

Precast Alternates

Using the new standards, providing alternate designs in the plan set, and using the wide flange girders Sara Watts, P.E.





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Plan Set Alternates Using the Standards Wide Flange Girders

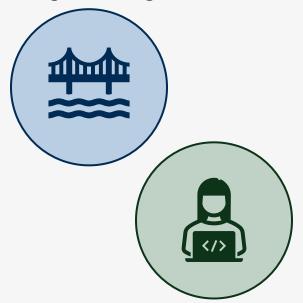


- Is there elements on your project that can be precast or prefabricated
- Original design + new construction idea = alternate plans



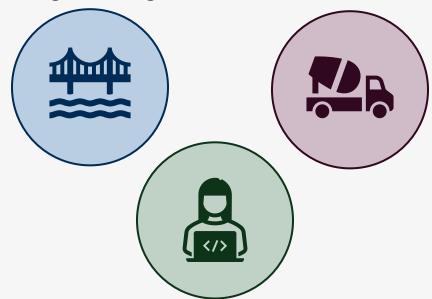


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How to use alternates

- MUST make an allowance in the plan set
 - Allowance in general notes in item 420
 and item 425
- Old SOP is gone
- Standards or Form 2800
 - Are you providing a design or is it a post letting change?





Can be found under the miscellaneous standards

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

10-24	PCA-SUP	Precast Superstructure Alternates	MS-PCA-SUP-24.dgn
10-24	PCA-SUB	Precast Substructure Alternates	MS-PCA-SUB-24.dgn

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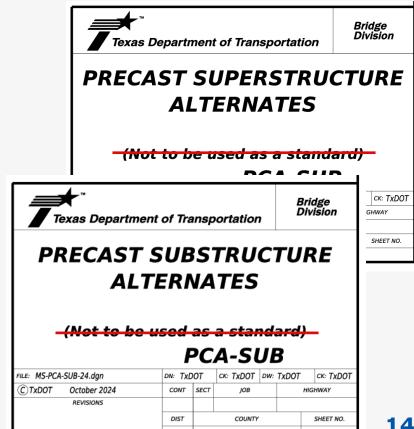


NOTE TO DESIGNER:

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.



- Notes cover various design and construction requirements
- READ ALL the notes and remove what you don't need
- Remove the note to designer box and "Not to be used as a standard" in title block
- Sign and Seal





- 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 cost 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.



What not to do

- Do NOT be innovative
 - 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
 - Do keep the intent of the original plans



Source: https://www.cbsnews.com/pictures/a-vision-of-the-future-from-1899/



Submission Requirements





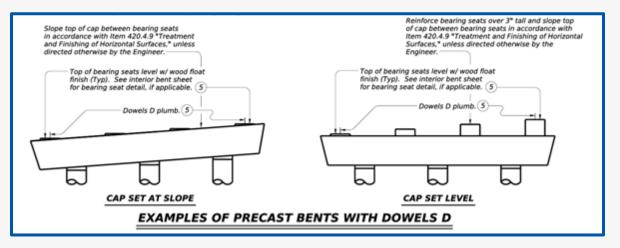
Substructure

- For the interior bents and abutments, the Contractor has the option of furnishing either the as designed or an approved alternate design. All alternate design submittals must be signed, sealed and dated by a Professional Engineer registered in the State of Texas
- Submit revised substructure plan sheets that take into consideration connections to superstructure, columns, and foundation elements, as needed.



Substructure Precast Bent Options

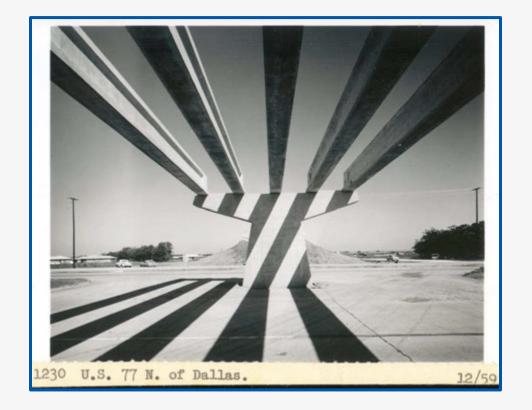
- PBC-P Precast Conc Bent Cap Opt for Conc & Steel Piles
- PBC-RC Precast Conc Bent Cap Opt for Round Columns
- PPBC-RC Prestressed, Precast Bent Cap Option for Round Columns





Superstructure

- Wide Flange Tx Girders
- Alternate Type of Prestressed
 Beams
- Continuous prestressed concrete spliced girders





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





Alternate type of prestressed beams

- Submit a revised plan set
 - Bridge Layout
 - Bearing seat elevations
 - Span Sheets
 - Framing Plan
 - Beam/Girder details
 - Beam/Girder Strand layout

- Bearing pad details
- Check foundation loads
- Substructure sheets





Continuous prestressed concrete spliced girders

- Approved optional design of spliced girders
 - Important design info to fill out
- Loading
- Pre-tensioning parameters
- Post-Tensioning Parameters
- Stress Limits

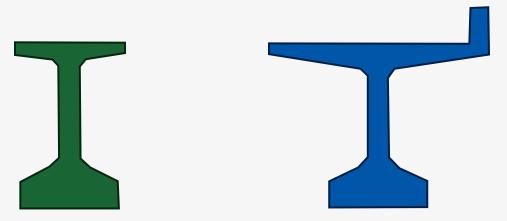
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girder reinforced concrete: ___ pcf
act
ge of ___°F to ___°F with installation at __°F
nt: 0.000006 per degree F
nory _ with wind speed (V) of ___ miles per hour
superstructure to substructure connection: 0.1!
```



Wide Flange

 https://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridgee.htm#PRESTRESSEDCONCRETEI-GIRDERS

WF-IGD Prestressed Concrete Wide Flange I-Girder Details
WF-IGND Prestressed Concrete Wide Flange I-Girder Designs
IG-WF-IGND-24.dgn





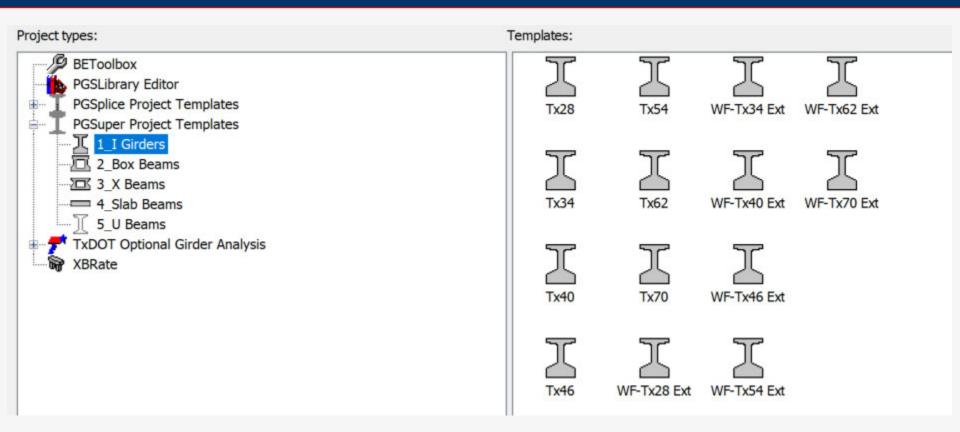
Wide Flange

- Encouraged to include exterior wide flange as an option for TxGirder projects
- Include two span sheets
- Memo from 8/6/2024

https://ftp.dot.state.tx.us/pub/txdot-info/cmd/cserve/standard/bridge/memo83.pdf

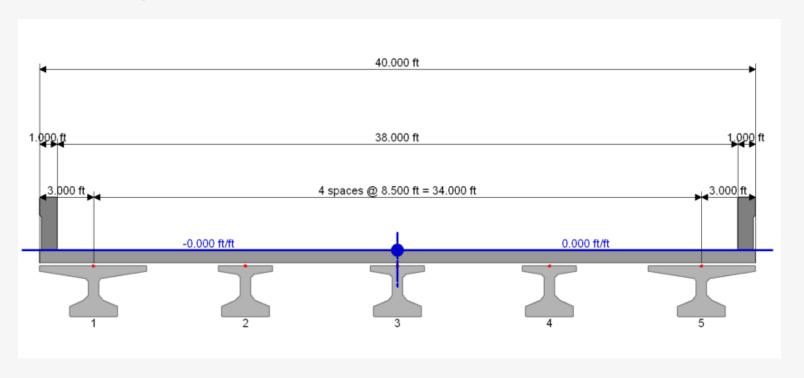








Wide Flange





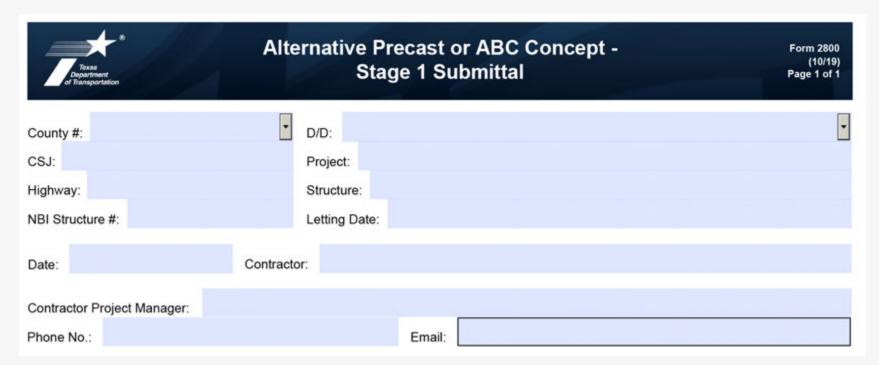
Form 2800

- This form is getting an update
- Post letting changes needs the form
- Key personnel recommends approval
- District PM can say no
- Update the plans
- No need to be afraid of this form.





Form 2800





Form 2800

Alternate Design Concept Description:							
Structural Elements Impacted by Alternate Design Concept:							
Justification for the benefit to TxDOT that Alternate Concept will provide:							
Key personnel that should be considered for Stage 1 Concept Review: Area Engineer, District Director of Construction, District Bridge Engineer, Bridge Division Design Section Director, Engineer of Record.							
District Project Manager:							
Phone No.:	Em	ail:					
The signature below represents authority to move forward with Stage 2 Alternate Design Development by the Contractor. Approved: Yes No							
District Project Manager Signature:	_		Date:				



In Summary

