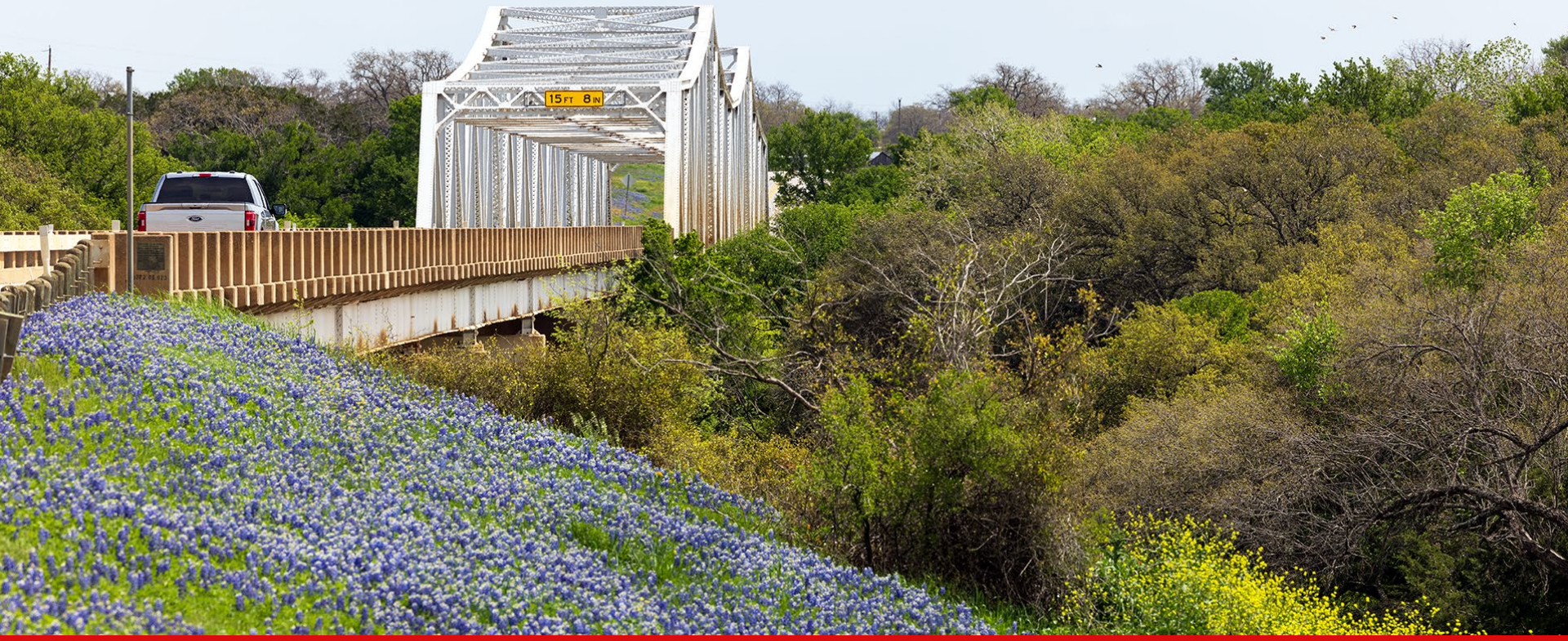
Design Directive Updates

Sara Watts, P.E.

Texas Department of Transportation

August 21, 2024



Bridge Design Manual Updates

Texas Department of Transportation

August 21, 2024

Bridge Design Manual *Upcoming* Updates

TxDOT Bridge Design Manual LRFD
http://onlinemanuals.txdot.gov/txdotmanuals/lrf/lrf.pdf

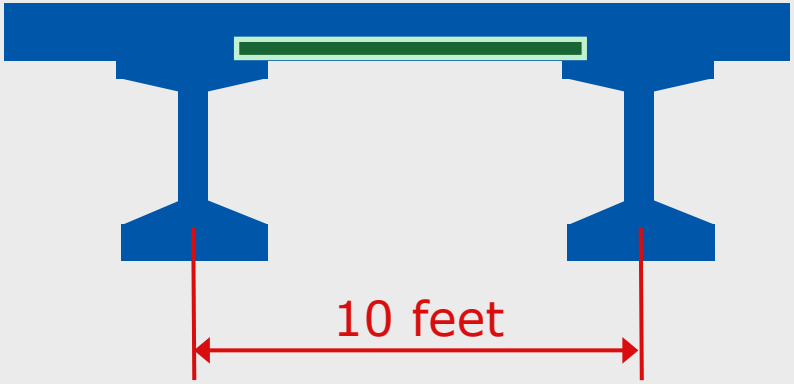
- Updates coming for end **Aug 2024**
  - Empirical Deck Design
  - Prefabricated Alternatives
  - Steel Straddle Caps

Empirical Deck Design

- Chapter 3 — Superstructure Design
  - Section 2
    - **Concrete Deck Slabs** on I-Girders, U-Beams, Spread Box Beams, Spread Slab Beams, Steel Plate Girders, and Steel Tub Girders

Empirical Deck Design

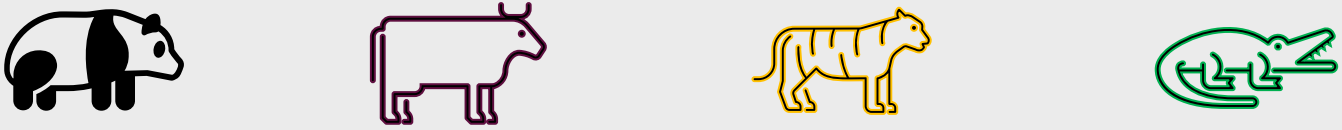
- For I girders and steel I beam/girders maximum beam spacing is **10 feet**.
- For spread box beams, U beams, and steel tub girders maximum of **10 feet** spacing from exterior web.



Empirical Deck Design

Remember your 10-foot beam spacing limit

- Alligators are dangerous



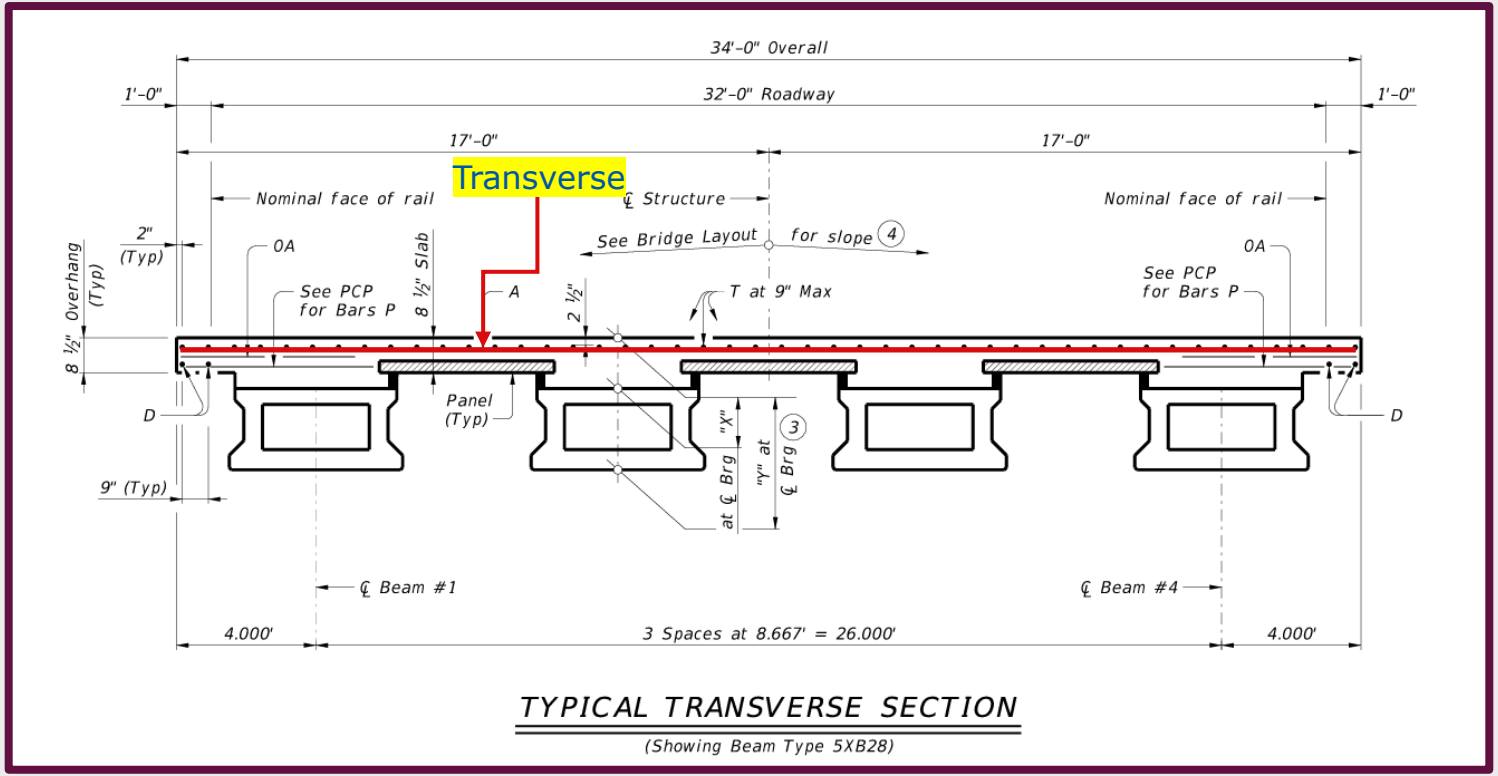
6 ft 8 ft 10 ft 10+ ft

Empirical Deck Design

Top mat reinforcement in No. 4 bars at 9 in maximum spacing (0.27 sq in./ft.) in both transverse and longitudinal direction. Place transverse bars closest to the top slab surface. In the overhangs, place No. 5 bars extending 2 ft. minimum past fascia girder web centerline between each transverse No. 4 bar.

- “Flipping the mat”
- Changes the direction of the crack

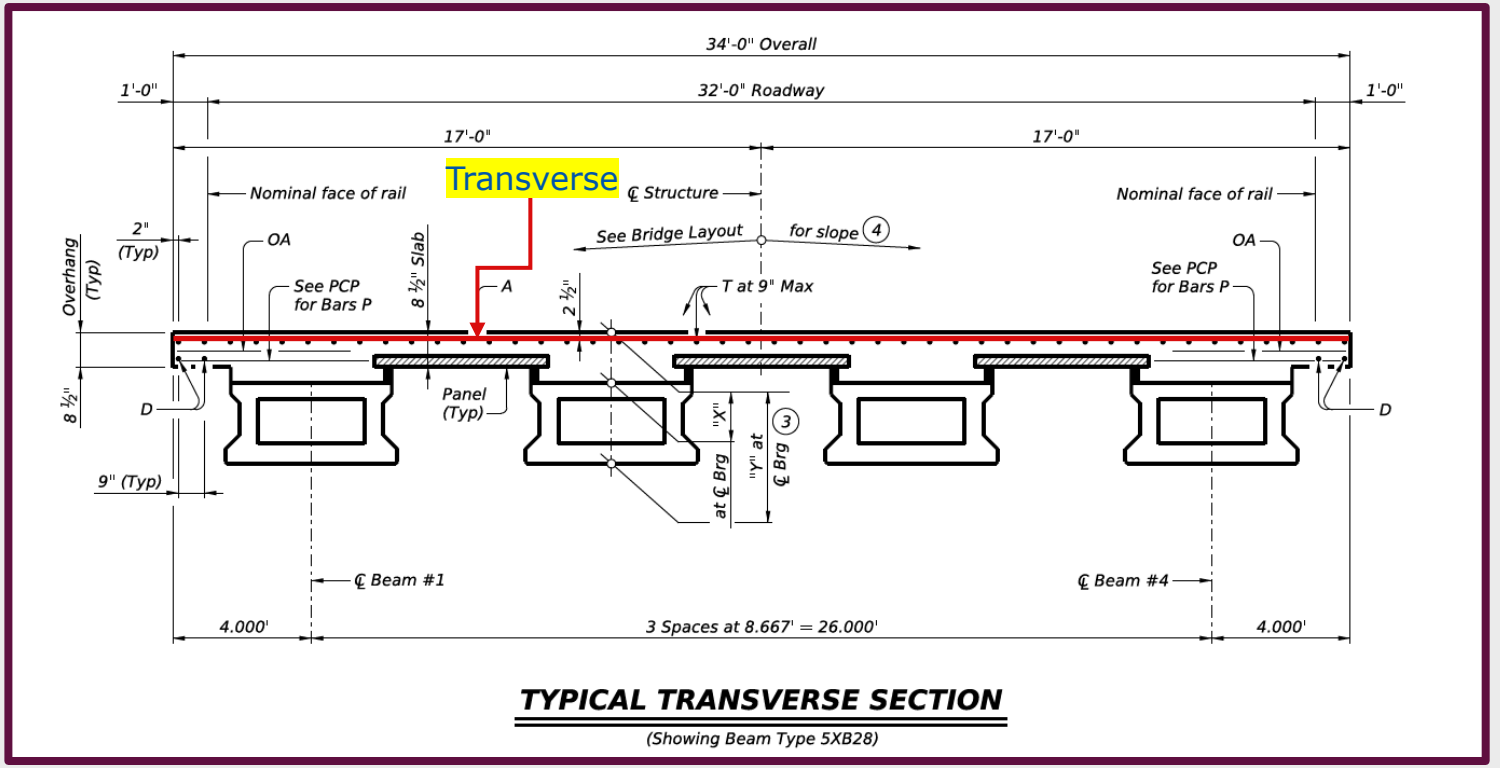
Empirical Deck Design



TYPICAL TRANSVERSE SECTION

(Showing Beam Type 5XB28)

Empirical Deck Design



TYPICAL TRANSVERSE SECTION

(Showing Beam Type 5XB28)

Empirical Deck Design

- Updates to standards coming
  - TxGirder standards (~November)
  - X Beam standards (~November)
  - The Misc standards {PCP, SGMD, SGTS, etc} (~September)

Precast Alternates

- Chapter 3 — Superstructure Design
  - Section 18
    - Prefabricated Superstructure Alternatives
- Chapter 4 — Substructure Design
  - Section 11
    - Precast and Prefabricated Substructure Alternatives

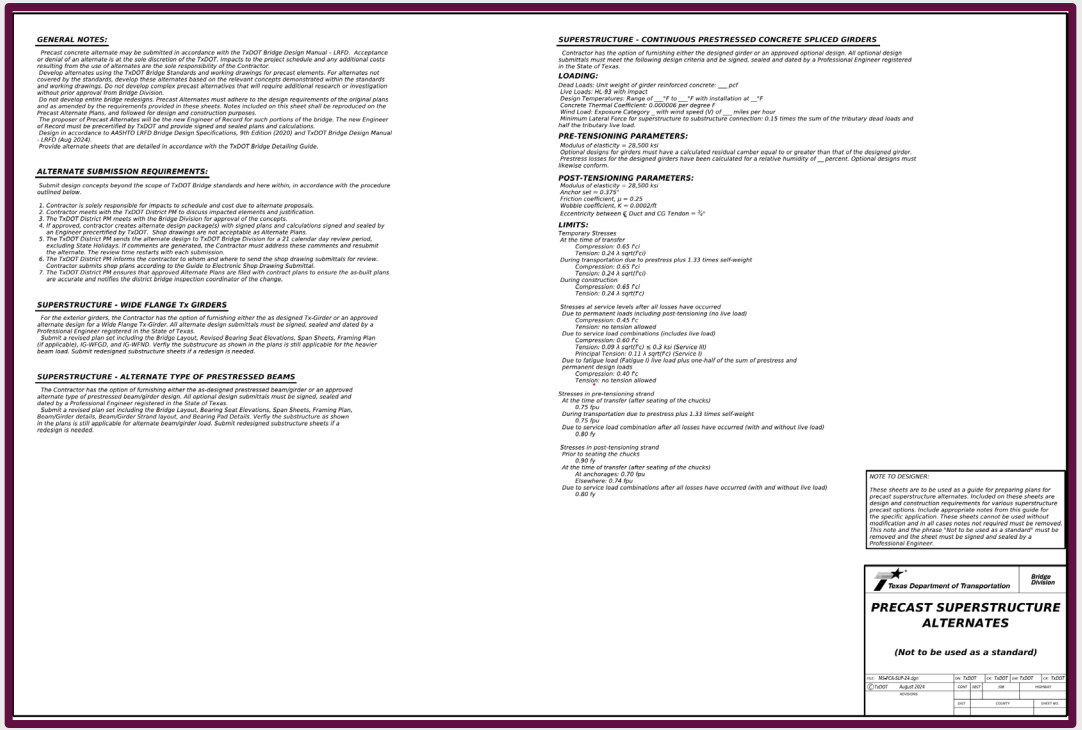
Precast Alternates

Removing current SOP and replacing with a working drawing

- This working drawing must be modified on project-by-project basis, then signed and seal
- Do not develop complex precast alternatives

Precast Alternates

- Will be posted under the Misc standards
- PCA-SUP
- PCA-SUB



GENERAL NOTES:

Precast concrete alternate may be submitted in accordance with the TxDOT Bridge Design Manual - LRFD. Acceptance or denial of an alternate is at the sole discretion of the TxDOT. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.
Develop alternates using the TxDOT Bridge Standards and working drawings for precast elements. For alternates not covered by the standards, develop these alternates based on the relevant concepts demonstrated within the standards and working drawings. Do not develop complex precast alternatives that will require additional research or investigation without prior approval from Bridge Division.
Do not develop entire bridge redesigns. Precast Alternates must adhere to the design requirements of the original plans and as amended by the requirements provided in these sheets. Notes included on this sheet shall be reproduced on the Precast Alternate Plans, and followed for design and construction purposes.
The proposer of Precast Alternates will be the new Engineer of Record for such portions of the bridge. The new Engineer of Record must be precertified by TxDOT and provide signed and sealed plans and calculations.
Design in accordance to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual - LRFD (Aug 2024).
Provide alternate sheets that are detailed in accordance with the TxDOT Bridge Detailing Guide.

ALTERNATE SUBMISSION REQUIREMENTS:

Submit design concepts beyond the scope of TxDOT Bridge standards and here within, in accordance with the procedure outlined below.

1. Contractor is solely responsible for impacts to schedule and cost due to alternate proposals.
2. Contractor meets with the TxDOT District PM to discuss impacted elements and justification.
3. The TxDOT District PM meets with the Bridge Division for approval of the concepts.
4. If approved, contractor creates alternate design package(s) with signed plans and calculations signed and sealed by an Engineer precertified by TxDOT. Shop drawings are not acceptable as Alternate Plans.
5. The TxDOT District PM sends the alternate design to TxDOT Bridge Division for a 21 calendar day review period, excluding State Holidays. If comments are generated, the Contractor must address these comments and resubmit the alternate. The review time restarts with each submission.
6. The TxDOT District PM informs the contractor to whom and where to send the shop drawing submittals for review. Contractor submits shop plans according to the Guide to Electronic Shop Drawing Submittal.
7. The TxDOT District PM ensures that approved Alternate Plans are filed with contract plans to ensure the as-built plans are accurate and notifies the district bridge inspection coordinator of the change.

SUPERSTRUCTURE - WIDE FLANGE Tx GIRDERS

For the exterior girders, the Contractor has the option of furnishing either the as designed Tx-Girder or an approved alternate design for a Wide Flange Tx-Girder. All alternate design submittals must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.
Submit a revised plan set including the Bridge Layout, Revised Bearing Seat Elevations, Span Sheets, Framing Plan (if applicable), IG-WFGD, and IG-WFNO. Verify the substructure as shown in the plans is still applicable for the heavier beam load. Submit redesigned substructure sheets if a redesign is needed.

SUPERSTRUCTURE - ALTERNATE TYPE OF PRESTRESSED BEAMS

The Contractor has the option of furnishing either the as-designed prestressed beam/girder or an approved alternate type of prestressed beam/girder design. All optional design submittals must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.
Submit a revised plan set including the Bridge Layout, Bearing Seat Elevations, Span Sheets, Framing Plan, Beam/Girder details, Beam/Girder Strand layout, and Bearing Pad Details. Verify the substructure as shown in the plans is still applicable for alternate beam/girder load. Submit redesigned substructure sheets if a redesign is needed.

SUPERSTRUCTURE - CONTINUOUS PRESTRESSED CONCRETE SPLICED GIRDERS

Contractor has the option of furnishing either the designed girder or an approved optional design. All optional design submittals must meet the following design criteria and be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

LOADING:

Dead Loads: Unit weight of girder reinforced concrete: ___ pcf
Live Loads: HL-93 with Impact
Design Temperatures: Range of ___°F to ___°F with installation at ___°F
Concrete Thermal Coefficient: 0.000006 per degree F
Wind Load: Exposure Category _ with wind speed (V) of ___ miles per hour
Minimum Lateral Force for superstructure to substructure connection: 0.15 times the sum of the tributary dead loads and half the tributary live load.

PRE-TENSIONING PARAMETERS:

Modulus of elasticity = 28,500 ksi
Optional designs for girders must have a calculated residual camber equal to or greater than that of the designed girder.
Prestress losses for the designed girders have been calculated for a relative humidity of __ percent. Optional designs must likewise conform.

POST-TENSIONING PARAMETERS:

Modulus of elasticity = 28,500 ksi
Anchor set = 0.375"
Friction coefficient, μ = 0.25
Wobble coefficient, K = 0.0002/ft
Eccentricity between ℄ Duct and CG Tendon = ¾"

LIMITS:

Temporary Stresses
At the time of transfer
Compression: 0.65 f'ci
Tension: 0.24 λ sqrt(f'ci)
During transportation due to prestress plus 1.33 times self-weight
Compression: 0.65 f'ci
Tension: 0.24 λ sqrt(f'ci)
During construction
Compression: 0.65 f'ci
Tension: 0.24 λ sqrt(f'ci)

Stresses at service levels after all losses have occurred
Due to permanent loads including post-tensioning (no live load)
Compression: 0.45 f'c
Tension: no tension allowed
Due to service load combinations (includes live load)
Compression: 0.60 f'c
Principal Tension: 0.24 λ sqrt(f'c) ≤ 0.3 ksi (Service III)
Principal Tension: 0.11 λ sqrt(f'c) (Service I)
Due to fatigue load (Fatigue I) live load plus one-half of the sum of prestress and permanent design loads
Compression: 0.40 f'c
Tension: no tension allowed

Stresses in pre-tensioning strand
At the time of transfer (after seating of the chucks)
0.75 fpu
During transportation due to prestress plus 1.33 times self-weight
0.75 fpu
Due to service load combination after all losses have occurred (with and without live load)
0.80 fy

Stresses in post-tensioning strand
Prior to seating the chucks
0.90 fy
At the time of transfer (after seating of the chucks)
At anchorages: 0.70 fpu
Elsewhere: 0.74 fpu
Due to service load combinations after all losses have occurred (with and without live load)
0.80 fy

NOTE TO DESIGNER:

These sheets are to be used as a guide for preparing plans for precast superstructure alternates. Included on these sheets are design and construction requirements for various superstructure precast options. Include appropriate notes from this guide for the specific application. These sheets cannot be used without modification and in all cases notes not required must be removed. This note and the phrase "Not to be used as a standard" must be removed and the sheet must be signed and sealed by a Professional Engineer.

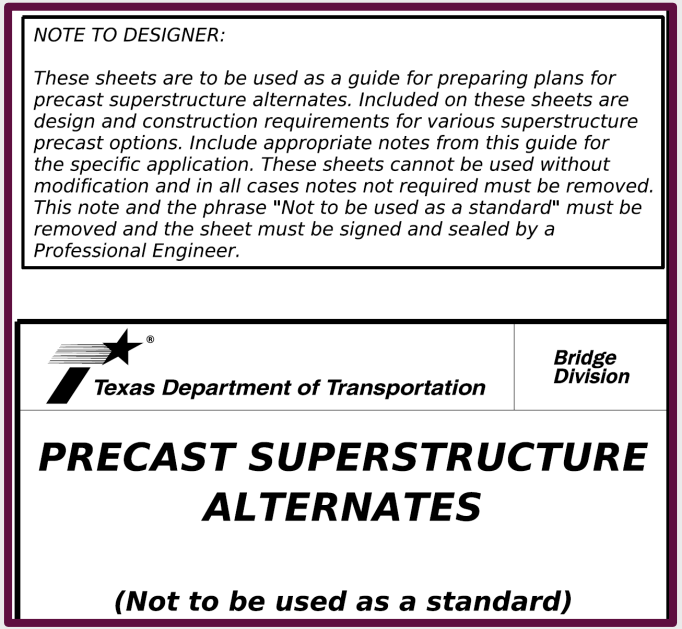
Texas Department of Transportation — Bridge Division

PRECAST SUPERSTRUCTURE ALTERNATES

(Not to be used as a standard)

FILE: MSAOG-SUP-24.dgn — DW: TxDOT — CK: TxDOT — DW: TxDOT — CK: TxDOT
©TxDOT August 2024 — CONT — SECT — JOB — HIGHWAY
REVISIONS — DIST — COUNTY — SHEET NO.

Precast Alternates



NOTE TO DESIGNER:

These sheets are to be used as a guide for preparing plans for precast superstructure alternates. Included on these sheets are design and construction requirements for various superstructure precast options. Include appropriate notes from this guide for the specific application. These sheets cannot be used without modification and in all cases notes not required must be removed. This note and the phrase "Not to be used as a standard" must be removed and the sheet must be signed and sealed by a Professional Engineer.

Texas Department of Transportation | Bridge Division

PRECAST SUPERSTRUCTURE ALTERNATES

(Not to be used as a standard)

NOTE TO DESIGNER:

These sheets are to be used as a guide for preparing plans for precast substructure alternates. Included on these sheets are design and construction requirements for various substructure precast options. Include appropriate notes from this guide for the specific application. These sheets cannot be used without modification and in all cases notes not required must be removed. This note and the phrase "Not to be used as a standard" must be removed and the sheet must be signed and sealed by a Professional Engineer.

Texas Department of Transportation | Bridge Division

PRECAST SUBSTRUCTURE ALTERNATES

(Not to be used as a standard)

Steel Straddle Bent Caps

- Chapter 4 — Substructure Design
  - Section 6
    - Steel Straddle Bent Caps

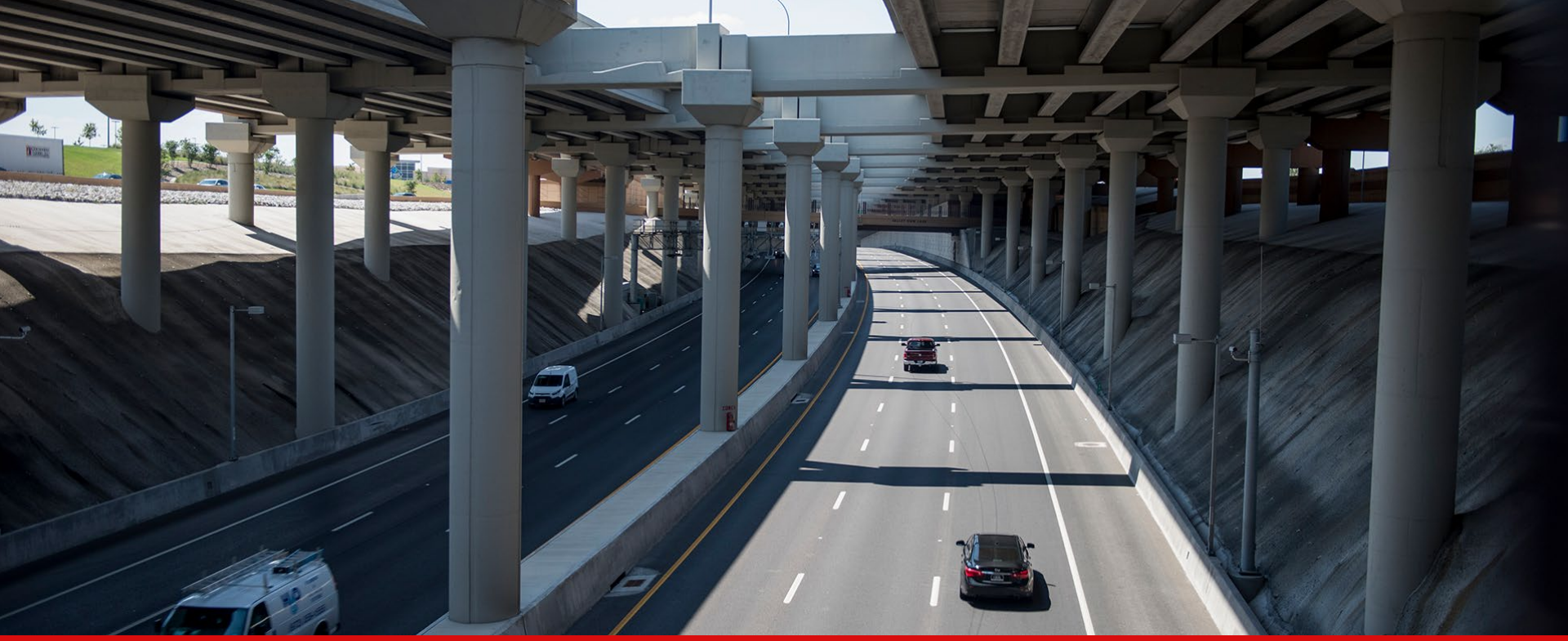
Steel Straddle Bent Caps

Updating some of the wording in manual, basic process is still the same

- Redundancy -> Internal Redundancy
- FHWA approval

Elastomeric Bearings

- Chapter 5 — Other Designs
  - Section 2
    - Steel-Reinforced Elastomeric Bearings for Pretensioned Concrete Beams
      - Use load factor for uniform temperature (TU) of 1.0



Standards Updates

Texas Department of Transportation

August 21, 2024

Want to know what changed?

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

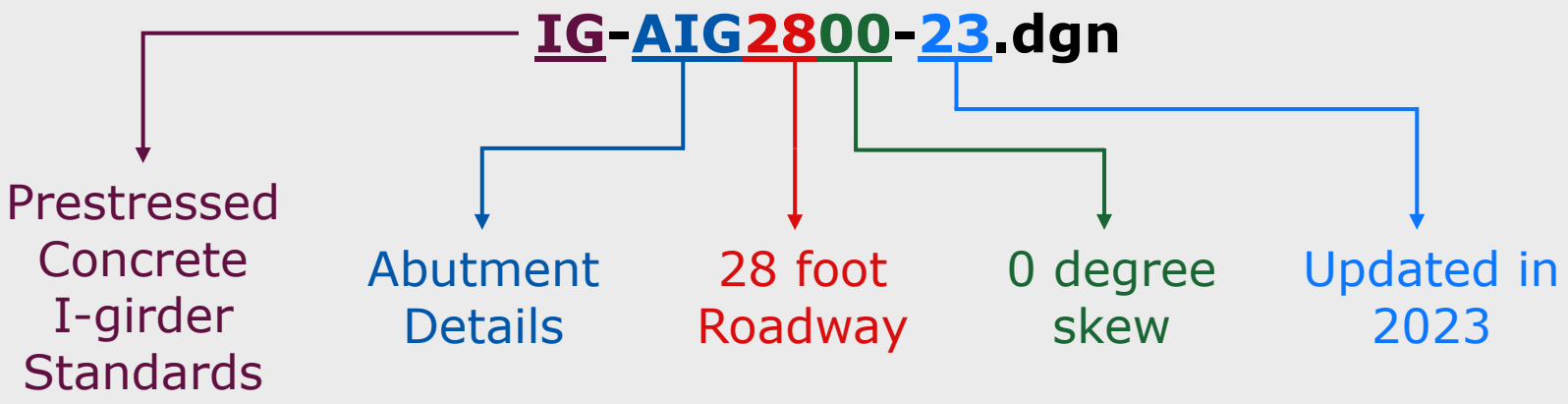
Memorandums of Issued/Revised Standards
From September 2000 to Present

Rev Date	Subject	File Name
08/06/2024	New Wide Flange I-Girder Standards	memo83.pdf
06/18/2024	New and Revised Culvert and Drainage Standards	memo82.pdf
06/18/2024	New and Revised Bridge Railing Standards	memo81.pdf
06/18/2024	New Wildlife Accommodation Standards and Working Drawings	memo80.pdf
05/29/2024	New Foundation Note sheet and Foundation Load Sheets for Designers Information	memo79.pdf
02/23/2024	New and Revised Working Drawings	memo78.pdf
10/23/2023	Revised Prestressed Concrete I-Girder Standard Drawings	memor77.pdf
07/31/2023	All Standard Drawings Update for Sheet Models and File Names	memoi76.pdf
06/26/2023	Revised Culvert Standard Drawings	memoi75.pdf
04/17/2023	New OBM Templates	memoi74.pdf
03/09/2023	New and Revised Miscellaneous, Bridge Railing, Culvert, I-Girder and U-beam Standard Drawings	memoi73.pdf
01/18/2023	New and Revised Concrete I-Girder Standard Drawings	memoi72.pdf
08/23/2022	Revised Prestressed Concrete X Beam Standard Drawings	memor71.pdf
08/23/2022	Revised Retaining Wall Standard Drawings	memor70.pdf
08/08/2022	New Working Drawings	memoi69.pdf

Standard Drawing File Names

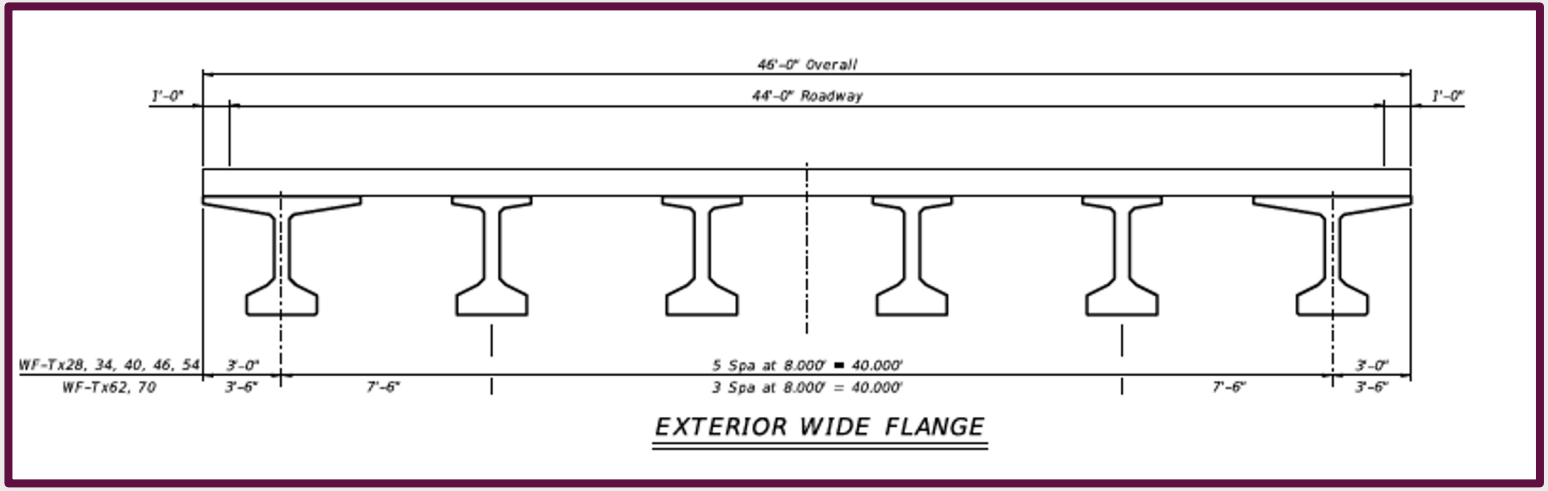
File names now represent standard type, standard name, and year of posting or most recent revision. Some names contain more information than others.

- For example, SSTR has a file name of RL-SSTR-19



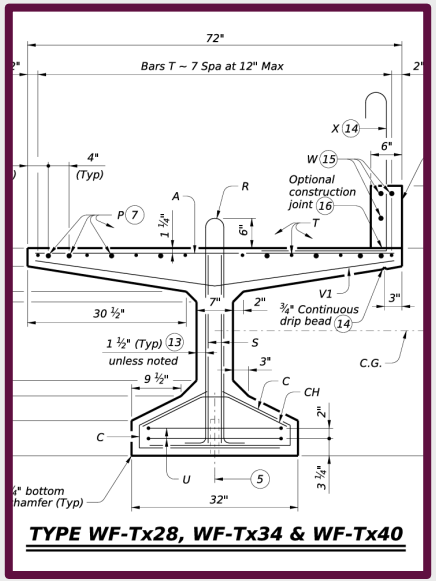
Wide Flanges

- The wide flange girder may be used as exterior girders (Exterior Wide Flange) or as all the girders (All Wide Flange). When used as exterior girder, the wide flange is place along the deck edge and replaces the traditional 3-foot overhang.

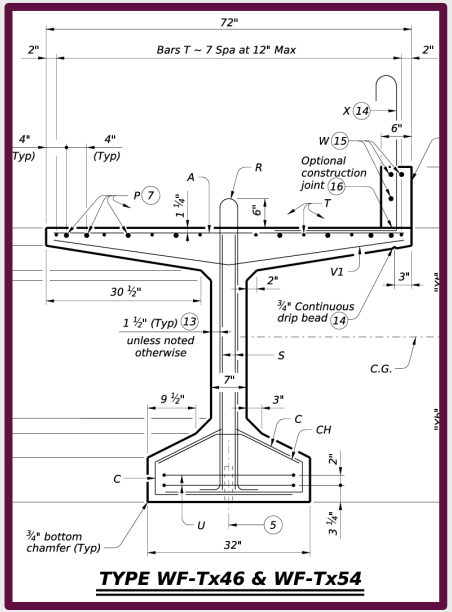


Wide Flanges

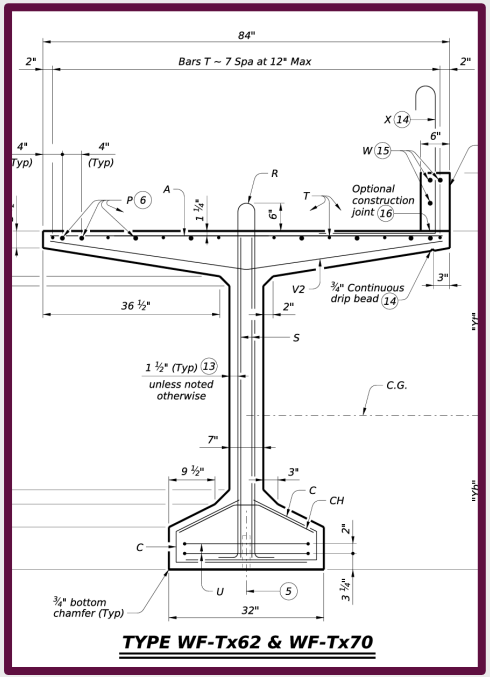
- Prestressed Concrete Wide Flange I-Girder Details (WF-IGD) standard provides the girder shapes and reinforcement details



TYPE WF-Tx28, WF-Tx34 & WF-Tx40



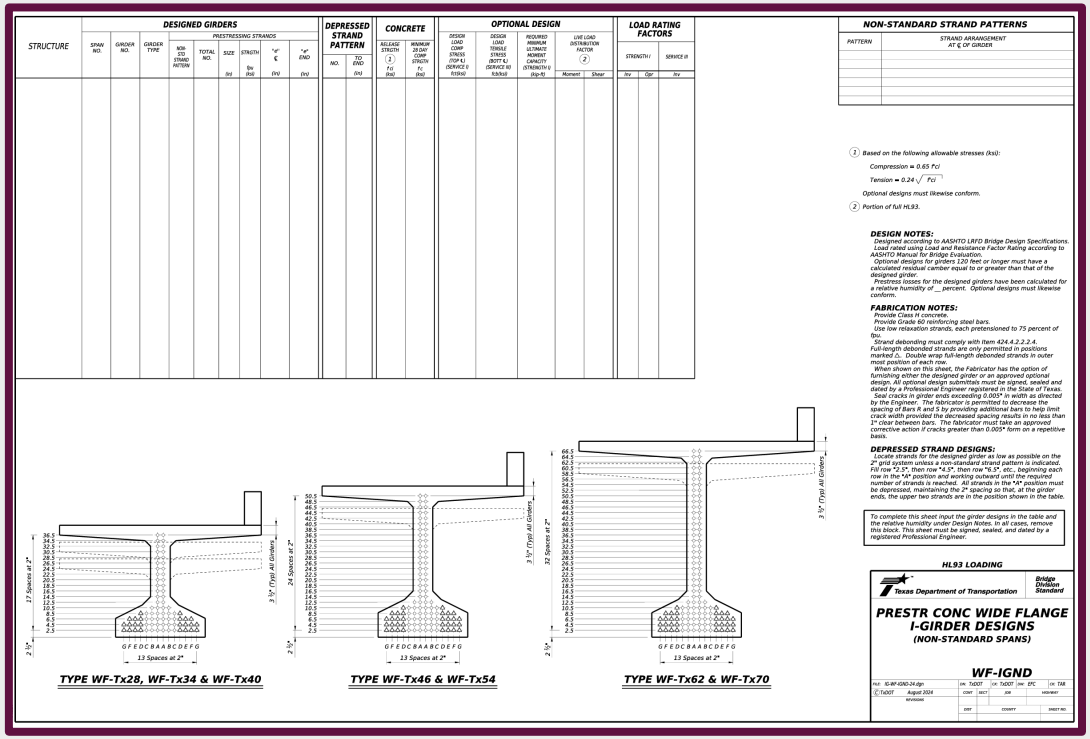
TYPE WF-Tx46 & WF-Tx54



TYPE WF-Tx62 & WF-Tx70

Wide Flanges

- Prestressed Concrete Wide Flange I-Girder Designs (WF-IGND) standard is to provide the strand pattern and optional design information. This sheet must be filled out, the block removed, and the sheet signed and sealed.



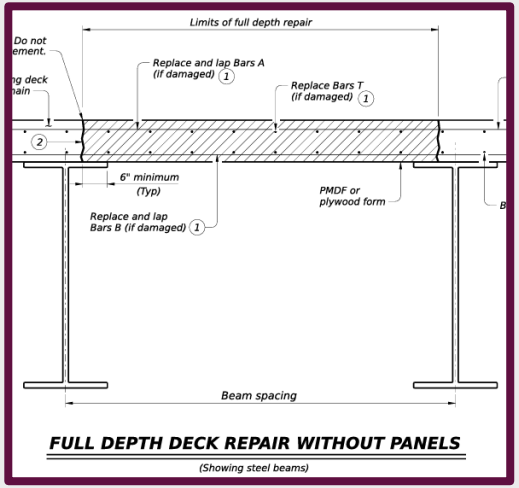
BridgeLink v8.0.6 (PGSUPER)

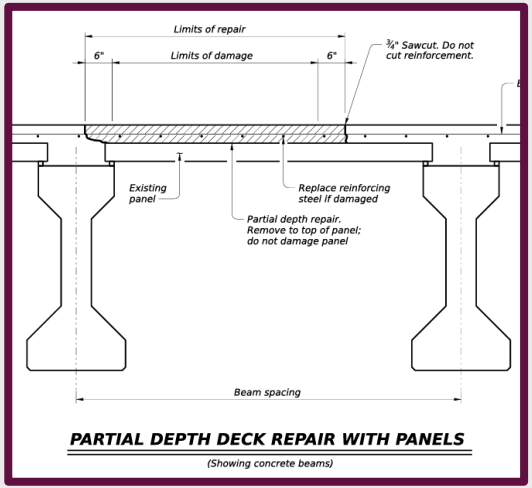
- New wide flange TxGirder shapes and templates are available in latest BridgeLink version
- https://www.txdot.gov/business/resources/design-tools-training/txdot-fhwa-engineering-software.html
- Bearing Seat Elevations are not part of Geometry Report in this version. Please go to the Details Report for this output.

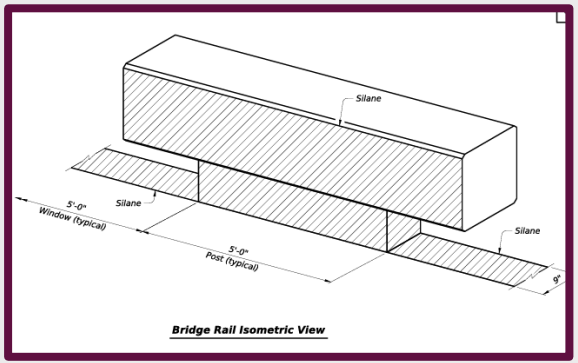
Working Drawings

New Working Drawings posted on Feb 2024

- Full Depth Deck Repair
- Partial Depth Deck Repair
- Waterproofing Details

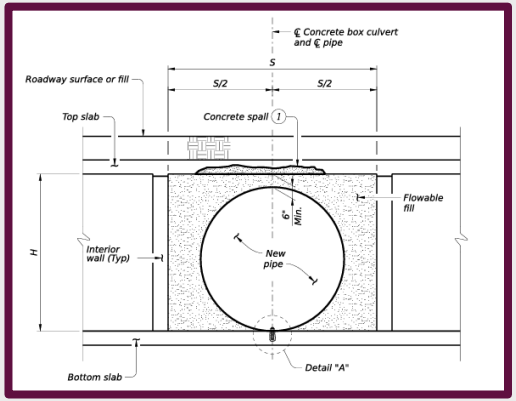


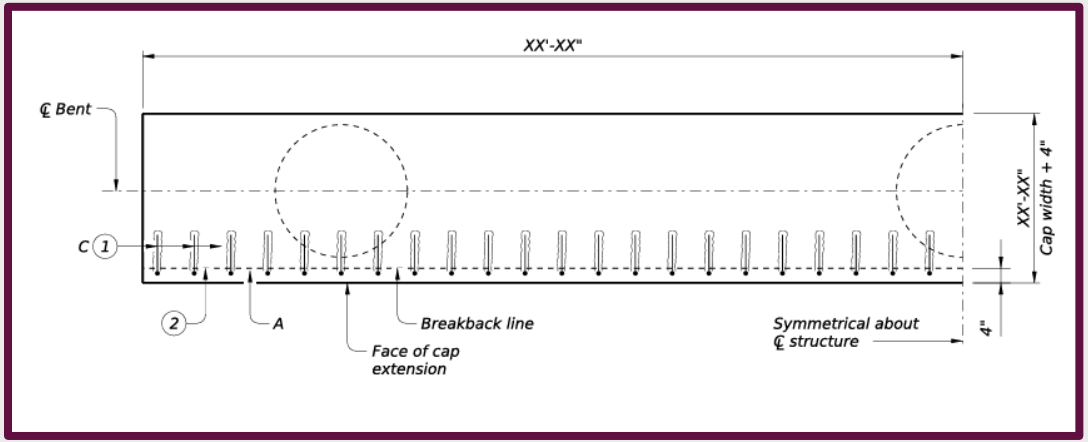


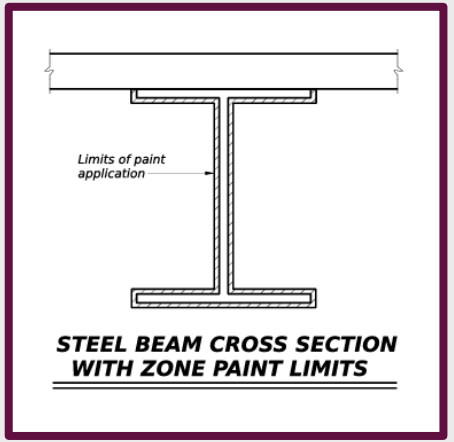


Working Drawings

- Zone Painting Details
- Bent Cap Repair Details
- Box Culvert Slip Lining Details

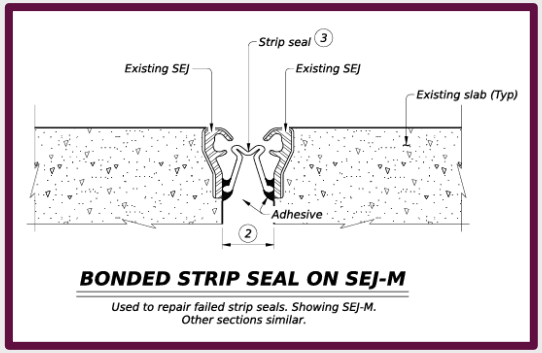


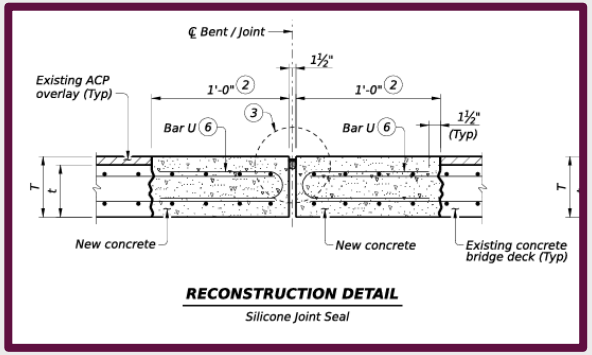


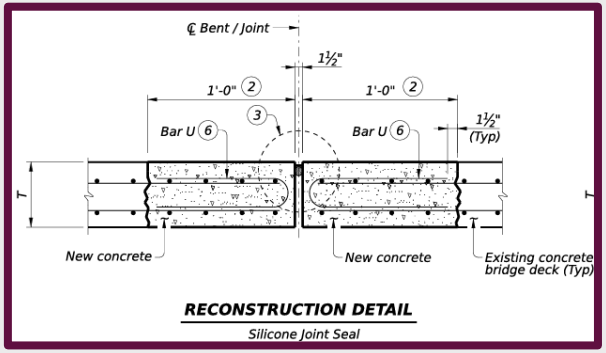


Working Drawings

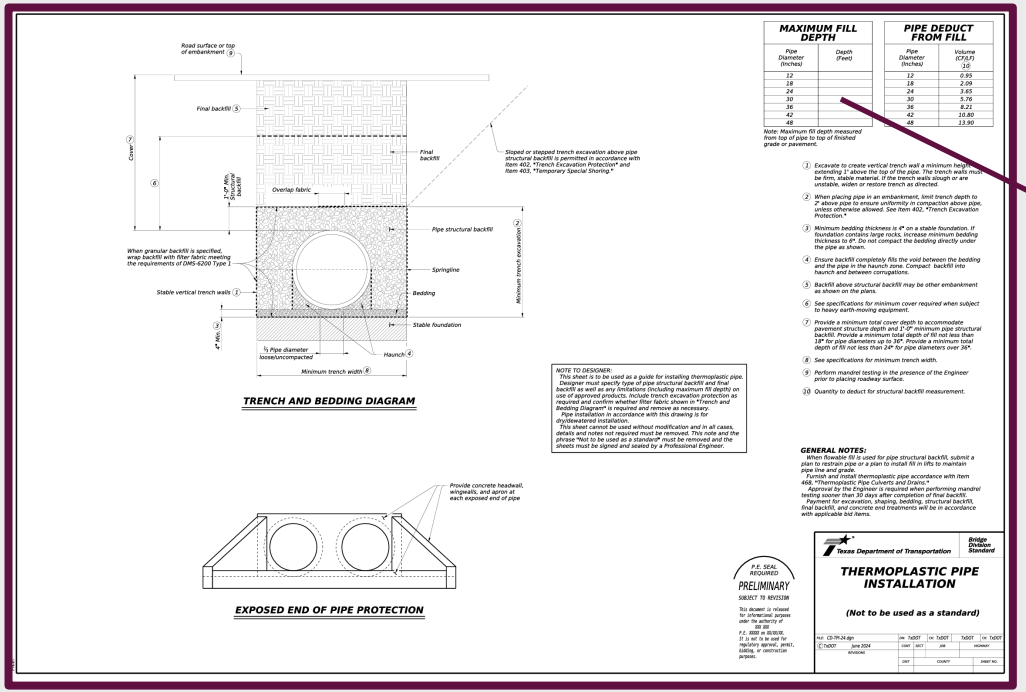
- Cleaning and Sealing Existing Bridge Joints (Strip Seal)
- Joint Repair and Replacement Details (Bridges with Asphalt Overlay)
- Joint Repair and Replacement Details (Bridges without Asphalt Overlay)







Thermoplastic Pipes, Joints, and Fittings



MAXIMUM FILL DEPTH

Pipe Diameter (Inches)	Depth (Feet)
12	
18	
24	
30	
36	
42	
48	

Note: Maximum fill depth measured from top of pipe to top of finished grade or pavement.

Thermoplastic Pipes, Joints, and Fittings

https://www.txdot.gov/business/resources/highway/bridge/pipe-design-durability.html

- Materials
- Site Condition
- Excavation
- Design Loading

Working Drawings

Revised working drawings include the following:

- Bridge Deck Overlay Notes
- Cleaning and Sealing Existing Bridge Joints (Pan Girders)
- Cleaning and Sealing Existing Bridge Joints
- Precompressed Foam Expansion Joint Seal
- Elastomeric Bearing Replacement Details for Concrete Beams
- Elastomeric Bearing Replacement Details for Steel Beams
- Prestressed Concrete Beam Repair Details
- Bridge Protective Beam Wrap
- Steel Beam Repair
- Pile Encasement Details

LRFD Foundations

- The FDN is a working drawing that must be filled out, modified, sign, sealed, and dated by a Professional Engineer for all bridge foundations designed using LRFD in accordance with the TxDOT Geotechnical Manual – LRFD

LRFD Foundations

- Provide foundation design data in plan sheets

FOUNDATION DESIGN DATA

Abutments			Bents		
Load Case	Strength I		Load Case	Strength I	
Axial Foundation Loads (tons)	81	Abut No. 1	Axial Foundation Loads (tons)	134	Bent No. 2
	87	Abut No. 4		146	Bent No. 3
Nominal Friction Resistance (tons/square foot)	1.2	(clay)	Nominal Friction Resistance (tons/square foot)	1.2	(clay)
	3.8	(shale, IGM)		3.8	(shale, IGM)
				11.6	(limestone, intact)
Friction Resistance Factor(s)	0.45	(clay)	Friction Resistance Factor(s)	0.45	(clay)
	0.7	(shale, IGM)		0.7	(shale, IGM)
				0.55	(limestone, intact)
Cumulative Factored Friction Resistance (tons/shaft)	99		Cumulative Factored Friction Resistance (tons/shaft)	299	
Nominal Bearing Resistance (tons/square foot)	46		Nominal Bearing Resistance (tons/square foot)	315	
Bearing Resistance Factor	0.7		Bearing Resistance Factor	0.5	
Factored Bearing Resistance (tons/shaft)	101		Factored Bearing Resistance (tons/shaft)	495	
Additional Notes: Design lengths based on side resistance (skin friction) alone, and disregarding to an elevation of 383 feet.			Additional Notes: Design lengths based on side resistance (skin friction) alone, and disregarding to an elevation of 372 feet.		

LRFD Foundations

- For standard bridge designs, use the Foundation Loads for Designer's Information sheets to fill out the tables on the FDN. The Foundation Loads for Designer's Information sheets provide foundation loads for a given beam type, roadway width, and span length as covered by the standard bridge types.
- **The Foundation Load for Designer's Information sheets must not be included in the plan set.** These sheets are for reference and are to be used by the designer only.

LRFD Foundations

TABLE OF FOUNDATION LOADS - 0° SKEW

Span Average	Drilled Shaft Loads		Pile Load							
			3 Pile				4 Pile			
	DC	LL	Service I (1)	Strength I (2)	DC	LL	Service I (1)	Strength (2)	DC	LL	Service I (1)	Strength (2)
Ft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile
40	76	28	104	144	29	10	39	54	23	7	30	41
45	83	30	113	156	31	10	41	56	24	8	32	44
50	89	31	120	166	33	11	44	61	26	8	34	47
55	95	33	128	177	35	11	46	63	27	9	36	50
60	101	34	135	186	37	12	49	67	29	9	38	52
65	107	35	142	195	39	12	51	70	30	9	39	53
70	114	37	151	207	41	13	54	74	32	10	42	58
75	120	38	158	217	44	13	57	78	34	10	44	60
80	126	39	165	226	46	13	59	80	35	10	45	61
85	132	40	172	235	48	14	62	85	37	10	47	64
90	139	42	181	247	50	14	64	87	38	11	49	67
95	145	43	188	257	52	15	67	91	40	11	51	69
100	151	44	195	266	54	15	69	94	41	11	52	71
105	157	45	202	275	56	15	71	96	43	12	55	75
110	163	46	209	284	58	16	74	101	44	12	56	76
115	170	47	217	295	60	16	76	103	46	12	58	79
120	176	49	225	306	62	17	79	107	48	13	61	83
125	182	50	232	315	64	17	81	110	49	13	62	84

TABLE OF FOUNDATION LOADS - 15° SKEW

Span Average	Drilled Shaft Loads		Pile Load							
			3 Pile				4 Pile			
	DC	LL	Service I (1)	Strength I (2)	DC	LL	Service I (1)	Strength (2)	DC	LL	Service I (1)	Strength (2)
Ft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile
40	77	28	105	145	29	10	39	54	23	7	30	41
45	83	30	113	156	31	10	41	56	24	8	32	44
50	89	31	120	166	33	11	44	61	26	8	34	47
55	95	33	128	177	35	11	46	63	27	9	36	50
60	102	34	136	187	37	12	49	67	29	9	38	52
65	108	35	143	196	39	12	51	70	30	9	39	53
70	114	37	151	207	42	13	55	75	32	10	42	58
75	120	38	158	217	44	13	57	78	34	10	44	60
80	126	39	165	226	46	13	59	80	35	10	45	61
85	133	40	173	236	48	14	62	85	37	10	47	64
90	139	42	181	247	50	14	64	87	38	11	49	67
95	145	43	188	257	52	15	67	91	40	11	51	69
100	151	44	195	266	54	15	69	94	41	11	52	71
105	158	45	203	276	56	15	71	96	43	12	55	75
110	164	46	210	286	58	16	74	101	44	12	56	76
115	170	47	217	295	60	16	76	103	46	12	58	79
120	176	49	225	306	62	17	79	107	48	13	61	83
125	182	50	232	315	64	17	81	110	49	13	62	84

TABLE OF FOUNDATION LOADS - 30° SKEW

Span Average	Drilled Shaft Loads		Pile Load							
			3 Pile				4 Pile			
	DC	LL	Service I (1)	Strength I (2)	DC	LL	Service I (1)	Strength (2)	DC	LL	Service I (1)	Strength (2)
Ft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile
40	78	28	106	147	30	10	40	55	23	7	30	41
45	84	30	114	158	32	10	42	58	25	8	33	45
50	90	31	121	167	34	11	45	62	26	8	34	47
55	97	33	130	179	36	11	47	64	28	9	37	51
60	103	34	137	188	38	12	50	69	29	9	38	52
65	109	35	144	198	40	12	52	71	31	9	40	55
70	115	37	152	209	42	13	55	75	32	10	42	58
75	121	38	159	218	44	13	57	78	34	10	44	60
80	128	39	167	228	46	13	59	80	35	10	45	61
85	134	40	174	238	48	14	62	85	37	10	47	64
90	140	42	182	249	50	14	64	87	39	11	50	68
95	146	43	189	258	52	15	67	91	40	11	51	69
100	153	44	197	268	54	15	69	94	42	11	53	72
105	159	45	204	278	56	15	71	96	43	12	55	75
110	165	46	211	287	59	16	75	102	45	12	57	77
115	171	47	218	296	61	16	77	104	46	12	58	79
120	177	49	226	307	63	17	80	109	48	13	61	83
125	184	50	234	318	65	17	82	111	49	13	62	84

TABLE OF FOUNDATION LOADS - 45° SKEW

Span Average	Drilled Shaft Loads		Pile Load							
			3 Pile				4 Pile			
	DC	LL	Service I (1)	Strength I (2)	DC	LL	Service I (1)	Strength (2)	DC	LL	Service I (1)	Strength (2)
Ft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile
40	80	28	108	149	30	10	40	55	24	7	31	42
45	86	30	116	160	32	10	42	58	25	8	33	45
50	92	31	123	169	34	11	45	62	27	8	35	48
55	99	33	132	182	36	11	47	64	28	9	37	51
60	105	34	139	191	39	12	51	70	30	9	39	53
65	111	35	146	200	41	12	53	72	31	9	40	55
70	117	37	154	211	43	13	56	77	33	10	43	59
75	124	38	162	222	45	13	58	79	34	10	44	60
80	130	39	169	231	47	13	60	82	36	10	46	63
85	136	40	176	240	49	14	63	86	38	10	48	65
90	142	42	184	251	51	14	65	88	39	11	50	68
95	148	43	191	260	53	15	68	93	41	11	52	71
100	155	44	199	271	55	15	70	95	42	11	53	72
105	161	45	206	280	57	15	72	98	44	12	56	76
110	167	46	213	289	59	16	75	102	45	12	57	77
115	173	47	220	299	61	16	77	104	47	12	59	80
120	180	49	229	311	63	17	80	109	48	13	61	83
125	186	50	236	320	65	17	82	111	50	13	63	85

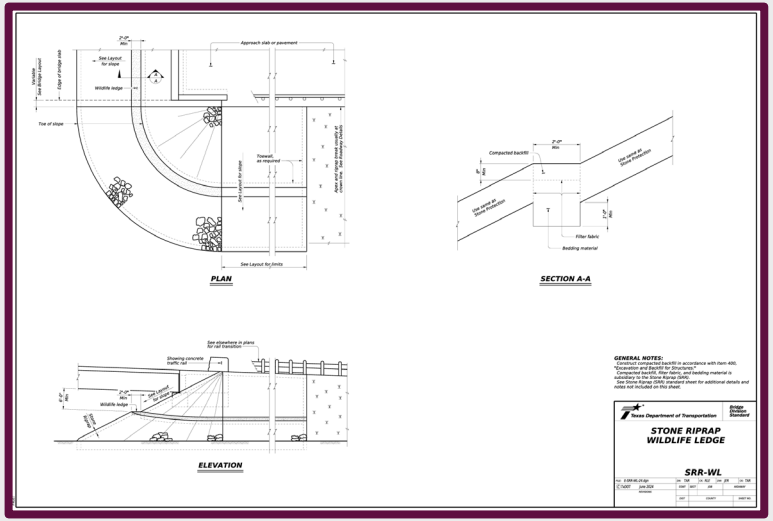
LRFD Foundations

TABLE OF FOUNDATION LOADS - 0° SKEW

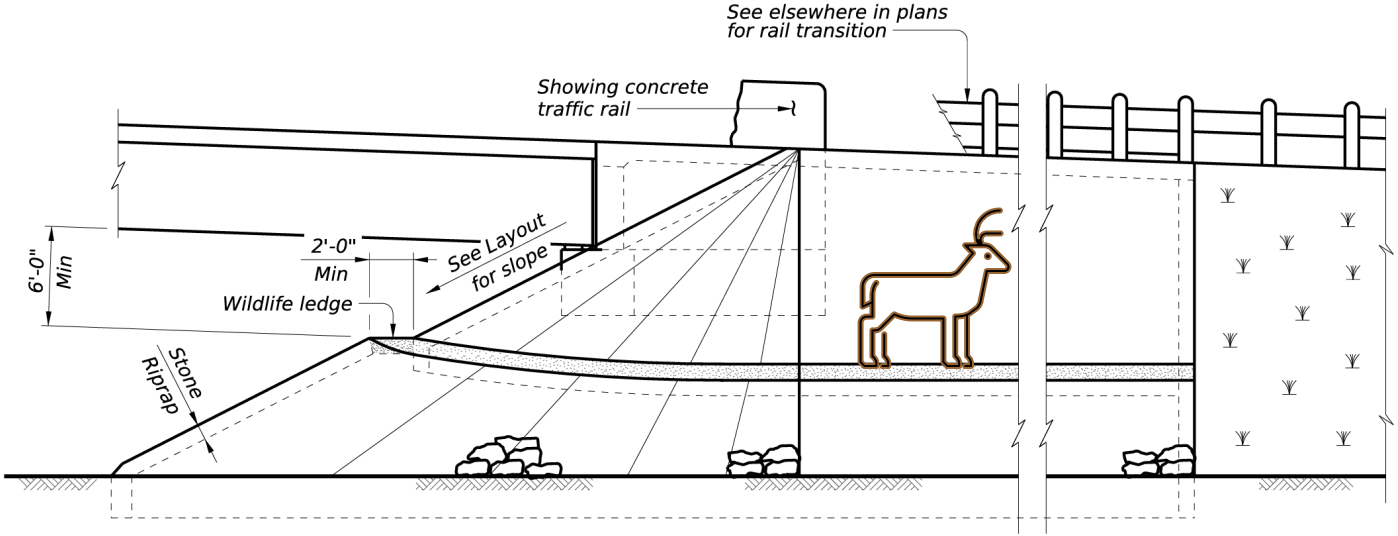
Span Average	Beam Type	Drilled Shaft Loads				Pile Loads			
		DC	LL	Service I (1)	Strength I (2)	DC	LL	Service I (1)	Strength I (2)
Ft		Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Shaft	Tons/Pile	Tons/Pile	Tons/Pile	Tons/Pile
25	5SB12	41	22	63	90	25	14	39	56
30	5SB12	48	25	73	104	29	15	44	63
35	5SB12	54	27	81	115	33	16	49	69
40	5SB12	61	28	89	125	37	17	54	76
25	5SB15	46	22	68	96	28	14	42	60
30	5SB15	54	25	79	111	33	15	48	68
35	5SB15	61	27	88	124	37	16	53	74
40	5SB15	68	28	96	134	41	17	58	81
45	5SB15	75	30	105	146	45	18	63	88
50	5SB15	82	31	113	157	50	19	69	96

Wildlife Accommodations

- Stone Riprap Wildlife Ledge (SRR-WL) standard that works in conjunction with the Stone Riprap standard to provide a wildlife path
- Still need to include the SRR in plan set when using SRR-WL



Wildlife Accommodations

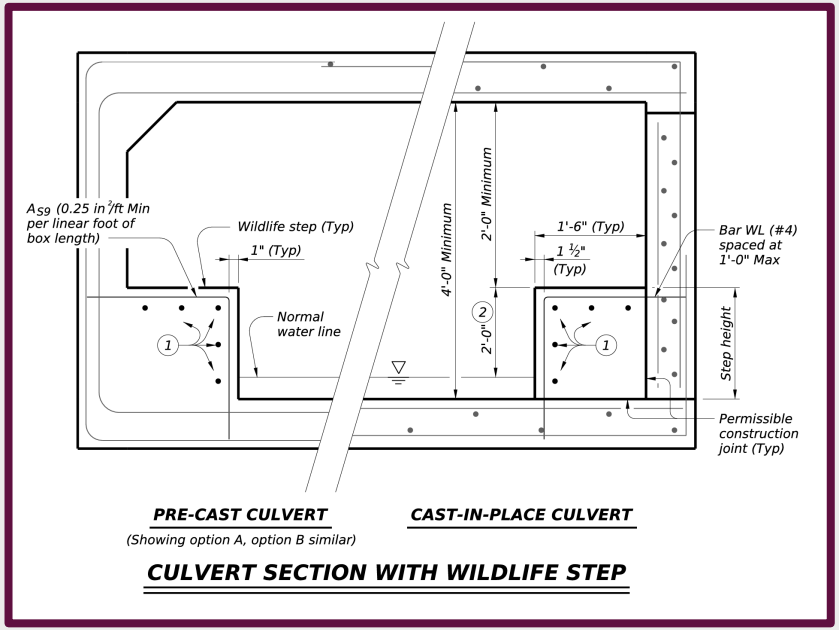


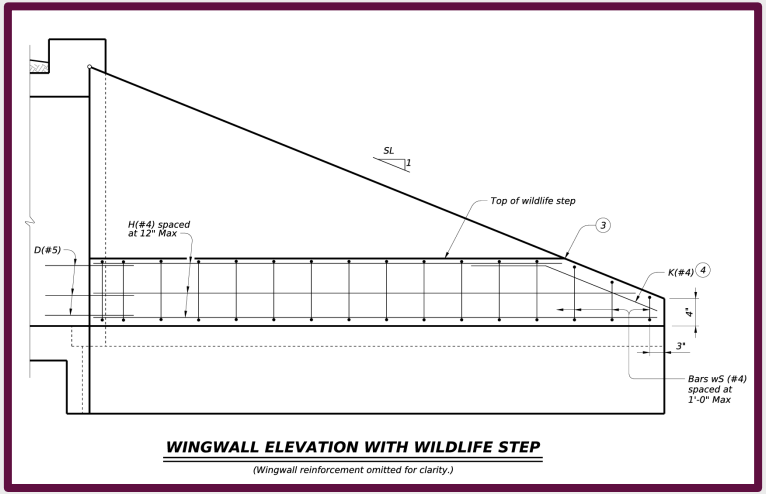
Wildlife Accommodations

- Wildlife Step for Box Culverts (WSBC) standard that works with the concrete box culvert standard to provide a wildlife step above the water line

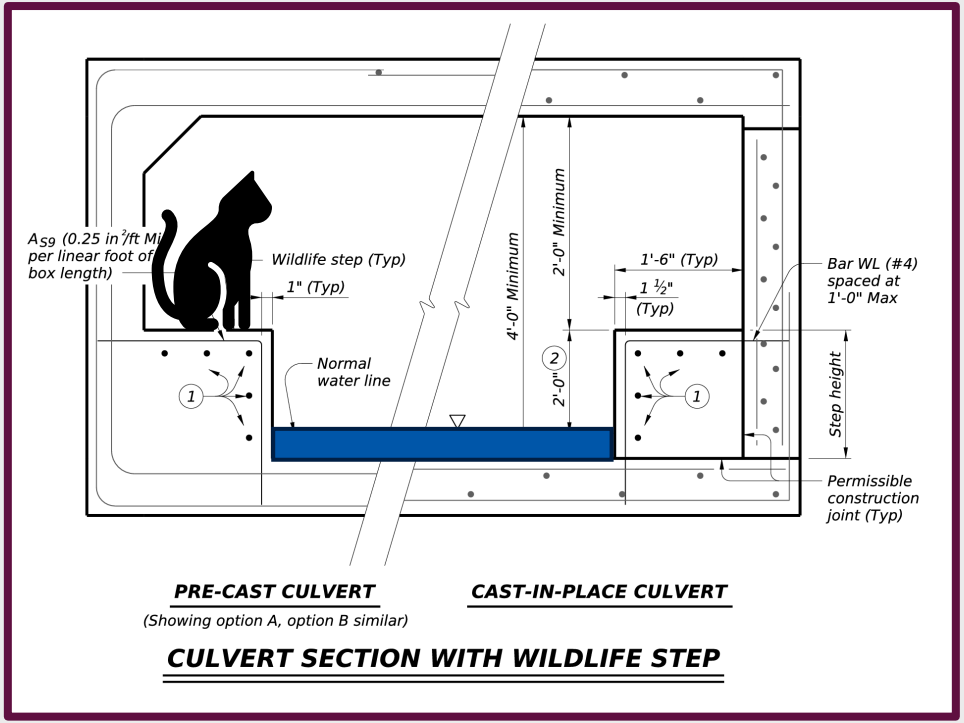
Wildlife Accommodations

- To be used with Pre-Cast Single Box Culverts, Cast-in-Place Single Box or Multiple Box Culverts, along with wingwall and end treatment standards



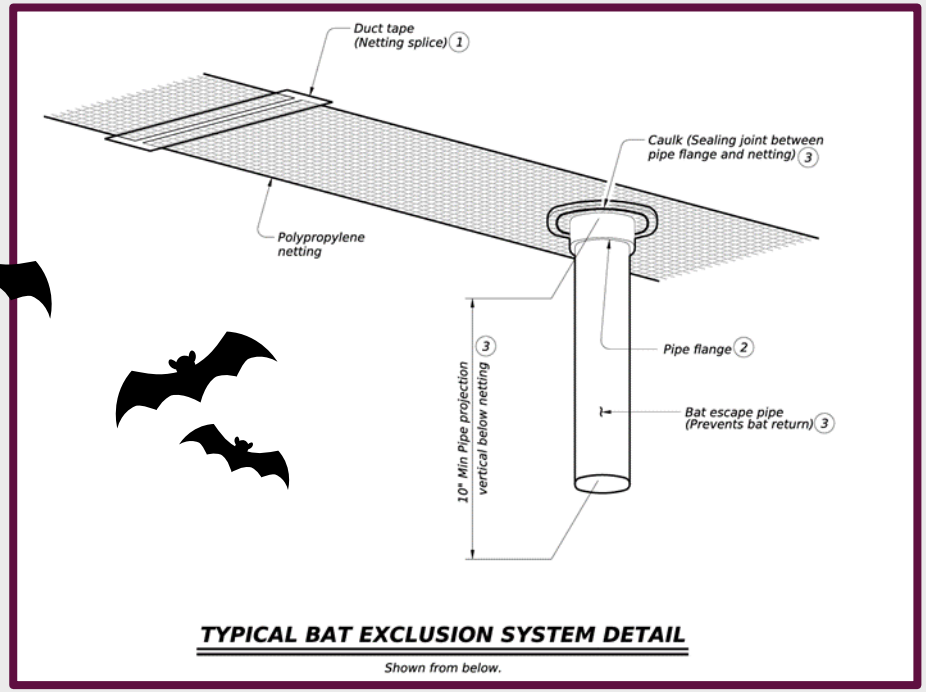


Wildlife Accommodations



Wildlife Accommodations

- Bat Exclusion System (BES) working drawing that provides guidance for construction projects

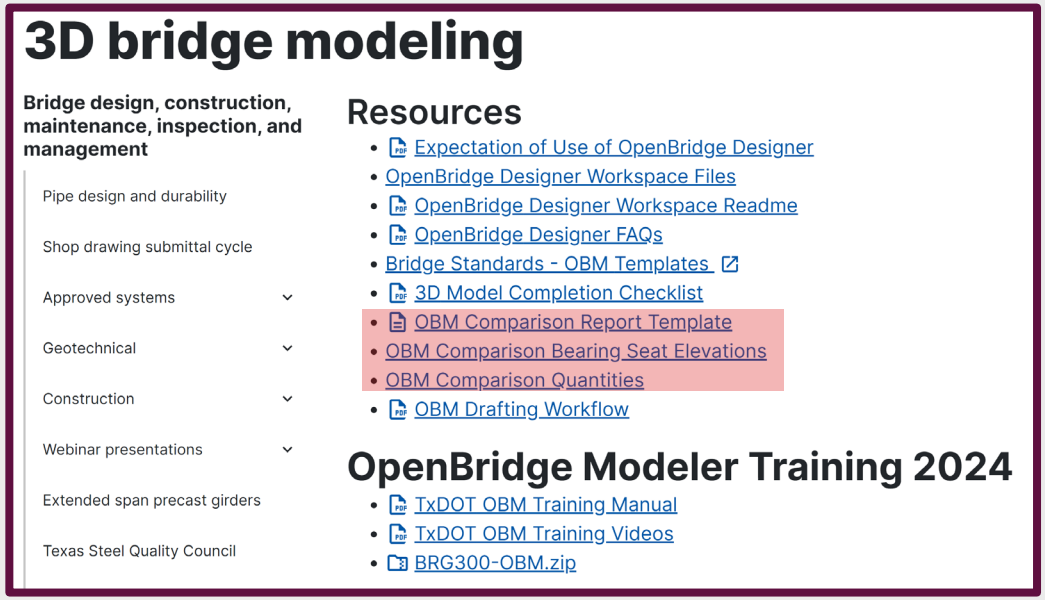


3D Models

- Required for 30% PBLR and 100% submittal
- TxDOT districts have the discretion to request the model at additional milestones
- Consists of 3D elements for slab, beams, abutments, wingwalls, caps, columns, and foundations
- https://www.txdot.gov/business/resources/highway/bridge/3d-bridge-modeling.html
- More Questions on 3D Models? Ask Bridge3DDesign@txdot.gov

3D Models

- Are you looking to prepare a letter report which includes the findings of the comparison of OBM 3D bridge model geometry and quantities verified by traditional design methods?
  - Templates are available here



Questions

- Under what scenarios would engineers be encouraged to use the new WF TxGirders?
  - Wide Flange girders enable faster and safter construction by eliminating the need for overhang brackets
- If we have submitted 60% plans and are in process of working towards 90%, do we still need to incorporate the new WF for exterior? What is the cutoff time for incorporation of these new standards?
  - Currently, consideration for providing these optional exterior wide flange girder designs should be given to project that are at 30% design or less

Questions

- With the new FDN sheet, will we still have to show foundation loads on the abutment and bent detail sheets?
  - Foundations loads will no longer be required on the abutment and bent details and will be shown on the FDN sheet
- Will the foundation sheets require dual signatures by the structural and geotechnical engineers?
  - The FDN sheet will be signed by the engineer responsible for the geotechnical design

Questions

- What version of PGSuper do you recommend we use at this point?
  - BridgeLink v8.0.6 (PGSUPER) now available here
- Will the OBM comparison report be required for PBLR Submittal?
  - The OBM comparison reports are required at the 100% submittal with the 100% 3D model

Reminders

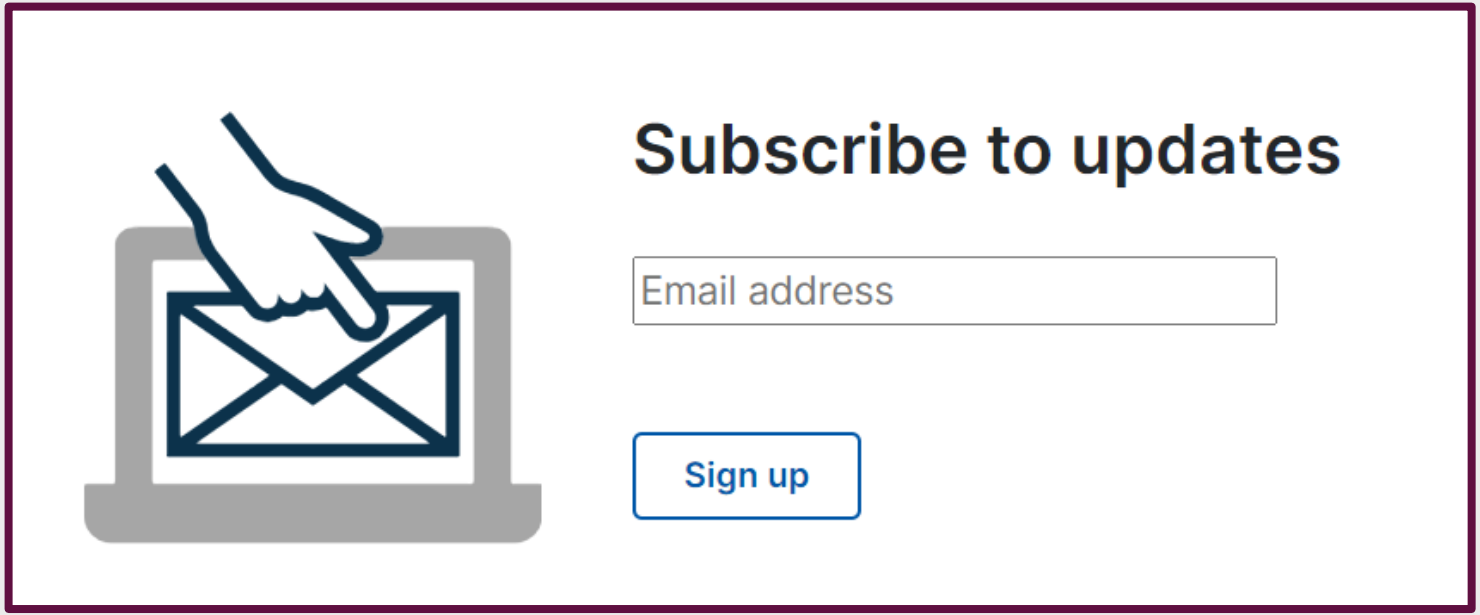
- Chat is turned off, please use the Q&A box
- Slides will be posted on the Bridge Website:

  https://www.txdot.gov/business/resources/highway/bridge/webinar-presentations/bridge-briefings.html

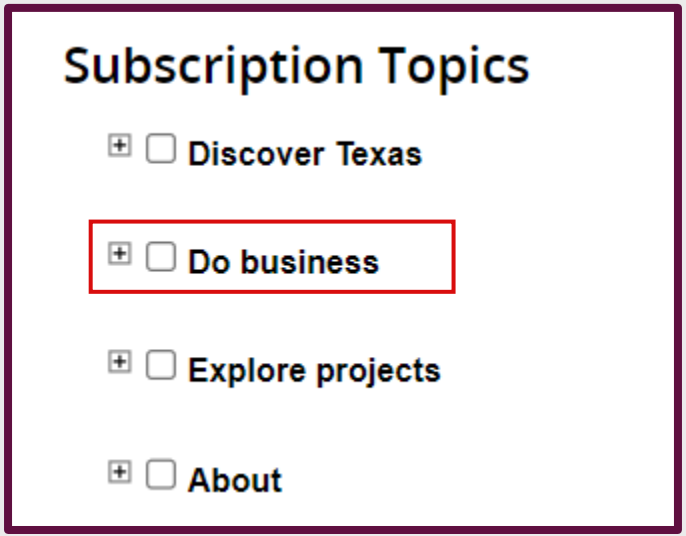
- Please submit additional Bridge Design related questions brg-design@txdot.gov

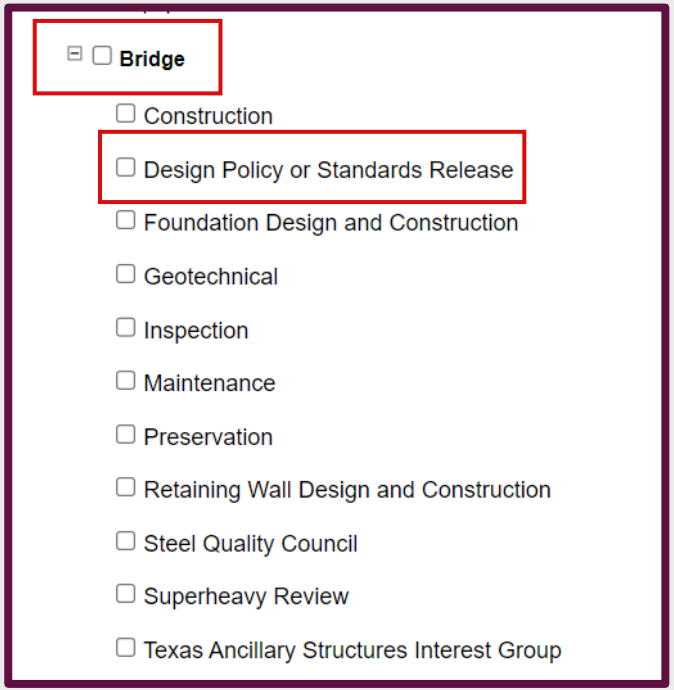
Don’t miss out on other updates!

https://www.txdot.gov/about/divisions/bridge-division.html



Don’t miss out on other updates!





PDH

- Please remember Bridge Division does not provide documentation for TX Board PDH approval. Each engineer should exercise personal judgement when counting webinar topics for their professional development hours. For more info on what qualifies for Continuing Education, please visit https://pels.texas.gov/CEPInfo.htm

Next Bridge Briefing: Sept 19th TIP Testing and Load Testing Drilled Shaft Guidance

Texas Department of Transportation

August 21, 2024