Lubbock ABC Project – Urban Site

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Texas Department of Transportation

April 17, 2025

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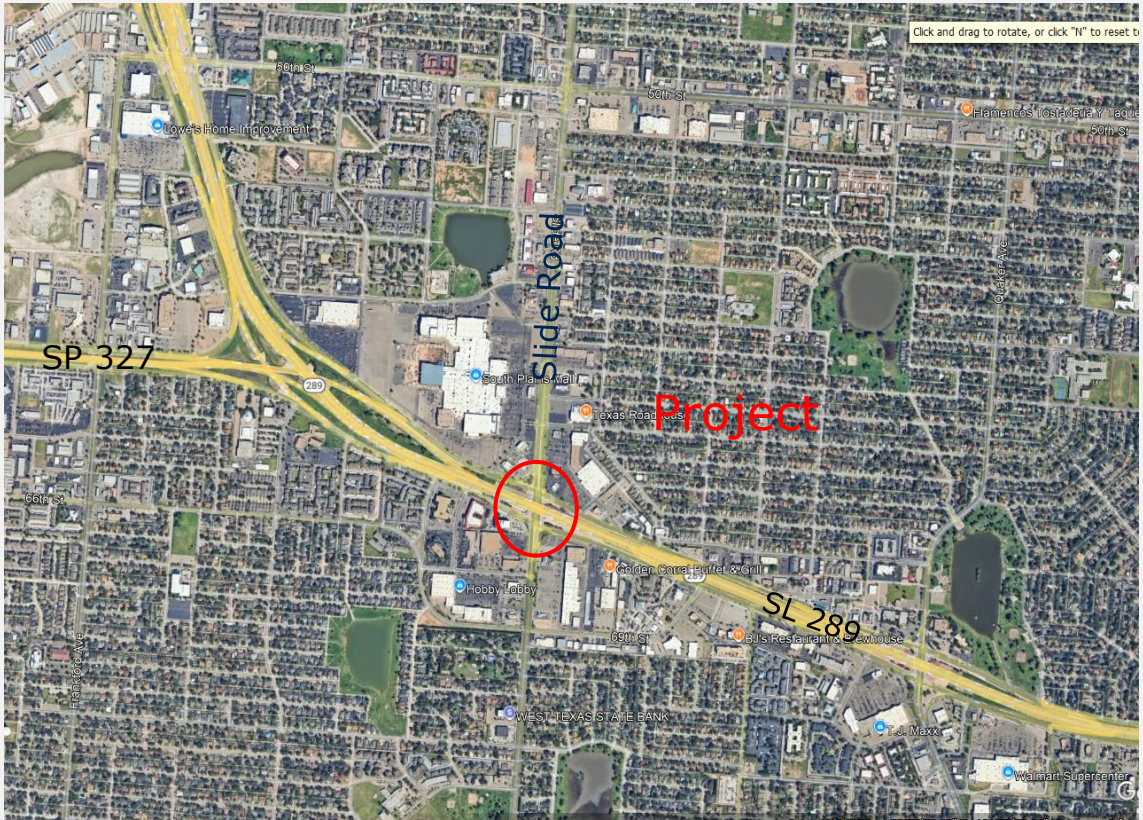
What is ABC?

ABC = Accelerated Bridge Construction

ABC is bridge construction that uses innovative planning, design, materials, and construction methods in a safe and cost-effective manner to reduce the onsite construction time that occurs when building new bridges or replacing and rehabilitating existing bridges. (per FHWA)

Location: SL 289 & Slide Road in Lubbock, TX

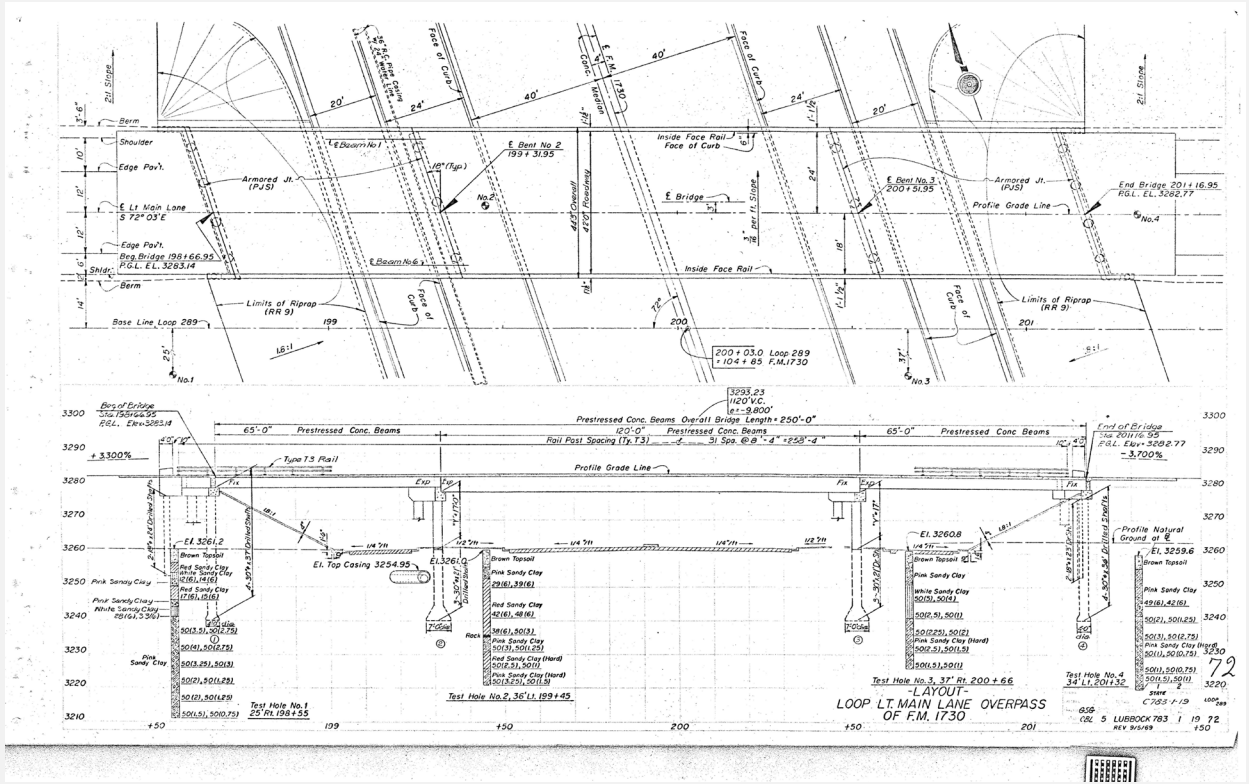


Questions to Consider for an Urban Site

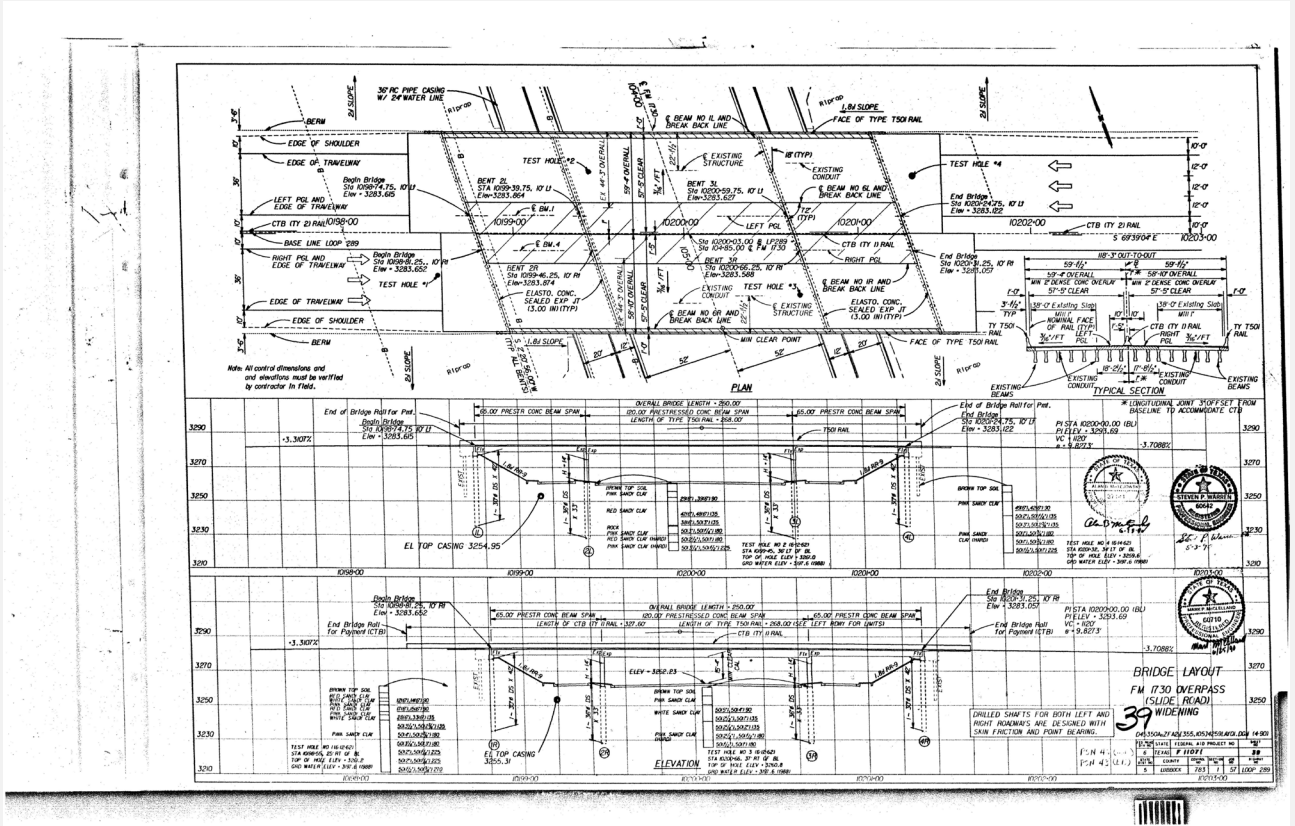
- Do I have lots of traffic and really need to use ABC? Long Detours?
- Do I have a location in close proximity to stage bridge components? Access to both sides?
- Can the substructure handle precast bridge components?
- How do we want to phase this thing? Keep SL 289 mainlanes open at all times
- How much money do I have?
- Am I close to retirement if we go with traditional cast-in-place construction?

Original Construction 1970

Two 44’ Wide 3-Span Prestressed Concrete Beam Units
65’-120’-65’



Widening - 1990



Mr. Warren's seal

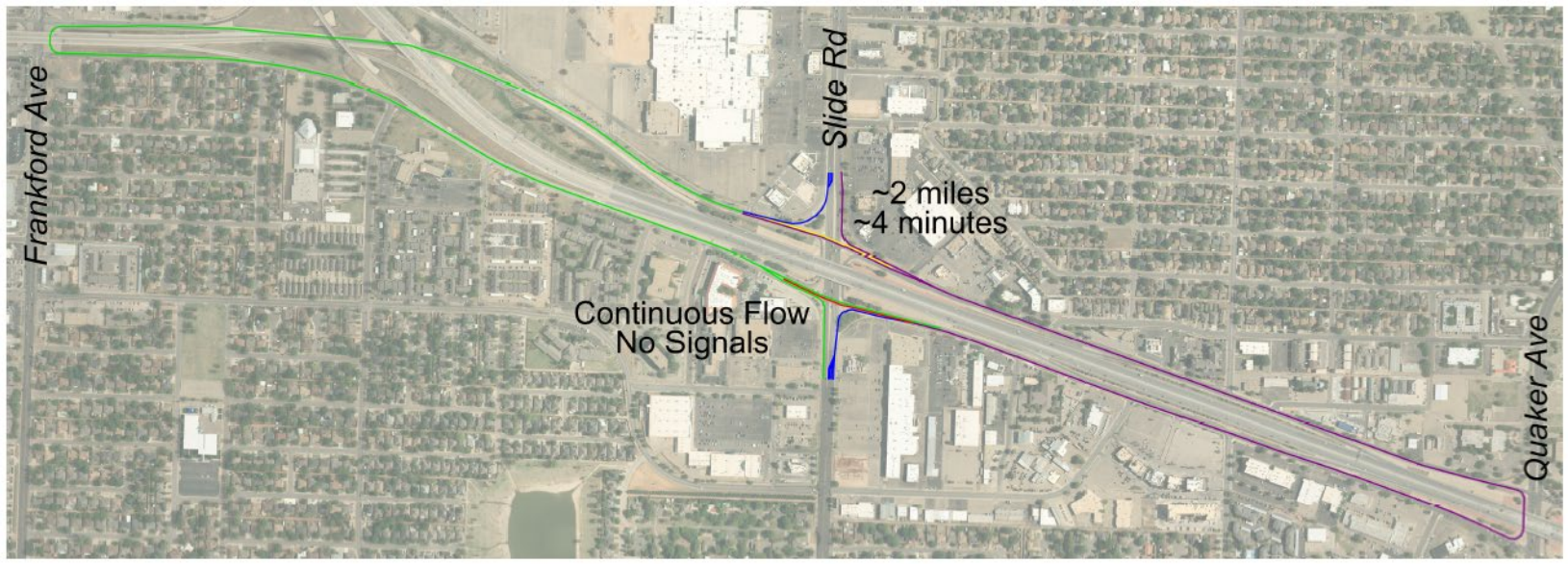
Traffic

Lots of traffic – highest traffic volumes in Lubbock

- SL 289 = 77,000 ADT
- Slide Rd = 39,000

Lots of Businesses including South Plains Mall and Golden Corral

Detours For Slide Road Closure



Staging Locations

Reuse Substructure?

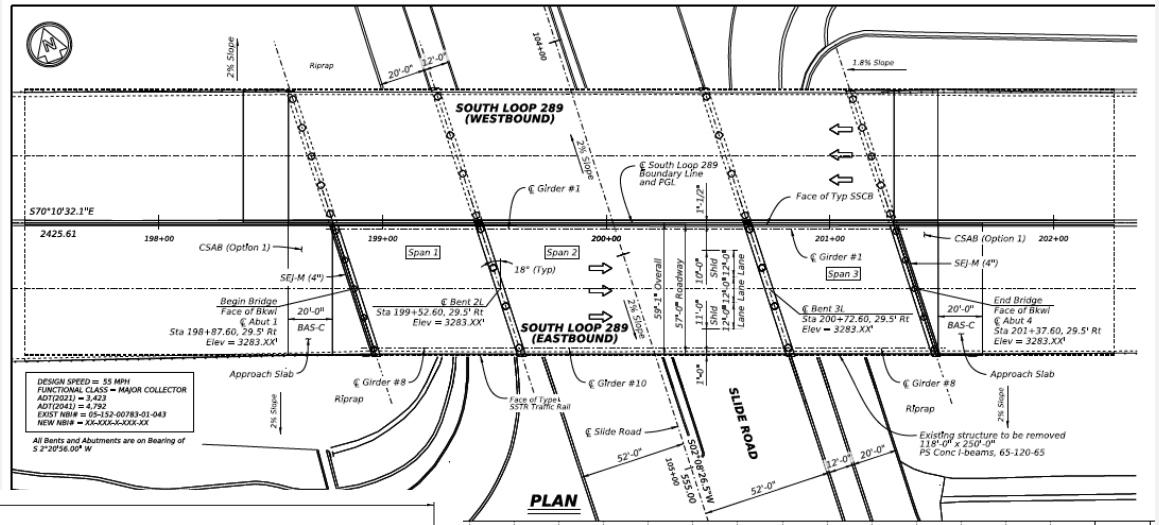
Turns out NO!

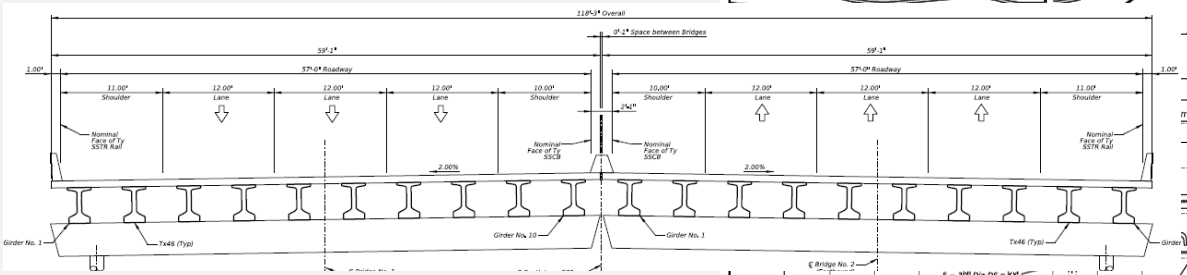
- Drilled shafts not adequate for new HL93 loadings

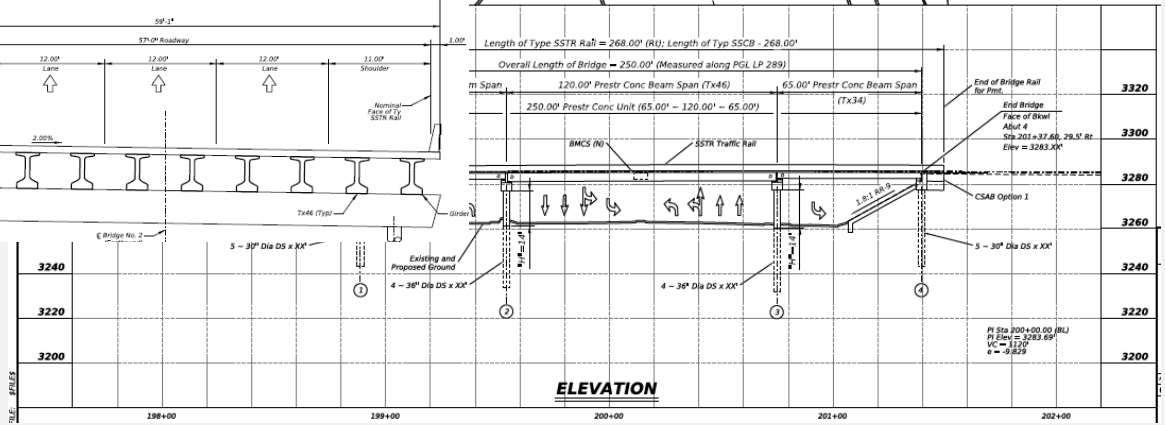
Use precast columns, caps, and abutments

Proposed Bridge

3 Span Prestressed
Conc Beam Units
65’-120’-65’







Phasing

Phase 1 - Flip SL 289 traffic to one side, close Slide Rd, and demo bridge in one weekend

Phase 2 – Substructure work with Slide Road traffic switches

Phase 3 – Close Slide Rd and Superstructure work in one weekend

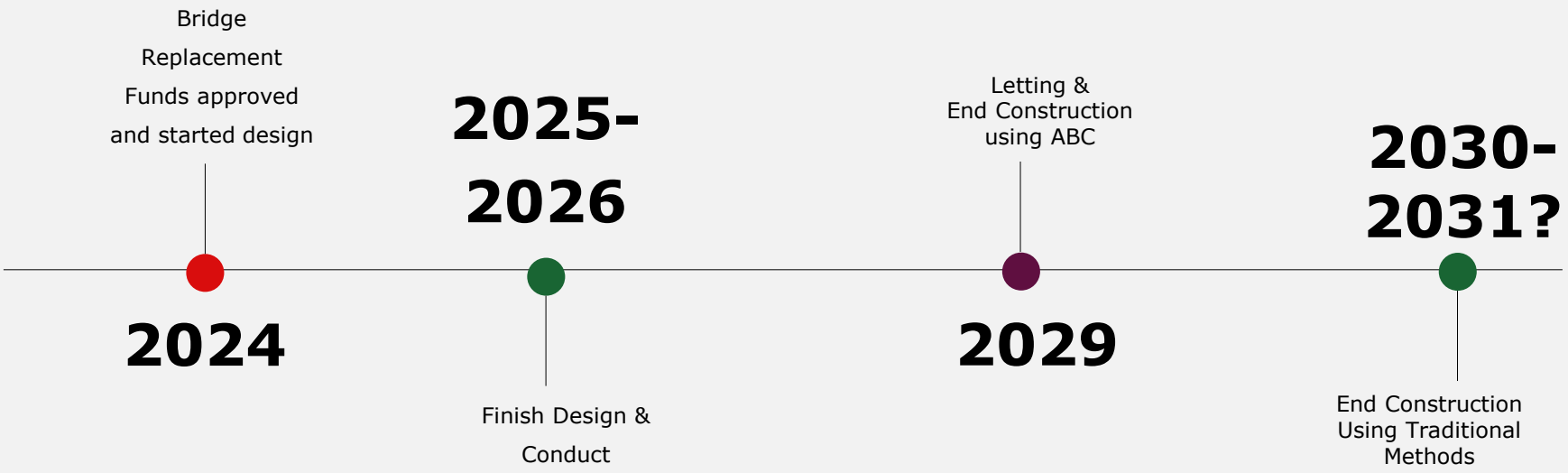
Phase 4 – Switch traffic and repeat

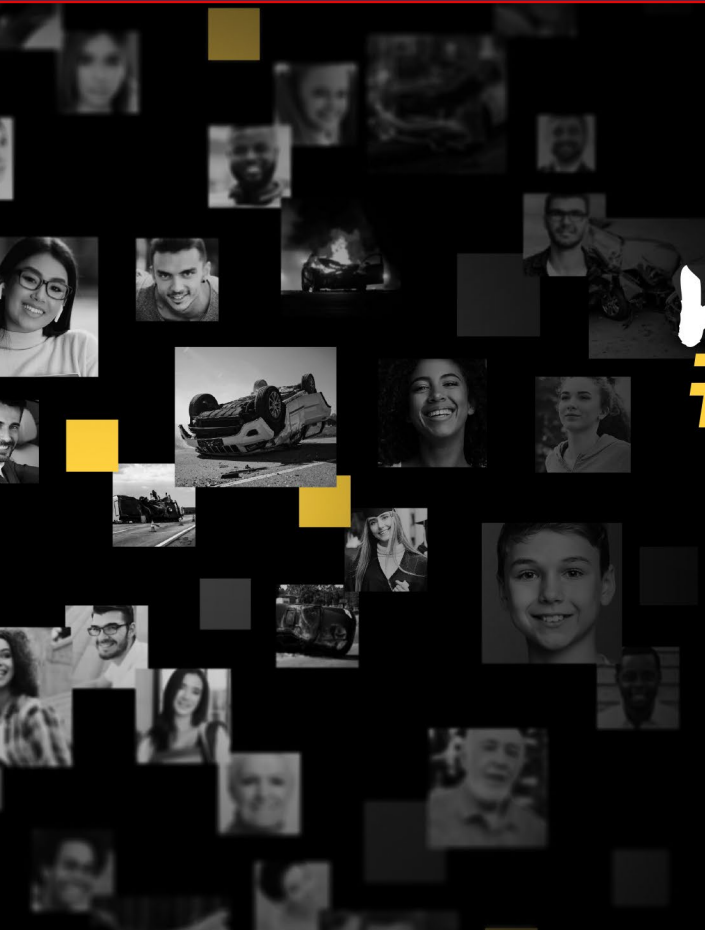
Recommend accelerated construction procedures such as milestones, increased LDs, A+B, lane rentals, etc.

Cost

- Plan for twice as much
- Normal long duration bridge construction = $5-10 million total
- ABC = $15-20 million total
- Make sure bridge division has this much to give you.

Project Timeline





HELP #EndTheStreakTX

End the streak of daily deaths on Texas roadways.

TxDOT.gov
#EndTheStreakTX Toolkit

Lubbock ABC Replacement (Urban)

Texas Department of Transportation

April 17, 2025

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Location and Site-Specific Conditions

Lubbock

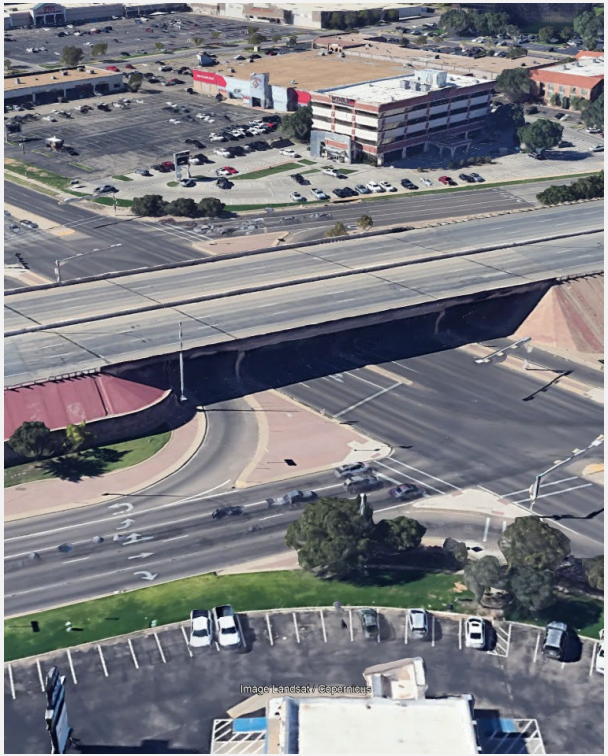
South Loop 289 over

Slide Road

Location and Site-Specific Conditions

Adjacent structures, 3 lanes in each direction

- 18-degree RF Skew
- Prestressed Concrete I-Girders
- 3 Span Units, 65’-120’-65’ (250-ft overall length)

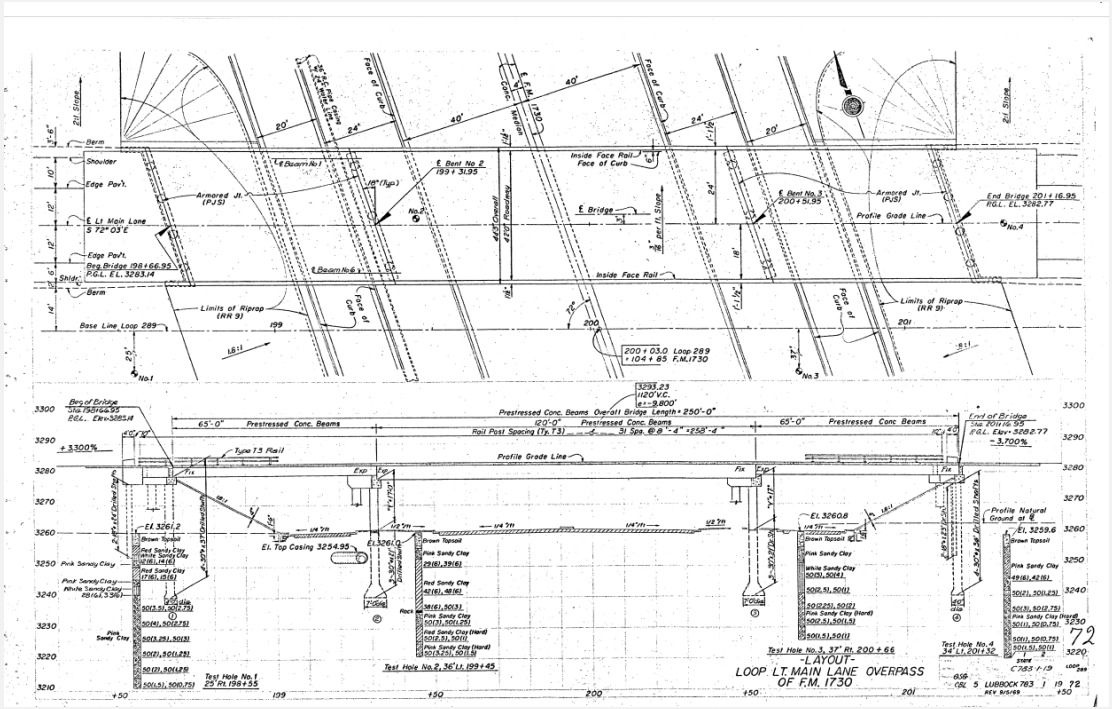


Location and Site-Specific Conditions

Built in 1972

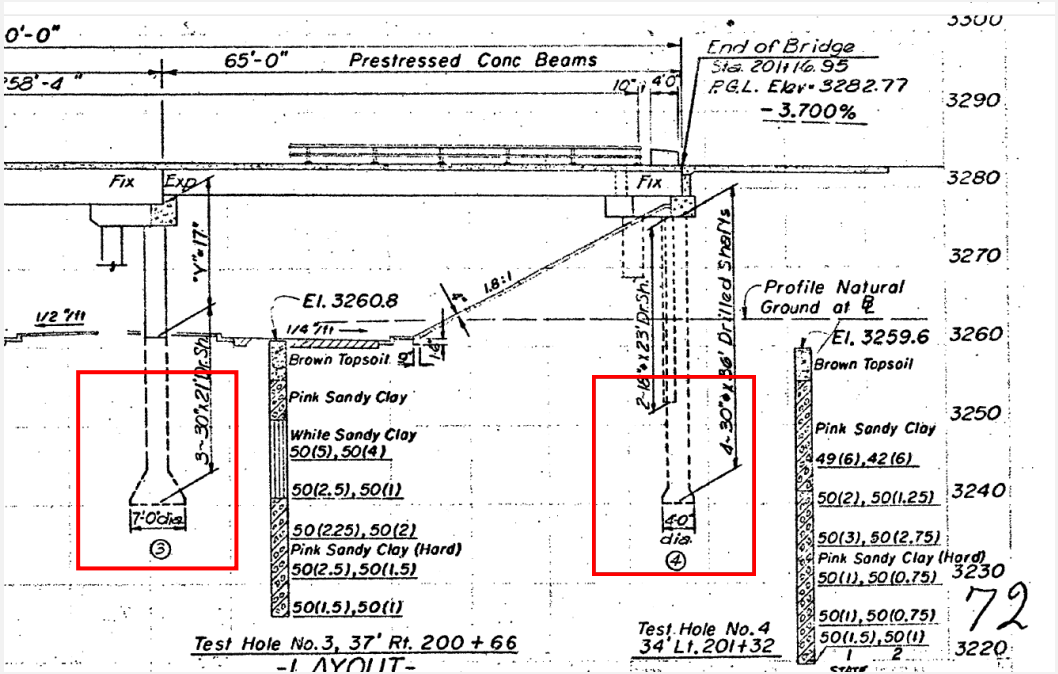
Westbound Layout Shown

- 2 lanes each direction
- 42-ft Roadway



Existing Bridge Condition & Elements
Foundations

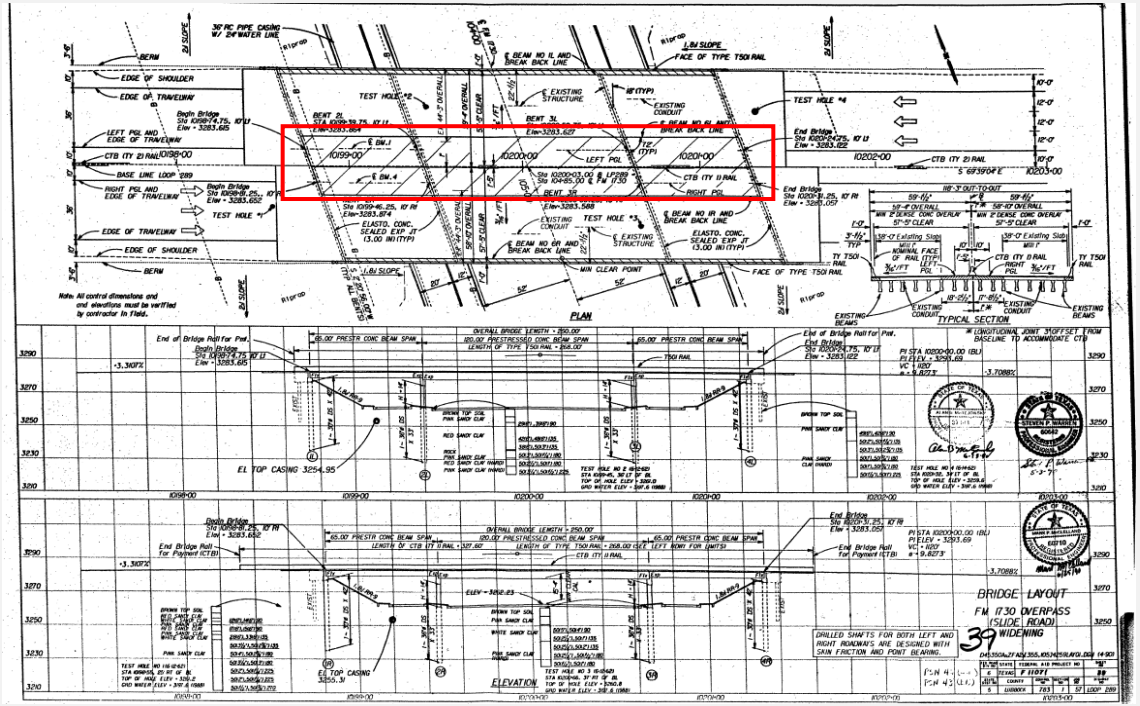
- Bents: 2.5-ft diameter drilled shafts with 7-ft diameter bell-shaped bases , 17.5-ft spacing
- Abutments: 2.5-ft diameter drilled shafts with 4-ft diameter bell-shaped bases, 12-ft spacing



Existing Bridge Condition & Elements Widened in 1992

Both Structures Shown

- Added 1 lane each direction
- 57.5-ft Roadway
- Foundations: Added 2.5-ft drilled shaft each direction (w/o bell-shaped bases), abutments and bents.



Existing Bridge Condition & Elements

ADT (WB/EB): 35,319/34,670

NBI Ratings (WB/EB)

- Deck: 5/5
- Superstructure: 6/6
- Substructure: 6/6

Top: Looking South

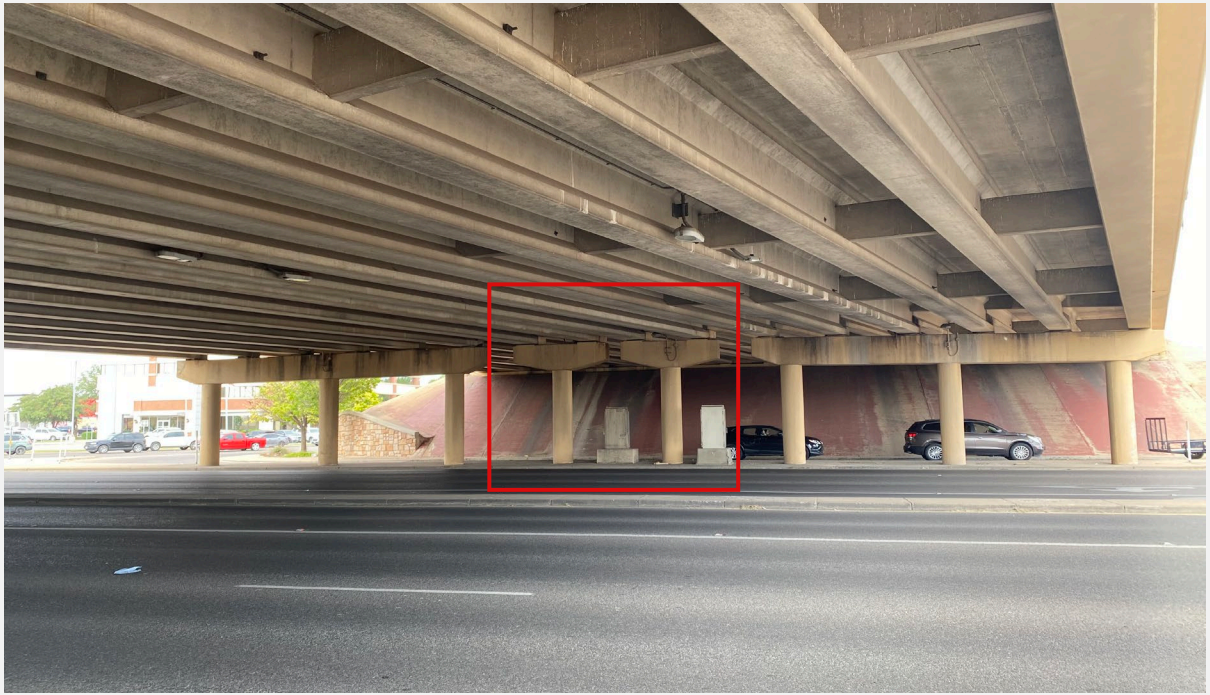
Bottom: Looking North

Existing Bridge Condition & Elements

Bent 2

- Signal Cabinets
- Column Locations
- Concrete Riprap

Looking West



Existing Bridge Condition & Elements

Abutment 4

- Riprap Condition
- Soffit Condition

  Looking East

Replacement Options and Alternatives

Bridge Standards

- Precast Options
- Prestressed/Precast Options
- Precast Alternates

MISCELLANEOUS STANDARDS

Rev Date	Std Name	Description	File Name
10-24		Index Sht of Miscellaneous Standards	MS-Table-24.dgn

***Selected** MISCELLANEOUS DETAIL SHEETS*

Rev Date	Std Name	Description	File Name
10-24	CP	Prestressed Concrete Piling	MS-CP-24.dgn
10-24	PBC-P	Precast Conc Bent Cap Opt for Conc & Steel Piles	MS-PBC-P-24.dgn
10-24	PBC-RC	Precast Conc Bent Cap Opt for Round Columns	MS-PBC-RC-24.dgn
10-24	PCA-SUP	Precast Superstructure Alternates	MS-PCA-SUP-24.dgn
10-24	PCA-SUB	Precast Substructure Alternates	MS-PCA-SUB-24.dgn
10-24	PCP	Prestressed Concrete Panels	MS-PCP-24.dgn
10-24	PCP-FAB	Prestressed Concrete Panel Fabrication Details	MS-PCP-FAB-24.dgn
10-24	PCSP	Prestressed Concrete Sheet Piling	MS-PCSP-24.dgn
10-24	PMDF	Permanent Metal Deck Forms	MS-PMDF-24.dgn
10-24	PPBC-RC	Prestressed, Precast Bent Cap Option for Round Columns	MS-PPBC-RC-24.dgn

https://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridge-e.htm

Replacement Options and Alternatives

Bridge Standards

- Guide to Standard Drawings
- Adjacent Box Beams

Replacement Options and Alternatives

Bridge Standards

- Wide Flange I-Girders
- Exterior Girders or all Wide Flange
- Eliminates Overhang Forming
- Tangent Edges (no chorded edges)

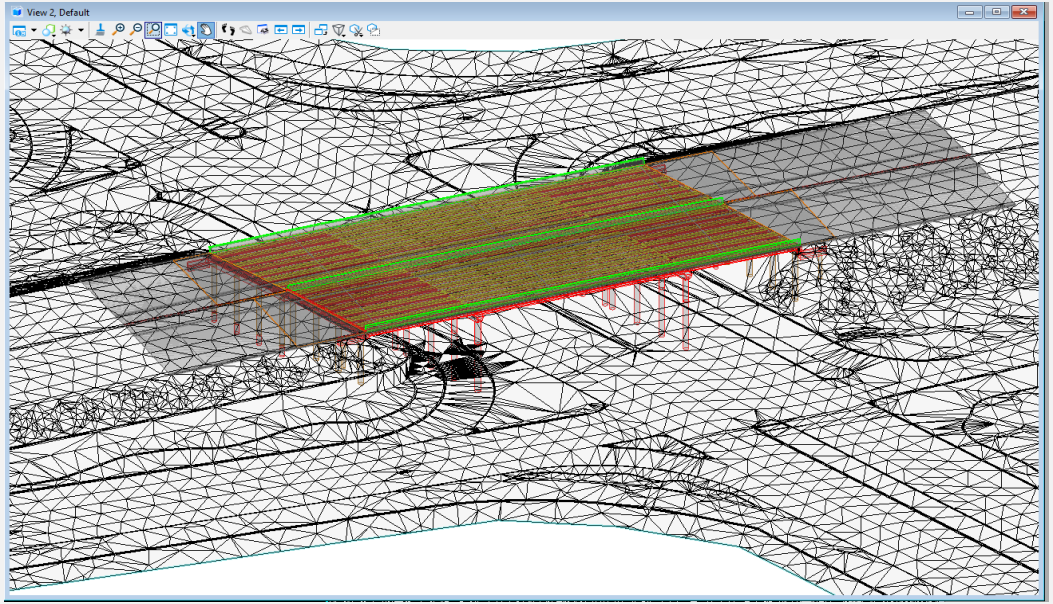
PRESTRESSED CONCRETE I-GIRDERS			
Rev Date	**Std Name**	**Description**	**File Name**
11-24		Index sht of Prestr I-Girder Standards	PDF IG-Table-24.dgn
		PRESTRESSED CONCRETE I-GIRDER DETAILS	
Rev Date	**Std Name**	**Description**	**File Name**
11-24	IGCS	Continuous Slab Details	PDF IG-IGCS-24.dgn
03-23	IGD	Prestressed Concrete I-Girder Details	PDF IG-IGD-23.dgn
08-17	IGEB	Elastomeric Bearing & Girder End Details	PDF IG-IGEB-17.dgn
11-24	IGFRP	GFRP Slab Top Mat Reinforcement	PDF IG-IGFRP-24.dgn
11-24	IGMS	Miscellaneous Slab Details	PDF IG-IGMS-24.dgn
03-22	IGND	Prestressed I-Girder Non-Standard Designs	PDF IG-IGND-22.dgn
08-17	IGSK	Shear Key Details for I-Girders	PDF IG-IGSK-17.dgn
11-24	IGTS	Thickened Slab End Details	PDF IG-IGTS-24.dgn
08-17	MEBR(C)	Minimum Erection & Bracing Requirements	PDF IG-MEBR(C)-17.dgn
07-24	WF-IGD	Prestressed Concrete Wide Flange I-Girder Details	PDF IG-WF-IGD-24.dgn
07-24	WF-IGND	Prestressed Concrete Wide Flange I-Girder Designs	PDF IG-WF-IGND-24.dgn

https://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridge-e.htm

Replacement Options and Alternatives

Prestressed/Precast Elements being considered for S LP 289 Bridge Replacement

- Abutments
- Columns
- Bents
- Wingwalls
- Superstructure
- Approach Slab



Replacement Options and Alternatives

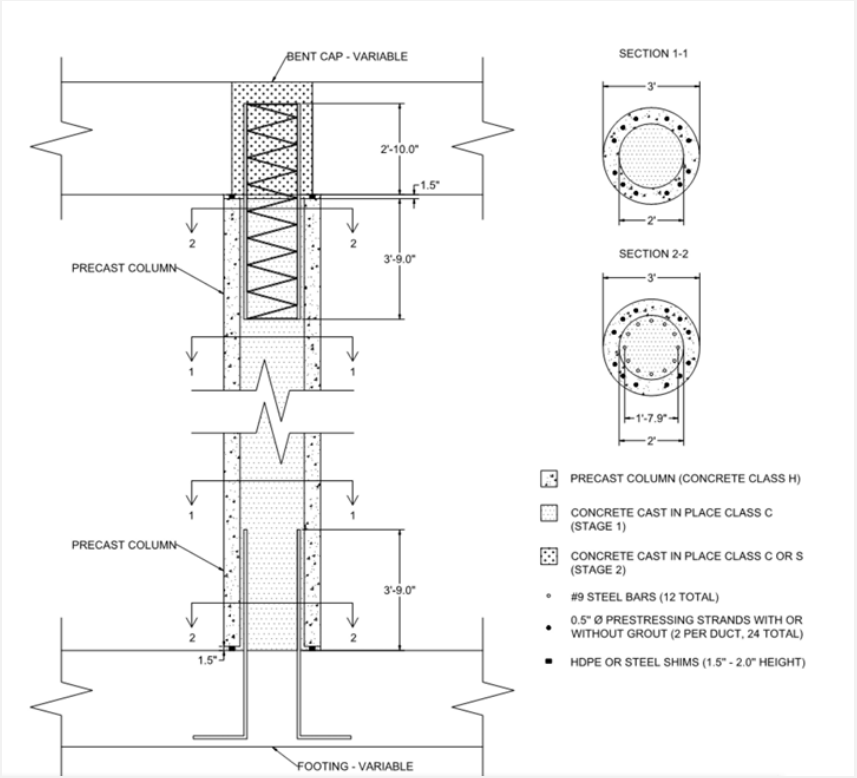
Precast Abutments

- Custom Design

Replacement Options and Alternatives

Prestressed Hollow Columns

- TxDOT Research Project 0-7089 (2024)
- Dead load: Shell
- Live load: Core
- Drilled Shaft Connections



Replacement Options and Alternatives

Bent Cap

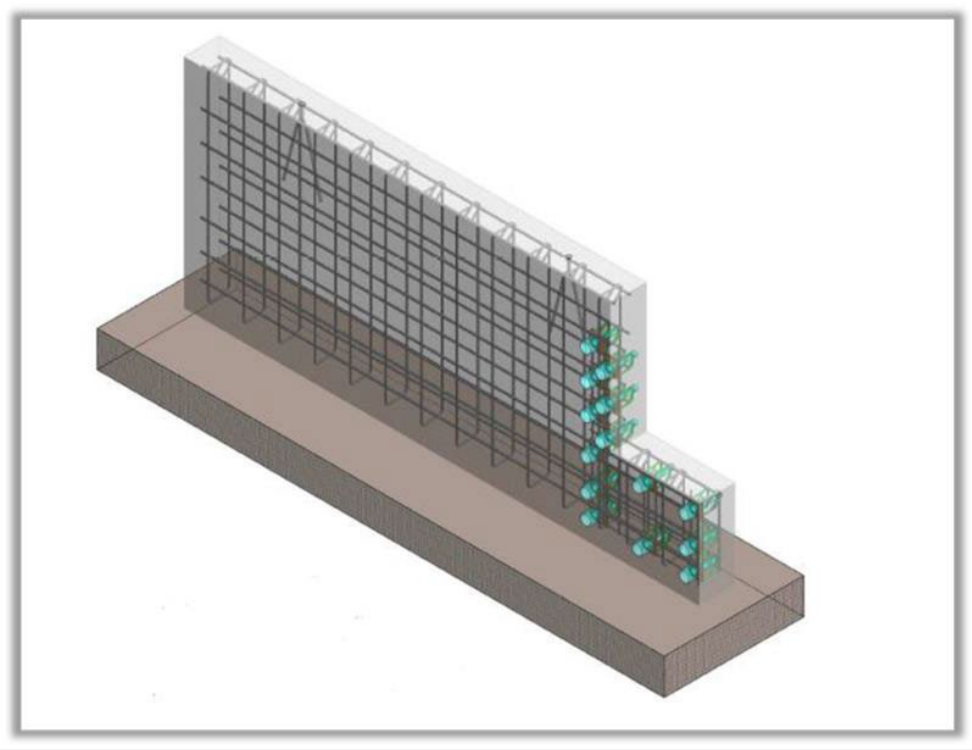
TxDOT Standards

- PBC-P
- PBC-RC
- PPBC-RC

Replacement Options and Alternatives

Wing Walls

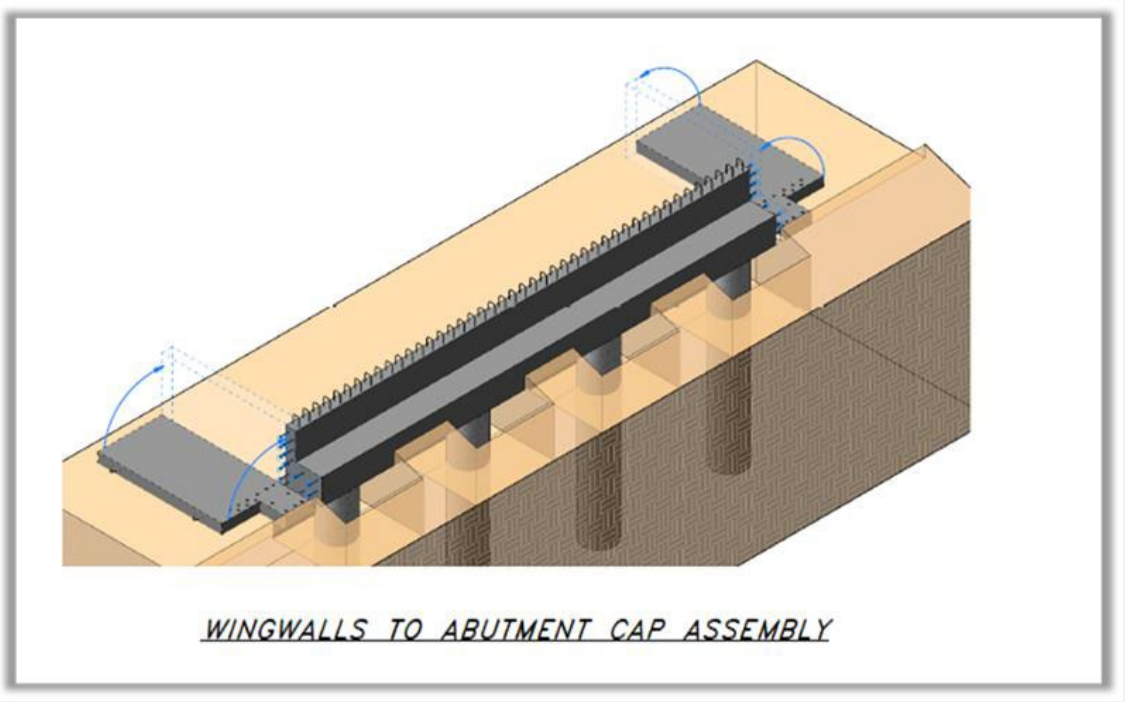
- Custom Design
- Integral to Abutment



Replacement Options and Alternatives

Wing Walls

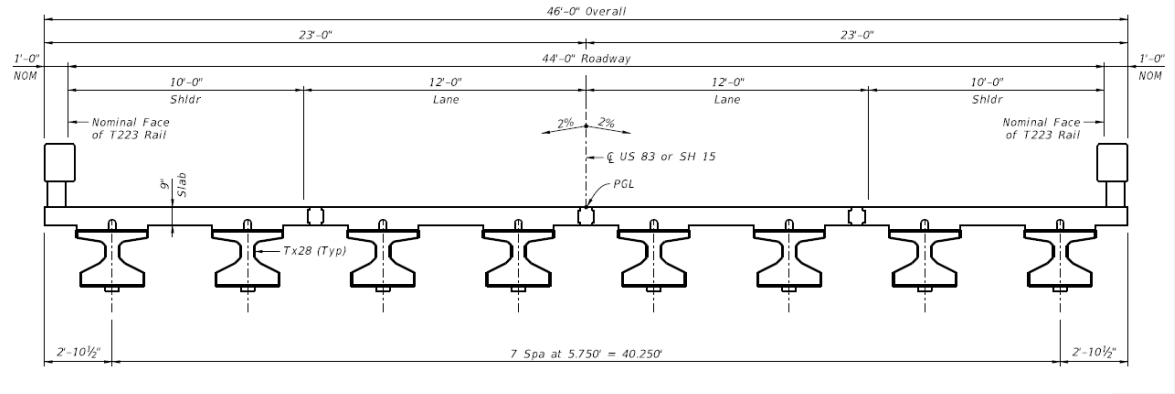
- Custom Design
- Drilled Shaft Founded

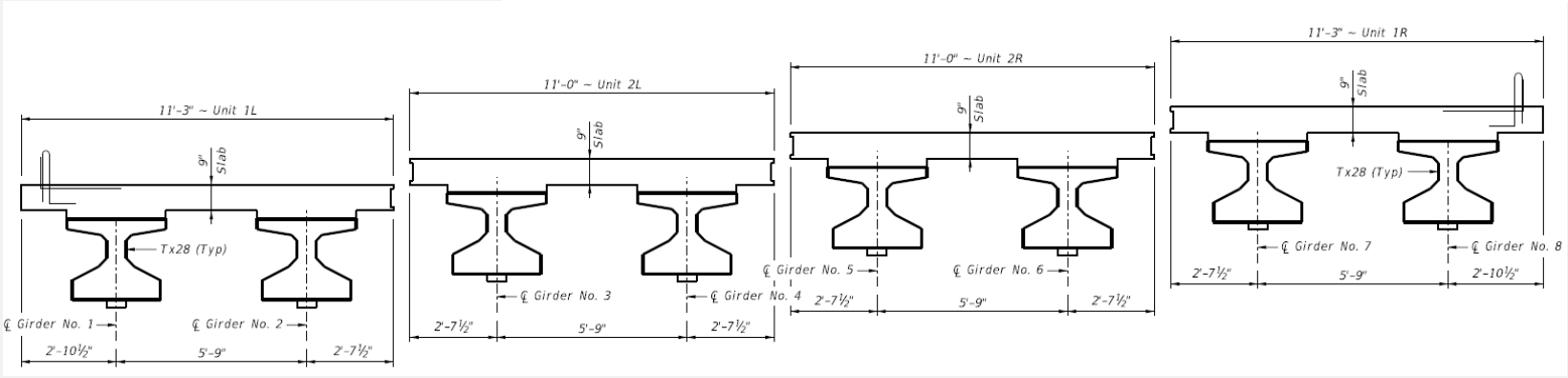


Replacement Options and Alternatives

Superstructure (PBU)

- Tx34 & Tx46 w/deck, Double Stemmed Sections
- SSTR w/ SSCB median barrier

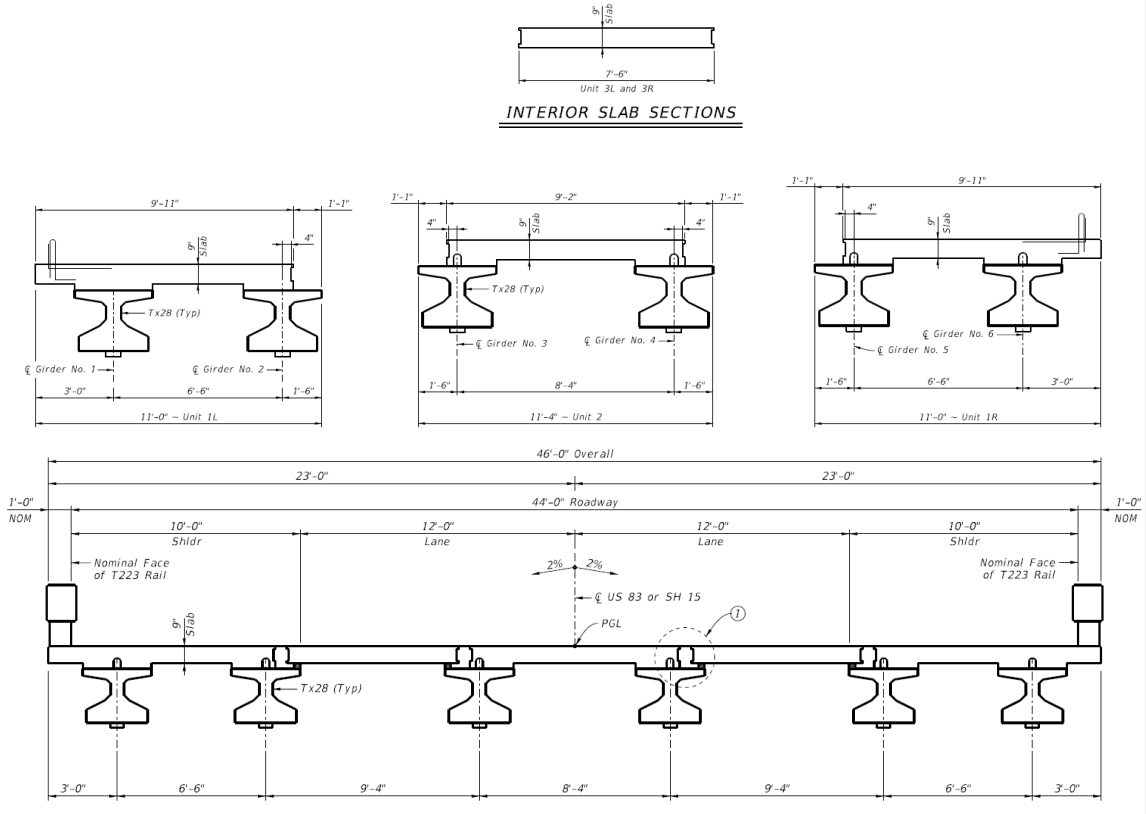




Replacement Options and Alternatives

Superstructure (PBU)

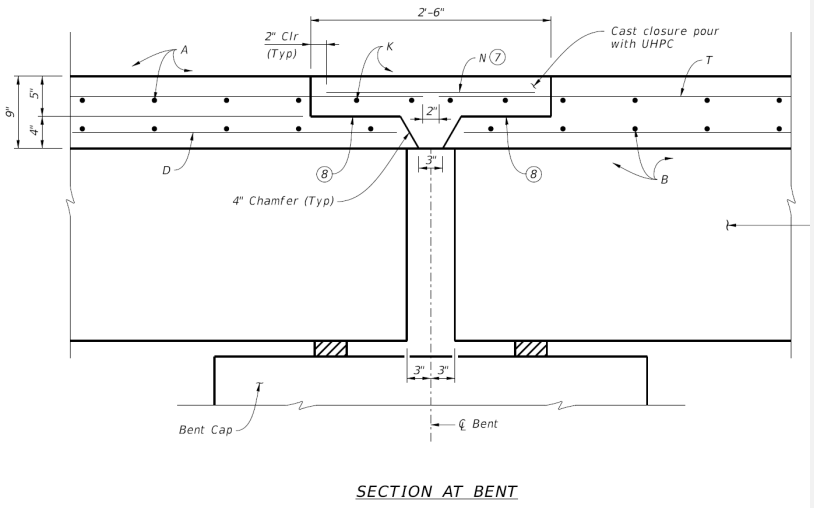
- Stemmed and Channel Sections
- Drop-in Panels



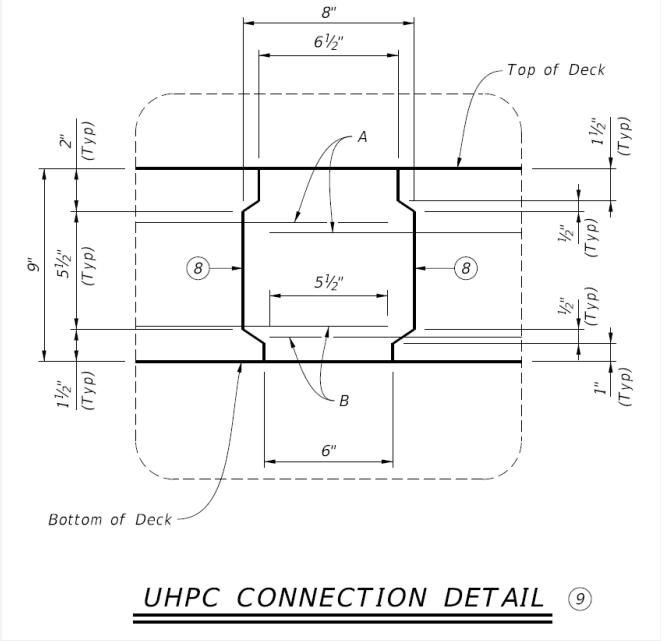
Replacement Options and Alternatives

Superstructure (PBU)

- Longitudinal and Transverse Closure Pours (UHPC)



SECTION AT BENT

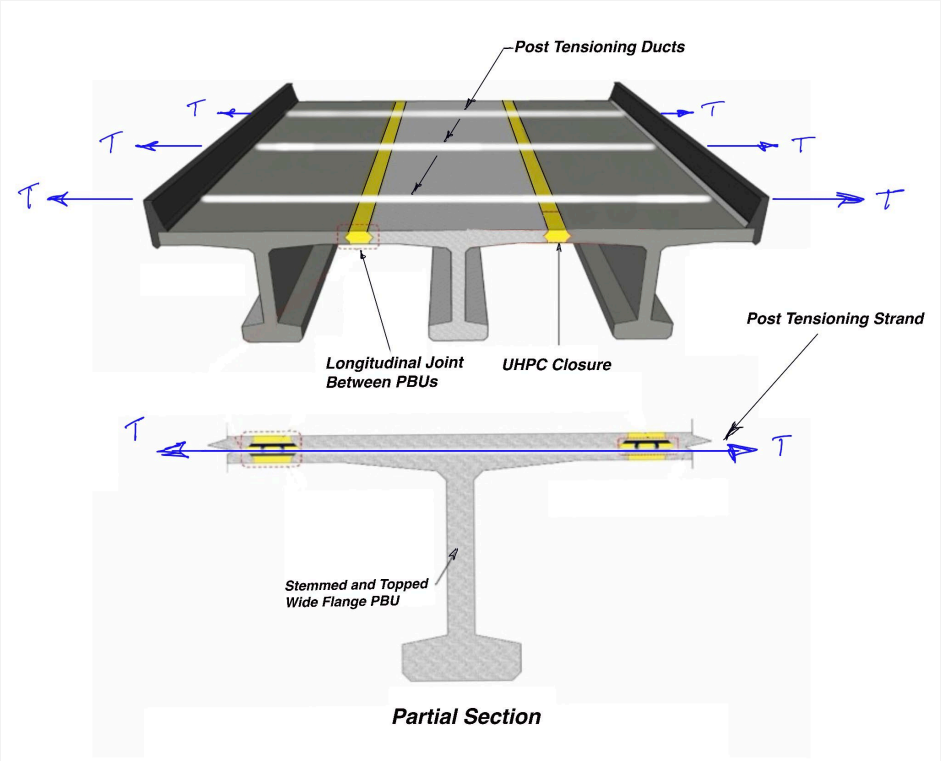


UHPC CONNECTION DETAIL 9

Replacement Options and Alternatives

Superstructure (PBU)

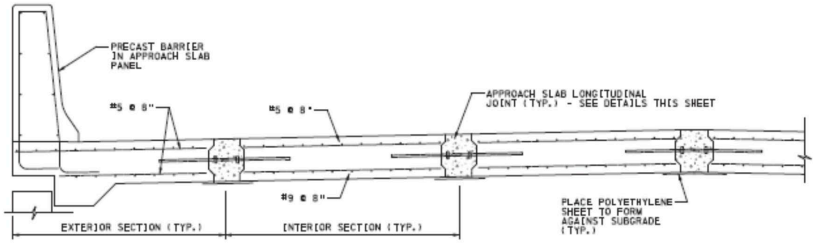
- Wide Flange
- Location of Longitudinal Joint



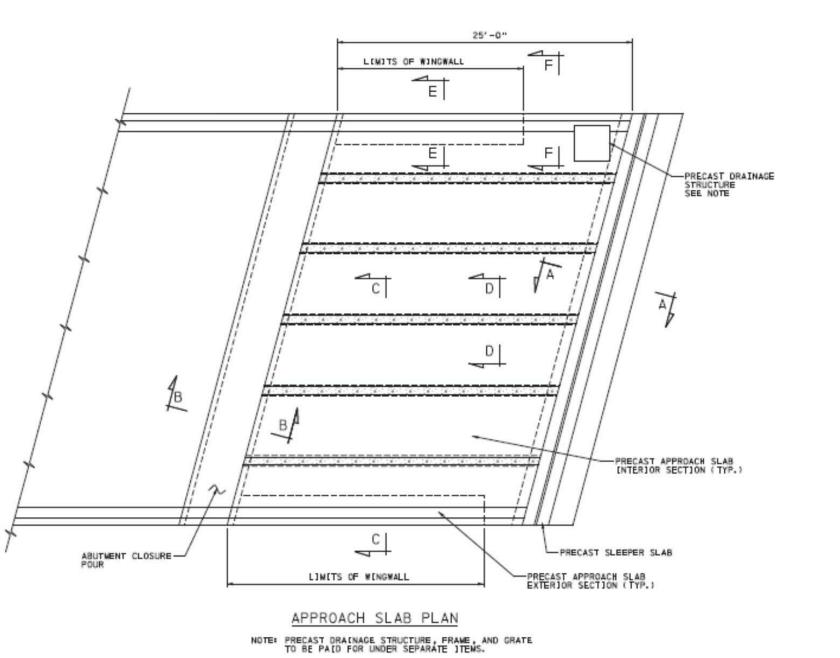
Replacement Options and Alternatives

Approach Slab

SSTR in Panel



SECTION C-C: TYPICAL APPROACH SLAB



APPROACH SLAB PLAN

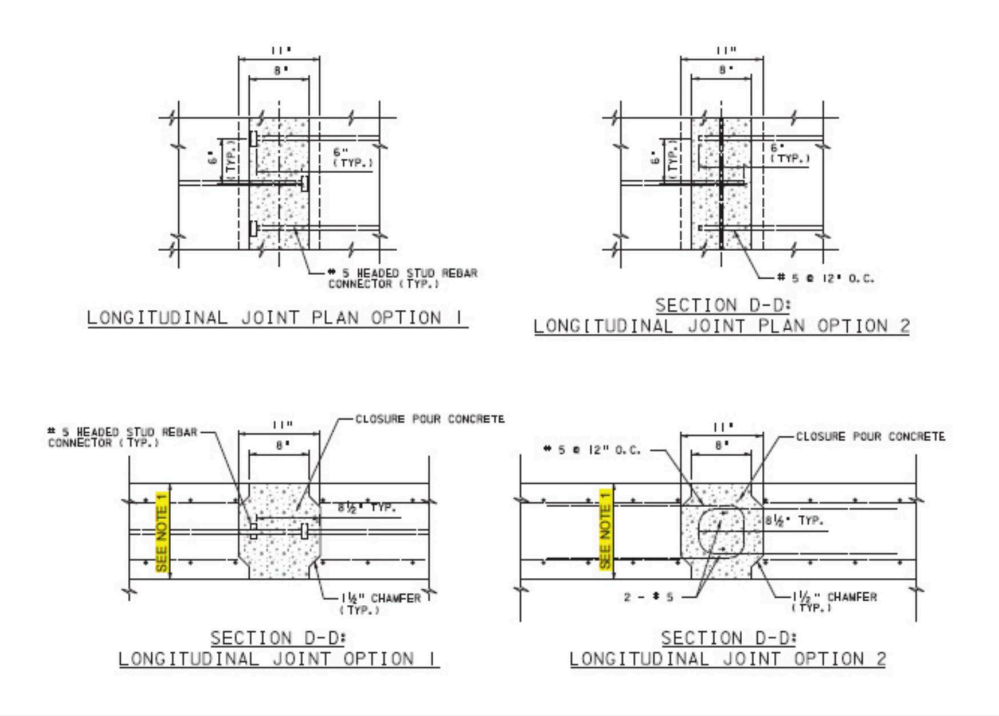
NOTE: PRECAST DRAINAGE STRUCTURE, FRAME, AND GRATE TO BE PAID FOR UNDER SEPARATE ITEMS.

Source: PennDOT

Replacement Options and Alternatives

Approach Slab

Longitudinal and Transverse Closure Pours (UHPC)



Source: PennDOT

Questions?

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