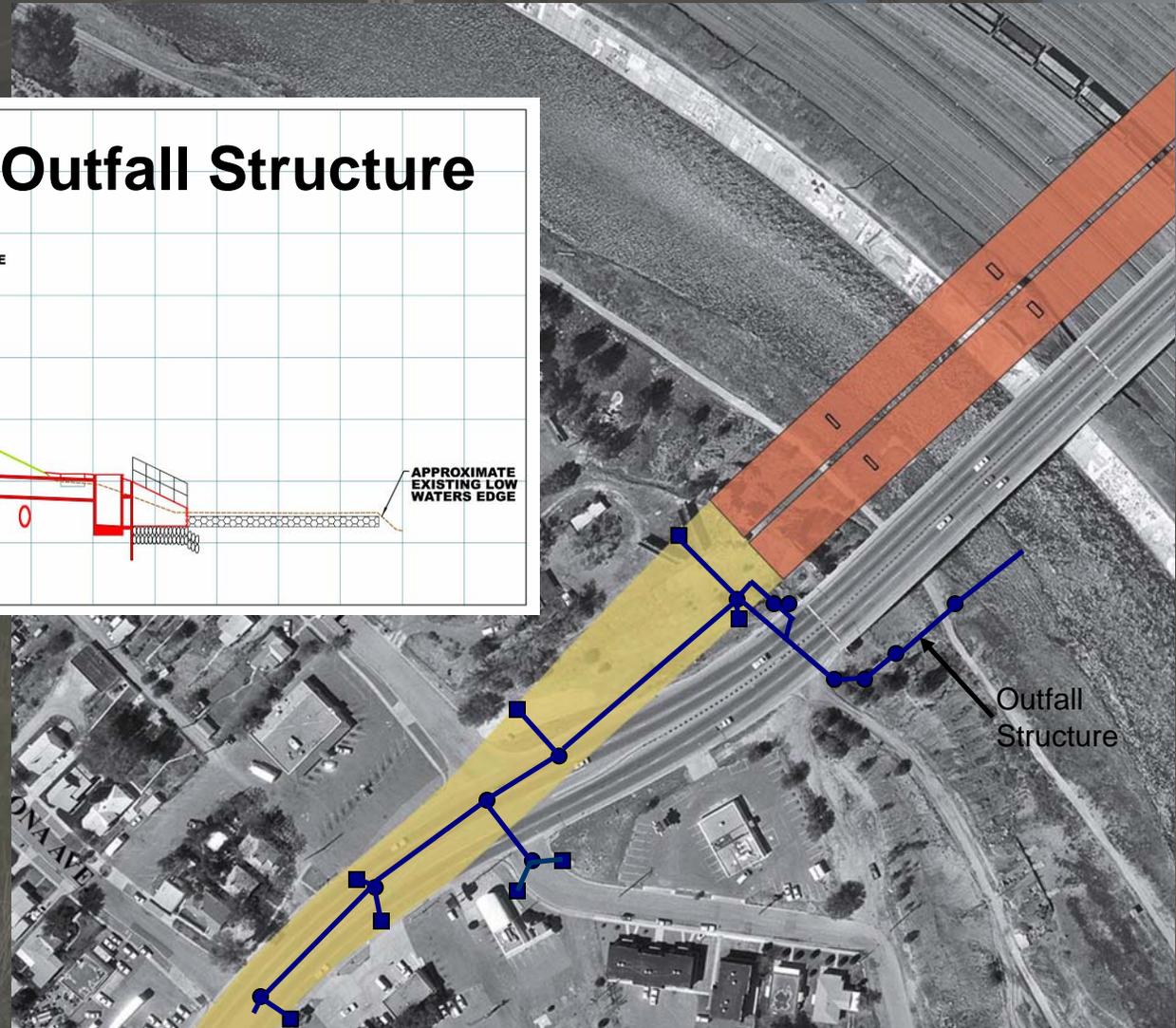
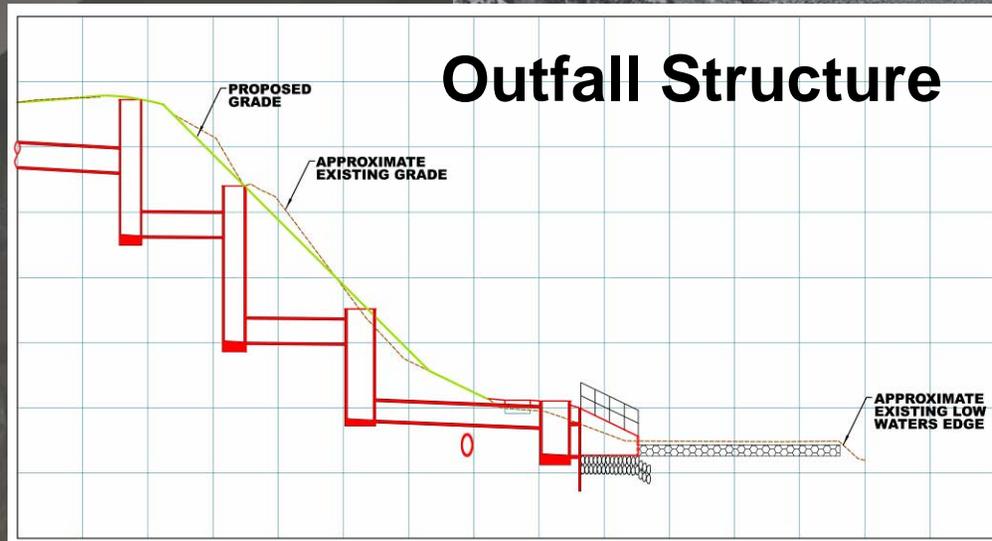


Approach Work



Drainage

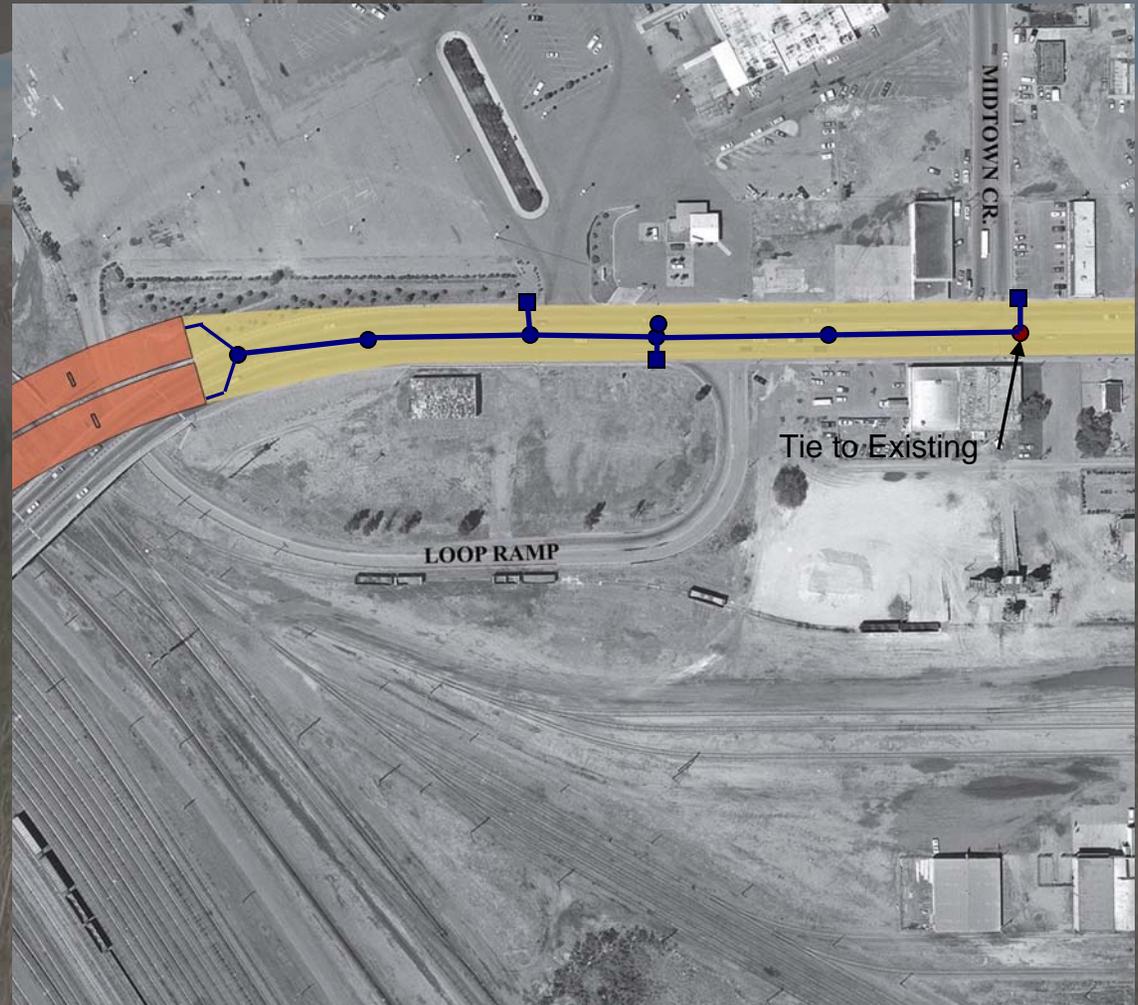
New Drainage System West End



Drainage

New Drainage System East End

- Connect Bridge Drains (2)
- Tie to Existing System at Midtown Circle Dr.

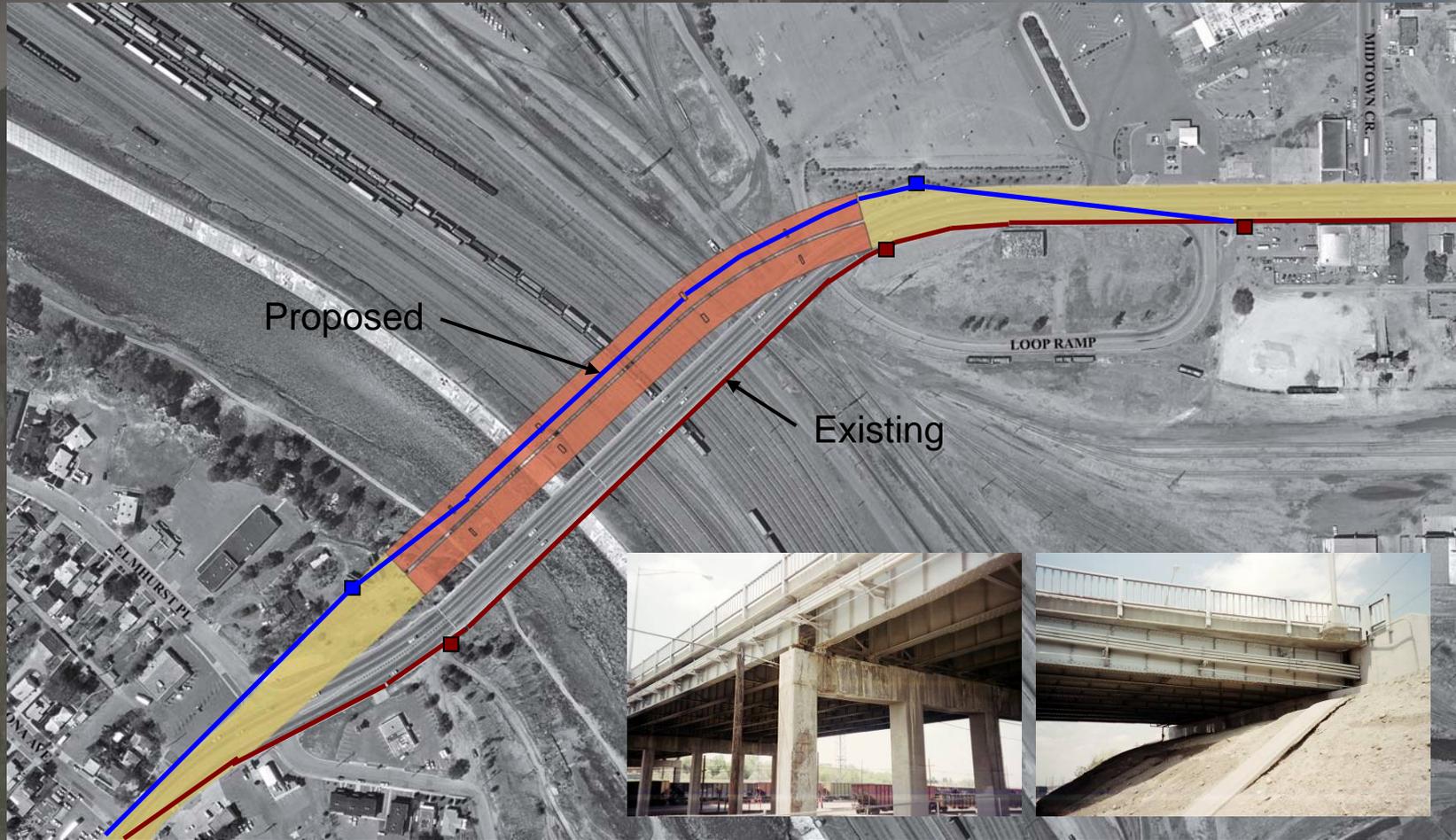


Utilities

- **Qwest Communications**
- **Future CDOT/City Communicatios**
- **Xcel Energy - Gas**
- **Aquila Electric**
 - **Distribution**
 - street lighting
 - Irrigation system
 - Box girder interior maintenance/power system
 - **Transmission Lines**
- **Railroads (by Railroad)**
 - Light Towers
 - Power, Communications, Gas Distribution
- **Board of Water Works**
 - Vertical Adjustments
 - West end water line is asbestos pipe

Utilities

Qwest Communications



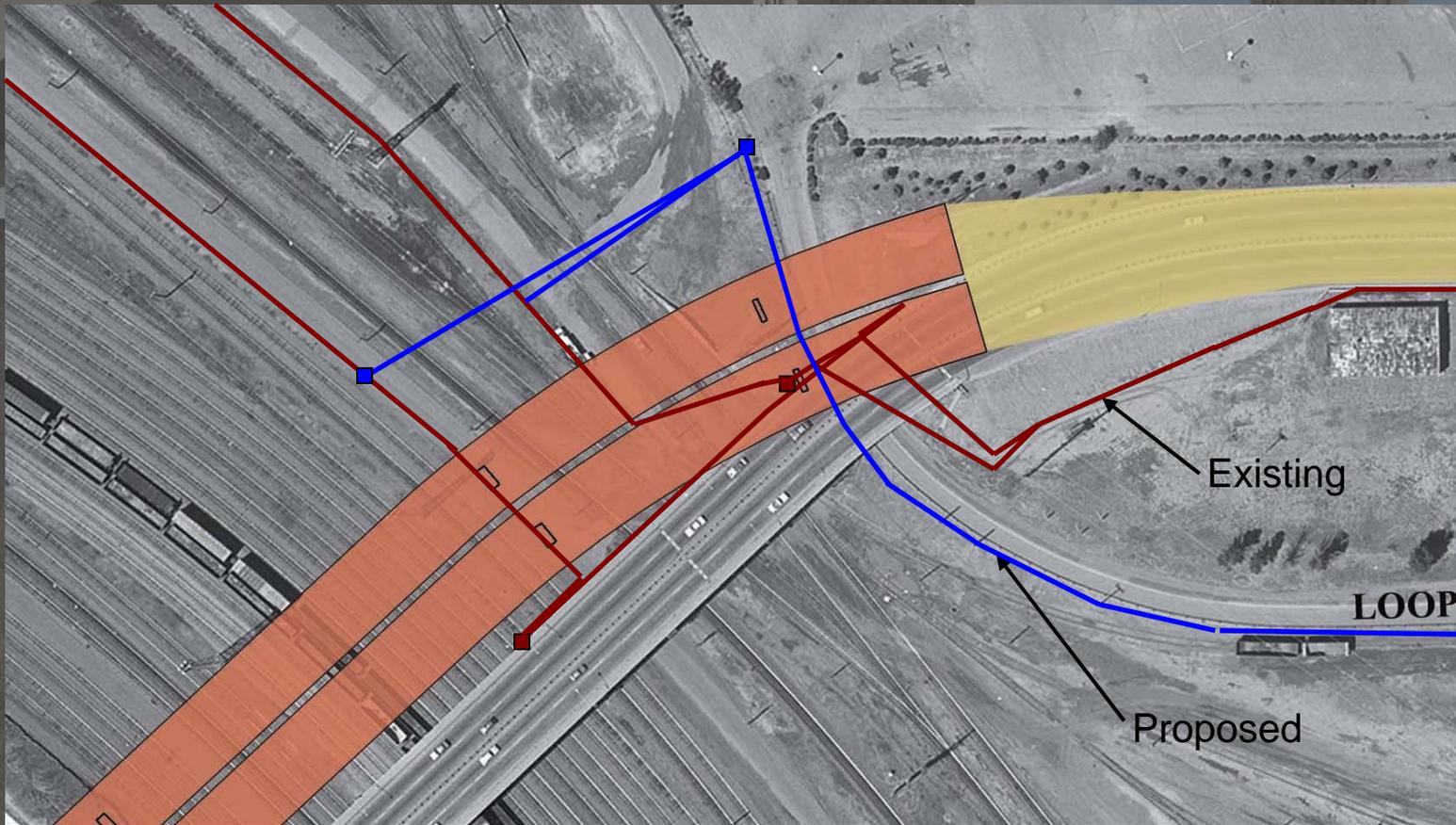
Utilities

Future CDOT/City Communications Conduit



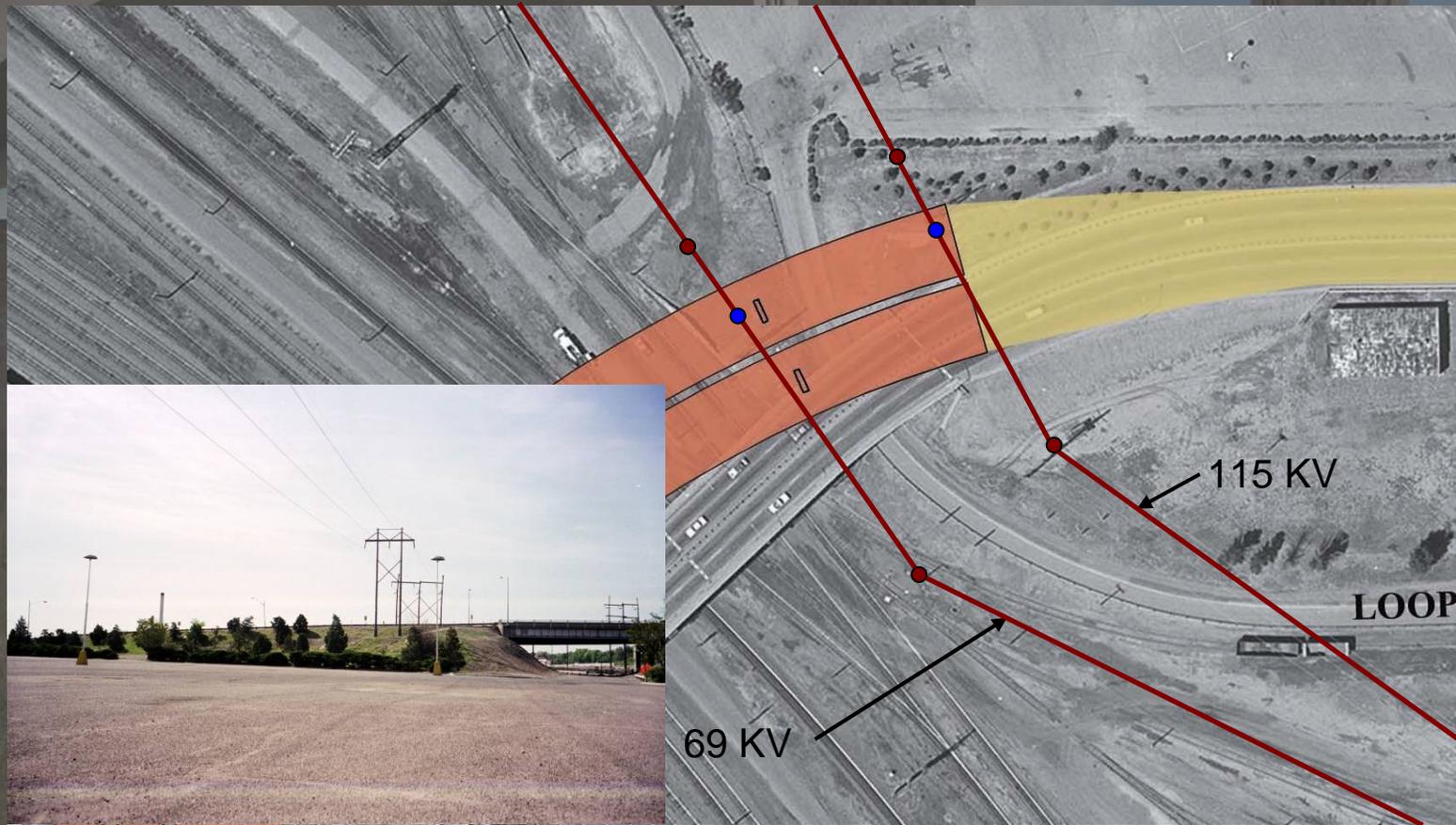
Utilities

Xcel Energy Gas Lines



Utilities

Aquila Electric – Transmission Lines

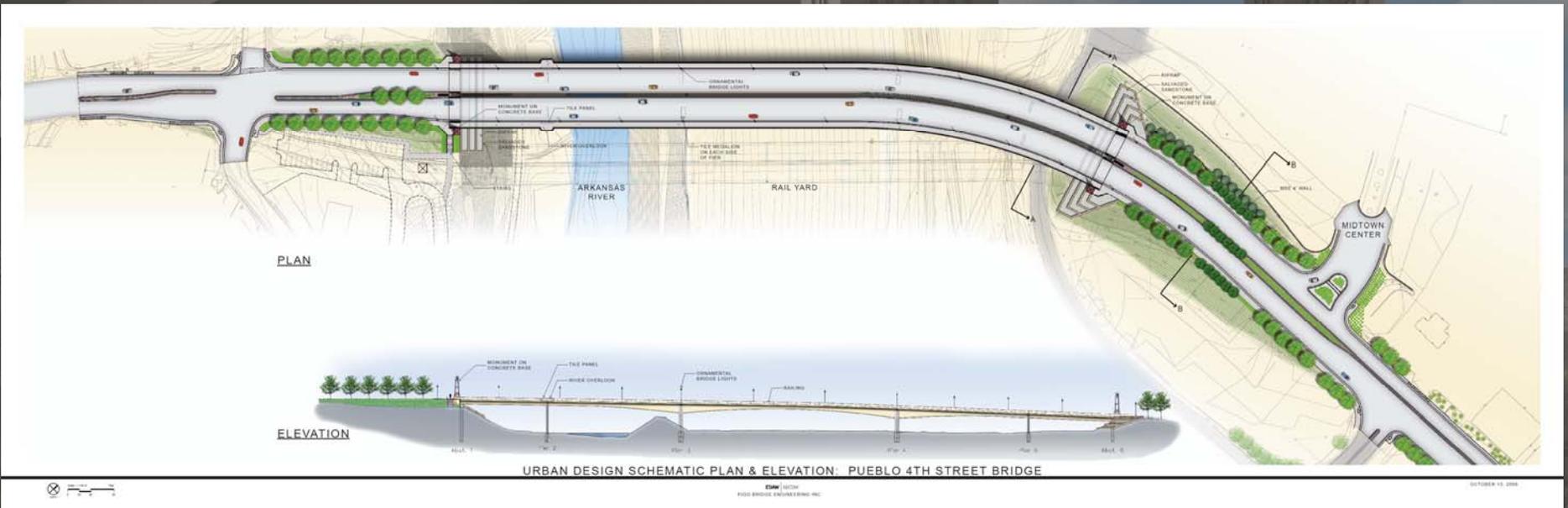


Lighting

- **Decorative Street Lights**
- **Under-Bridge Lights**
- **Maintenance Lighting and Power Within Superstructure Girders**
- **Temporary Lighting WB Bridge During Construction**



Landscaping



SPECIAL PROVISIONS



Insurance Requirements

- **Project Special Provision Rev 107 (page 30-34)**
 - Higher amounts for some of the standard insurances
 - Coverage for
 - Contractors Pollution Legal Liability Insurance \$5M
 - Umbrella or excess Liability insurance \$5M
 - Builders risk insurance
- **Different Requirements for Alternate Bridge**
 - Professional Liability higher \$5M
 - Umbrella or Excess Liability \$10M
 - Additional requirement
- **Comply with UPRR and BNSF Requirements**

Environmental / Permits

- **Environmental Considerations**
 - Erosion Control
 - Wetlands Protection / Mitigation
 - Swallows
 - Protection from Falling Debris
 - City Ordinances (Noise, Dust, Trash, etc.)
- **Permits**
 - NPDES (Colorado)
 - Project Permitted under Nationwide 23 (incl. 404)

Wetlands

- **Along the Arkansas River (West Bank)**
- **Shown in Plans**
- **Comply with USACOE Permit (available from CDOT RE)**
- **Temporary Impacts are allowed per the Special Provisions**

Public Information Services

- **Designate a Public Information Manager**
- **Provide local contact information**
- **Distribute Project Flyers**
 - Local businesses and residents within the project limits
 - One week prior to start of construction
 - One week prior to any lane closures
 - One flyer per 6 months (minimum)
- **Host two Public Meetings**
 - First prior to start of construction
 - Second at mid-point of construction
- **Construction Signs with duration and contact**
- **Monthly Bus Passes**
 - When Pedestrian Access is Restricted from the Bridge (Phase II)
 - Coordinate with CDOT and City bus service

Trail Use

- **Maintain Pedestrian Access to River and Trail**
 - Haul Road
 - Arkansas River Trail
- **Provide Pedestrian Detour Plan**
 - Advance notice for any trail closure or river use closure.
 - Need to sign areas and fence delineation.
- **Rebuild Portion of Trail per Trail Plans**
- **Maintain Haul Road and finish with ABC**

ADA Requirements

- **ADA compliance is required during construction and will be enforced.**
 - Need to provide temporary wheel chair ramps – asphalt or wooden.
 - Need to provide guidance for blind people - detectable. Bottom edge shall be provided.
 - Need to physically block areas where pedestrians are not allowed. Tape, rope or plastic hung between devices is not acceptable.

Railroad Requirements

- **Special Provisions**
- **Construction Clearances**
 - UPRR: 12' horizontal, 21' vertical
 - BNSF: 15' horizontal, 21.5' vertical
- **Permanent Clearances (per plans)**
 - UPRR: 18' horizontal, 23' vertical
 - BNSF: 18' horizontal, 24' vertical
- **Flagging**
 - UPRR and BNSF
 - When work is within 25' of centerline track
(including equipment extensions)
 - Follow proper notification procedures
 - Paid by F/A up to contract limit

Special Construction Requirements

- **BNSF 4th Quarter No Work (w/out approval)**
- **Coordinate all access and staging**
(CDOT, City, Conservancy, Railroads, Property Owners)
- **Maintain Yard Roads Open per Railroads**
(re-align and finish East Yard Road upon construction completion to railroad satisfaction)
- **Provide Temp. Yard Lighting**
(where construction activities reduce yard light levels)
- **Comply with Pueblo Ordinances**
- **No work shall interfere with State Fair (August)**
- **Storm Sewer Outfall Phasing**
 - complete outfall & trunk line within first 150 days
 - Complete seeding and planting ASAP to establish channel vegetation

Contractor's Personnel

Personnel Requirements:

- **Construction Manager:**
 - Minimum 3 years construction management experience
- **Project Manager:**
 - Prior experience at supervisory level
 - In overall charge, on site full time
- **Foundation Superintendent:**
 - Experience in large diameter drilled shafts and Footings
 - On site full time during foundation construction
- **Structures Superintendent:**
 - Experience in balanced cantilever and on-falsework construction, or other heavy construction
 - In overall charge, on site full time during this work
- **2nd Structures Superintendent:**
 - Same as Structures Superintendent
 - Assume control when Structures Superintendent not available
 - Can perform other duties

Contractor's Personnel

Personnel Requirements (cont.):

- **Geometry Control Technician(s):**
 - Experience in Segmental Balanced Cantilever Casting Geometry Control
 - Cast in Place on Falsework Experience
- **Contractor's Engineer:**
 - Registered Colorado PE
 - Successful Experience in Design and Construction of CIP Segmental Balanced Cantilever bridges
 - Successful Experience in Design and Construction of CIP bridges built on falsework
 - Available as per the special provisions
- **PT Grouting Supervisor:**
 - Directly supervise all grouting and grouting personnel
 - Experience as per the special provision
 - ASBI Certified

Contractor's Personnel

Personnel Requirements (cont.):

- QC Manager:
 - Minimum 1 year QC related experience
 - Not supervised by Contractor's Production Section
 - QC is sole duty (for pre-stressed concrete)

Award Dependent Submittal

- Documentation must be submitted to CDOT within 5 days after bid letting
- CDOT will accept/deny proposed individuals within 5 days after receipt
- CDOT may request revisions

Expected Revision Under Ad

- **Stormwater Management**
 - Change Erosion Control supervisor to days rather than lump sum
 - If Contractor is out of compliance, he will have 48 hours to correct
 - Written violation is issued if not corrected and given another 48 hours to correct.
 - \$500/day fine issued if still out of compliance.
 - Contractor's ECS will be responsible for tracking and documenting BMP's installed and submitting weekly erosion control schedule.

Question and Answer



Contact

- **Follow Up Questions / Comments**
 - **Contact CDOT Directly**
 - **Dean Sandoval**
 - **(719) 546-5440**
 - **Minutes, Question Responses, and Sign In Sheet will be posted to website and meeting minutes.**