

2024 AASHTO Bridge Design Specifications, 10th Ed.

Updates benefit U-BEAM construction



U-BEAM



Bent Plates

Section 6.7.8 – Structural steel plates shall be bent to the requirements of the AASHTO LRFD Steel Bridge Fabrication Specifications, which specifies $5.0t$, where t is the thickness of the plate, and the radius is measured to the concave face of the plate.

- AASHTO BDS did not previously specify a bend radius
- The previous recommended bend radius in the AASHTO Construction Specifications was $3.5t$
- Bend radius is no longer a barrier to designing or specifying PBTG

Shear Stud Spacing

Section 6.10.10.1.2 – The minimum spacing of shear studs was reduced from six times the diameter of the stud to four times the diameter of the stud

- We can now get six 7/8" diameter studs per linear foot of beam instead of four
- This is a 50% increase in allowable studs on beam
- This spacing reduction allows for higher fatigue cycles
- We can accommodate 50% more truck traffic with a single row of studs per flange



Proportion Limits

Section 6.11.2.2 – Top flange to web proportion limits “shall only apply to built-up tub-section members” and “need not apply to tub-section members that are formed from a single plate”

- PBTG did not meet the previous proportion limit requirement
- AASHTO BDS did not previously recognize “tub-section members that are formed from a single plate”
- This eliminates a major obstacle from designing and specifying PBTG

Updates benefit U-BEAM construction

Bottom Flange Proportion

Section 6.11.2.2 – Bottom flange proportion limits have now been included for tub girders in AASHTO BDS-10

- There were no previous bottom flange proportion requirements
- ALL Valmont U-Beams currently meet the new bottom flange proportion requirements
- No change
- This eliminates a major obstacle from designing and specifying PBTG

Bracing Requirements

Section 6.11.3.2 – Top flange bracing systems shall extend between 20 to 25 percent of the span length from each support.

- AASHTO BDS did not previously specify a bracing system length
- Previously Engineers needed to follow a rigorous analysis approach to determine bracing requirements
- This simple approach allows bracing design to no longer be an impediment to designing or specifying PBTG
- This eliminates a major obstacle from designing and specifying PBTG

Creep Reduction Factor

Section 6.13.2.8 – A creep factor taken equal to 0.80 for Class C galvanized faying surfaces

- Previously there was no AASHTO BDS creep reduction factor for galvanized surfaces
- However, Michigan DOT has already applied this creep reduction factor to their design requirements
- This will increase the number of bolts in a splice by about 20%
- We already have splice design standards for this change due to the MDOT requirement

COMING SOON!

A complete Design Guideline for PBTG's will be available from -AISC/NSBA

<https://www.aisc.org/nsba/>



U-Design Bridge Tool

Description	Value	Units	Variable	Comment
Total Width of Bridge:	35.5833	ft	Wdeck	
Total Girder Length, ft:	89.25	ft	n/a	Total length
Number of Beams:	5		Nb	
Overhang from Deck Edge to Top Flange:	6	in	Soverhang	
Support Skew Angle	15	degree	Skew	Right bridges has zero Skew
Cross Section (U-Beam):	U33	Text	SectionName	
Girder Location:	Exterior		GirderLoc	
End of Slab to Center of Bearing (Left):	6	in	Xbearing1	
End of Slab to Center of Bearing (Right):	6	in	Xbearing2	
Width of Left Sidewalk:	0	ft	Bswalk1	
Width of Right Sidewalk:	0	ft	Bswalk2	
Sacrificial Slab Thickness:	0	in	Tss	
Structural Slab Thickness:	8	in	Td	
Haunch Thickness:	2	in	Th	



Scan code for the complete PBTG's Design Guideline