

Multi-Span Beam Design

An Introductory Tutorial to
WoodWorks Canadian Sizer 2002

Introduction

- This example demonstrates how to create and design a multi-span beam using WoodWorks Sizer 2002.
- The multi-span beam has three 20 ft interior spans and 2 ft overhangs at each end.
- Note that Sizer can create a maximum of six beam spans.

Creating Five Span Beam

- Select Mode / Beam
- Enter 20 in the Span input box and press the Enter key five times to create five spans
- Modify the first and last spans to 2 ft and select “both” in the Cantilever drop-down list
- Enter the following properties:
 - Material as Built-up
 - Species as D.Fir-L
 - Grade as No. 1/No.2
 - Width as 2 in
 - Leave the Depth and Plies as unknown

WoodWorks® Sizer - [Beam1: Beam Input]

File Mode Settings Design View Window Help

No sections generated

Spans: 2 ft
 2'
 20'
 20'
 20'
 2'

Cantilevers: Both

Pitch: 0 /12

Joists Spacing: mm
 Vibration...

Type: Beam
 Material: Built-up
 Species: D.Fir-L
 Grade: No.1/No.2
 Width: 2 in/pl
 Depth: (unknown) in
 From: ? to ? Plies

Deflection Limits: Live: L/360 Total: L/180

Load Sharing: Case 1
 Service Conditions: Dry

End Notches: At: None
 Depth: in
 Length, e: in

Treatment: None
 Fire-retardant factor:

Lateral Support Spacing: Top: At supports Bottom: At supports

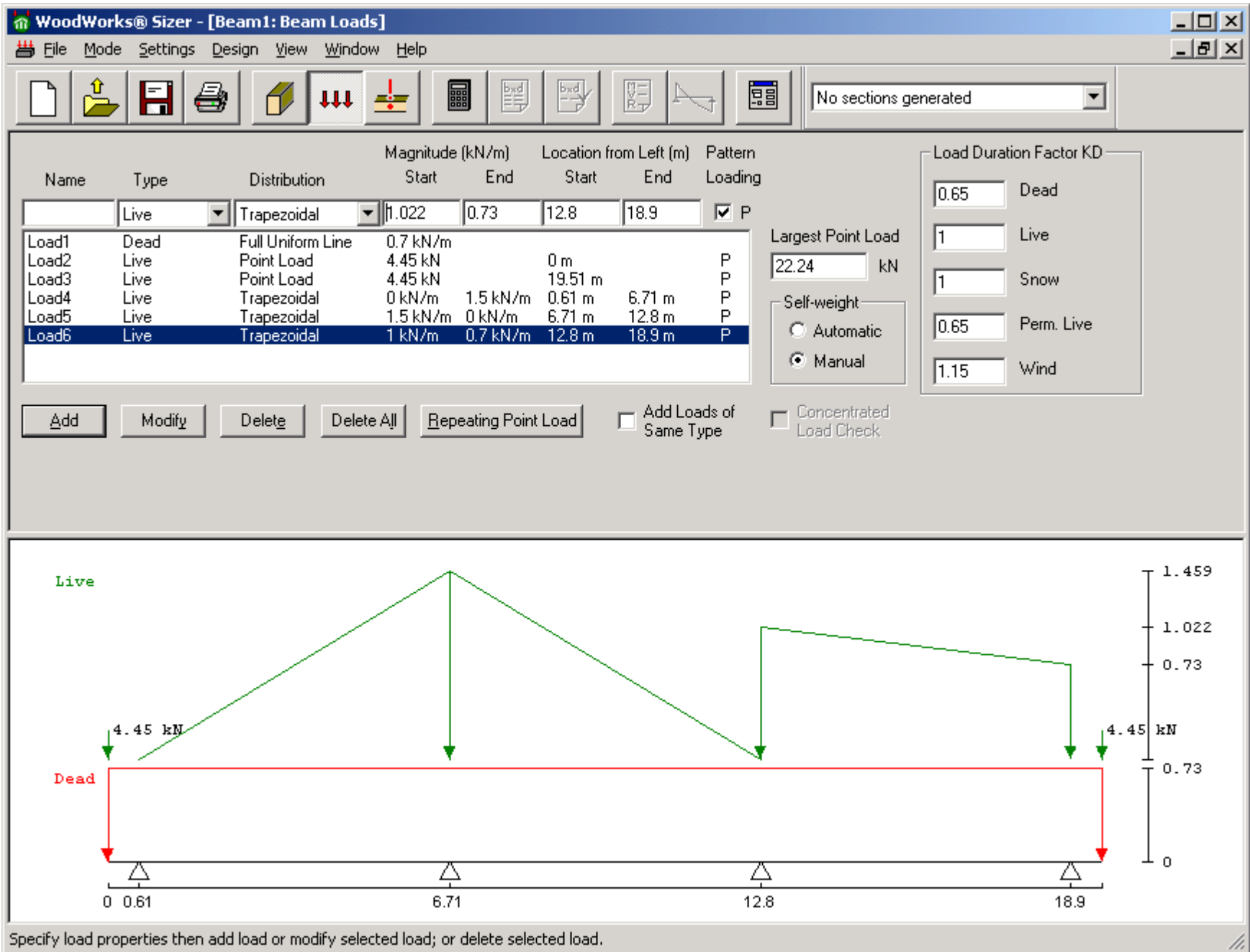
Oblique Angle: 0 Deg

0' 2' 20' 22' 20' 42' 20' 62' 64'

Add, delete, or modify beam spans; select beam type, material and other properties.

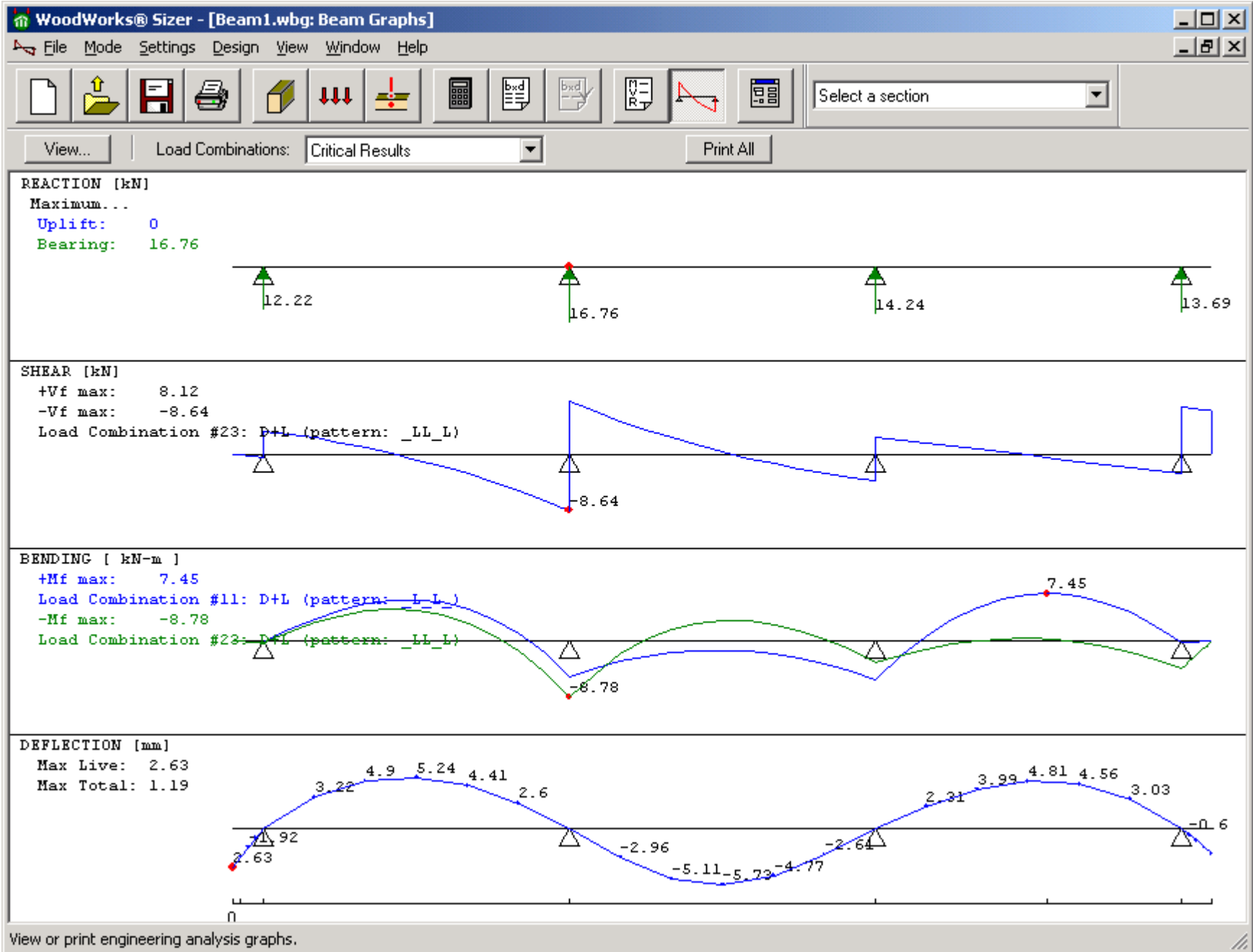
Entering Loads

- Select the Loads View button (you may convert to metric units through Settings / Change / Format)
- Enter the following six loads:
 1. Dead, Uniform Line Load of 0.7 KN/m
 2. Live, Point Load of 4.45 KN at 0 m
 3. Live, Point Load of 4.45 KN at 19.51 m
 4. Live, Trap. Load of 0-1.5 KN/m at 0.61-6.71 m
 5. Live, Trap. Load of 1.5 KN/m at 6.71-12.8m
 6. Live, Trap. Load of 1-0.7 KN/m at 12.8-18.9 m



Design and Check Results

- Click on the Run Design button
- The Results by Group report will be shown
- Click the View Diagrams button to view the Reaction, Shear, Moment and Deflection diagrams
- The desired load combination can be selected from the Load Combinations drop-down list



Enhanced Design Check Report

- Select two plies of 38 x 286 mm from the drop-down list to view the Enhanced Design Check report for this section

WoodWorks® Sizer - [Beam1.wbc: Design Check]

File Mode Settings Design View Window Help

D.Fir-L No.1/No.2 2-38x286

		COMPANY	PROJECT	
		Oct. 8, 2004 14:25:40	Beam1.wwb	

Design Check Calculation Sheet
Sizer 2002

LOADS: (kN, kN/m2, or kN/m)

Load	Type	Distribution	Magnitude		Location [m]		Pattern Load?
			Start	End	Start	End	
Load1	Dead	Full UDL	0.73				No
Load2	Live	Point	4.45		0.00		Yes
Load3	Live	Point	4.45		19.51		Yes
Load4	Live	Trapezoidal	0.00	1.46	0.61	6.71	Yes
Load5	Live	Trapezoidal	1.46	0.00	6.71	12.80	Yes
Load6	Live	Trapezoidal	1.02	0.73	12.80	18.90	Yes

MAXIMUM REACTIONS (kN) and BEARING LENGTHS (mm) :

	△	△	△	△
	0.061	6.71	12.8	18.9951 m
Unfactored:				
Dead	2.25	4.87	4.87	2.25
Live	6.27	7.12	5.44	7.25
Total	8.52	11.98	10.30	9.50
Factored:				
Total	12.22	16.76	14.24	13.69
Bearing:				
Length	0	25	29	25

Built-up, D.Fir-L, No.1/No.2, 38x286 mm, 2-Plys

Load sharing: case 1; Lateral support: top= at supports, bottom= at supports;

WARNING: Member length exceeds typical stock length of 5.5 [m]

View or print engineering analysis graphs.