
Photo: 2024 Prize Bridge Merit Award, Medium Span - Rt. 34B over Salmon Creek Bridge – Photo Credit: NYSDOT

Smarter Steel Bridge Design to Accelerate Bridge Project Delivery Part 2

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Smarter.
Stronger.
Steel.

Outline

Part 2

- Design Build
  - Type, Size, Location
  - Speed Up Decisions

- Resources derived from AISC/NSBA Standards

- Value for Contractors & Designers

aisc.org/standard-bridge-plans

Design-Build

Early Decision Aid

- Save time with preliminary design work
- Provides a starting framework for deck sizing
- Allows to dedicate resources to focus on other innovations
- Reduces uncertainty in early phases of design

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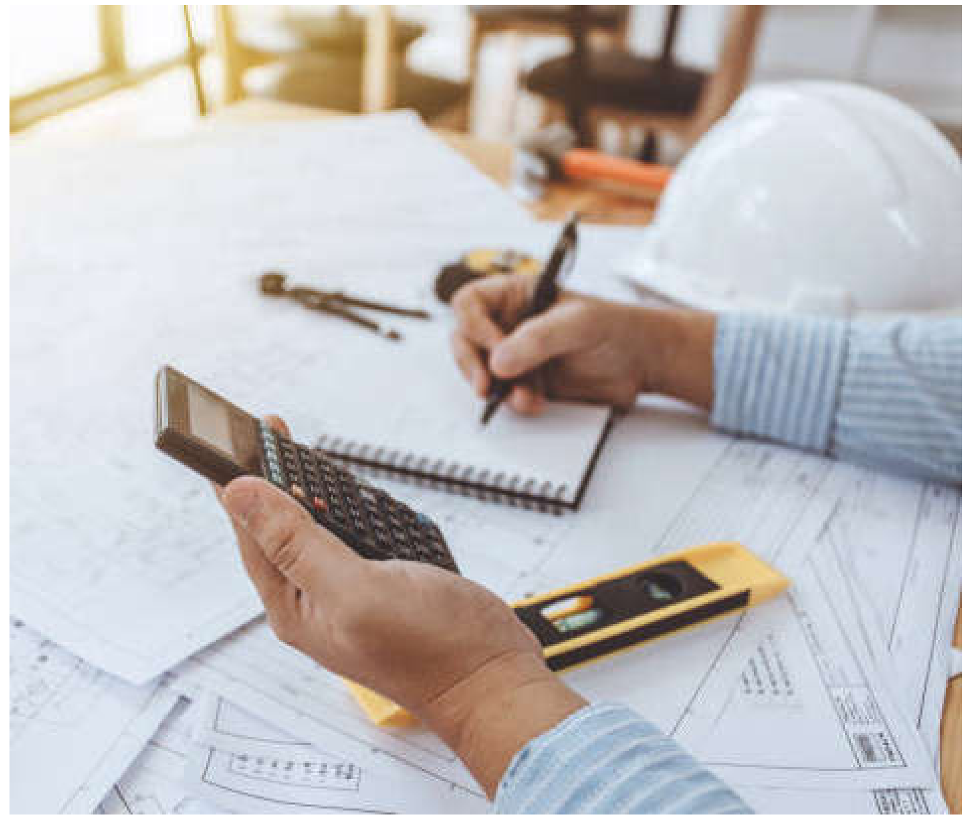
TS&L Kickstarter

Design-Build Tool

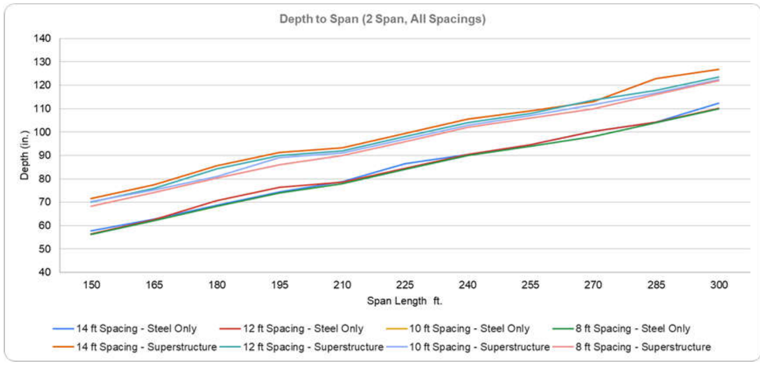


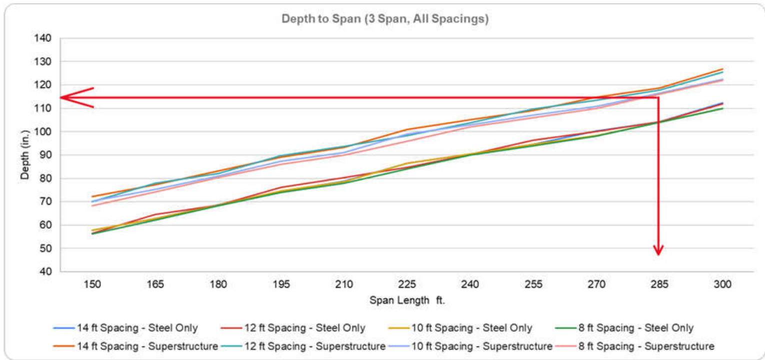
- Provides rapid preliminary bridge concepts
- Helps scope projects and estimate early
- Reduces risk of over- or under-designing
- Promotes collaboration between design & construction teams
- *Standard Plans "Put you on 3rd base with no outs" -FR*

Span-to-Depth Charts

Applications

- Elevations: estimate bridge profiles quickly
- Cross Sections: define girder layout and proportions
- Erection & Construction: weight and shipping length for field pieces
- Improves constructability at conceptual stage





Span-to-Depth Charts

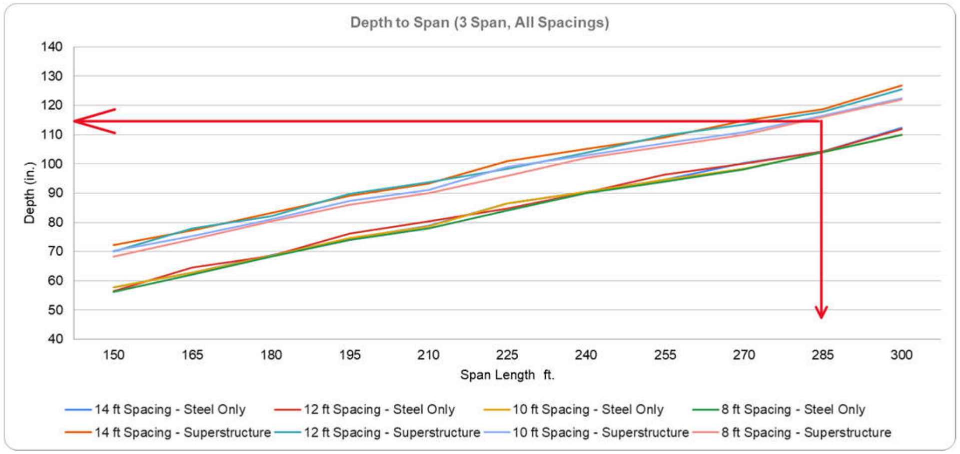
Recommendations & Considerations

- **Steel I-Girders**: For spans up to 300 feet, span-to-depth ratios range from **20 to 30**
- **Closer girder spacing** (e.g., 9-10 ft) can allow for **shallower girders**
- **Longer spans** may require **deeper girders** or **higher-strength materials** (HPS 70W)
- **Variable-depth girders** can be considered for aesthetic or structural optimization

Span-to-Depth Charts

Takeaways

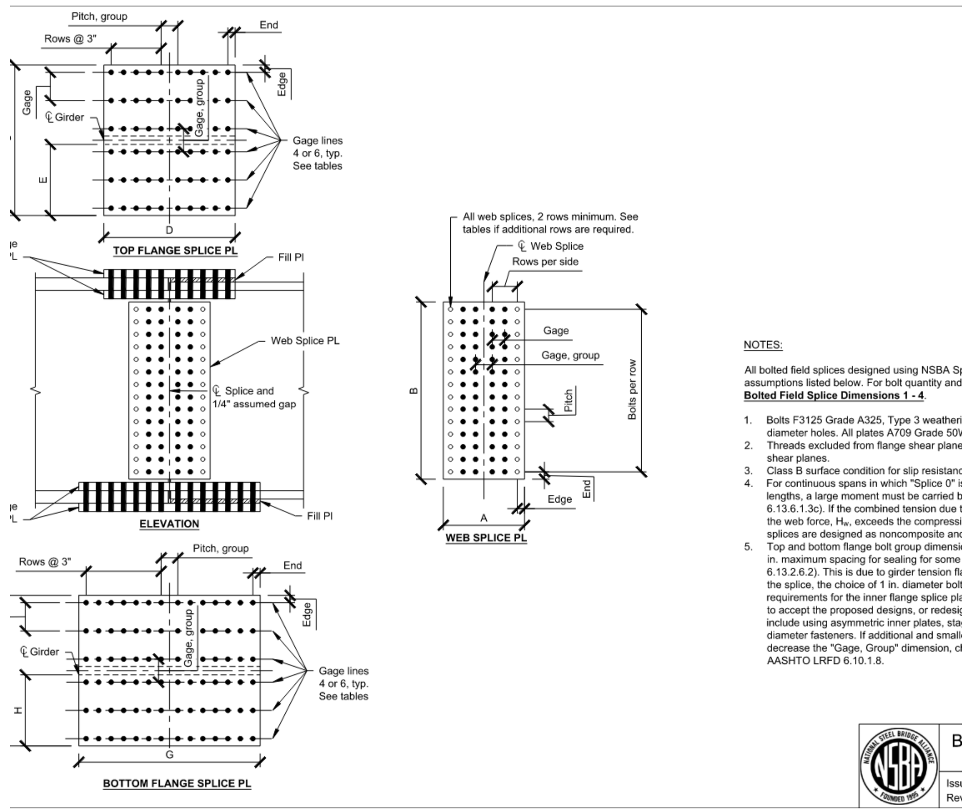
- Quick reference for girder sizing
- Not exact bridge design, but close starting point
- Facilitates clearance checks, earthwork estimates, shipping feasibility



Bolted Field Splices

Quantities!!

- Field splice bolts and sizes standardized for constructability
- Consistency reduces design effort
- Improves erection efficiency
- Supports balance of economy and practicality



Value for Contractors & Designers

Takeaways

GIRDER WEIGHT					
Span, ft. End-Int.-End	Segment A tons	Segment B tons	Segment C tons	Segment D tons	Total tons
117-150-117	11.12	---	12.60	9.73	57.17
129-165-129	13.29	---	14.26	11.89	66.98
141-180-141	14.92	---	16.15	13.55	75.70
153-195-153	16.33	---	19.52	15.16	86.88
164-210-164	18.02	---	23.67	17.32	100.70
176-225-176	22.68	---	27.92	21.30	122.49
188-240-188	24.94	---	33.00	23.42	139.30
199-255-199	27.43	---	36.57	25.91	153.93
211-270-211	10.20	21.86	40.90	27.99	173.91
223-285-223	10.63	25.08	43.79	29.80	188.80
234-300-234	12.40	28.79	49.64	30.25	211.91

Note: Girder weight is total weight of web and flanges only measured between CL brg at each end. Does not include girder extension at end bearings, stiffeners, shear studs, bracing, or any other allowances.

- Contractors: improved fabrication, shipping, and erection efficiency
- Designers: confidence in preliminary sizing
- Shared reference promotes collaboration
- Resources allow teams to focus on value-added innovations

Thank You

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