

*AASHTOWare BrDR 7.5.1*

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*Advanced Concrete Beam Tutorial 2*  
*AC2 – Three Span Advanced Concrete PT & RC MCB Web*  
*Example*

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

AASHTOWare Bridge Design and Rating Training

AC2 – Advanced Concrete PT MCB Web Example

Topics Covered:

- Advanced Concrete Beam Member Alternative with PT and RC regions
- Model a web in an MCB structure
- LRFR Rating

Overview of Advanced Concrete Beam features:

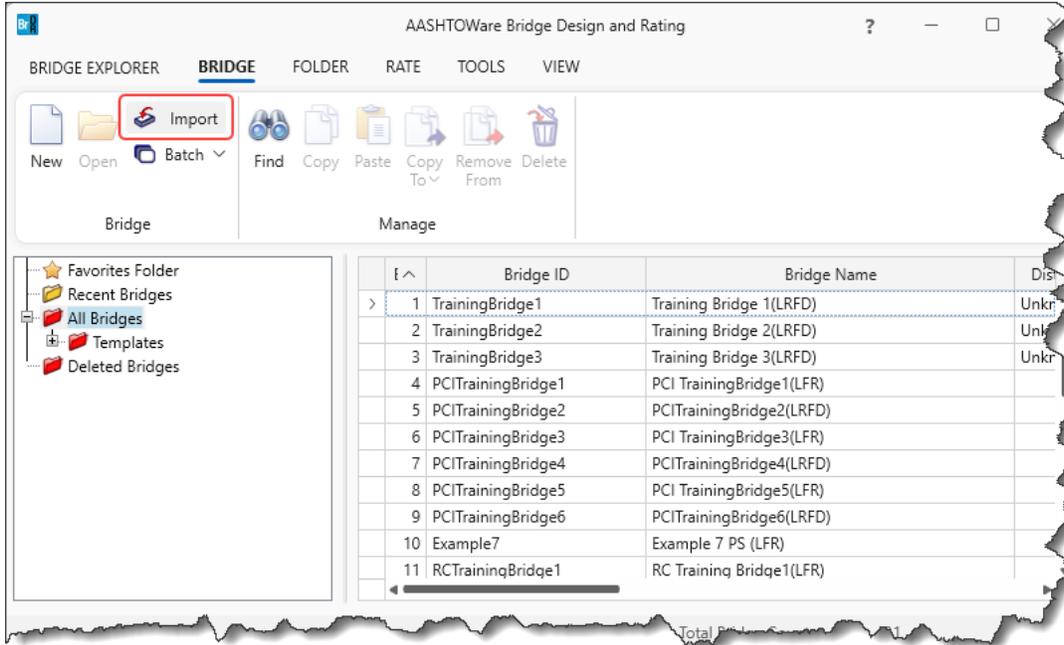
- Advanced concrete beams implemented in BrDR version 7.1.0 in September 2021
- Advanced concrete PT: LRFR/LFR
- Model girders in a multi-girder system or individual webs in a multi-cell box.
- Model schedule based non-symmetric RC Beams
- Post-tensioned/reinforced concrete regions
- Different stages of post-tensioning

This tutorial describes the data entry for a post-tensioned multi-cell box(MCB) web using the Advanced Concrete beam alternative in BrDR version 7.5.1 Taking this approach to model the webs in an MCB is useful when the multi-cell box superstructure definition in BrDR does not provide a way to model the structure.

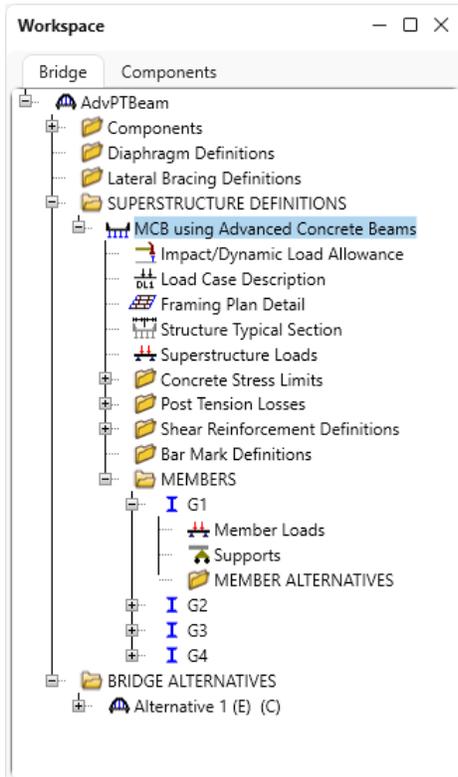
## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

### Advanced Concrete Beam Member Alternative with PT and RC regions

Import the **AC2 – Advanced Concrete PTRC.xml** file provided with this tutorial into BrDR by clicking on the Import button from **BRIDGE** ribbon in the **Bridge Explorer** as shown below.

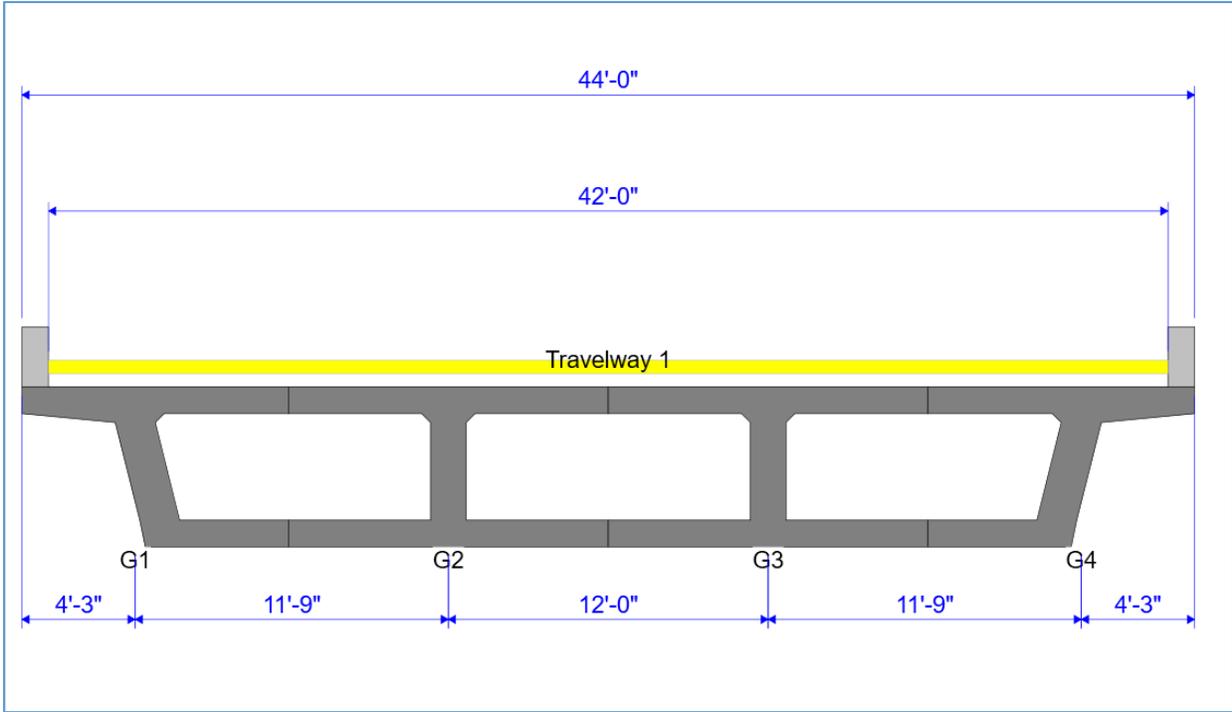


The **Bridge Workspace** tree is shown below.



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The following sketch shows the superstructure definition that will be described in this example. This training example will first review the superstructure windows in this superstructure definition and then an advanced concrete member alternative will be entered for **G1**.



## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

### Girder System Superstructure Definition

Double click on the **MCB using Advanced Concrete Beams** node in the **Bridge Workspace** tree to open the **Girder System Superstructure Definition** window as shown below. Note that the **Modeling** type for this superstructure is **MCB**. This selection tailors the data entry of the girders to model the webs in a multi-cell box structure. The number of girders is set to 4. When the modeling type is **MCB**, the number of girders corresponds to the number of webs in the multi-cell box being described. Click **Cancel** to close the window without saving any errant changes that may have been made.

**Girder System Superstructure Definition**

Definition Analysis Specs Engine

Name: MCB using Advanced Concrete Beams

Description:

Default units: US Customary

Number of spans: 3

Number of girders: 4

Enter span lengths along the reference line:

Span	Length (ft)
1	100
2	100
3	75

Modeling

Multi-girder system  MCB

With frame structure simplified definition

Deck type: Concrete Deck

For PS/PT only

Average humidity: %

Member alt. types

Steel

P/S

R/C

Timber

P/T

Horizontal curvature along reference line

Horizontal curvature

Distance from PC to first support line: ft

Superstructure alignment

Curved

Tangent, curved, tangent

Tangent, curved

Curved, tangent

Start tangent length: ft

Radius: ft

Direction: Left

End tangent length: ft

Distance from last support line to PT: ft

Design speed: mph

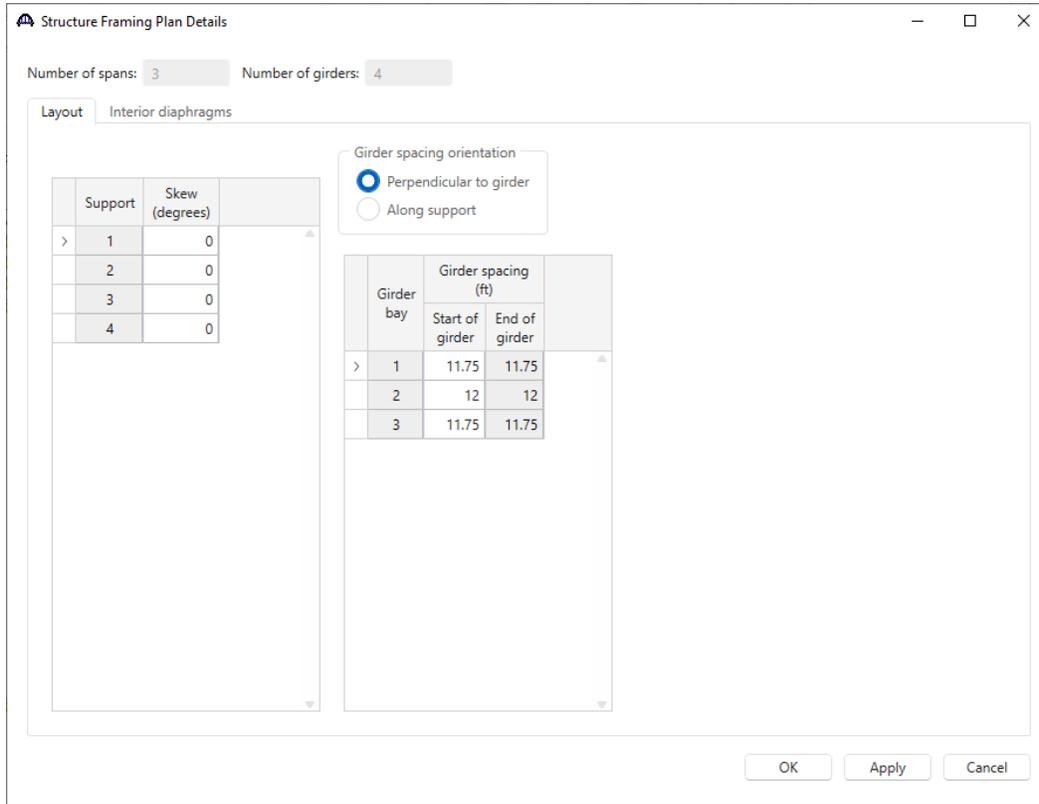
Superelevation: %

OK Apply Cancel

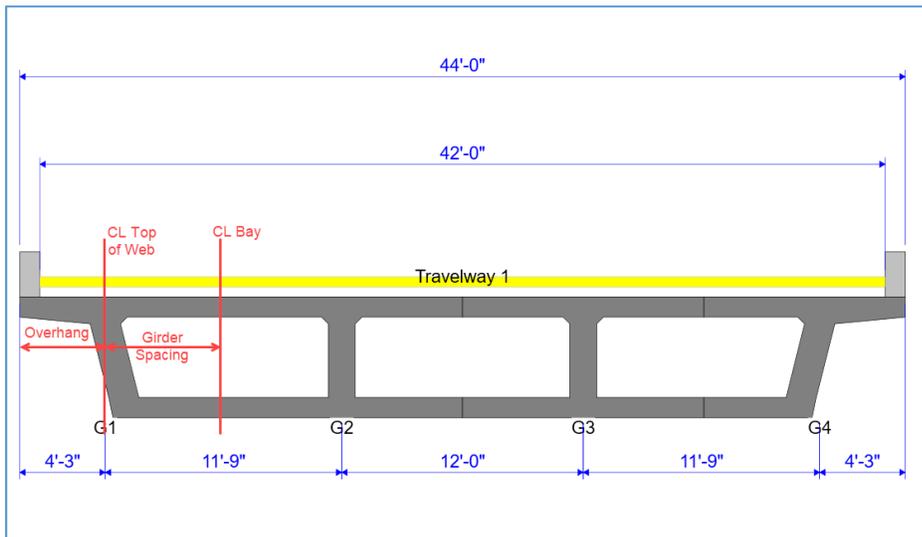
# AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

## Framing Plan Detail

Open the **Structure Framing Plan Details** window shown below by double clicking on the **Framing Plan Details** node in the **BWS** tree.



The following sketch documents the rules for entering the overhang and girder spacing for the exterior girder. The overhang is measured from the edge of deck to the centerline of the web top. The girder spacing is measured from the centerline of the web top to the centerline of the bay.



## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

### Structure Typical Section

Open the **Structure Typical Section** window shown below and review the following tabs.

Structure Typical Section

Distance from left edge of deck to superstructure definition ref. line | Distance from right edge of deck to superstructure definition ref. line

Deck thickness | Superstructure Definition Reference Line

Left overhang | Right overhang

Deck | Deck (cont'd) | Parapet | Median | Railing | Generic | Sidewalk | Lane position | Striped lanes | Wearing surface

Superstructure definition reference line is: within the bridge deck.

Start | End

Distance from left edge of deck to superstructure definition reference line: 22 ft | 22 ft

Distance from right edge of deck to superstructure definition reference line: 22 ft | 22 ft

Left overhang: 4.25 ft | 4.25 ft

Computed right overhang: 4.25 ft | 4.25 ft

OK | Apply | Cancel

Structure Typical Section

Distance from left edge of deck to superstructure definition ref. line | Distance from right edge of deck to superstructure definition ref. line

Deck thickness | Superstructure Definition Reference Line

Left overhang | Right overhang

Deck | Deck (cont'd) | Parapet | Median | Railing | Generic | Sidewalk | Lane position | Striped lanes | Wearing surface

Sacrificial wear thickness: in | Structural overlay density: 0.145 kcf

Top slab crack control parameter: kip/in | Structural overlay thickness: 2 in

Sustained modular ratio factor:

Top slab exposure factor:

OK | Apply | Cancel

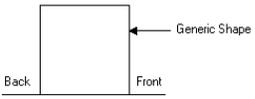
If entered, the depth of the girder is decreased by the **sacrificial wear thickness** in the section property and capacity calculations. The self-weight of the girder is not adjusted by this value.

The depth of the girder is increased by the structural overlay thickness in the section property and capacity calculations.

The self-weight of the girder is increased by entering a structural overlay density and thickness.

# AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

Structure Typical Section



Generic Shape

Back Front

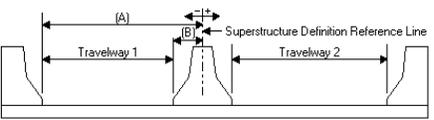
Deck Deck (cont'd) Parapet Median Railing **Generic** Sidewalk Lane position Striped lanes Wearing surface

Name	Load case	Measure to	Edge of deck dist. measured from	Distance at start (ft)	Distance at end (ft)	Front face orientation
> 12" Barrier	DC1	Back	Left Edge	0	0	Right
12" Barrier	DC1	Back	Right Edge	0	0	Left

New Duplicate Delete

OK Apply Cancel

Structure Typical Section



Travelway 1 Travelway 2 Superstructure Definition Reference Line

Deck Deck (cont'd) Parapet Median Railing **Generic** Sidewalk **Lane position** Striped lanes Wearing surface

Travelway number	Distance from left edge of travelway to superstructure definition reference line at start (A) (ft)	Distance from right edge of travelway to superstructure definition reference line at start (B) (ft)	Distance from left edge of travelway to superstructure definition reference line at end (A) (ft)	Distance from right edge of travelway to superstructure definition reference line at end (B) (ft)
> 1	-21	21	-21	21

LRFD fatigue

Lanes available to trucks:

Override Truck fraction:

Compute

New Duplicate Delete

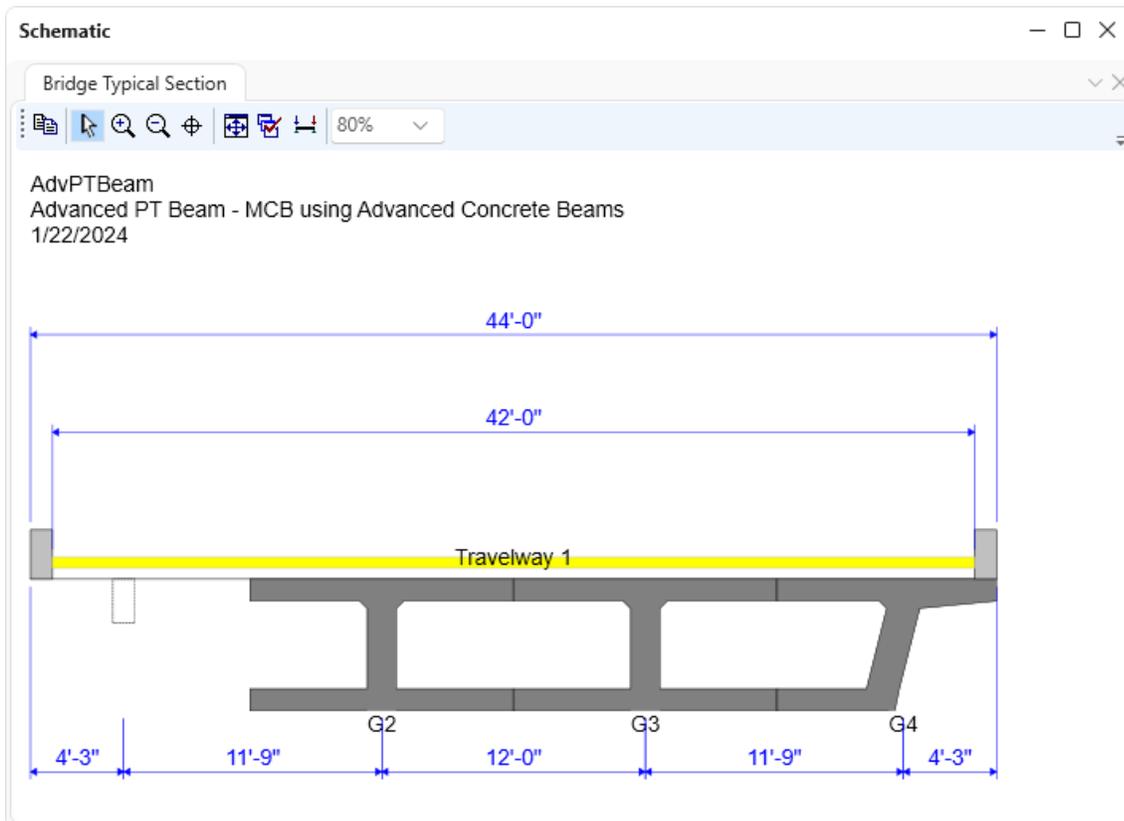
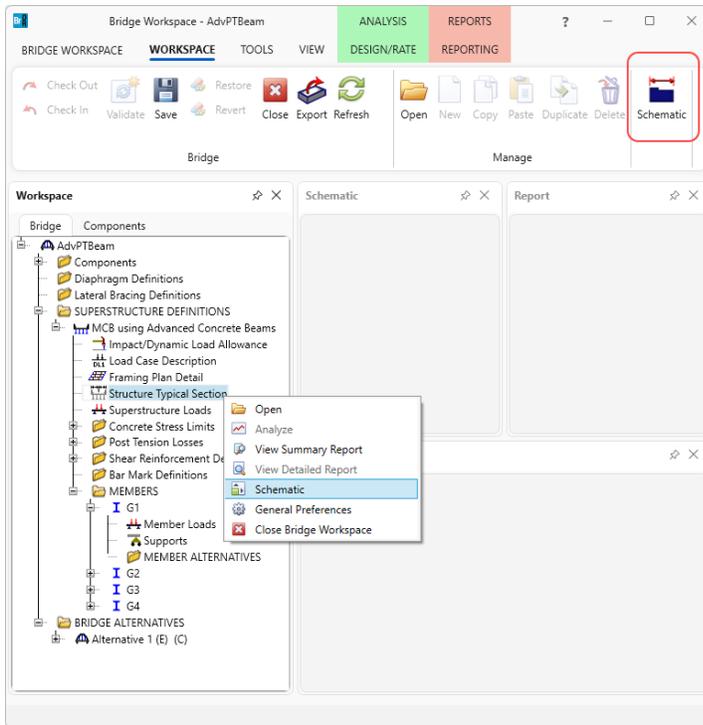
OK Apply Cancel

Click **Cancel** to close the window.

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

### Schematic – Structure Typical Section

With **Structure Typical Section** selected in the **BWS** tree, click on the **Schematic** button from the **WORKSPACE** ribbon, or right click and select **Schematic** to view the section schematic as shown below.



## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

This superstructure definition contains post-tensioned regions, so the following post-tension data is present in this superstructure.

### Concrete Stress Limits

The screenshot shows the 'Stress Limit Sets - Concrete' dialog box in the Bridge Workspace software. The dialog is open over a tree view of the project components. The dialog fields include Name, Description, Corrosion condition, Final allowable tension stress limit coef. (US) override, and Concrete material. A table shows LFD and LRFD values for various stress limits.

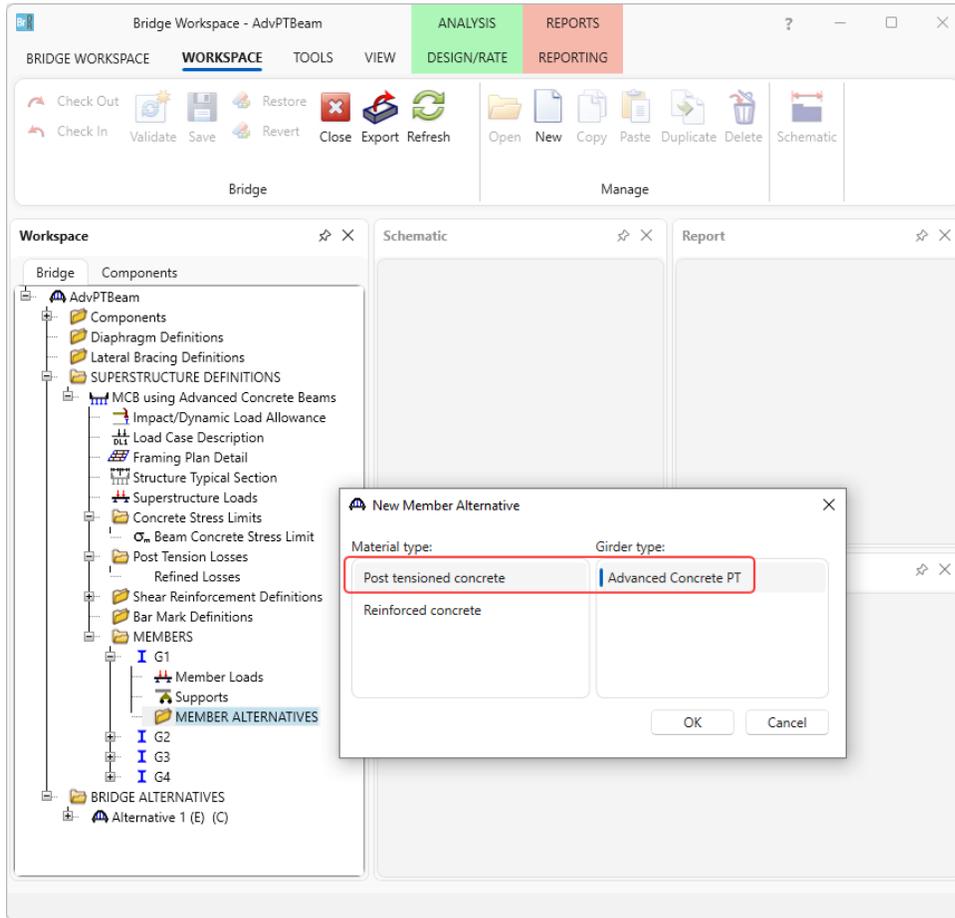
	LFD	LRFD
Initial allowable compression:	2.4 ksi	2.6 ksi
Initial allowable tension:	0.1897367 ksi	0.1896 ksi
Final allowable compression:	2.7 ksi	2.7 ksi
Final allowable tension:	0.4030509 ksi	0.4030509 ksi
Final allowable DL compression:	1.8 ksi	2.025 ksi
Final allowable slab compression:	ksi	ksi
Final allowable compression: (LL+1/2(Pe+DL))	1.8 ksi	1.8 ksi



## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

### Member Alternative

Double click **MEMBER ALTERNATIVES** under member **G1** to open the **New Member Alternative** window.



Since this superstructure definition's modeling type is MCB, only Advanced Concrete beams are available. Since this beam contains both post-tensioned and reinforced concrete regions, select **Post tensioned concrete** so the post-tensioning information will be available. Click **OK** and the **Member Alternative Description** window will open.

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

Enter a name for the member alternative.

Member Alternative Description

Member alternative:

Description | Specs | Factors | Engine | Import | Control options

Description:

Material type:

Girder type:

Modeling type:

Default units:

Girder property input method

Schedule based

Cross-section based

Self load

Load case:

Additional self load:  kip/ft

Additional self load:  %

Default rating method:

Crack control parameter (Z)

Top of beam:  kip/in

Bottom of beam:  kip/in

Exposure factor

Top of beam:

Bottom of beam:

OK Apply Cancel

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

Switch to the **Control Options** tab and uncheck the **Ignore design & legal load shear** checkbox. Click **OK** to close the window and create the member alternative.

The screenshot shows the 'Member Alternative Description' dialog box with the 'Control options' tab selected. The 'Member alternative' is 'PT Web 1'. The dialog is divided into two main sections: LRFD (Left) and LFR (Right).

**LRFD Section:**

- Points of interest:**
  - Generate at tenth points except supports
  - Generate at support points
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
- Shear computation method:**
  - Ignore
  - General procedure
  - General procedure - Appendix B5
  - Simplified procedure
  - Simplified procedure - Vci, Vcw
- Loss & stress calculations:**
  - Use gross section properties
  - Use transformed section properties
- Consider splitting resistance article

**LFR Section:**

- Points of interest:**
  - Generate at tenth points except supports
  - Generate at support points
  - Generate at support face & critical shear points
  - Generate at section change points
  - Generate at user-defined points
- Shear computation method:**
  - Ignore
  - Use AASHTO 1979 interim code
  - Use current AASHTO
- Distribution factor application method:**
  - By axle
  - By POI
- Consider moment capacity reduction

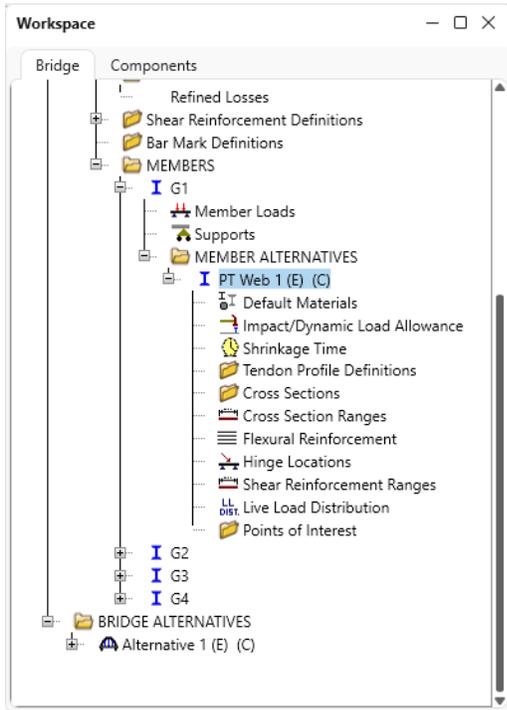
**Right Panel (LFR):**

- Ignore design & legal load shear (highlighted with a red box)
- Ignore permit load shear
- Consider legal load tensile concrete stress
- Consider splitting resistance article
- Ignore tensile rating in top of beam
- Consider permit load tensile steel stress
- Ignore long. reinf. in rating
- Consider inclined flexural forces
- Ignore moment skew reduction factor
- Distribution factor application method:**
  - By axle
  - By POI
- Allow negative epsilon in general shear method
- Allow moment redistribution
- Consider iterative shear rating
- Modify MCFT theta
- Modify MCFT size effect

Buttons at the bottom: OK, Apply, Cancel.

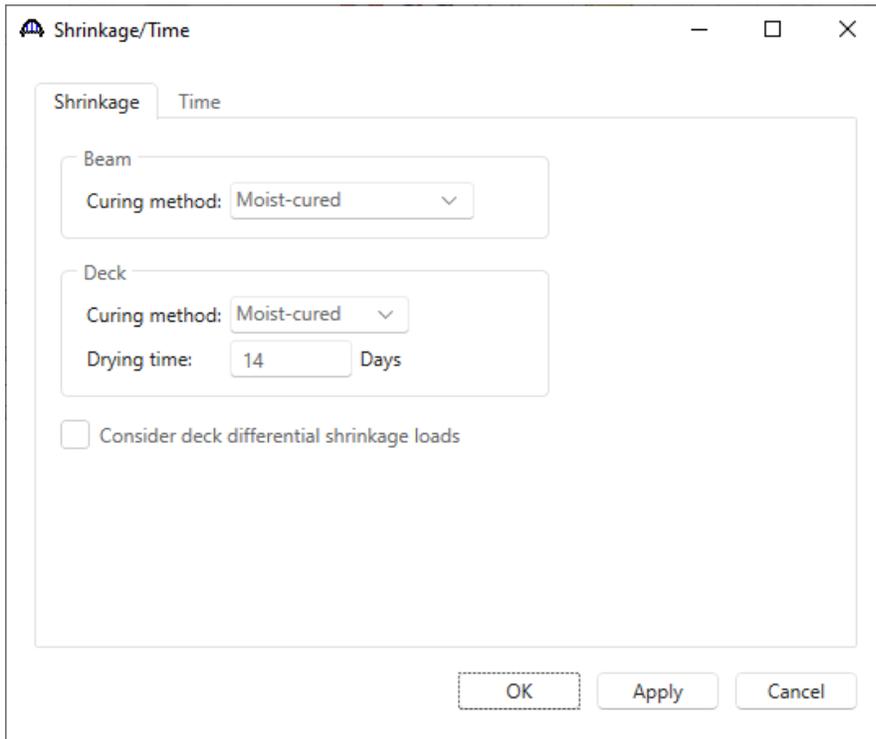
## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

The partially expanded **BWS** is shown below. For a girder system modeled as an MCB, each girder has its own post-tensioning data.



### Shrinkage/Time

Open the **Shrinkage/Time** window and enter the following data in each tab then click **OK**.



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**Shrinkage/Time**

Shrinkage | **Time**

Curing time: 14 Days

Time continuous: 7 Days

Time composite: 7 Days

Service life: 75 Years

Time of analysis: 15 Years

OK Apply Cancel

### Tendon Profile Definition

Double click on **Tendon Profile Definitions** folder in the **BWS** tree and enter the following data in each tab of this window. The tendons in this example extend only over the first 2 spans. The third span is reinforced concrete.

**Tendon Profile Definition**

Profile name: Cable 1 Starting span: 1 Ending span: 2 Start distance into start span: 0 ft End distance from end span: 0 ft Stage: Composite (long term) (Stage 2)

Profile | Post tensioning | Stress limits

Inflection point entry method:  Percentage  Distance

Span	Profile type	Inflection points			Vertical offset					
		Left (%)	Low (%)	Right (%)	Left end (in)	Measured from	Low (in)	Measured from	Right end (in)	Measured from
> 1	Type 1	15	50	15	36	Bottom	12	Bottom	20	Top
2	Type 1	15	50	15	20	Top	12	Bottom	36	Bottom

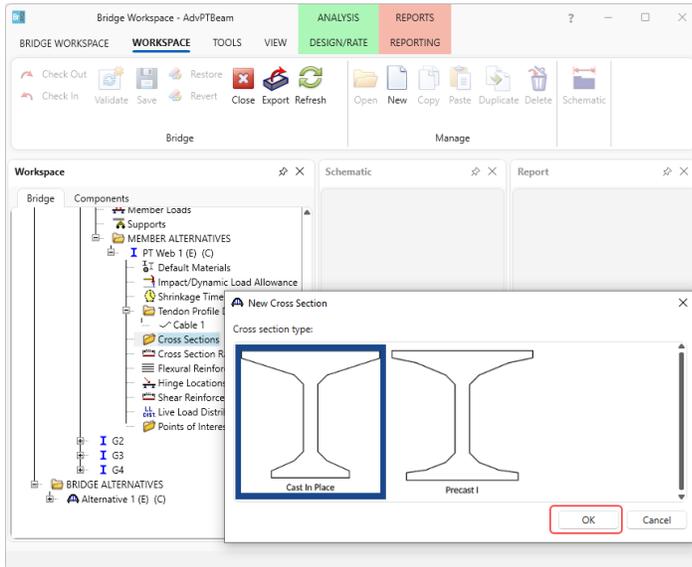
OK Apply Cancel



# AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

## Cross Sections

Double click on the **Cross Sections** folder in the **BWS** tree, select **Cast in Place** and click **OK**.



Enter the following data. Click the **Compute** button to validate the section dimensions and compute the section properties. Click **OK** to close the window.

**Advanced Concrete Cross Section**

Name: Section 1

Symmetric

Type: Cast in place

Dimensions		(in)	
>	TFW	120	
	BSW	64.5	
	D	72	
Left Dimensions		Right Dimensions	
	LFT1	12	RFT1
	LFT2	4	RFT2
	AL1		AR1
	LFW	42	RFW
	AL2		AR2
	BL2	-2.5	BR2
	LSW		RSW
	BL1	12	BR1
	LST2		RST2
>	LST1	0	RST1
	Offset L	55.5	> Offset R
			0

**Top flange**

CJ:  in

Concrete: PT Beam Concrete 4.5

Stress limit: Beam Concrete Stress

**Other parts**

Concrete: PT Beam Concrete 4.5

Stress limit: Beam Concrete Stress

**Properties**

Computed WT1: 18 in

Computed WT2: 18 in

Area: 3185 in<sup>2</sup>

Ixx: 2097183.14 in<sup>4</sup>

Iyy: 2660404.85 in<sup>4</sup>

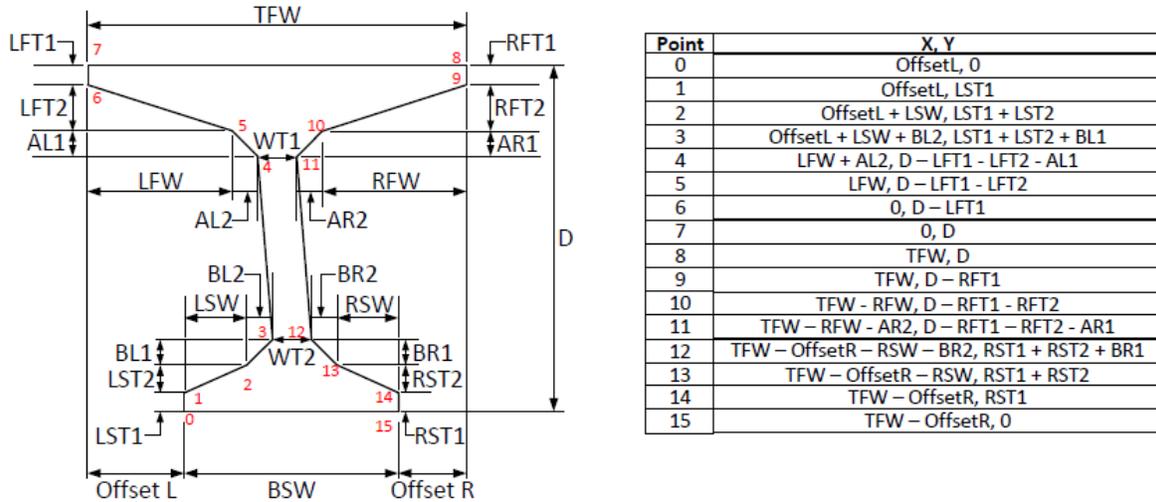
J: 835132.647 in<sup>4</sup>

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

The following rules are considered when creating the cross section from the entered dimensions:

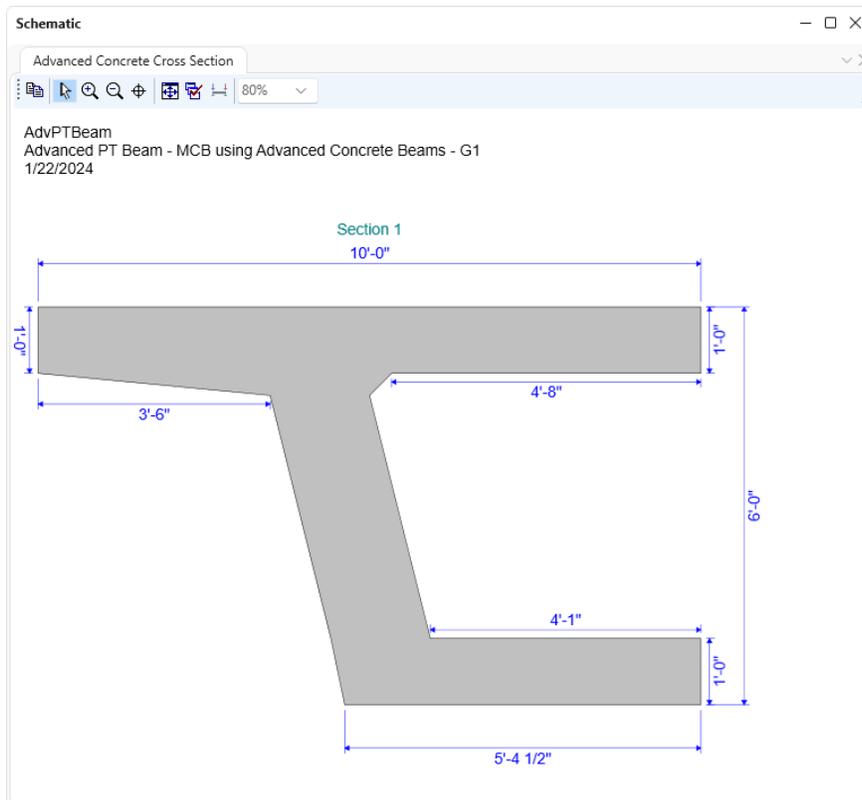
**WT1** and **WT2** are not used to locate any points in the cross section. They are used as validation to ensure the computed WT1 and WT2 match the entered values. The shear capacity calculations will use  $bw = (WT1 + WT2)/2$ .

Cross section coordinates are located in the following manner:



Schematic – Cross Section.

With the **Section 1** cross section selected in the **BWS** tree, click the **Schematic** button from the **WORKSPACE** ribbon. The cross section schematic is shown below:



## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

### Cross Section Ranges

Open the **Cross Section Ranges** window and enter the following data:

Cross sections | Post tensioning | Effective supports

Left end projection: 9 in    Right end projection: 9 in

	Start section	End section	Depth vary	Solid section	Support number	Start distance (ft)	Length (ft)	End distance (ft)
>	Section 1	Section 1	None	<input checked="" type="checkbox"/>	1	0	4	4
	Section 1	Section 1	None	<input type="checkbox"/>	1	4	94	98
	Section 1	Section 1	None	<input checked="" type="checkbox"/>	1	98	6	104
	Section 1	Section 1	None	<input type="checkbox"/>	2	4	93	97
	Section 1	Section 1	None	<input checked="" type="checkbox"/>	2	97	6	103
	Section 1	Section 1	None	<input type="checkbox"/>	3	3	68	71
	Section 1	Section 1	None	<input checked="" type="checkbox"/>	3	71	4	75

New    Duplicate    Delete

OK    Apply    Cancel

This training example contains a single tendon, but advanced concrete PT beams can have multiple tendons and overlapping tendons.

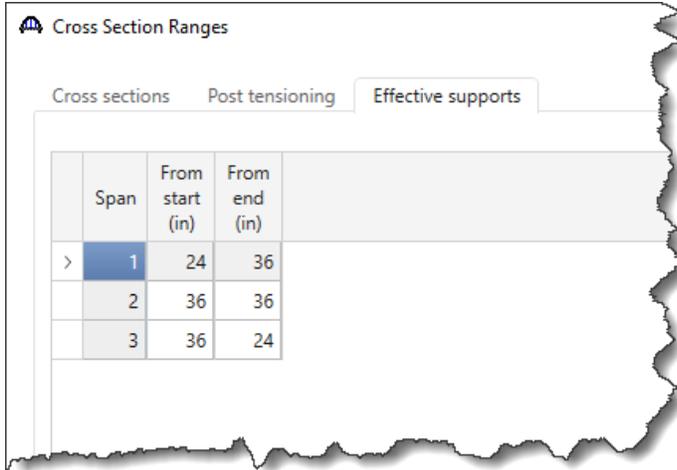
Cross sections | Post tensioning | Effective supports

Post tension losses: Refined Losses

Tendon assignments

	Tendon profile	Start span	Start distance into start span (ft)	End span	End distance from end span (ft)	Stage
>	Cable 1	1	0	2	0	Composite (long term) (Stage 2)

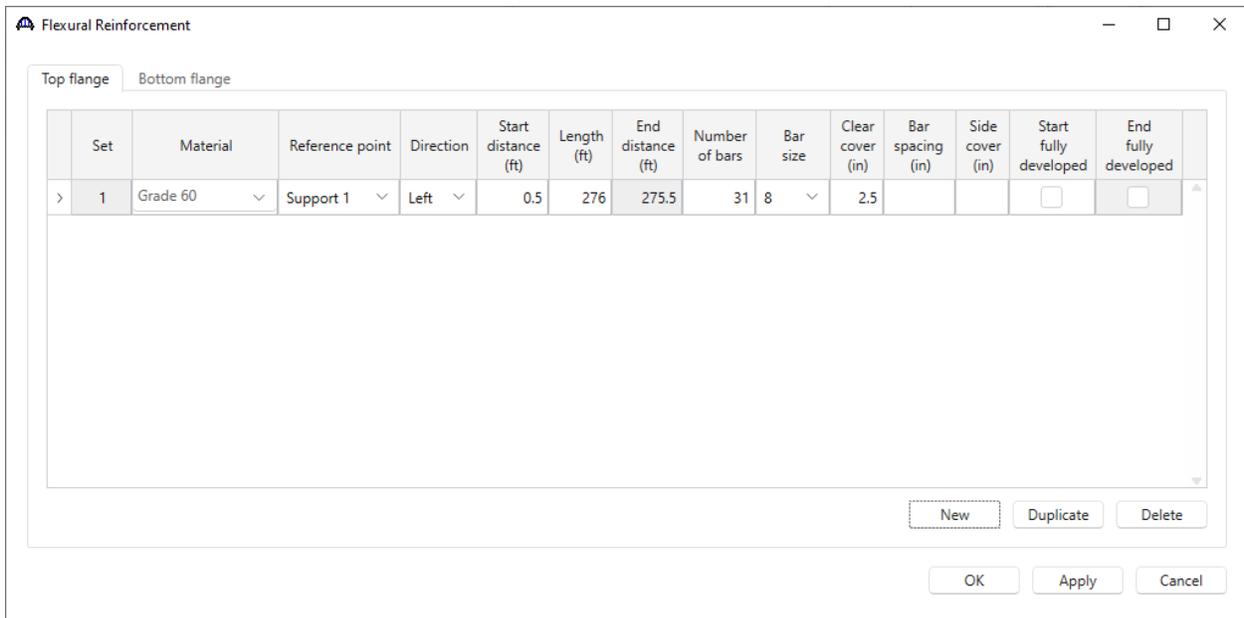
## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example



Click **OK** to apply the data and close the window.

### Flexural Reinforcement

Enter the following flexural reinforcement in the flanges:



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Set	Material	Reference point	Direction	Start distance (ft)	Length (ft)	End distance (ft)	Number of bars	Bar size	Clear cover (in)	Bar spacing (in)	Side cover (in)	Start fully developed	End fully developed
> 1	Grade 60	Support 1	Left	0.5	276	275.5	20	11	2			<input type="checkbox"/>	<input type="checkbox"/>

Click **OK** to apply the data and close the window.

### Shear Reinforcement Ranges

Open the **Shear Reinforcement Ranges** window. Be sure to select **Centerline bearings** as the input type and then click the **Stirrup Wizard** button.

Input reference type

Voids  Centerline bearings

Span ranges

Span: 1

Name	Start distance (ft)	Number of spaces	Spacing (in)	Length (ft)	End distance (ft)
------	---------------------	------------------	--------------	-------------	-------------------

Stirrup wizard...

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

Enter the following data in the **Stirrup Wizard** for each span and then click **Apply All**.

Stirrup Wizard
✕

Input reference type

Voids     Centerline bearings

Span:

Maximum interior spacing:  in

Measured from left end of span

Start distance:  in

	Name	Number of spaces	Spacing (in)
>	#4 stirrup	20	6
	#4 stirrup	18	16

Measured from right end of span

Start distance:  in

	Name	Number of spaces	Spacing (in)
>	#4 stirrup	20	6
	#4 stirrup	18	16

# AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

**Stirrup Wizard** [Close]

Input reference type:  
 Voids  Centerline bearings

Span: 2 Maximum interior spacing: 24 in

Measured from left end of span

Start distance: 0 in

	Name	Number of spaces	Spacing (in)
>	#4 stirrup	30	6
	#4 stirrup	32	9

New Duplicate Delete

Measured from right end of span

Start distance: 0 in

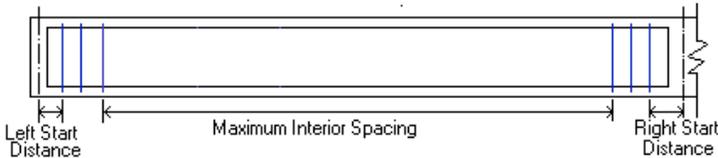
	Name	Number of spaces	Spacing (in)
>	#4 stirrup	30	6
	#4 stirrup	32	9

New Duplicate Delete

Apply all Apply span Cancel

# AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

**Stirrup Wizard** ✕



Input reference type  
 Voids  Centerline bearings

Span:  Maximum interior spacing:  in

Measured from left end of span

Start distance:  in

	Name	Number of spaces	Spacing (in)
	#4 stirrup	20	6
>	#4 stirrup	24	12

Measured from right end of span

Start distance:  in

	Name	Number of spaces	Spacing (in)
>	#4 stirrup	20	6
	#4 stirrup	18	16

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

The **Shear Reinforcement Ranges** window is updated as shown below.

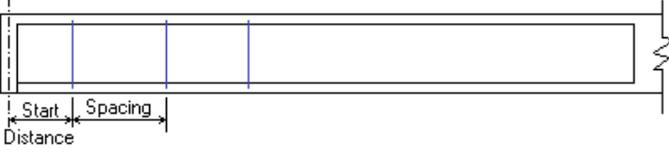
The screenshot shows the 'Shear Reinforcement Ranges' window. At the top, there is a diagram of a beam with three spans. The first span is highlighted with a blue background. Below the diagram, there are labels for 'Start Distance', 'Spacing', and 'End Distance'. Below the diagram, there is a section for 'Input reference type' with two radio buttons: 'Voids' (unselected) and 'Centerline bearings' (selected). Below that, there is a section for 'Span ranges' with a dropdown menu set to '1'. Below the dropdown is a table with the following data:

Name	Start distance (ft)	Number of spaces	Spacing (in)	Length (ft)	End distance (ft)
#4 stirrup	0	1	0	0	0
#4 stirrup	0	20	6	10	10
#4 stirrup	10	18	16	24	34
#4 stirrup	34	16	24	32	66
#4 stirrup	66	18	16	24	90
#4 stirrup	90	20	6	10	100

At the bottom of the window, there are buttons for 'Stirrup wizard...', 'New', 'Duplicate', 'Delete', 'OK', 'Apply', and 'Cancel'.

AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

Shear Reinforcement Ranges



Input reference type

Voids  Centerline bearings

Span ranges

Span: 2

Name	Start distance (ft)	Number of spaces	Spacing (in)	Length (ft)	End distance (ft)
#4 stirrup	0	1	0	0	0
#4 stirrup	0	30	6	15	15
#4 stirrup	15	32	9	24	39
#4 stirrup	39	11	24	22	61
#4 stirrup	61	32	9	24	85
#4 stirrup	85	30	6	15	100

Stirrup wizard... New Duplicate Delete

OK Apply Cancel

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

Shear Reinforcement Ranges

Input reference type  
 Voids  Centerline bearings

Span ranges  
 Span: 3

Name	Start distance (ft)	Number of spaces	Spacing (in)	Length (ft)	End distance (ft)
#4 stirrup	0	1	0	0	0
#4 stirrup	0	20	6	10	10
#4 stirrup	10	24	12	24	34
#4 stirrup	34	1	24	2	36
#4 stirrup	36	1	12	1	37
#4 stirrup	37	2	24	4	41
#4 stirrup	41	18	16	24	65
#4 stirrup	65	20	6	10	75

Stirrup wizard... New Duplicate Delete OK Apply Cancel

Click **OK** to apply the data and close the window.

### Schematic – Member Alternative

Select **PT Web 1** in the **BWS** tree and click the **Schematic** button on the ribbon to display the girder profile schematic.

Schematic

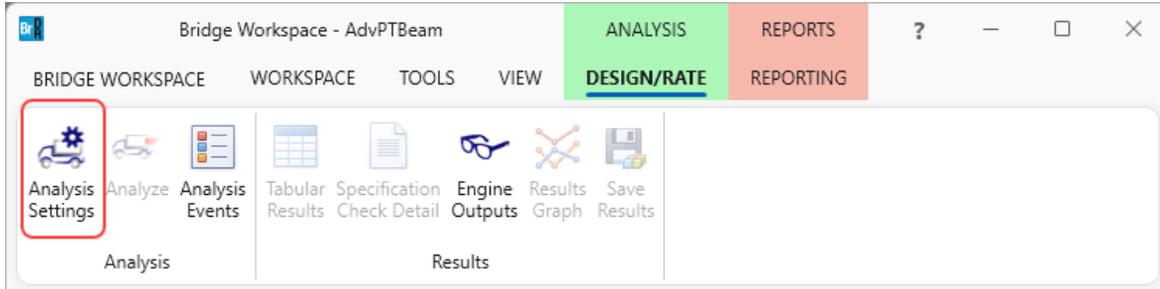
Advanced Concrete Profile

25%

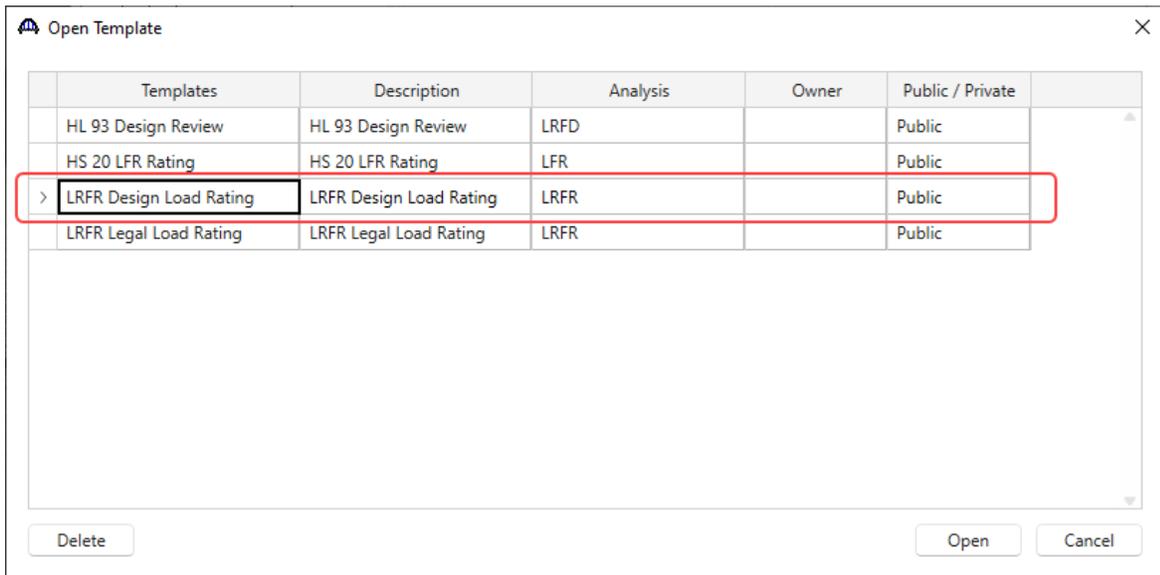
## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

### LRFR Analysis

The member alternative can now be analyzed. To perform an LRFR rating, select the **PT Web 1** alternative in the **BWS** tree, open the **ANALYSIS DESIGN/RATE** tab on the ribbon, and select the **Analysis Settings** button.

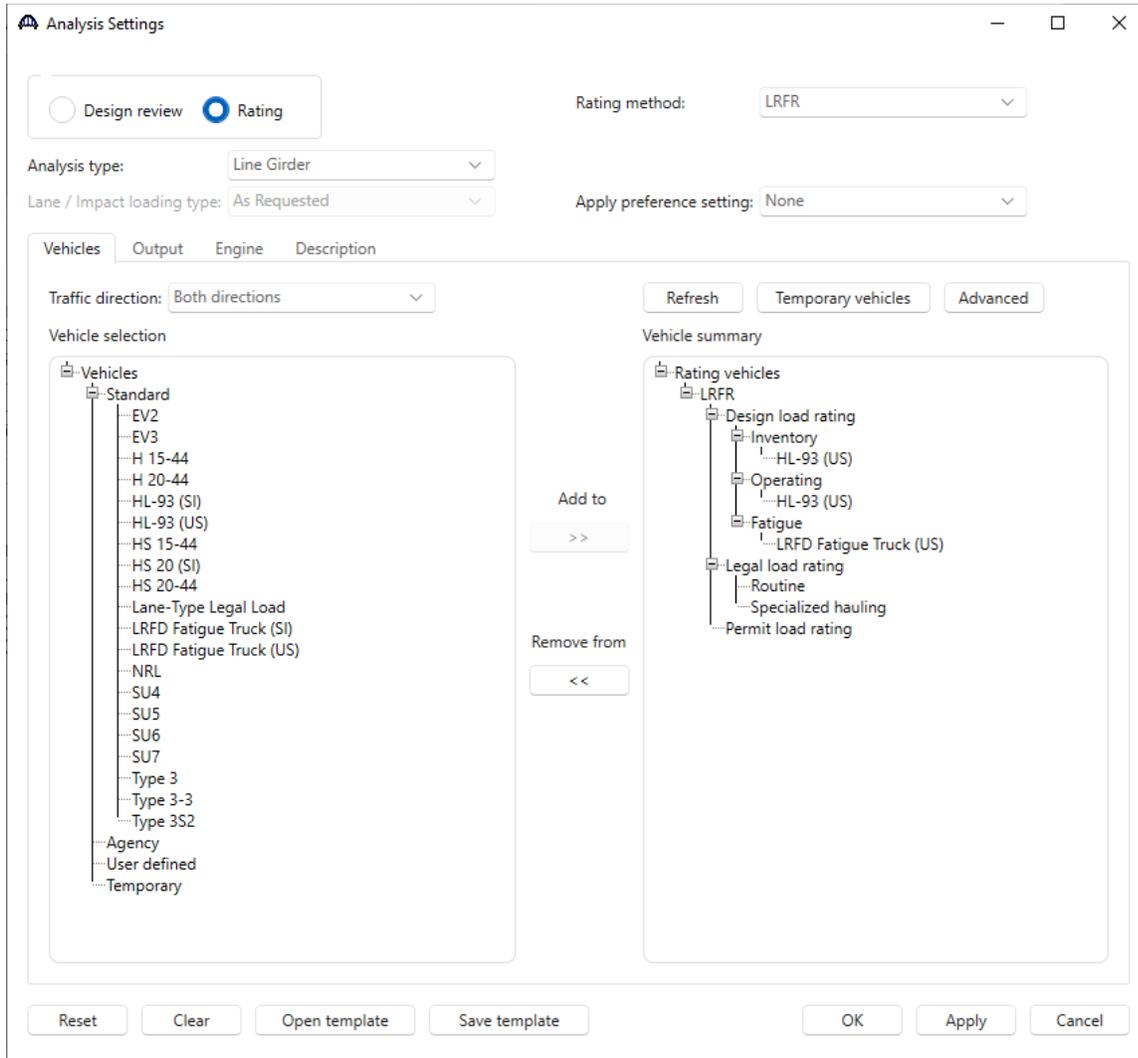


The **Analysis Settings** window will open. Click the **Open template** button and select the **LRFR Design Load Rating** to be used in the rating and click **Open**.

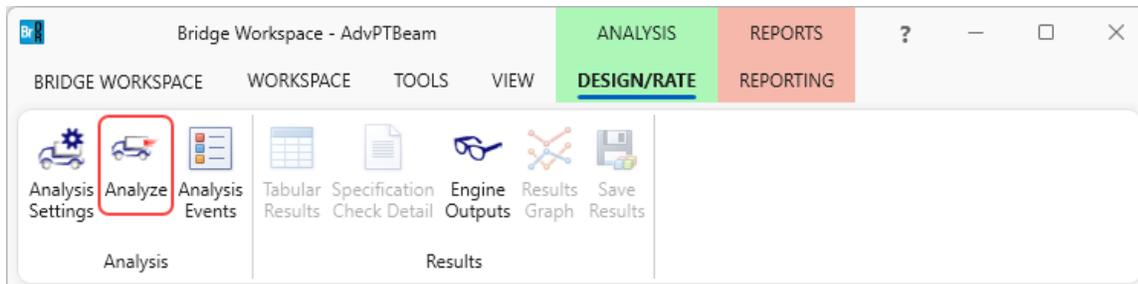


## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

The **Analysis Settings** window will be populated as shown below. Click **OK** to close the window.



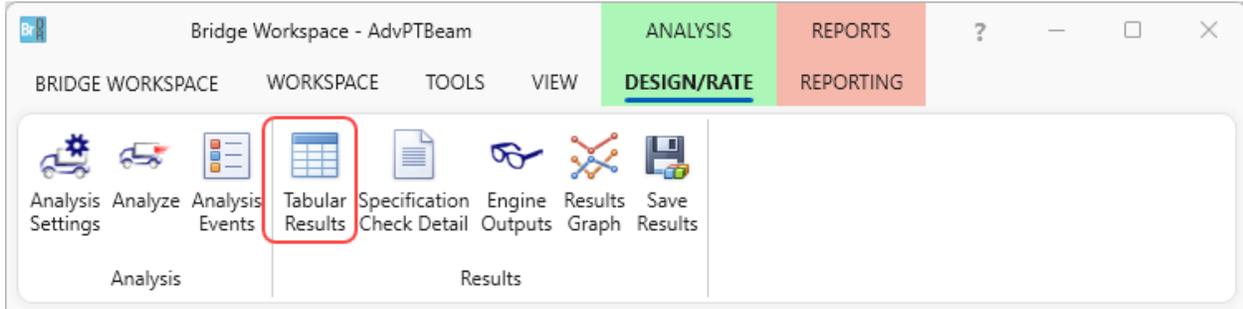
Click **Analyze** on the ribbon to launch the rating.



# AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

## Tabular Results

When the rating is finished results can be reviewed by clicking the **Tabular Results** button on the ribbon.



The window shown below will open. Select **Single rating level per row** as the display format to display the output in single rows as shown below.

The screenshot shows the 'Analysis Results - PT Web 1' window. At the top left is a 'Print' button. Below it are controls for 'Report type' (Rating Results Summary), 'Lane/Impact loading type' (As requested selected), and 'Display Format' (Single rating level per row selected). The main area contains a table with the following data:

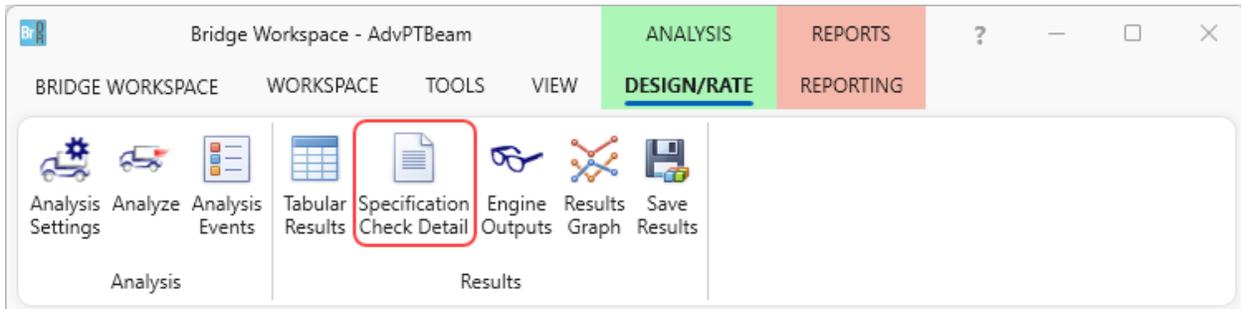
Live Load	Live Load Type	Rating Method	Rating Level	Load Rating (Ton)	Rating Factor	Location (ft)	Location Span-(%)	Limit State	Impact	Lane
HL-93 (US)	Truck + Lane	LRFR	Inventory	49.82	1.384	90.00	1 - (90.0)	STRENGTH-I Concrete Shear	As Requested	As Requested
HL-93 (US)	Truck + Lane	LRFR	Operating	66.47	1.846	90.00	1 - (90.0)	STRENGTH-I Concrete Shear	As Requested	As Requested
HL-93 (US)	90%(Truck Pair + Lane)	LRFR	Inventory	115.79	3.216	203.00	3 - (4.0)	STRENGTH-I Concrete Flexure	As Requested	As Requested
HL-93 (US)	90%(Truck Pair + Lane)	LRFR	Operating	150.09	4.169	203.00	3 - (4.0)	STRENGTH-I Concrete Flexure	As Requested	As Requested
HL-93 (US)	Tandem + Lane	LRFR	Inventory	62.77	1.744	90.00	1 - (90.0)	STRENGTH-I Concrete Shear	As Requested	As Requested
HL-93 (US)	Tandem + Lane	LRFR	Operating	83.35	2.315	90.00	1 - (90.0)	STRENGTH-I Concrete Shear	As Requested	As Requested

At the bottom left, it says 'AASHTO LRFR Engine Version 7.5.1.3001' and 'Analysis preference setting: None'. A 'Close' button is at the bottom right.

## AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

### Specification Check Detail

Click **Specification Check Detail** on the ribbon to review the detailed spec checks. The tendons in this example stop at pier 2. Examination of the analysis points to the left of this location show post-tension articles being considered while analysis points to the right of this location consider only reinforced concrete articles.



Specification Checks for PT Web 1 - 17 of 2267

Articles: All articles  
Format: Bullet list

Specification filter: Report

Specification reference	Limit State	Flex. Sense	Pass/Fail
✓ 5.4.2.1 Compressive Strength		N/A	Passed
5.4.2.5 Poisson's Ratio		N/A	General Comp.
5.4.2.6 Modulus of Rupture		N/A	General Comp.
5.4.2.8 Concrete Density Modification Factor		N/A	General Comp.
NA 5.5.3.2 Reinforcing Bars and Welded Wire Reinforcement		N/A	Not Required
5.5.4.2 PS Strength Limit State - Resistance Factors		N/A	General Comp.
5.6.2.2 Rectangular Stress Distribution		N/A	General Comp.
✓ 5.6.3.2 PS Flexural Resistance (Prestressed Concrete)		N/A	Passed
✓ 5.6.3.3 Minimum Reinforcement		N/A	Passed
✓ 5.9.2.3.2b Tensile Stresses		N/A	Passed
5.9.4.3.2 Bonded Strand		N/A	General Comp.
✓ 6A.4.2.1 Design Load Rating Prestress Service III Tensile Stress		N/A	Passed
✓ 6A.4.2.1 General Load Rating Equation - Concrete Flexure		N/A	Passed
Computation of Vp		N/A	General Comp.
Cracked_Moment_of_Inertia Section Property Calculations		N/A	General Comp.
PS_Basic_Properties Calculation		N/A	General Comp.
PS_Gross_Composite_Section_Properties PS Gross Composite Section		N/A	General Comp.

# AC2 – Three Span Advanced Concrete PT & RC MCB Web Example

Specification Checks for PT Web 1 - 12 of 2267

Properties | Generate | Articles: All articles | Format: Bullet list | Report

Specification filter	Specification reference	Limit State	Flex. Sense	Pass/Fail
Span 2 - 3.00 ft.	✓ 5.4.2.1 Compressive Strength		N/A	Passed
Span 2 - 7.44 ft.	5.4.2.5 Poisson's Ratio		N/A	General Comp.
Span 2 - 10.00 ft.	5.4.2.6 Modulus of Rupture		N/A	General Comp.
Span 2 - 20.00 ft.	5.4.2.8 Concrete Density Modification Factor		N/A	General Comp.
Span 2 - 40.00 ft.	NA 5.5.3.2 Reinforcing Bars and Welded Wire Reinforcement		N/A	Not Required
Span 2 - 50.00 ft.	5.5.4.2 Strength Limit State - Resistance Factors		N/A	General Comp.
Span 2 - 60.00 ft.	5.6.2.2 Rectangular Stress Distribution		N/A	General Comp.
Span 2 - 70.00 ft.	✓ 5.6.3.2 Flexural Resistance (Reinforced Concrete)		N/A	Passed
Span 2 - 80.00 ft.	✓ 5.6.3.3 Minimum Reinforcement		N/A	Passed
Span 2 - 90.00 ft.	NA 5.6.7.Crack Control of Cracking by Distribution of Reinforcement		N/A	Not Required
Span 2 - 92.56 ft.	✓ 6A.4.2.1 General Load Rating Equation - Concrete Flexure		N/A	Passed
Span 2 - 97.00 ft.	Cracked_Moment_of_Inertia Section Property Calculations		N/A	General Comp.
Span 3 - 3.00 ft.				
Span 3 - 7.50 ft.				
Span 3 - 8.57 ft.				
Span 3 - 15.00 ft.				
Span 3 - 22.50 ft.				
Span 3 - 30.00 ft.				
Span 3 - 37.50 ft.				
Span 3 - 45.00 ft.				
Span 3 - 52.50 ft.				
Span 3 - 60.00 ft.				
Span 3 - 67.18 ft.				