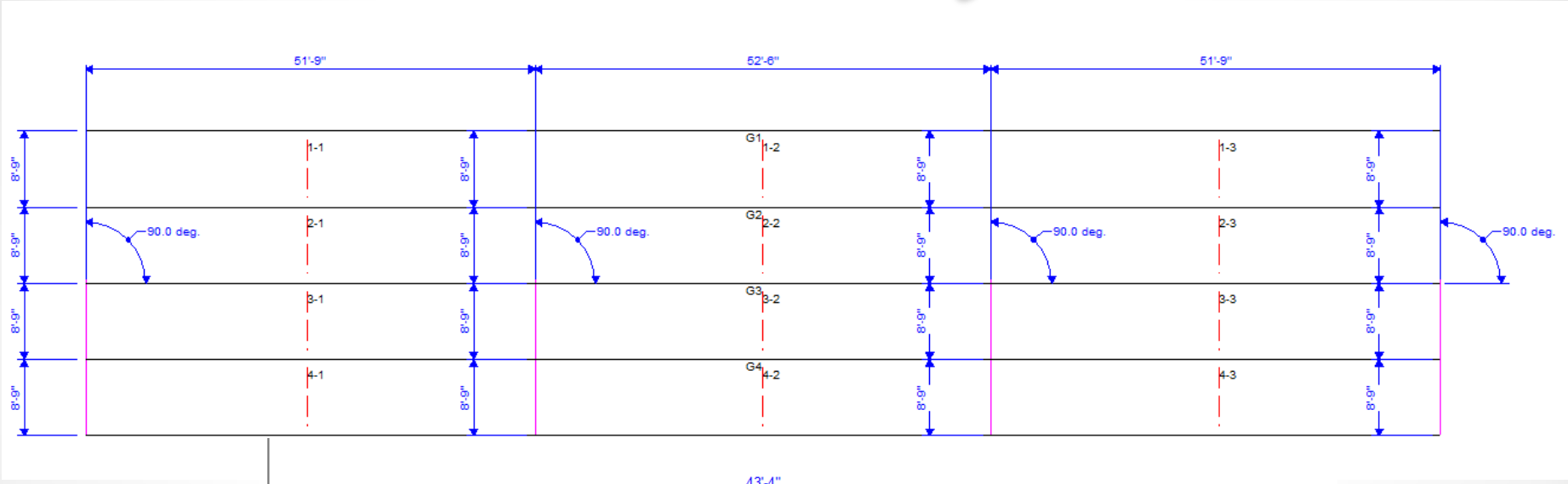
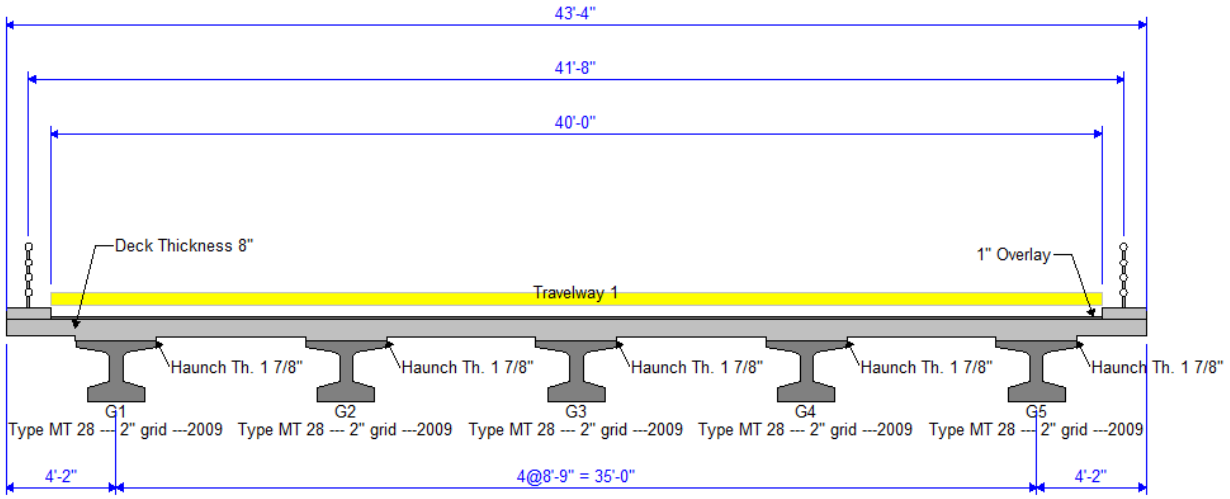
Prestressed Concrete Design Tool

2016 RADBUG
David Schroeder
Montana Dept. Transportation
Bridge Design

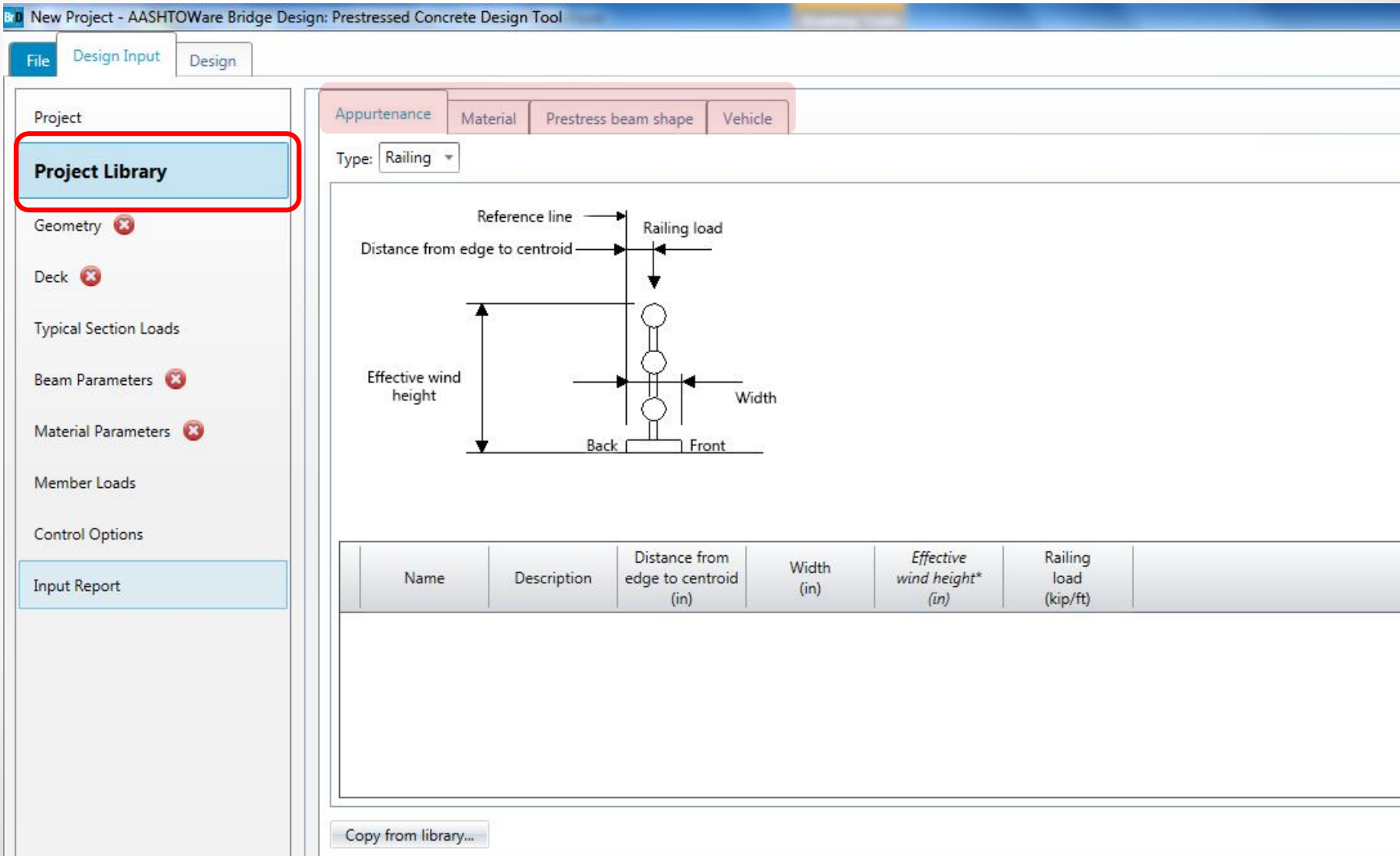
General Layout

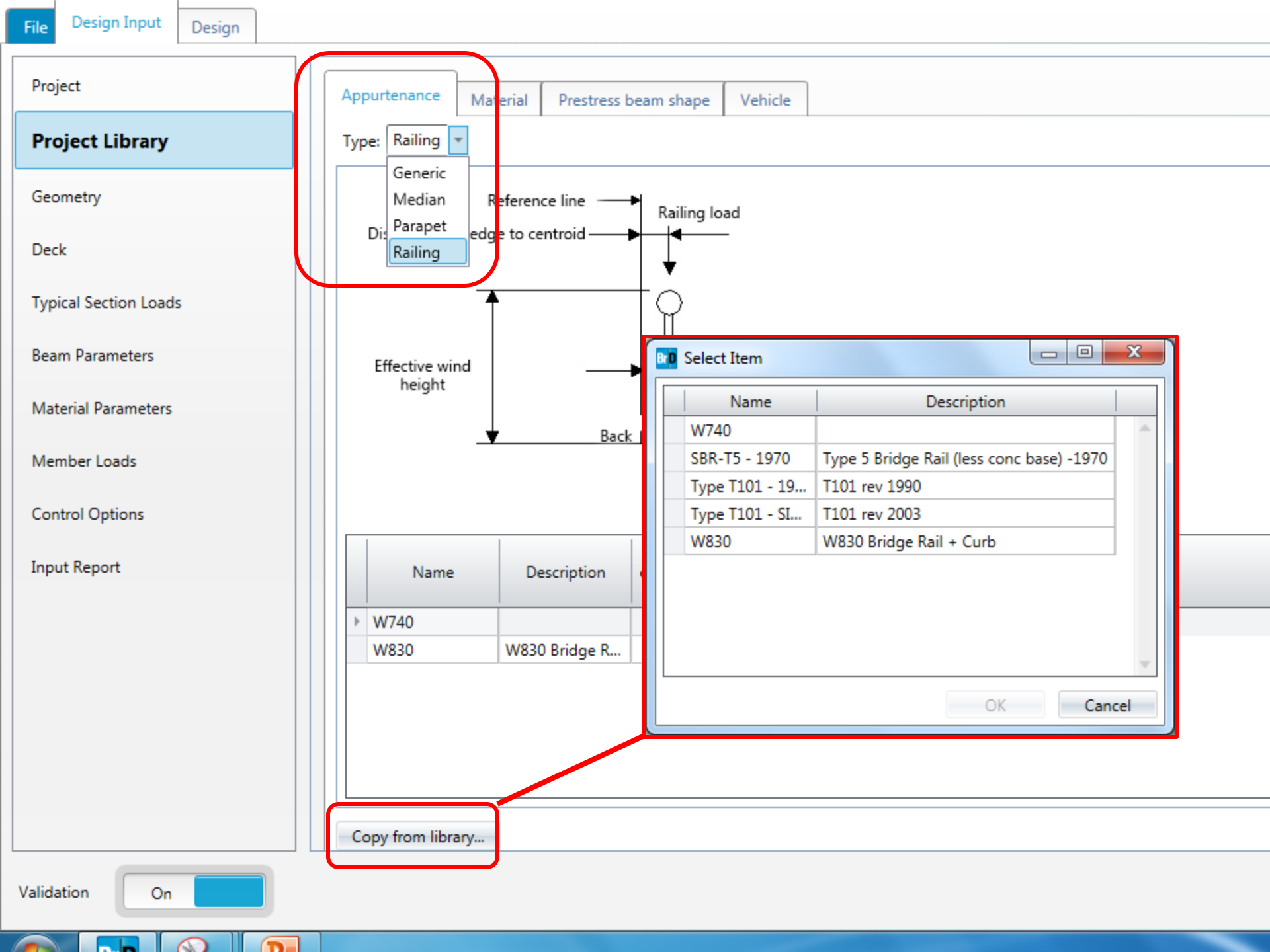




Design Inputs

Project Library




File
Design Input
Design
Project
Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report
Appurtenance
Material
Prestress beam shape
Vehicle
Type:
Railing
Generic
Median
Parapet
Railing
Reference line
Railing load
edge to centroid
Effective wind height
Back
Name
Description
W740
W830
W830 Bridge R...
Select Item
Name
Description
W740
SBR-T5 - 1970
Type 5 Bridge Rail (less conc base) -1970
Type T101 - 19...
T101 rev 1990
Type T101 - SI...
T101 rev 2003
W830
W830 Bridge Rail + Curb
OK
Cancel
Copy from library...
Validation
On

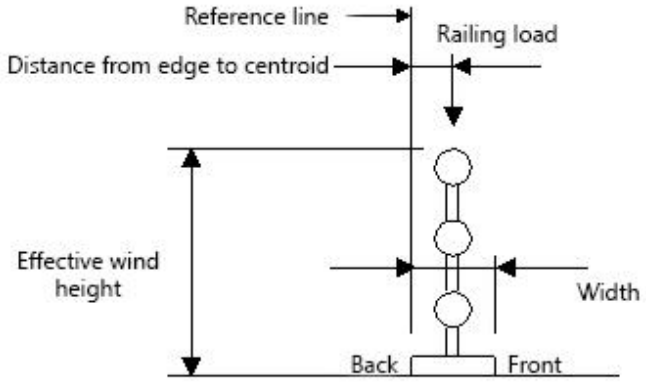
New Project - AASHTOWare Bridge Design: Prestressed Concrete Design Tool

File | Design Input | Design

- Project
- **Project Library**
- Geometry
- Deck
- Typical Section Loads
- Beam Parameters
- Material Parameters
- Member Loads
- Control Options
- Input Report

Appurtenance | Material | Prestress beam shape | Vehicle

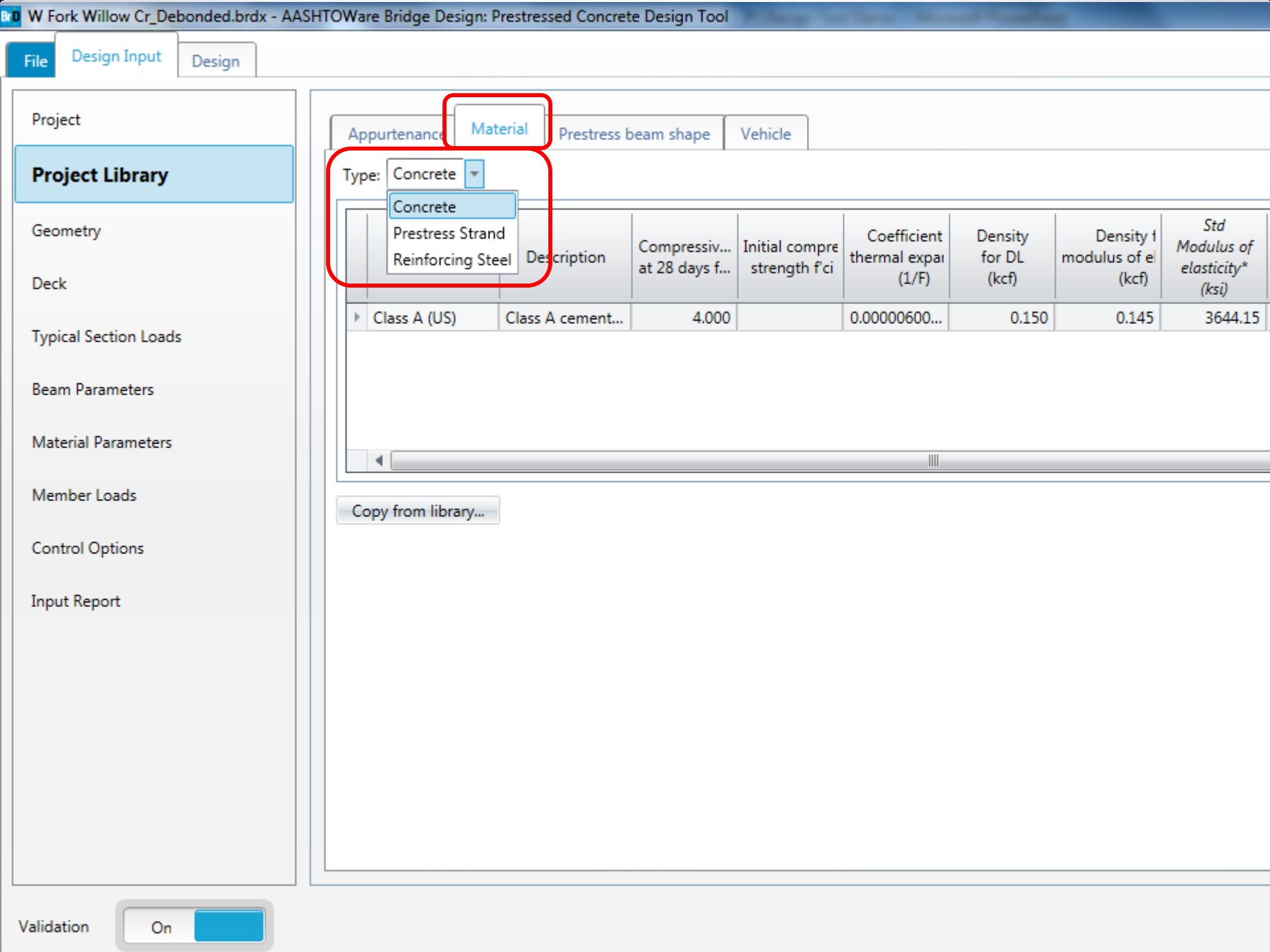
Type: Railing



Name	Description	Distance from edge to centroid (in)	Width (in)	*Effective wind height* (in)*	Railing load (kip/ft)
W740		10.0000	20.0000	41.0000	0.158
W830	W830 Bridge R...	16.0000	20.0000	32.7500	0.165

Copy from library...

Validation On


W Fork Willow Cr_Debonded.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
File
Design Input
Design
Project
Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report
Appurtenance
Material
Prestress beam shape
Vehicle
Type:
Concrete
Concrete
Prestress Strand
Reinforcing Steel
Description
Compressiv... at 28 days f...
Initial compre strength f'ci
Coefficient thermal expai (1/F)
Density for DL (kcf)
Density f modulus of el (kcf)
Std Modulus of elasticity* (ksi)
Class A (US)
Class A cement...
4.000
0.00000600...
0.150
0.145
3644.15
Copy from library...
Validation
On

W Fork Willow Cr_Debonded.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool

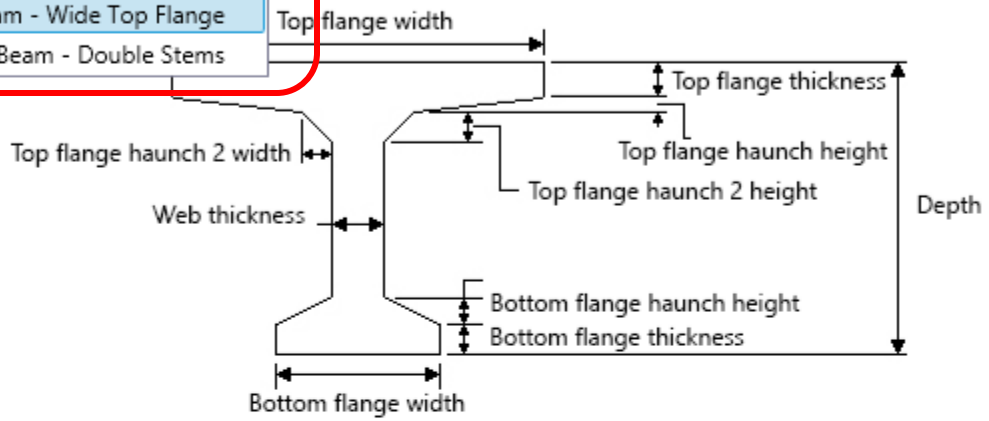
File | Design Input | Design

- Project
- **Project Library**
- Geometry
- Deck
- Typical Section Loads
- Beam Parameters
- Material Parameters
- Member Loads
- Control Options
- Input Report

Appurtenance | Material | Prestress beam shape | Vehicle

Type: I Beam - Wide Top Flange

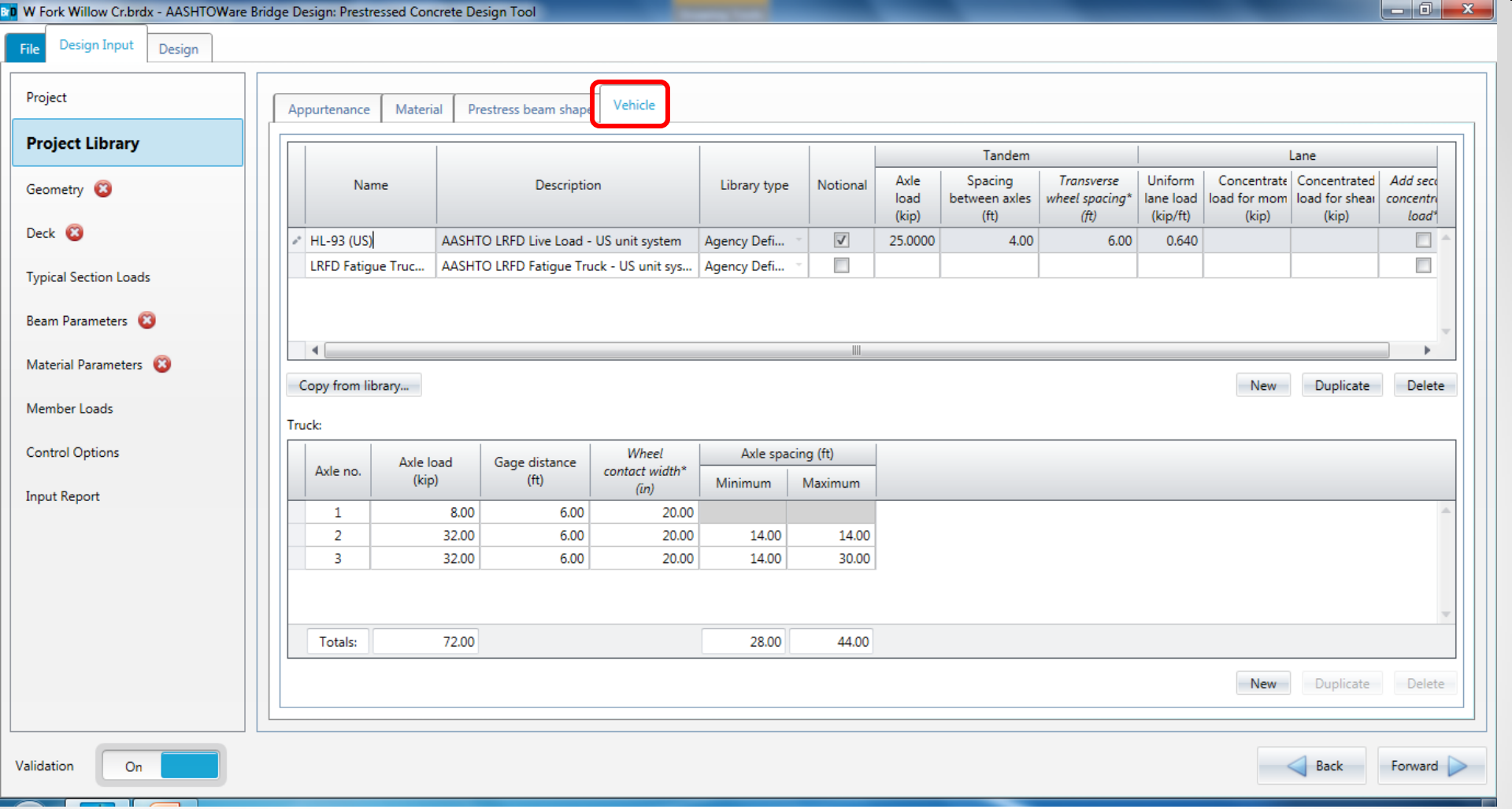
- Box Beam - Rectangular Void
- I Beam - Narrow Top Flange
- I Beam - Wide Top Flange
- Tee Beam - Double Stems



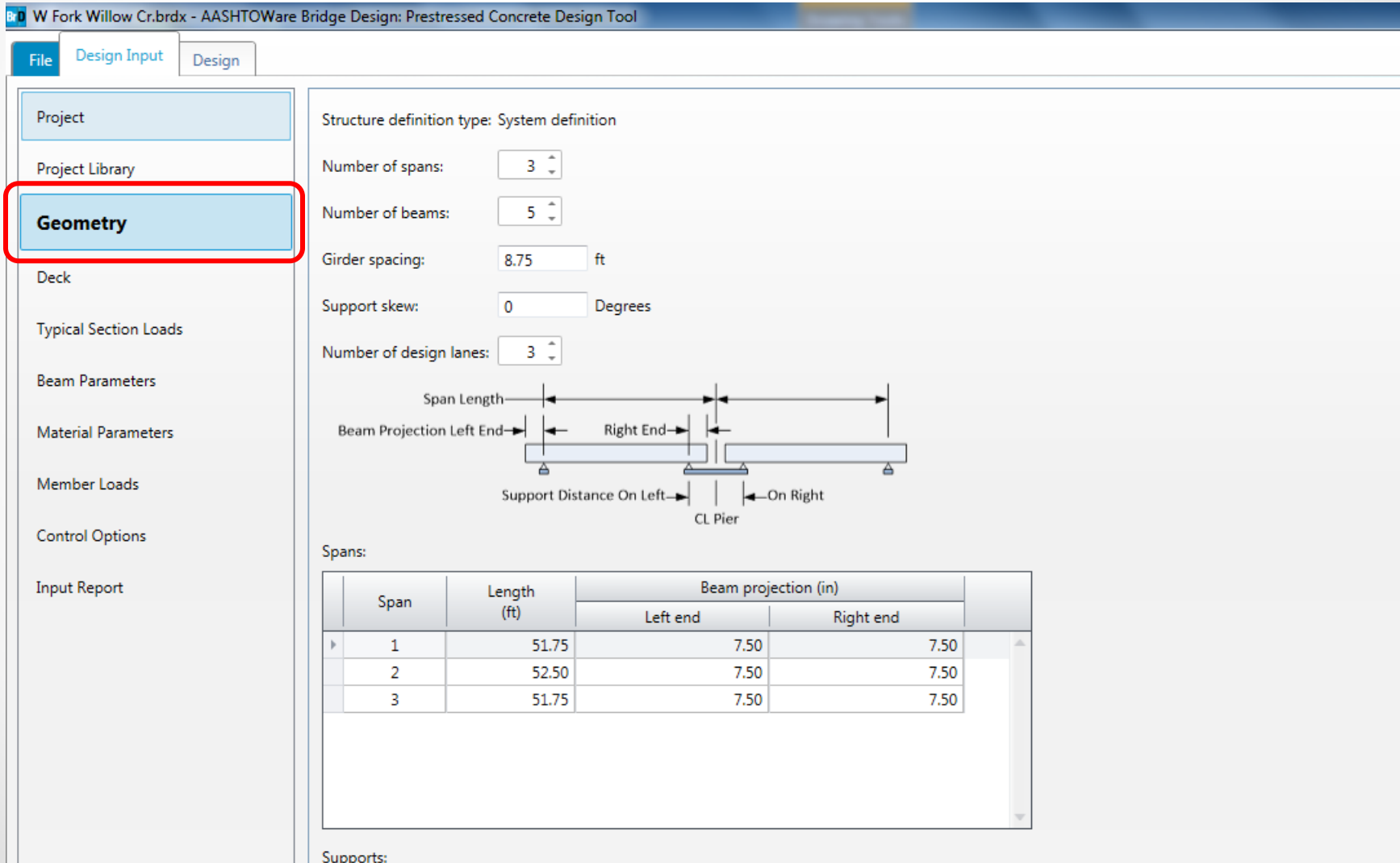
Name	Description	Depth	Web thickness	Top flange thickness	Top flange width	Bottom flang thickness	Bottom flang width
Type MT 28...	Type MT 28 --- 2" grid	28.0000	6.0000	3.0000	37.0000	6.5000	26.0000

Copy from library...

Validation On


W Fork Willow Cr.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
File
Design Input
Design
Project
Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report
Appurtenance
Material
Prestress beam shape
Vehicle
Name
Description
Library type
Notional
Tandem
Lane
Axle load (kip)
Spacing between axles (ft)
Transverse wheel spacing* (ft)
Uniform lane load (kip/ft)
Concentrate load for mom (kip)
Concentrated load for shear (kip)
HL-93 (US)
AASHTO LRFD Live Load - US unit system
Agency Defi...
25.0000
4.00
6.00
0.640
LRFD Fatigue Truc...
AASHTO LRFD Fatigue Truck - US unit sys...
Agency Defi...
Copy from library...
New
Duplicate
Delete
Truck:
Axle no.
Axle load (kip)
Gage distance (ft)
Wheel contact width* (in)
Axle spacing (ft)
Minimum
Maximum
1 8.00 6.00 20.00
2 32.00 6.00 20.00 14.00 14.00
3 32.00 6.00 20.00 14.00 30.00
Totals: 72.00 28.00 44.00
New
Duplicate
Delete
Validation
On
Back
Forward

Geometry


W Fork Willow Cr.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
File
Design Input
Design
Project
Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report
Structure definition type: System definition
Number of spans: 3
Number of beams: 5
Girder spacing: 8.75 ft
Support skew: 0 Degrees
Number of design lanes: 3
Span Length
Beam Projection Left End
Right End
Support Distance On Left
On Right
CL Pier
Spans:
Span
Length (ft)
Beam projection (in)
Left end
Right end
1 51.75 7.50 7.50
2 52.50 7.50 7.50
3 51.75 7.50 7.50
Supports:

Project
Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report

Validation Off

Structure definition type: System definition

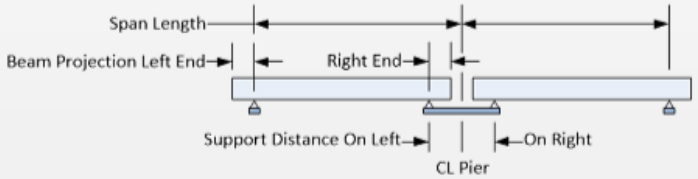
Number of spans: 3

Number of beams: 5

Girder spacing: 8.75 ft

Support skew: 0 Degrees

Number of design lanes: 3



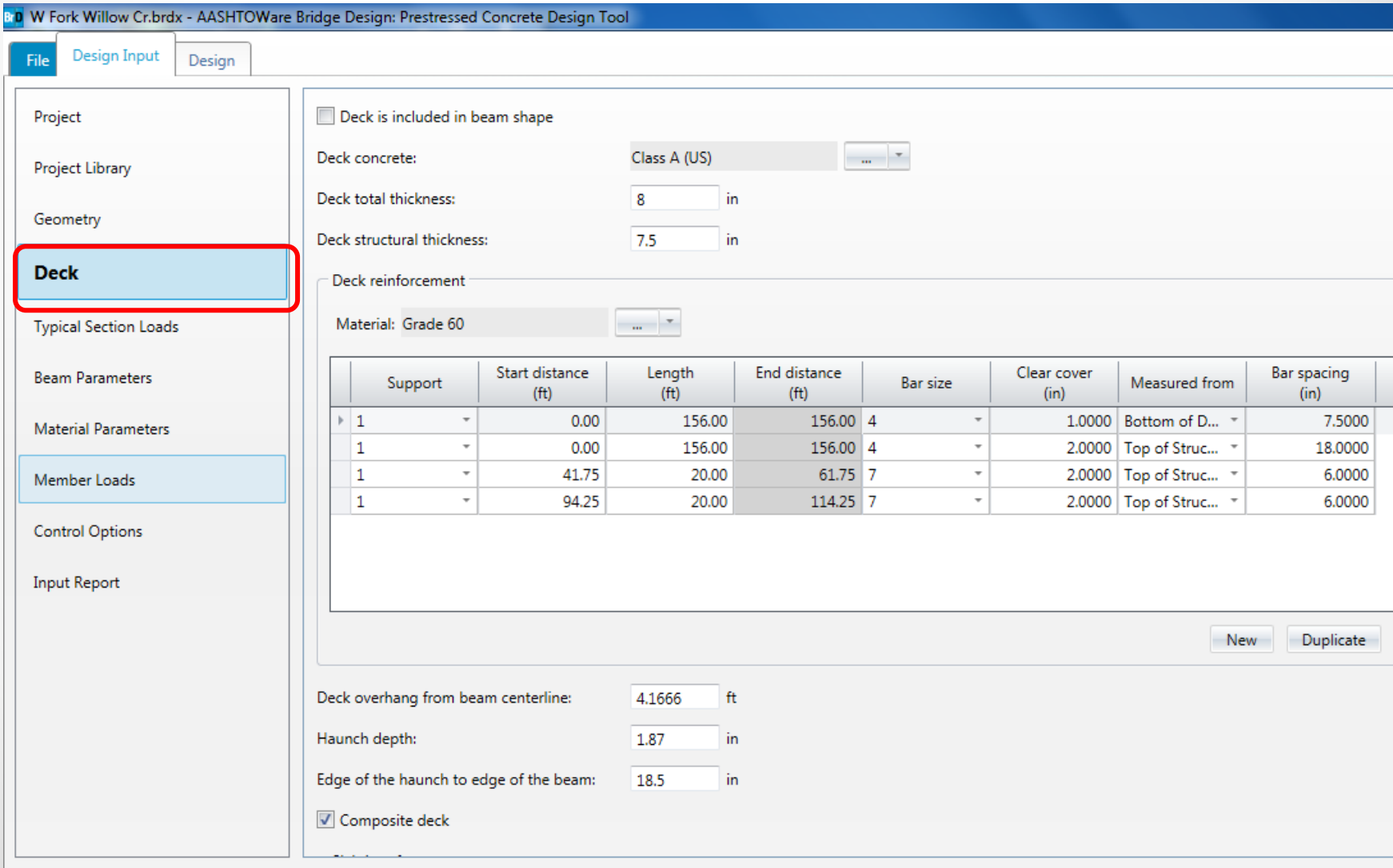
Spans:

Span	Length (ft)	Beam projection (in)	
		Left end	Right end
1	51.75	7.50	7.50
2	52.50	7.50	7.50
3	51.75	7.50	7.50

Supports:

Support	Support type	Support distance (in)	
		On left	On right
1	Pinned		
2	Roller	9.0	9.0
3	Roller	9.0	9.0
4	Roller		

Deck


W Fork Willow Cr.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
File
Design Input
Design
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Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report
Deck is included in beam shape
Deck concrete:
Class A (US)
Deck total thickness:
8
in
Deck structural thickness:
7.5
in
Deck reinforcement
Material:
Grade 60
Support
Start distance (ft)
Length (ft)
End distance (ft)
Bar size
Clear cover (in)
Measured from
Bar spacing (in)
1 0.00 156.00 156.00 4 1.0000 Bottom of D... 7.5000
1 0.00 156.00 156.00 4 2.0000 Top of Struc... 18.0000
1 41.75 20.00 61.75 7 2.0000 Top of Struc... 6.0000
1 94.25 20.00 114.25 7 2.0000 Top of Struc... 6.0000
New
Duplicate
Deck overhang from beam centerline:
4.1666
ft
Haunch depth:
1.87
in
Edge of the haunch to edge of the beam:
18.5
in
Composite deck

W Fork Willow Cr.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool

File | Design Input | Design

- Project
- Project Library
- Geometry
- **Deck**
- Typical Section Loads
- Beam Parameters
- Material Parameters
- Member Loads
- Control Options
- Input Report

Validation: On

☐ Deck is included in beam shape

Deck concrete: Class A (US) ...

Deck total thickness: 8 in

Deck structural thickness: 7.5 in

Deck reinforcement

Material: Grade 60 ...

Support	Start distance (ft)	Length (ft)	End distance (ft)	Bar size	Clear cover (in)	Measured from	Bar spacing (in)
1	0.00	156.00	156.00	4	1.0000	Bottom of D...	7.5000
1	0.00	156.00	156.00	4	2.0000	Top of Struc...	18.0000
1	41.75	20.00	61.75	7	2.0000	Top of Struc...	6.0000
1	94.25	20.00	114.25	7	2.0000	Top of Struc...	6.0000

New | Duplicate | Delete

Deck overhang from beam centerline: 4.1666 ft

Haunch depth: 1.87 in

Edge of the haunch to edge of the beam: 37 in

☑ Composite deck

Slab interface

Interface type: Intentionally Roughened

Compute

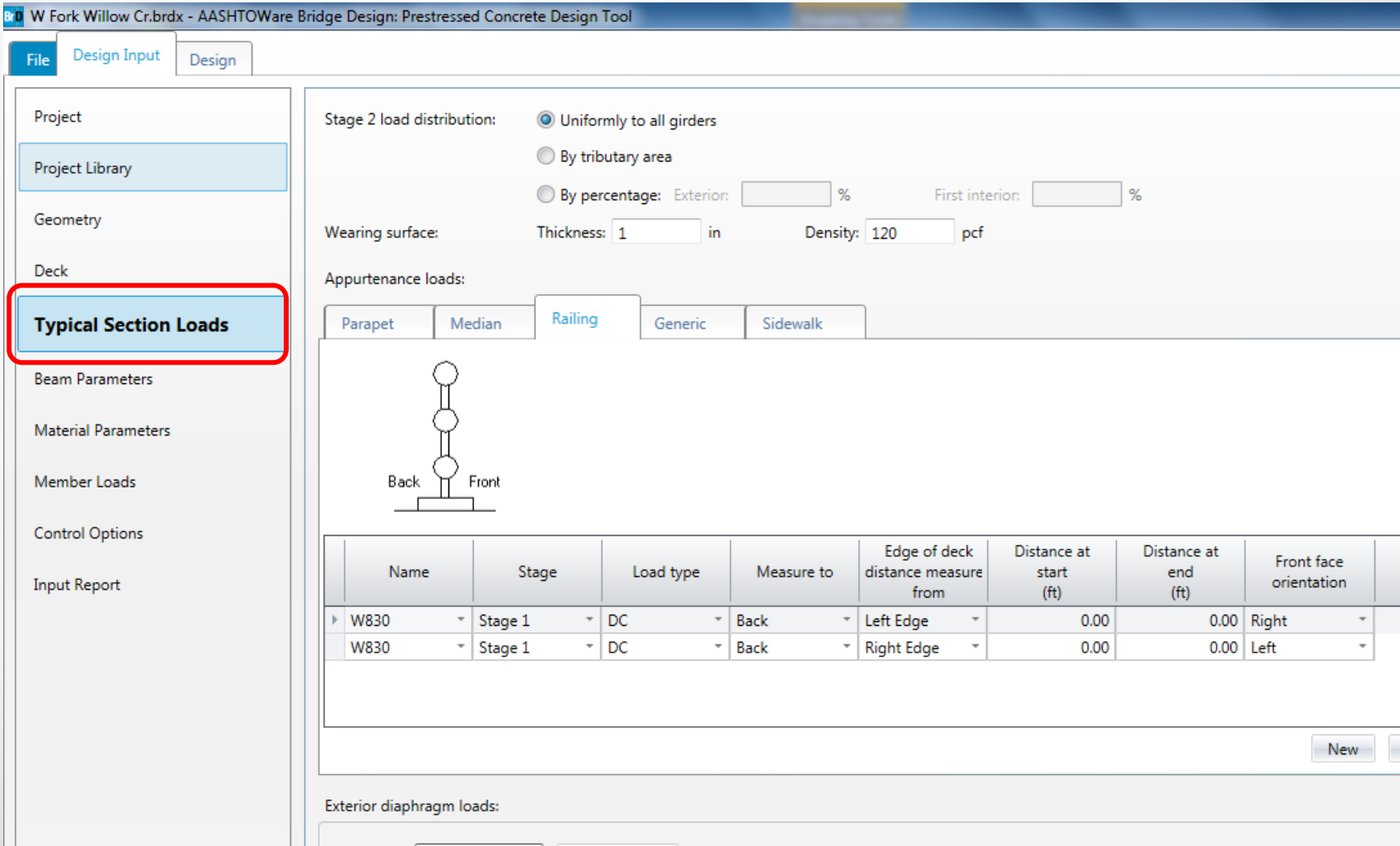
Cohesion factor: 0.28 ksi

Friction factor: 1

K1: 0.3

K2: 1.8 ksi

Typical Section Loads



Project
Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report

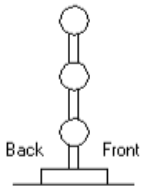
Validation Off

Stage 2 load distribution: (•) Uniformly to all girders ( ) By tributary area ( ) By percentage: Exterior: % First interior: %

Wearing surface: Thickness: 1 in Density: 120 pcf

Appurtenance loads:

Parapet | Median | Railing | Generic | Sidewalk



Name	Stage	Load type	Measure to	Edge of deck distance measure from	Distance at start (ft)	Distance at end (ft)	Front face orientation
W830	Stage 1	DC	Back	Left Edge	0.00	0.00	Right
W830	Stage 1	DC	Back	Right Edge	0.00	0.00	Left

New | Duplicate | Delete

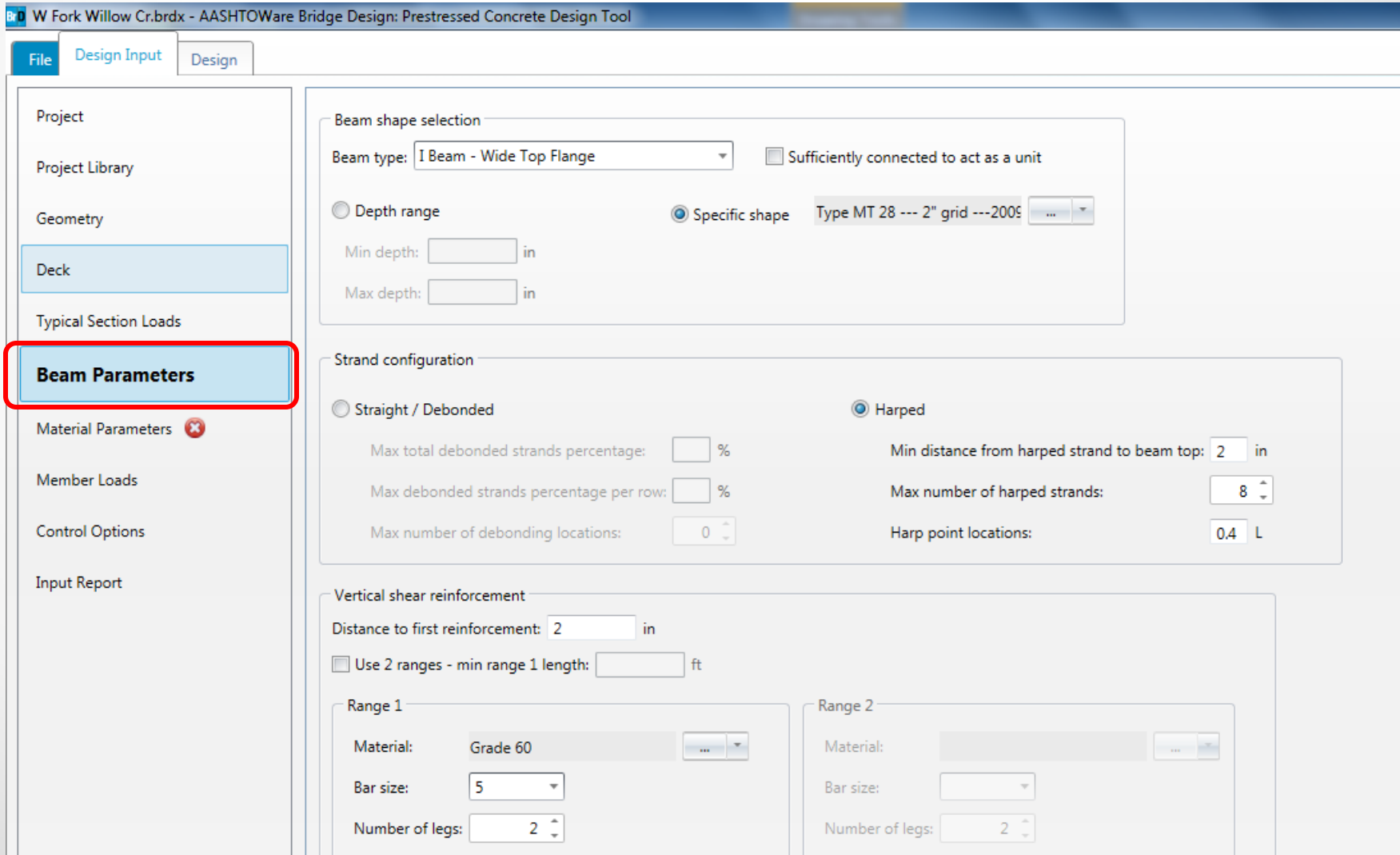
Exterior diaphragm loads:

Girder bay: 1 | Copy bay to...

Support	Start distance (ft)		Diaphragm spacing (ft)	Number of spaces	Length (ft)	End distance (ft)		Load (kip)
	Left girder	Right girder				Left girder	Right girder	
1	0.00	0.00	25.50	1	25.50	25.50	25.50	1.640
1	0.00	0.00	78.00	1	78.00	78.00	78.00	1.640
1	0.00	0.00	130.50	1	130.50	130.50	130.50	1.640

New | Duplicate | Delete

Beam Parameters



W Fork Willow Cr.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool

File | Design Input | Design

- Project
- Project Library
- Geometry
- Deck
- Typical Section Loads
- **Beam Parameters**
- Material Parameters
- Member Loads
- Control Options
- Input Report

Validation: On

Beam shape selection

Beam type: I Beam - Wide Top Flange

Sufficiently connected to act as a unit

Depth range

Min depth: in

Max depth: in

Specific shape: Type MT 28 --- 2" grid ---2009

Strand configuration

Straight / Debonded

Max total debonded strands percentage: %

Max debonded strands percentage per row: %

Max number of debonding locations: 0

Harped

Min distance from harped strand to beam top: 2 in

Max number of harped strands: 8

Harp point locations: 0.4 L

Vertical shear reinforcement

Distance to first reinforcement: 2 in

Use 2 ranges - min range 1 length: ft

Range 1

Material: Grade 60

Bar size: 5

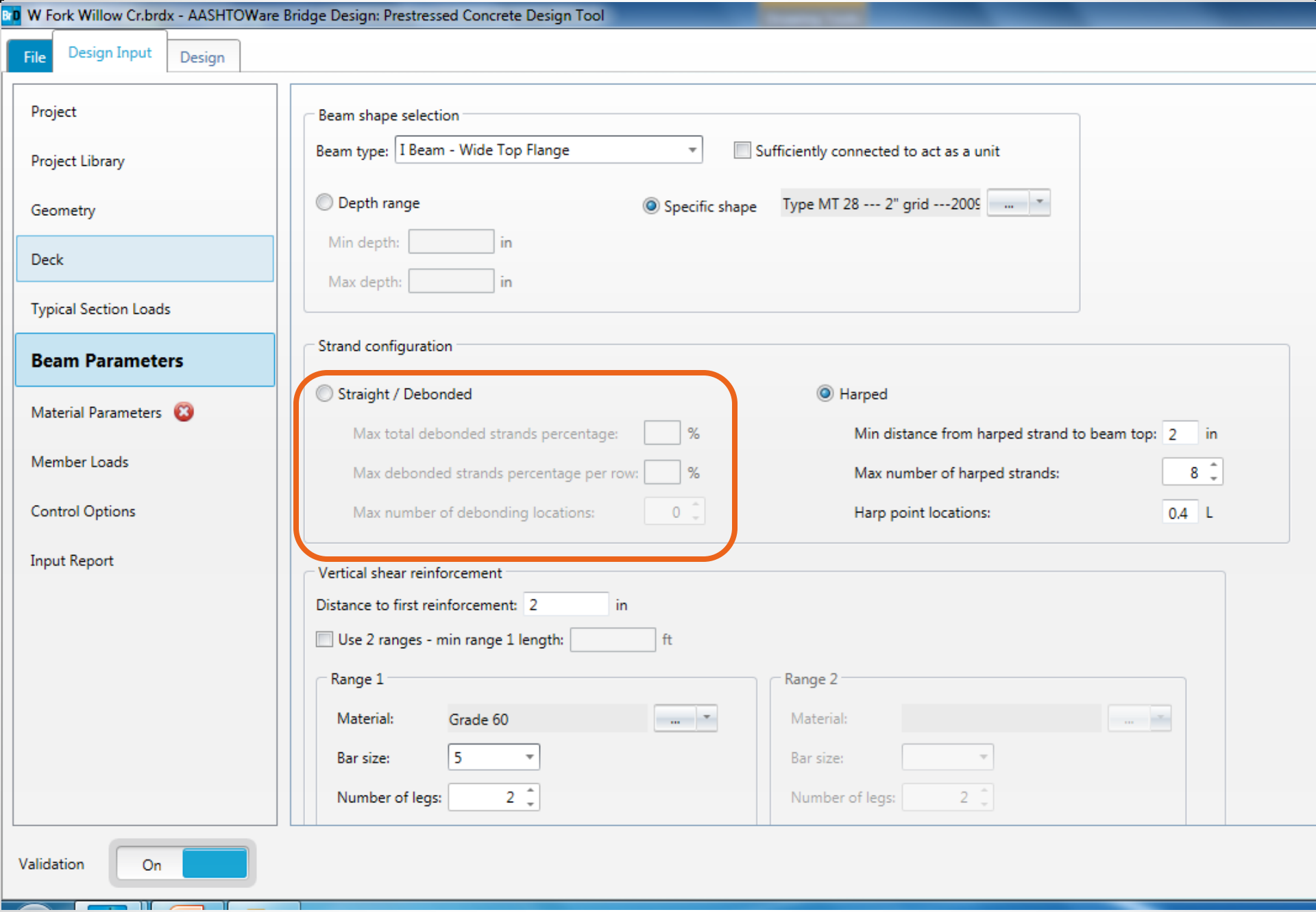
Number of legs: 2

Range 2

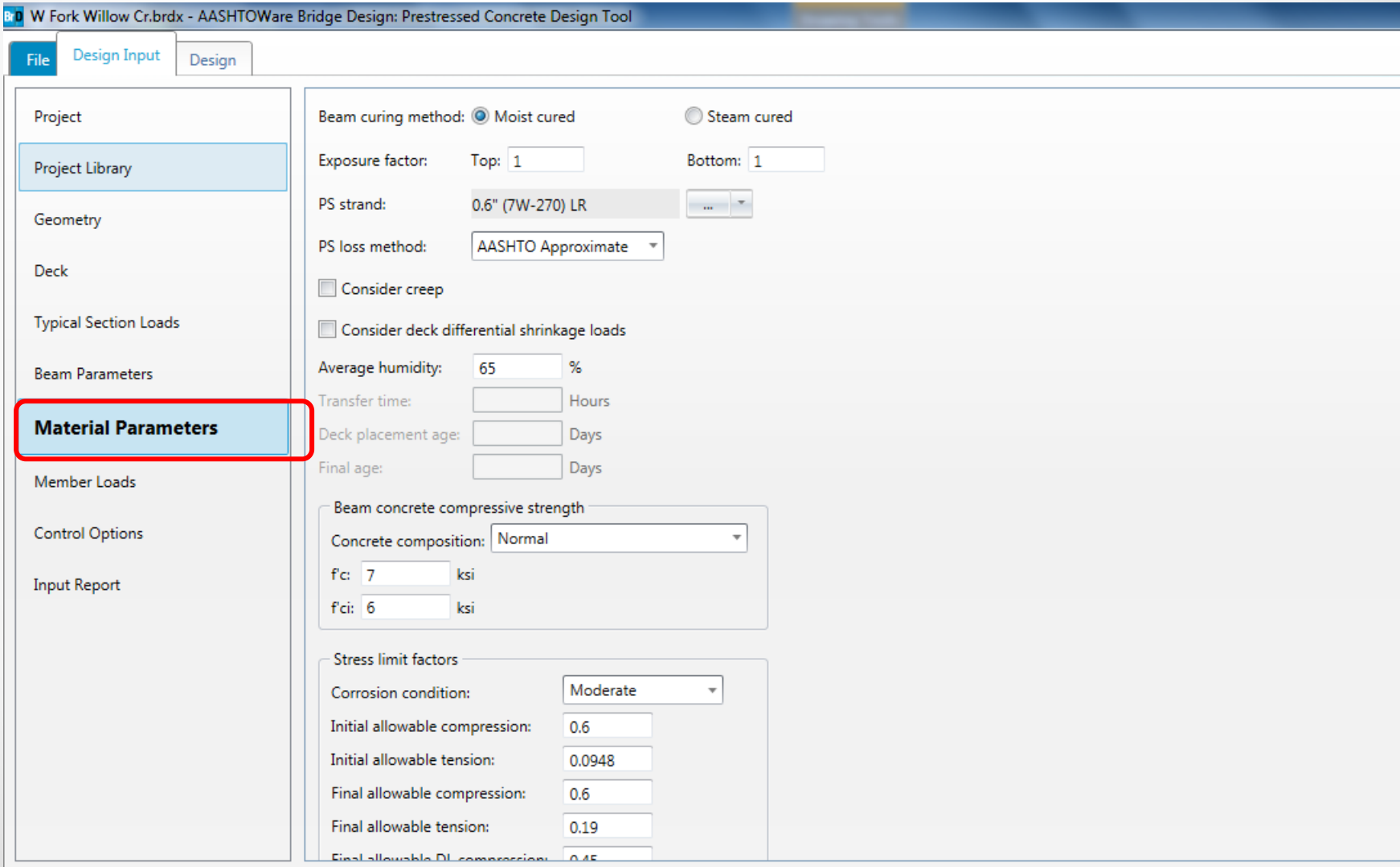
Material:

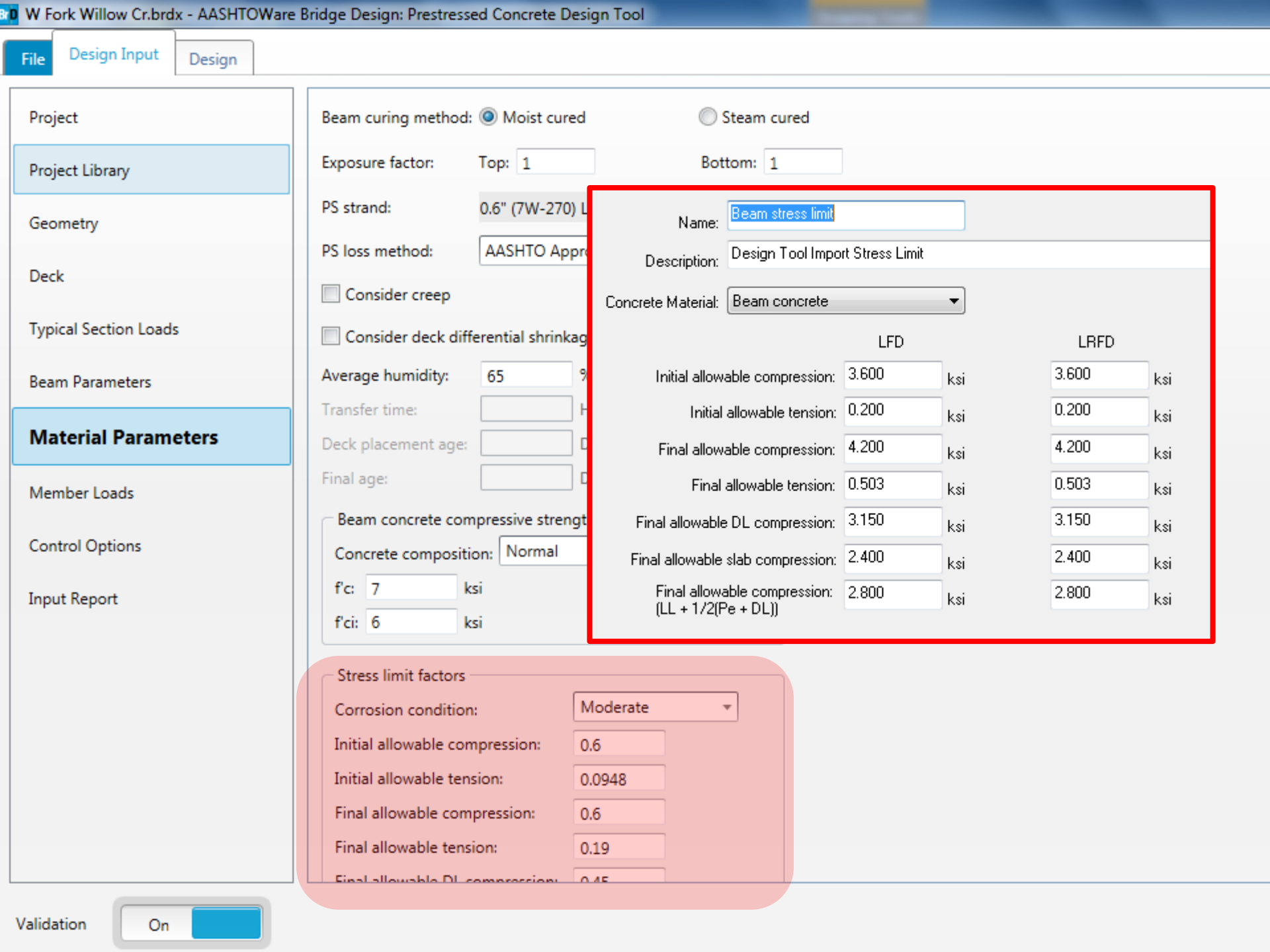
Bar size:

Number of legs: 2


W Fork Willow Cr.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
File
Design Input
Design
Project
Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report
Beam shape selection
Beam type:
I Beam - Wide Top Flange
Sufficiently connected to act as a unit
Depth range
Specific shape
Type MT 28 --- 2" grid ---2009
Min depth:
in
Max depth:
in
Strand configuration
Straight / Debonded
Max total debonded strands percentage:
%
Max debonded strands percentage per row:
%
Max number of debonding locations:
0
Harped
Min distance from harped strand to beam top:
2
in
Max number of harped strands:
8
Harp point locations:
0.4
L
Vertical shear reinforcement
Distance to first reinforcement:
2
in
Use 2 ranges - min range 1 length:
ft
Range 1
Material:
Grade 60
Bar size:
5
Number of legs:
2
Range 2
Material:
Bar size:
Number of legs:
2
Validation
On

Material Parameters




W Fork Willow Cr.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
File
Design Input
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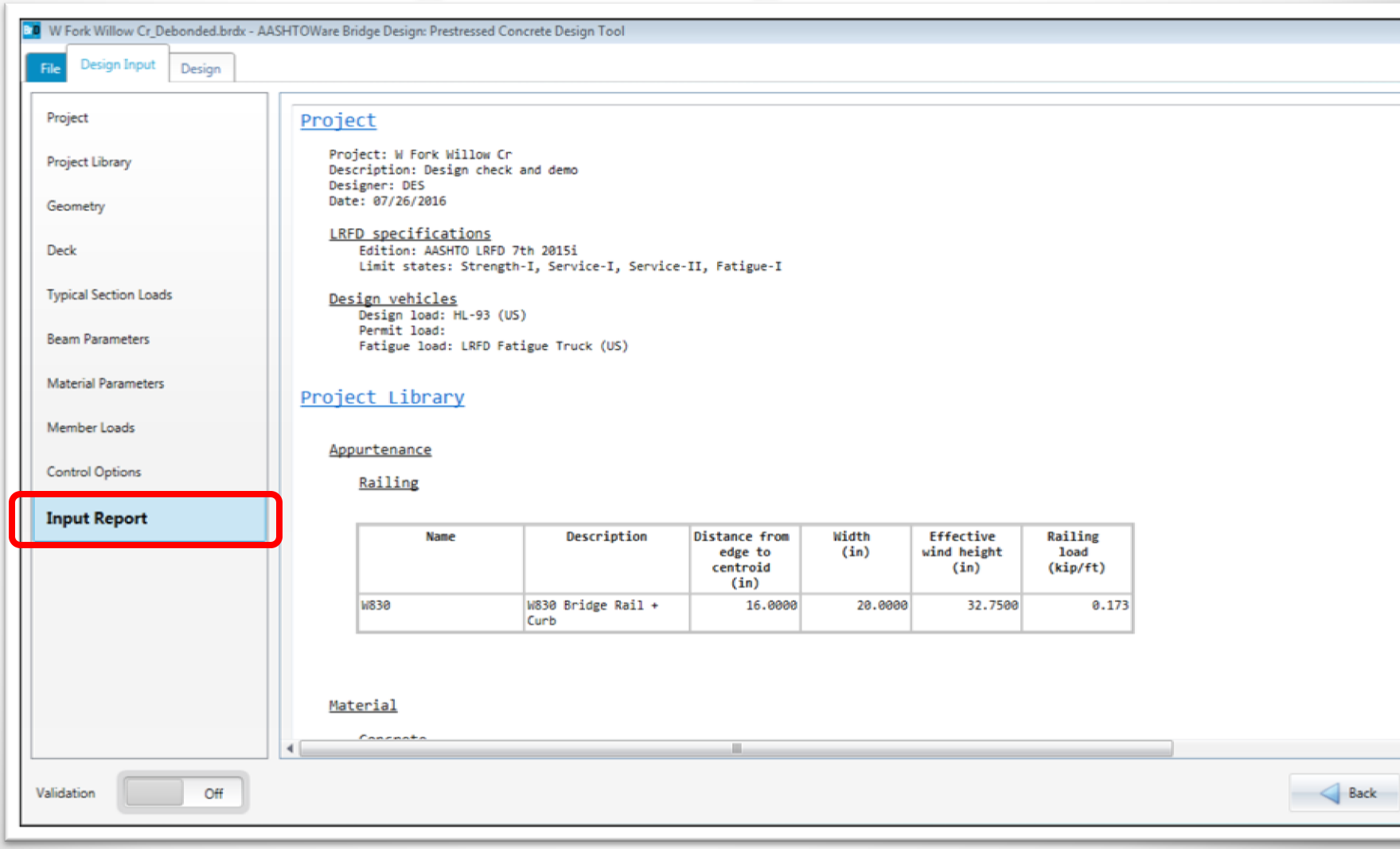
Project
Project Library
Geometry
Deck
Typical Section Loads
Beam Parameters
Material Parameters
Member Loads
Control Options
Input Report
Beam curing method: Moist cured Steam cured
Exposure factor: Top: 1 Bottom: 1
PS strand: 0.6" (7W-270) L
PS loss method: AASHTO Appr
Consider creep
Consider deck differential shrinkag
Average humidity: 65 %
Transfer time: H
Deck placement age: D
Final age: D
Beam concrete compressive strengt
Concrete composition: Normal
f'c: 7 ksi
f'ci: 6 ksi
Name: Beam stress limit
Description: Design Tool Import Stress Limit
Concrete Material: Beam concrete
LFD
LRFD
Initial allowable compression: 3.600 ksi 3.600 ksi
Initial allowable tension: 0.200 ksi 0.200 ksi
Final allowable compression: 4.200 ksi 4.200 ksi
Final allowable tension: 0.503 ksi 0.503 ksi
Final allowable DL compression: 3.150 ksi 3.150 ksi
Final allowable slab compression: 2.400 ksi 2.400 ksi
Final allowable compression: (LL + 1/2(Pe + DL)) 2.800 ksi 2.800 ksi
Stress limit factors
Corrosion condition: Moderate
Initial allowable compression: 0.6
Initial allowable tension: 0.0948
Final allowable compression: 0.6
Final allowable tension: 0.19
Validation
On

Input Report



Input Report

Concrete

I Beam - Wide Top Flange

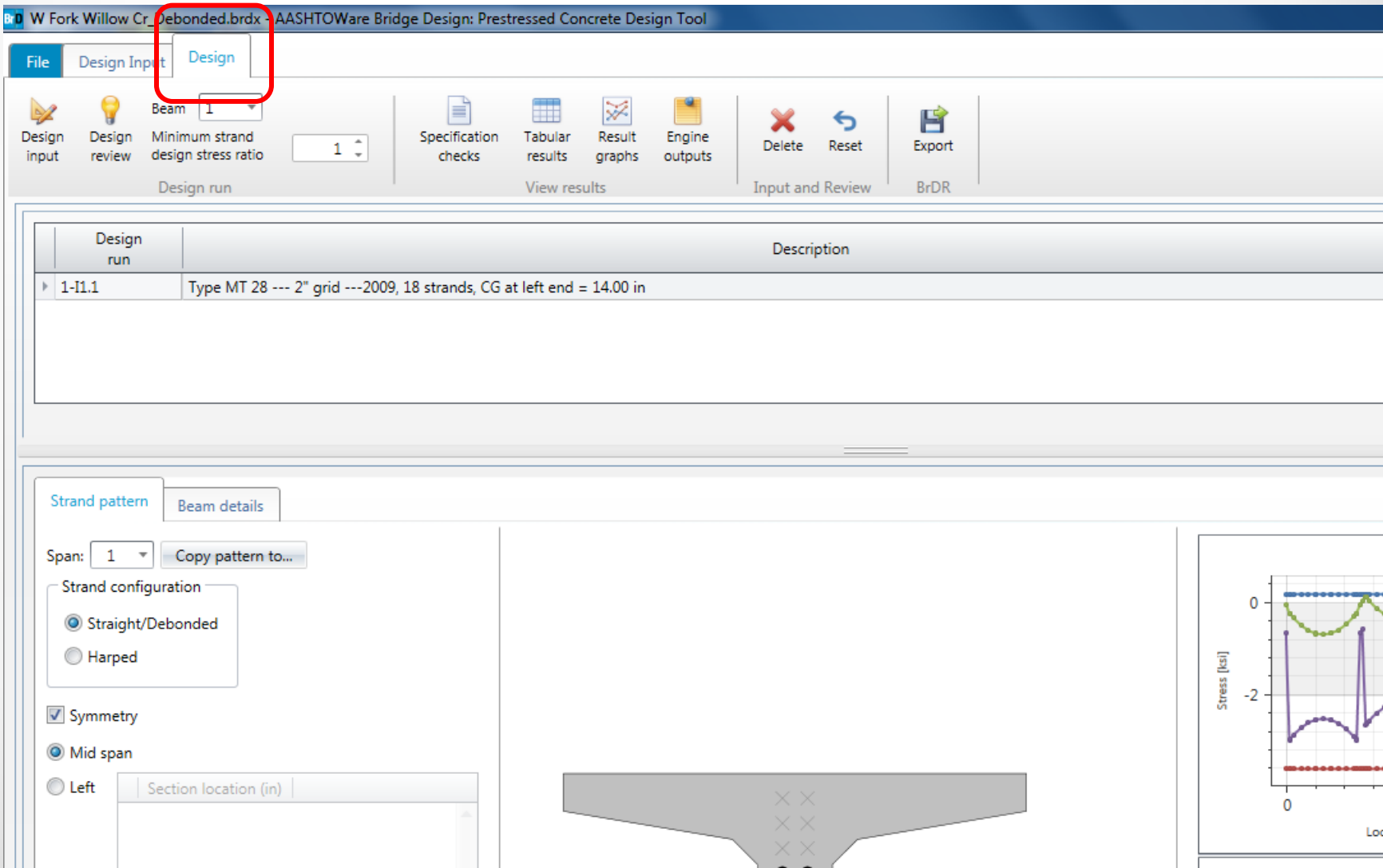
Type MT 28 --- 2" grid ---2009 - Type MT 28 --- 2" grid

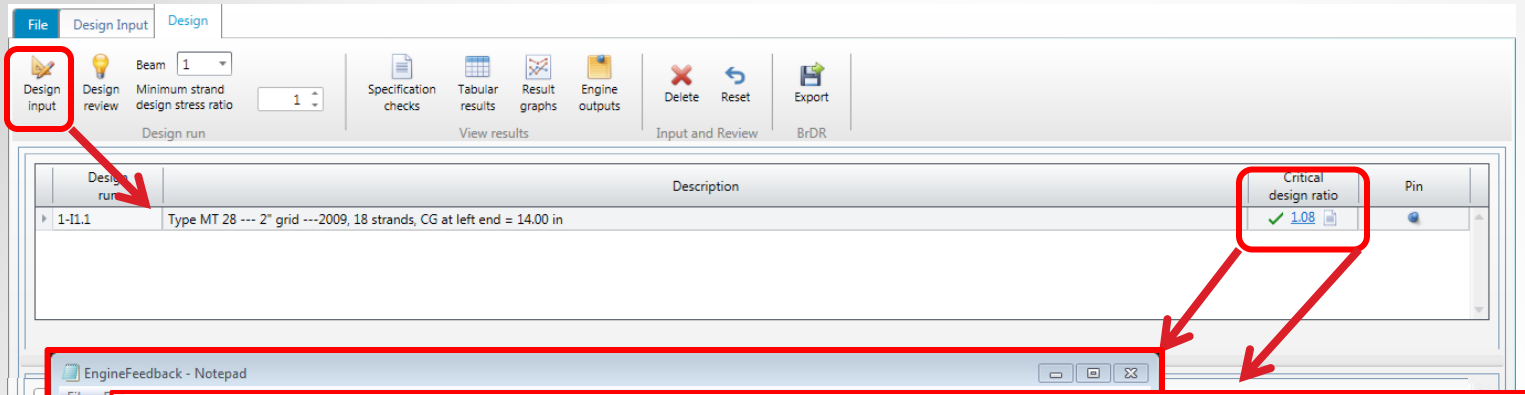
Strand Grid

Row no.	No. of strands	Vertical distance from bottom (in)	Horizontal spacing (in)
1	12	2.0000	2.0000
2	12	4.0000	2.0000
3	8	6.0000	2.0000
4	2	8.0000	2.0000
5	2	10.0000	2.0000
6	2	12.0000	2.0000
7	2	14.0000	2.0000
8	2	16.0000	2.0000
9	2	18.0000	2.0000
10	2	20.0000	2.0000
11	2	22.0000	2.0000
12	2	24.0000	2.0000
13	2	26.0000	2.0000

Design Outputs

Design Tab


W Fork Willow Cr_Debonded.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
File
Design Input
Design
Design input
Design review
Beam
1
Minimum strand design stress ratio
1
Design run
Specification checks
Tabular results
Result graphs
Engine outputs
View results
Delete
Reset
Input and Review
Export
BrDR
Design run
Description
1-I1.1
Type MT 28 --- 2" grid ---2009, 18 strands, CG at left end = 14.00 in
Strand pattern
Beam details
Span:
1
Copy pattern to...
Strand configuration
Straight/Debonded
Harped
Symmetry
Mid span
Left
Section location (in)
Stress [ksi]
0
-2
0



EngineFeedback - Notepad

Bridge ID :
Bridge :
Superstructure Def :
Member :
Analysis Preference Setting :

NBI Structure ID :
Bridge Alt :
Member Alt :

AASHTO LRFD Specification, Edition 7, Interim 2015

Specification Check Summary

Article	Status
Initial Stress at Transfer (5.9.4.1.1, 5.9.4.1.2)	Pass
Final Stress due to Permanent and Transient Loads (5.9.4.2.1, 5.9.4.2.2)	Pass
Flexure (5.7.3.2, 5.7.3.3.2)	Pass
Shear (5.8.3.3, 5.8.2.5, 5.8.2.7, 5.8.3.5)	Pass
Deflection (5.7.3.6.2)	Pass

Initial Compression Stress At Transfer of Prestress

Location (ft)	Allowable Stress (ksi)	Actual Stress Top of Beam (ksi)	Actual Stress Bot of Beam (ksi)	Ratio	Code
0.000	-3.60	-0.02	-0.64	5.62	Pass
2.375	-3.60	-0.21	-2.97	1.21	Pass
2.619	-3.60	-0.22	-2.96	1.21	Pass
5.175	-3.60	-0.32	-2.87	1.26	Pass
10.350	-3.60	-0.48	-2.71	1.33	Pass
15.525	-3.60	-0.59	-2.59	1.39	Pass
20.275	-3.60	-0.66	-2.53	1.42	Pass

I(x) = 150766.263 (in^4)

File | Design Input | Design

Design input | Design review | Beam 1 | Minimum strand design stress ratio 1 | Design run

Specification checks | Tabular results | Result graphs | Engine outputs | View results

Delete | Reset | Input and Review

Export | BrDR

Design run	Description	Critical design ratio	Pin
1-I1.1	Type MT 28 --- 2" grid ---2009, 18 strands, CG at left end = 14.00 in	✓ 1.08	

Strand pattern | Beam details

Span: 1 | Copy pattern to...

Strand configuration

- (•) Straight/Debonded
- ( ) Harped

[x] Symmetry

(•) Mid span

( ) Left — Section location (in) — New | Modify | Delete

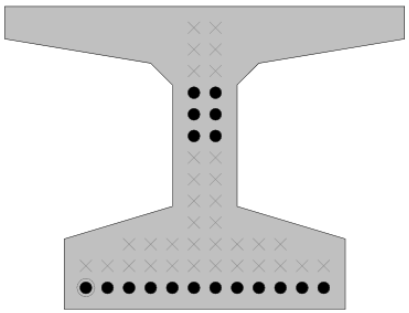
( ) Right — Section location (in) — New | Modify | Delete

```
Beam shape: Type MT 28 --- 2" grid ---2009
==========================================
Location = 25.875

Non-composite Section Properties:
---------------------------------
     Number of Strands = 18
               Area (Ag) = 464.375 (in^2)
N.A. to bottom of beam = 14.005 (in)
   N.A. to top of beam = 13.995 (in)
                S(top) = 3335.868 (in^3)
                S(bot) = 3333.250 (in^3)
                  I(x) = 46683.823 (in^4)

Composite Section Properties:
---------------------------------
N.A. to bottom of beam = 25.323 (in)
   N.A. to top of beam = 2.677 (in)
   N.A. to top of slab = 12.047 (in)
          S(top-slab) = 16378.003 (in^3)
                S(top) = 56323.756 (in^3)
                S(bot) = 5953.676 (in^3)
                  I(x) = 150766.263 (in^4)

==========================================
```



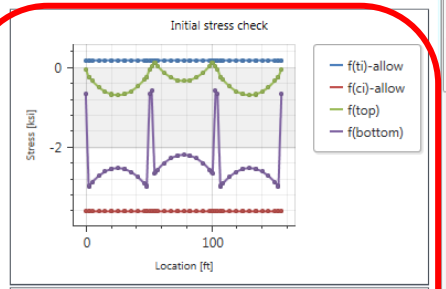
Number of strands = 18

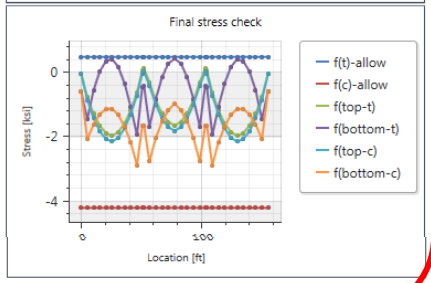
Number of debonded strands (Total/Here/Other) = 0/0/0

CG of strands (measured from bottom of section) = 7.33 in

Legend:

- No strand at this position at the current section location.
- No strand at this position at the current location but a strand is harped to this position.
- A strand occupies this position at the current section location.
- The strand is debonded from the end of the beam to the current section location.
- The strand is debonded at other section location. Hover over the strand for more information.
- The harped position of a harped strand.
- The mid-span position of a harped strand.
- The mid-span position of one strand and the harped position of another strand.





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File | Design Input | Design

Design input | Design review | Beam 2 | Minimum strand design stress ratio 1 | Specification checks | Tabular results | Result graphs | Engine outputs | Delete | Reset | Export

Design run | View results | Input and Review | BrDR

Strand pattern | Beam details

Beam shape: Type MT 28 --- 2" grid ---2009

Vertical shear reinforcement ranges:

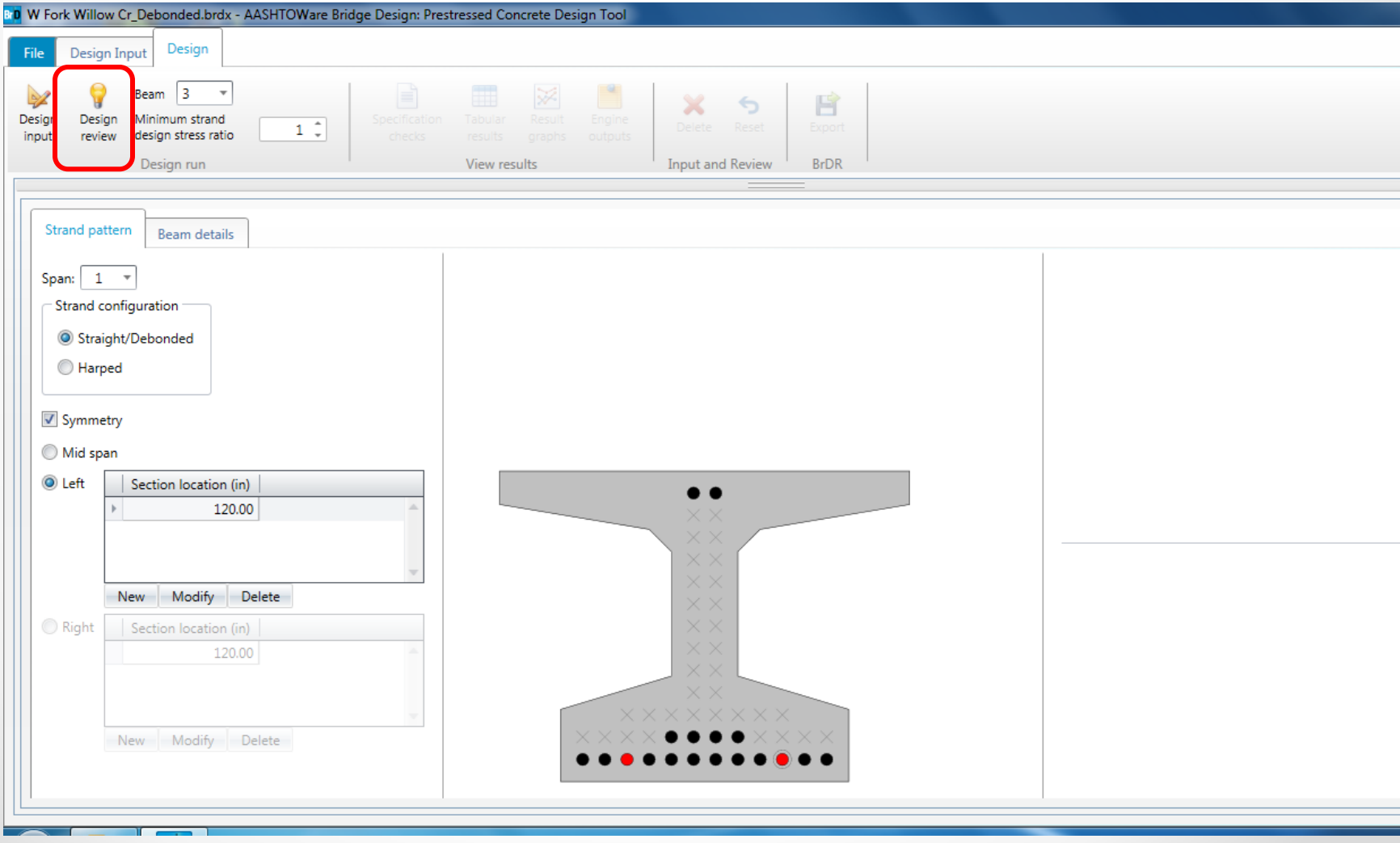
Reinforcement	Extends into deck	Span	Start distance (ft)	Number of spaces	Spacing (in)	Length (ft)	End distance (ft)
Range 1	☑	1	0.17	1	0.00	0.00	0.17
Range 1	☑	1	0.17	8	6.00	4.00	4.17
Range 1	☑	1	4.17	1	1.90	0.16	4.33
Range 1	☑	1	4.33	17	12.00	17.00	21.33
Range 1	☑	1	21.33	1	9.60	0.80	22.13
Range 1	☑	1	22.13	4	24.00	8.00	30.13
Range 1	☑	1	30.13	1	9.60	0.80	30.93
Range 1	☑	1	30.93	17	12.00	17.00	47.93
Range 1	☑	1	47.93	1	1.90	0.16	48.08

New | Duplicate | Delete

Positive moment continuity steel:

Span	Left support				Right support			
	Material	Distance (in)	Number of bars	Bar size	Material	Distance (in)	Number of bars	Bar size
1					Grade 60	3.00	5.00	5
2	Grade 60	3.00	5.00	5	Grade 60	3.00	5.00	5

Design Review



File | Design Input | Design

Design input | Design review | Beam 1 | Minimum strand design stress ratio 1 | Design run

Specification checks | Tabular results | Result graphs | Engine outputs | View results

Delete | Reset | Input and Review

Export | BrDR

Design run	Description	Critical design ratio	Pin
1-I1.1	Type MT 28 --- 2" grid ---2009, 18 strands, CG at left end = 14.00 in	1.08	
1-R1.1	Type MT 28 --- 2" grid ---2009, 18 strands, CG at left end = 14.00 in	1.08	

Strand pattern | Beam details

Span: 1

Strand configuration

- Straight/Debonded
- Harped

Symmetry

Mid span

Left

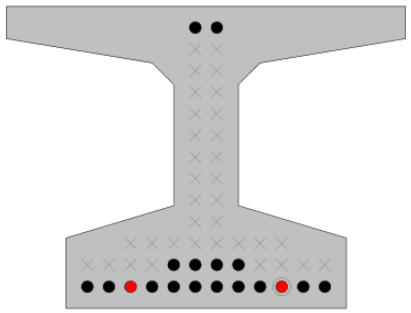
Section location (in)
120.00

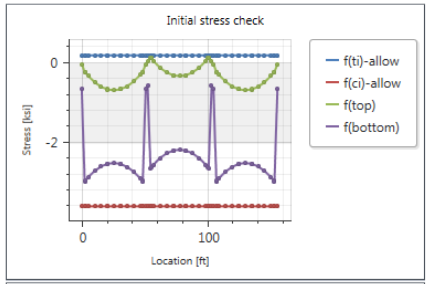
New | Modify | Delete

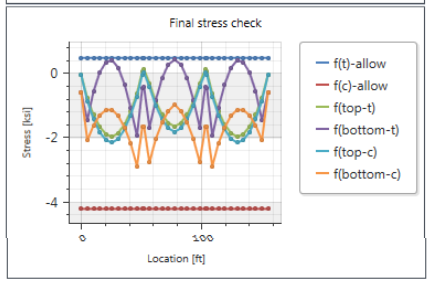
Right

Section location (in)
120.00

New | Modify | Delete








```
Beam shape: Type MT 28 --- 2" grid ---2009
================================================
Location = 25.875

Non-composite Section Properties:
--------------------------------
     Number of Strands = 18
               Area (Ag) = 464.375 (in^2)
N.A. to bottom of beam = 14.005 (in)
   N.A. to top of beam = 13.995 (in)
               S(top) = 3335.868 (in^3)
               S(bot) = 3333.250 (in^3)
                 I(x) = 46683.823 (in^4)

Composite Section Properties:
--------------------------------
N.A. to bottom of beam = 25.323 (in)
   N.A. to top of beam = 2.677 (in)
   N.A. to top of slab = 12.047 (in)
         S(top-slab) = 16378.003 (in^3)
               S(top) = 56323.756 (in^3)
               S(bot) = 5953.676 (in^3)
                 I(x) = 150766.263 (in^4)

================================================
```

Number of strands = 18

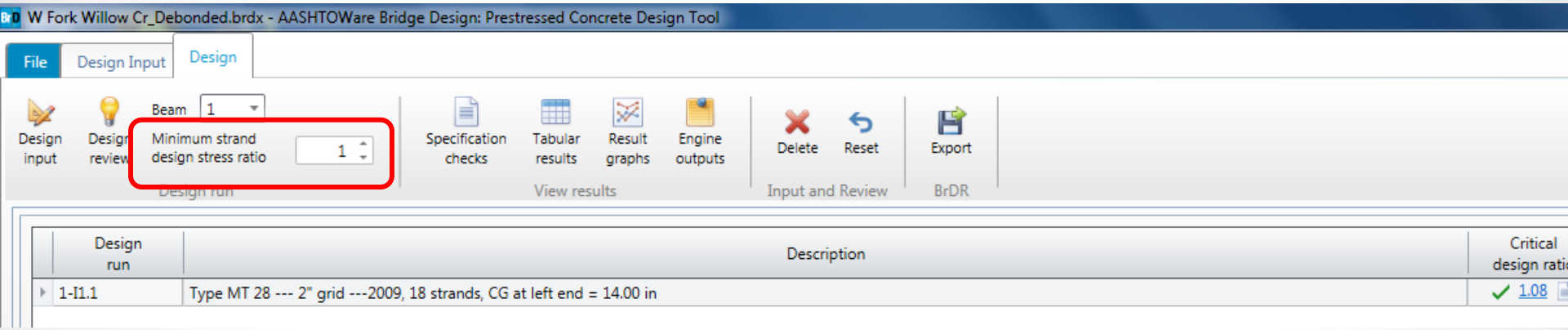
Number of debonded strands (Total/Here/Other) = 0/0/0

CG of strands (measured from bottom of section) = 7.33 in

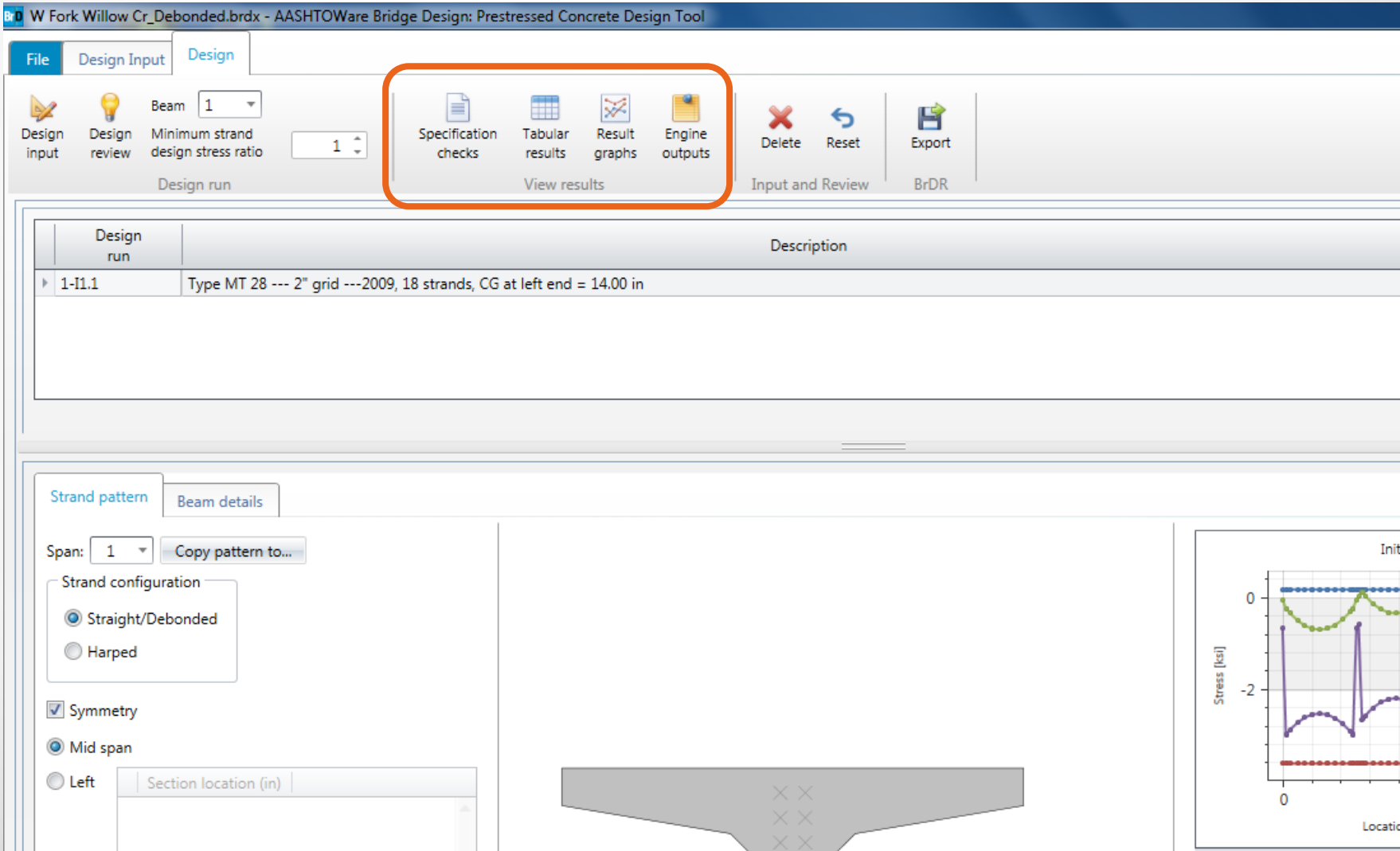
Legend:

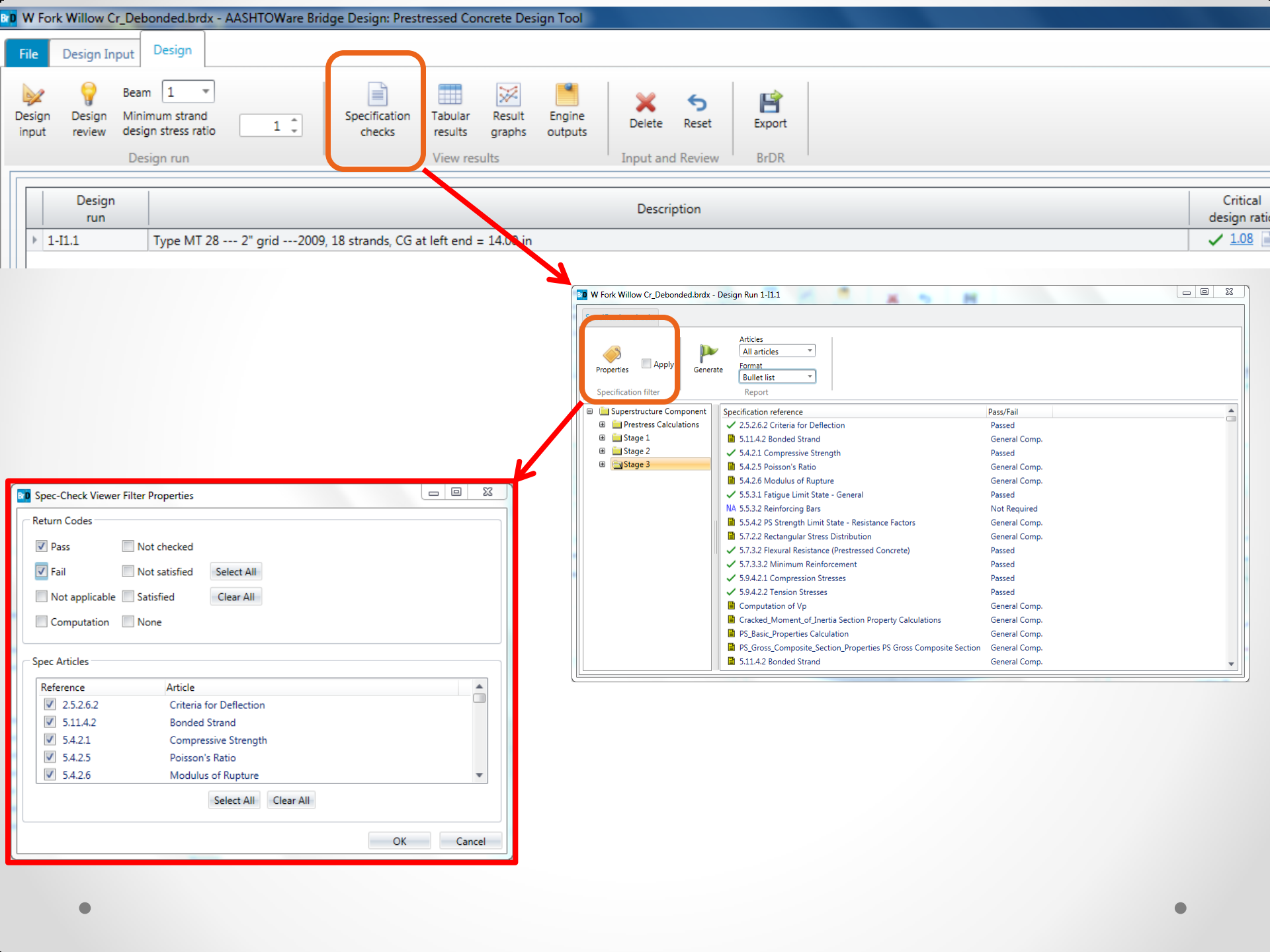
- No strand at this position at the current section location.
- No strand at this position at the current location but a strand is harped to this position.
- A strand occupies this position at the current section location.
- The strand is debonded from the end of the beam to the current section location.
- The strand is debonded at other section location. Hover over the strand for more information.
- The harped position of a harped strand.
- The mid-span position of a harped strand.
- The mid-span position of one strand and the harped position of another strand.

Minimum strand design stress ratio



View Results




W Fork Willow Cr_Debonded.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
File
Design Input
Design
Design input
Design review
Beam
1
Minimum strand design stress ratio
1
Design run
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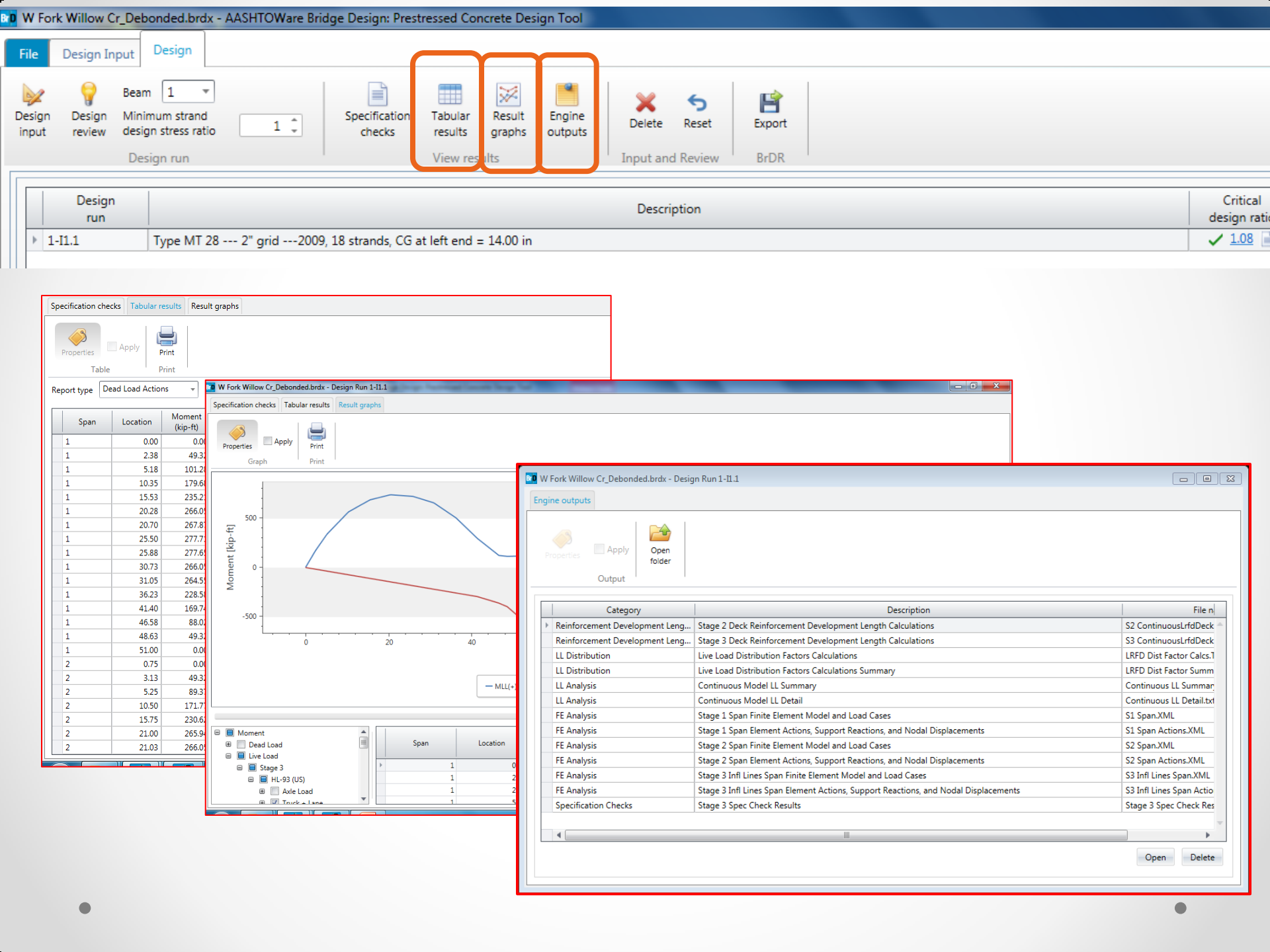
Tabular results
Result graphs
Engine outputs
View results
Delete
Reset
Input and Review
Export
BrDR
Design run
Description
Critical design ratio
1-I1.1
Type MT 28 --- 2" grid ---2009, 18 strands, CG at left end = 14.00 in
1.08
W Fork Willow Cr_Debonded.brdx - Design Run 1-I1.1
Properties
Apply
Specification filter
Generate
Articles
All articles
Format
Bullet list
Report
Superstructure Component
Prestress Calculations
Stage 1
Stage 2
Stage 3
Specification reference
Pass/Fail
2.5.2.6.2 Criteria for Deflection
Passed
5.11.4.2 Bonded Strand
General Comp.
5.4.2.1 Compressive Strength
Passed
5.4.2.5 Poisson's Ratio
General Comp.
5.4.2.6 Modulus of Rupture
General Comp.
5.5.3.1 Fatigue Limit State - General
Passed
NA 5.5.3.2 Reinforcing Bars
Not Required
5.5.4.2 PS Strength Limit State - Resistance Factors
General Comp.
5.7.2.2 Rectangular Stress Distribution
General Comp.
5.7.3.2 Flexural Resistance (Prestressed Concrete)
Passed
5.7.3.3.2 Minimum Reinforcement
Passed
5.9.4.2.1 Compression Stresses
Passed
5.9.4.2.2 Tension Stresses
Passed
Computation of Vp
General Comp.
Cracked_Moment_of_Inertia Section Property Calculations
General Comp.
PS_Basic_Properties Calculation
General Comp.
PS_Gross_Composite_Section_Properties PS Gross Composite Section
General Comp.
5.11.4.2 Bonded Strand
General Comp.
Spec-Check Viewer Filter Properties
Return Codes
Pass
Not checked
Fail
Not satisfied
Select All
Not applicable
Satisfied
Clear All
Computation
None
Spec Articles
Reference
Article
2.5.2.6.2
Criteria for Deflection
5.11.4.2
Bonded Strand
5.4.2.1
Compressive Strength
5.4.2.5
Poisson's Ratio
5.4.2.6
Modulus of Rupture
Select All
Clear All
OK
Cancel


W Fork Willow Cr_Debonded.brdx - AASHTOWare Bridge Design: Prestressed Concrete Design Tool
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1-I1.1
Type MT 28 --- 2" grid ---2009, 18 strands, CG at left end = 14.00 in
1.08
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Result graphs
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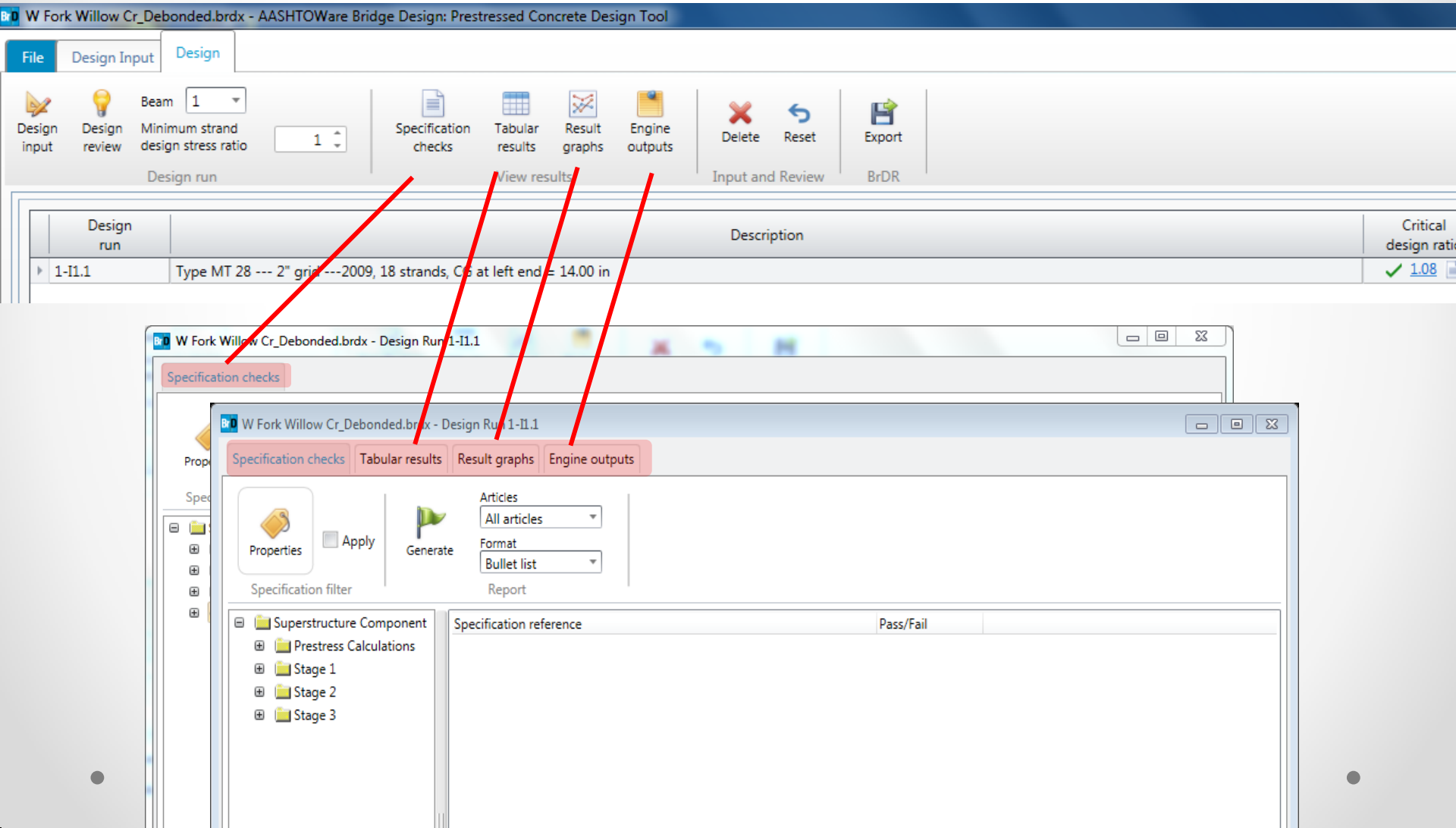
Apply
Print
Table
Print
Report type
Dead Load Actions
Span
Location
Moment (kip-ft)
W Fork Willow Cr_Debonded.brdx - Design Run 1-I1.1
Graph
Moment [kip-ft]
Moment
Dead Load
Live Load
Stage 3
HL-93 (US)
Axle Load
W Fork Willow Cr_Debonded.brdx - Design Run 1-I1.1
Engine outputs
Open folder
Output
Category
Description
File n
Reinforcement Development Leng...
Stage 2 Deck Reinforcement Development Length Calculations
S2 ContinuousLrfdDeck
Reinforcement Development Leng...
Stage 3 Deck Reinforcement Development Length Calculations
S3 ContinuousLrfdDeck
LL Distribution
Live Load Distribution Factors Calculations
LRFD Dist Factor Calcs.T
LL Distribution
Live Load Distribution Factors Calculations Summary
LRFD Dist Factor Summ
LL Analysis
Continuous Model LL Summary
Continuous LL Summar
LL Analysis
Continuous Model LL Detail
Continuous LL Detail.txt
FE Analysis
Stage 1 Span Finite Element Model and Load Cases
S1 Span.XML
FE Analysis
Stage 1 Span Element Actions, Support Reactions, and Nodal Displacements
S1 Span Actions.XML
FE Analysis
Stage 2 Span Finite Element Model and Load Cases
S2 Span.XML
FE Analysis
Stage 2 Span Element Actions, Support Reactions, and Nodal Displacements
S2 Span Actions.XML
FE Analysis
Stage 3 Infl Lines Span Finite Element Model and Load Cases
S3 Infl Lines Span.XML
FE Analysis
Stage 3 Infl Lines Span Element Actions, Support Reactions, and Nodal Displacements
S3 Infl Lines Span Actio
Specification Checks
Stage 3 Spec Check Results
Stage 3 Spec Check Res
Open
Delete

Pro Tip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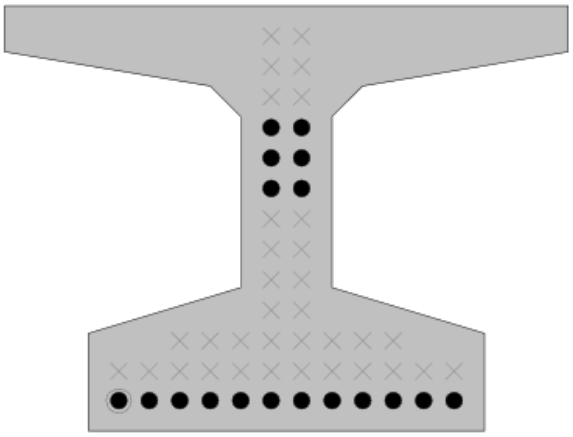
Prestress Calculations
Stage 1
Stage 2
Stage 3
Specification reference
Pass/Fail

Design Comparisons

Exterior Girder (Span 1)

Debonded/Straight



Number of strands = 18

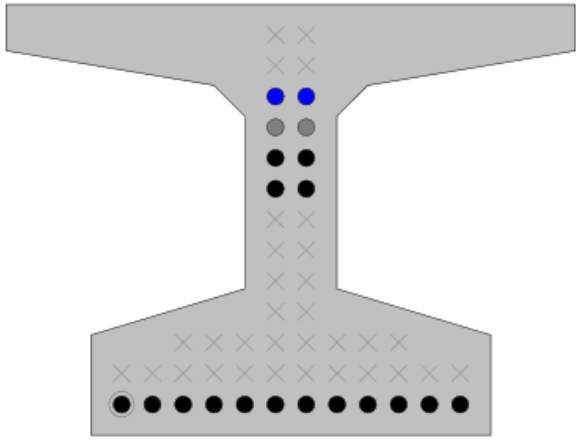
Number of debonded strands (Total/Here/Other) = 0/0/0

CG of strands (measured from bottom of section) = 7.33 in

Legend:

- No strand at this position at the current section location.
- No strand at this position at the current location but a strand is harped to this position.
- A strand occupies this position at the current section location.
- The strand is debonded from the end of the beam to the current section location.
- The strand is debonded at other section location. Hover over the strand for more information.
- The harped position of a harped strand.
- The mid-span position of a harped strand.
- The mid-span position of one strand and the harped position of another strand.

Harped



Number of strands = 18

Number of harped strands = 2

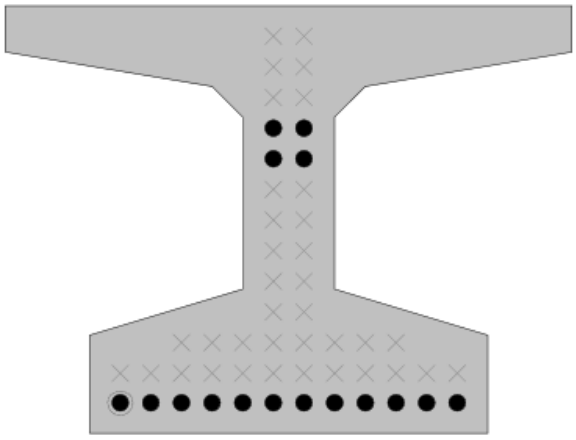
CG of strands (measured from bottom of section) = 7.56 in

Legend:

- No strand at this position at the current section location.
- No strand at this position at the current location but a strand is harped to this position.
- A strand occupies this position at the current section location.
- The strand is debonded from the end of the beam to the current section location.
- The strand is debonded at other section location. Hover over the strand for more information.
- The harped position of a harped strand.
- The mid-span position of a harped strand.
- The mid-span position of one strand and the harped position of another strand.

Interior Girder (Span 1)

Debonded/Straight



Number of strands = 16

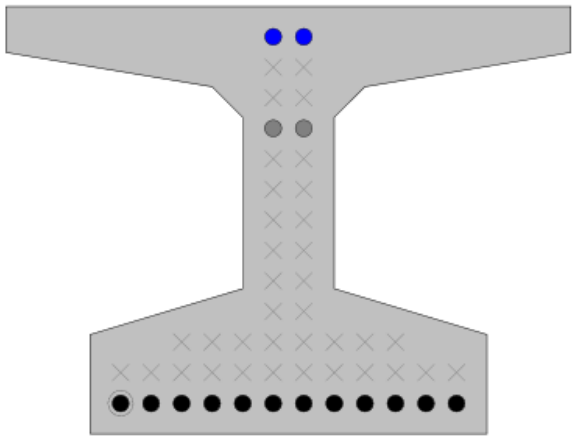
Number of debonded strands (Total/Here/Other) = 0/0/0

CG of strands (measured from bottom of section) = 6.25 in

Legend:

- No strand at this position at the current section location.
- No strand at this position at the current location but a strand is harped to this position.
- A strand occupies this position at the current section location.
- The strand is debonded from the end of the beam to the current section location.
- The strand is debonded at other section location. Hover over the strand for more information.
- The harped position of a harped strand.
- The mid-span position of a harped strand.
- The mid-span position of one strand and the harped position of another strand.

Harped



Number of strands = 14

Number of harped strands = 2

CG of strands (measured from bottom of section) = 5.43 in

Legend:

- No strand at this position at the current section location.
- No strand at this position at the current location but a strand is harped to this position.
- A strand occupies this position at the current section location.
- The strand is debonded from the end of the beam to the current section location.
- The strand is debonded at other section location. Hover over the strand for more information.
- The harped position of a harped strand.
- The mid-span position of a harped strand.
- The mid-span position of one strand and the harped position of another strand.

Comparison of Results Between Prestressed Tool and PSBeam

Action	PS Tool	PSBeam	% difference
Distribution Factors			
DF moment SL	0.857	0.857	0%
DF shear SL	0.857	0.857	0%
Gross Properties			
NC Area	464	464	0%
Comp Area	1105	1084	-2%
NC I	46684	46684	0%
Comp I	150028	148504	-1%
Losses			
Short Term Losses	13.1	12.7	-3%
Long Term Losses	24.2	24.2	0%
Strength I Actions			
Mu (0.5 pt)	2237	2238	0%
Vu (0.1pt)	164	163	-1%

Thank You!