pst-stru
A PSTricks package to draw structural schemes in civil engineering analysis (beams, portals, archs, piles)
ver. 0.11

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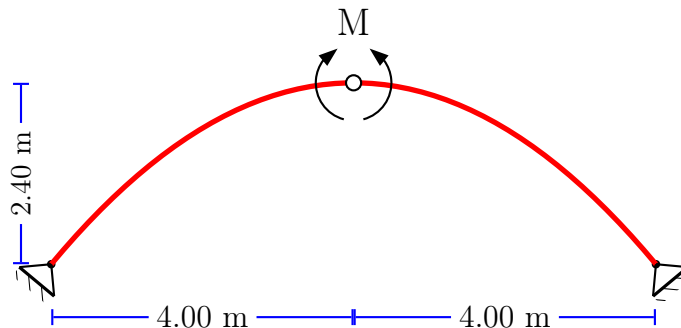
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Contents

1   Simple example

M

2.40 m

4.00 m   4.00 m

```
1  \psset{arrowsize=0.8mm,arrowinset=0}
2  \begin{pspicture}(-5,-1)(5,5)
3  \pnode(0,2.4) {OO}
4  \pnode(-4,0) {A}
5  \pnode(4,0) {B}
6  \node(A)
7  \node(B)
8  \psplot[linecolor=red,linewidth=2pt]{-4}{4}{x neg x mul 0.15 mul 2.4 add}
9  \rput{-39.8}(A){\hinge}
10 \rput{39.8}(B){\hinge}
11 \rput{0}(OO){\interhinge}
12 \rput{-5}(OO){\clockCouple}
13 \rput{5}(OO){\noclockCouple}
14 \rput(0,3.2){\Large M}
15 \pcline [offset=-7mm,linecolor=blue]{|-|}(-4,0)(0,0)
16 \lput*{:U}{\large 4.00 m}
17 \pcline [offset=-7mm,linecolor=blue]{|-|}(0,0)(4,0)
18 \lput*{:U}{\large 4.00 m}
19 \pcline [offset=0,linecolor=blue]{|-|}(-4.4,0)(-4.4,2.4)
20 \lput*{:U}{2.40 m}
21 \end{pspicture}
```
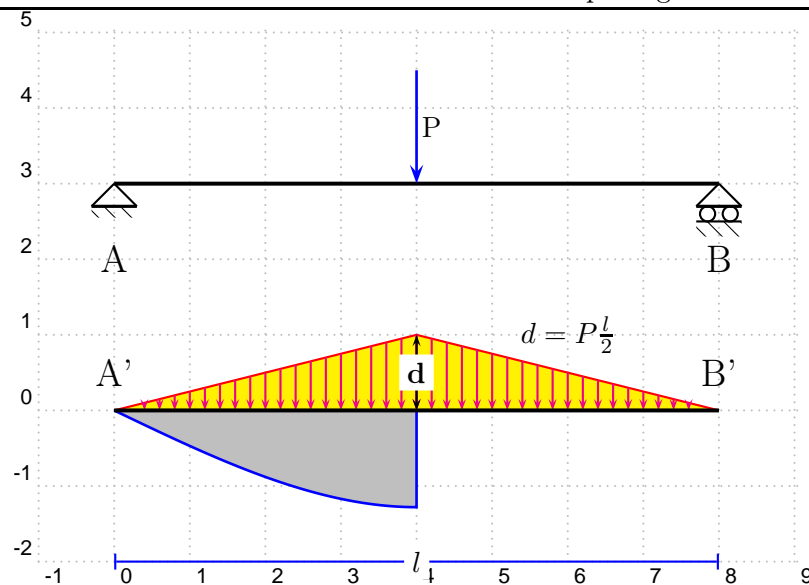
2   Elastic Line of a simple beam loaded with concentrated load P at the center line

Bernoulli's Equation: $EJ\eta'' = -M$

The **elastic curve** of the assigned beam AB (P loaded at mid-span) is obtained by computing the Bending Moment of the auxiliary beam A'B' to which is applied the BM of AB (EJ=const)

$$EJ \cdot \eta = \frac{Pl^2}{16}x - \frac{P}{12}x^3 \qquad 0 \le x \le l/2$$
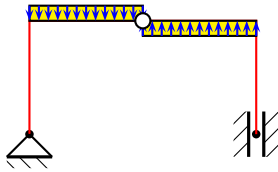
```
1   \begin{pspicture}[showgrid=true](-1,-2.4)(9,4.5)
2   \pnode(0,3){A} \pnode(8,3){B}
3   \pnode(0,0){A1} \pnode(8,0){B1}
4   \pnode(4,0){M}
5   \psline[linewidth=1.5pt](0,3)(8,3) % Beam AB
6   \psArrowCivil[RotArrows=0,length=1.5,start=0.5,%
7       linecolor=blue,arrowsize=1.8mm,OffsetLabel=0.2,linewidth=1pt](A)(B){\rput
        {90}{P}}
8   \rput{0}(A){\hinge} \rput{0}(B){\roller}
9   \psline[linecolor=red,fillcolor=yellow,fillstyle=solid](0,0)(4,1)(8,0)
10  \rput(0,2){\Large A} \rput(8,2){\Large B}
11  %% 1st half load
12   \multido{\nStart=1.00+0.05}{-19}{%
13  \psArrowCivil[RotArrows=0,length=\nStart,start=\nStart,%
14      linecolor=magenta](A1)(M){}}
15  %% 2nd half load
16   \multido{\nStart=1.00+0.05}{-19}{%
17  \psArrowCivil[RotArrows=180,length=\nStart,start=\nStart,%
18      linecolor=magenta](B1)(M){}}
19  \pcline[offset=0,linecolor=black]{<->}(4,0)(4,1)
20   \lput*{:R}{\bf d}
21  \rput(6,1){$d=P\frac{l}{2}$}
22  \rput(0,0.5){\Large A'} \rput(8,0.5){\Large B'}
23  \pcline[offset=0,linecolor=blue]{|-|}(0,-2)(8,-2)
24  \lput*{:U}{\bf $l$}
25  % Paramenters #1 P = 6 #2 l=8 #3 scale factor =0.02
26  %----------- Elastic curve of beam AB ----------------------
27  \def\ElasticAB#1#2#3{#1 16.0 div #2 #2 x mul mul mul
28                 #1 -12.0 div x x x mul mul mul add #3 mul neg}
29  \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=lightgray]{%
30   \psplot[]{0.0}{4.0}{\ElasticAB{6}{8}{0.02}}
31   \psline[](4,0)(0,0)}
32  \psline[linewidth=1.5pt](0,0)(8,0) % Beam A'B'
33  \end{pspicture}
```

3   Antisymmetric distributed load

```
1  \begin{pspicture}(-3,-3)(4,3)
2  \pnode(0,1.5) {OO}
3  \pnode(1.5,1.5) {C}
4  \pnode(-1.5,1.5) {D}
5  \pnode(-1.5,0) {A}
6  \pnode(1.5,0) {B}
7  \node(A)
8  \node(B)
9  \psline[linecolor=red](A)(D)(C)(B)
10 \rput{0}(A){\hinge}
11 \rput{90}(B){\guide}
12 \psframe[fillstyle=solid,fillcolor=yellow](-1.5,1.5)(0,1.7)
13 \psframe[fillstyle=solid,fillcolor=yellow](0,1.3)(1.5,1.5)
14 \multido{\nStart=0.0+0.0833}{13}{%
15   \psArrowCivil[RotArrows=0,length=0.2,start=\nStart,%
16     linecolor=blue](D)(OO){}
17   \psArrowCivil[RotArrows=180,length=0.2,start=\nStart,%
18     linecolor=blue](OO)(C){}}
19 \rput{0}(OO){\interhinge}
20 \end{pspicture}
```
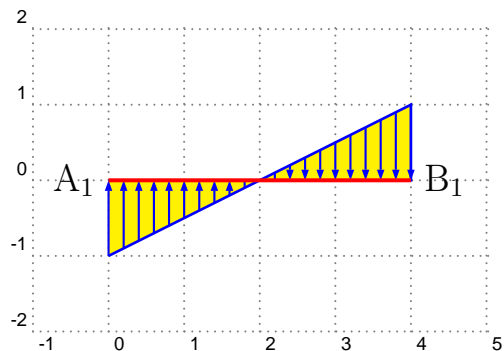
4   Antisymmetric load

```
1  \FPmessagesfalse
2  \def\retta#1#2{#1 x mul #2 add}
3  \def\rettaTeX#1#2{%
4    \multido{\nStart=0.0+0.2}{21}{%
5    \pnode(\nStart,0){E1}
6    \FPeval{\ValueRetta}{(#1)*(\nStart)+(#2)}
7    \pnode(\nStart,\ValueRetta){E2}
8    \FPeval{\Test}{abs(\ValueRetta)-0.2}
9    \FPifneg{\Test}\psset{arrowsize=0}\else\psset{arrowsize=1mm}\fi
10   \psline[linecolor=blue,arrowinset=0]{->}(E2)(E1)}}
```



```
1  \begin{pspicture}(-1,-2.5)(5,2)
2  \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=gray]
3  \pnode(0,0) {A1}
4  \pnode(4,0) {B1}
5  \uput[180](A1){\Large A$_1$}
6  \uput[0](B1){\Large B$_1$}
7  %----------------------------------------
8  % Parameters
9  % #1 m = 0.5   y = mùx + n   (1)
10 % #2 n = -1
11 %---------- line 1 ------- -------------------------
12 \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=yellow]{
13 \psplot[linecolor=blue]{0}{4}{\retta{0.5}{-1}}
14 \psline(B1)(A1)}
15 \rettaTeX{0.5}{-1}
16 \psline[linecolor=red,linewidth=1.5pt](A1)(B1) % Beam A1-B1
17 \end{pspicture}
```

5   Triangular load


```
1   \begin{pspicture}(-1,-2.5)(5,2)
2   \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=gray]
3   %----------------------------------------
4   % Parameters
5   % #1 m = 0.25   y = mùx + n   (2)
6   % #2 n = 0
7   %---------- line 2 ------- -------------------------
8   \pnode(0,0) {A2}
9   \pnode(4,0) {B2}
10  \uput[180](A2){\Large A$_2$}
11  \uput[0](B2){\Large B$_2$}
12  \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=cyan]{
13  \psplot[linecolor=blue]{0}{4}{\retta{0.25}{0}}
14  \psline(B2)(A2)}
15  \rettaTeX{0.25}{0}
16  \psline[linecolor=red,linewidth=1.5pt](A2)(B2) % Beam A2-B2
17  \end{pspicture}
```

6   Triangular load


```
1  \begin{pspicture}(-1,-2.5)(5,2)
2  \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=gray]
3  %-----------------------------------------
4  % Parameters
5  % #1 m = -0.5  y = mùx + n   (2)
6  % #2 n = 1
7  %----------- line 2 ------- Triangular load -------------------------
8  \pnode(0,0) {A3}
9  \pnode(4,0) {B3}
10 \uput[180](A3){\Large A$_3$}
11 \uput[0](B3){\Large B$_3$}
12 \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=cyan]{
13 \psplot[linecolor=blue]{0}{4}{\retta{-0.5}{1}}
14 \psline(B3)(A3)}
15 \rettaTeX{-0.5}{1}
16 \psline[linecolor=red,linewidth=1.5pt](A3)(B3) % Beam A3-B3
17 \end{pspicture}
```
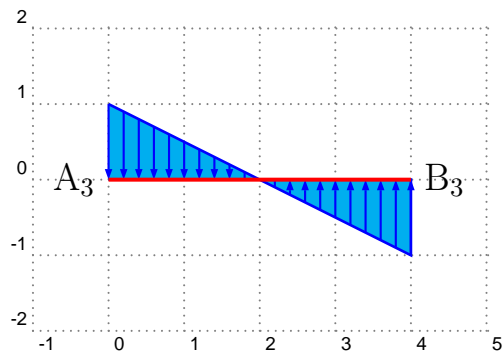
7   Antisymmetric load


```
1  \begin{pspicture}(-1,-2)(5,2)
2  \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=gray]
3  \pnode(0,0) {A1}
4  \pnode(4,0) {B1}
5  \uput[180](A1){\Large A$_4$}
6  \uput[0](B1){\Large B$_4$}
7  %------------------------------------------
8  % Parameters
9  % #1 m = -0.5   y = mùx + n    (1)
10 % #2 n = 1
11 %---------- line 1 ------- Antisymmetric load --------------------------
12 \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=yellow]{
13 \psplot[linecolor=blue]{0}{4}{\retta{-0.5}{1}}
14 \psline(B1)(A1)}
15 \rettaTeX{-0.5}{1}
16 \psline[linecolor=red,linewidth=1.5pt](A1)(B1) % Beam A1-B1
17 \end{pspicture}
```
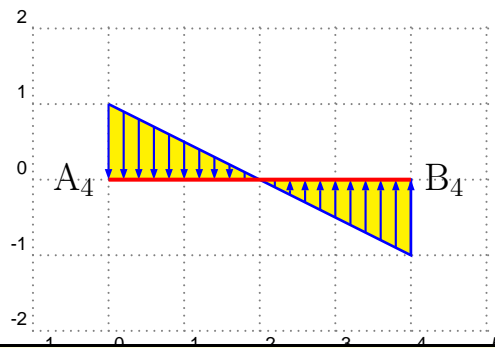
8 Loads: Position and naming
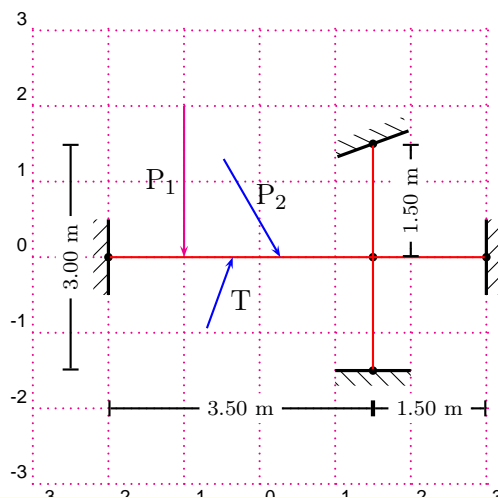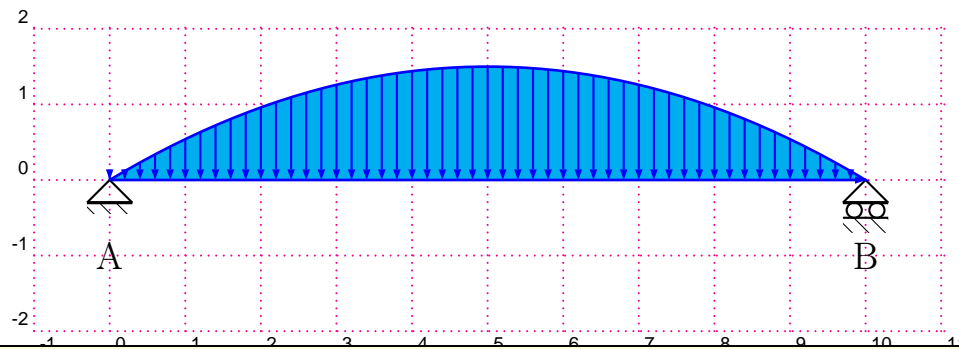


```
1  \begin{pspicture}(-3,-3)(3,3)
2  \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
3  % ------ KNOTS definition -----------
4  \pnode(-2,0){A} \pnode(1.5,0){B}
5  \pnode(1.5,-1.5){E}\pnode(1.5,1.5){F}
6  \pnode(3,0){G}
7  \node(A) \node(E) \node(B) \node(F) \node(G)
8  % ------ Structure drawing and fixed ends position -----------
9  \psline[linecolor=red](A)(G)
10 \psline[linecolor=red](E)(F)
11 \rput{-90}(A){\fixedend} % left FE
12 \rput{0}(E){\fixedend} % bottom FE
13 \rput{-160}(F){\fixedend} % top FE
14 \rput{90}(G){\fixedend} % right FE
15 % ------ Loads: Position and naming -----------
16 \psArrowCivil[RotArrows=0,length=2.0,start=0.286,%
17    linecolor=magenta,OffsetLabel=-0.3](A)(B){\rput{90}{P$_1$}}
18 \psArrowCivil[RotArrows=30,length=1.5,start=0.65,%
19    linecolor=blue,OffsetLabel=0.3](A)(B){\rput{60}{P$_2$}}
20 \psArrowCivil[RotArrows=-200,length=1.0,start=0.47,%
21    linecolor=blue,OffsetLabel=-0.3](A)(B){\rput{-70}{T}}
22 % ------ Spans measures -----------
23 \pcline [offset=-5mm]{|-|}(-2,-1.5)(1.5,-1.5)
24 \lput*{:U}{\scriptsize 3.50 m}
25 \pcline [offset=-5mm]{|-|}(1.5,-1.5)(3,-1.5)
26 \lput*{:U}{\scriptsize 1.50 m}
27 \pcline [offset=5mm]{|-|}(-2,-1.5)(-2,1.5)
28 \lput*{:U}{\scriptsize 3.00 m}
29 \pcline [offset=0mm]{|-|}(2,0)(2,1.5)
30 \lput*{:U}{\scriptsize 1.50 m}
31 \end{pspicture}
```

9   Distributed load


```
1  \def\BMdistributed#1#2#3{#2 x sub 0.5 #1 x mul mul mul #3 mul}
2  \begin{pspicture}(-1,-2)(11,2)
3  \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
4  \pnode(0,0) {A}
5  \pnode(10,0) {B}
6  \rput{0}(A){\hinge}
7  \rput{0}(B){\roller}
8  \rput(0,-1){\Large A}
9  \rput(10,-1){\Large B}
10 \psline[linecolor=blue](A)(B)
11 %=========================================================================
12 % Paramenters
13 % #1 q = 12
14 % #2 l = 10
15 % #3 scale factor =0.01: to be multiplied by (10/l)^2 (when l<> 10)
16 %----------- BM distributed load ---------------------
17 \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=cyan]{
18   \psplot[linecolor=blue]{0}{10}{\BMdistributed{12}{10}{0.01}}
19   \psline[](10,0)(0,0)}
20 \psset{arrowsize=1.5mm}
21 \multido{\nStart=0.0+0.2}{51}{%
22 \pnode(\nStart,0){E1}
23 \pnode(! /x \nStart\space def
24    x \BMdistributed{12}{10}{0.01}){E2}
25 \psline[linecolor=blue,arrowinset=0,arrowsize=1mm]{->}(E2)(E1)}
26 \end{pspicture}
```

10

10   Macro `\triload`


```
\begin{pspicture}[showgrid=true](-1,-4)(11,3)
% Total span is (K+1) times L, say AC=(K+1)*L [K=dimensionless value]
% ------------------------------------
 \triload[K=1,P=8,L=5] % k=1 -> AB=BC
% \triload[K=0.333,P=8,L=7.5] % k=1/3, like example 6
% \triload[K=2,P=8,L=3] % k=2 -> BM always NEGATIVE in the whole structure
% \triload[K=2.5,P=8,L=2] % k>2 -> Reaction in C downwards
% ------------------------------------
\end{pspicture}
```

```latex
1  \begin{pspicture}(-1,-6)(11,3)
2  % \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
3   % Total span is (K+1) times L, say AC=(K+1)*L [K=dimensionless value]
4  % ----------------------------------
5  % \triload[K=1,P=8,L=5] % k=1 -> AB=BC
6   \triload[K=0.333,P=8,L=7.5] % k=1/3, like example 6
7  % \triload[K=2,P=8,L=3] % k=2 -> BM always NEGATIVE in the whole structure
8  % \triload[K=2.5,P=8,L=2] % k>2 -> Reaction in C downwards
9  % ----------------------------------
10 \end{pspicture}
```

$k = 2 \quad l = 3$

A

B

C

p

$\longmapsto\!\!\!\!\!\longmapsto k \cdot l \longrightarrow\!\!\!\!\!\longmapsto l \longrightarrow\!$

```
1  \begin{pspicture}(-1,-3)(11,5)
2  % \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
3   % Total span is (K+1) times L, say AC=(K+1)*L [K=dimensionless value]
4  % -----------------------------------
5  % \triload[K=1,P=8,L=5] % k=1 -> AB=BC
6  % \triload[K=0.333,P=8,L=7.5] % k=1/3, like example 6
7   \triload[K=2,P=8,L=3] % k=2 -> BM always NEGATIVE in the whole structure
8  % \triload[K=2.5,P=8,L=2] % k>2 -> Reaction in C downwards
9  % -----------------------------------
10 \end{pspicture}
```

$k = 2.5 \quad l = 2$
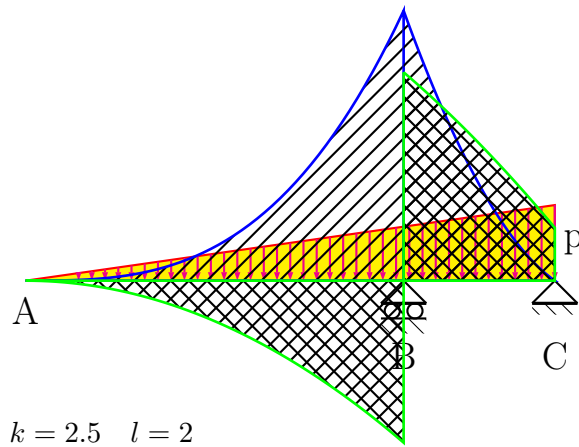
```
1   \begin{pspicture}(-1,-3)(11,4)
2   % \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
3    % Total span is (K+1) times L, say AC=(K+1)*L [K=dimensionless value]
4   % ------------------------------------
5   % \triload[K=1,P=8,L=5] % k=1 -> AB=BC
6   % \triload[K=0.333,P=8,L=7.5] % k=1/3, like example 6
7   % \triload[K=2,P=8,L=3] % k=2 -> BM always NEGATIVE in the whole structure
8    \triload[K=2.5,P=8,L=2] % k>2 -> Reaction in C downwards
9   % ------------------------------------
10  \end{pspicture}
```
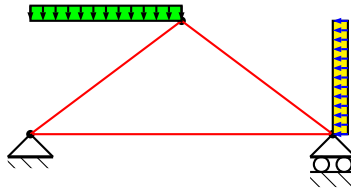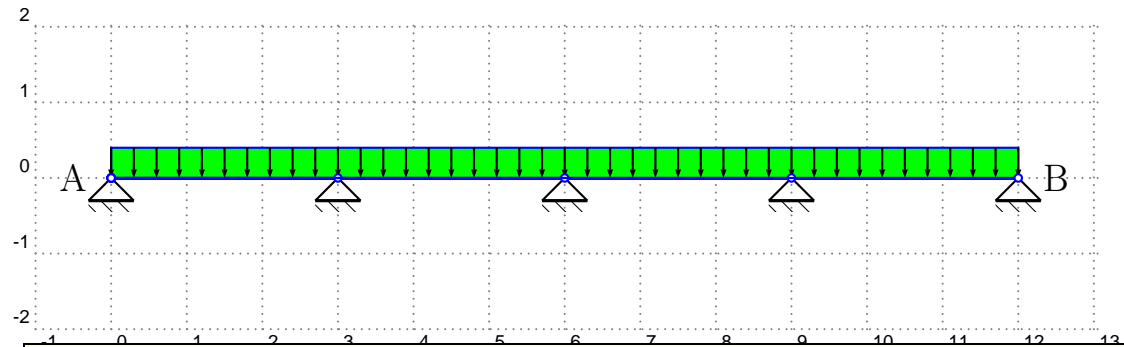
11   Non-symmetric superimposed dead load

```
1  \begin{pspicture}(-3,-3)(3,3)
2  \pnode(-2,0){A} \pnode(2,0) {B}
3  \pnode(0,1.5){V} \pnode(-2,1.5) {A0}
4  \pnode(2,1.5){B0}
5  \node(A) \node(B) \node(V)
6  \psline[linecolor=red](A)(V)(B)(A)
7  \rput{0}(A){\hinge} \rput{0}(B){\roller}
8  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
9  %       Non-symmetric superimposed dead load
10 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
11 \psframe[fillstyle=solid,fillcolor=green](-2,1.5)(0,1.7)
12 \psframe[fillstyle=solid,fillcolor=yellow](2,0)(2.2,1.5)
13 \multido{\nStart=0.0+0.0833}{13}{%
14 \psArrowCivil[RotArrows=0,length=0.2,start=\nStart,%
15    linecolor=black](A0)(V){}
16 %       Lateral load (i.e. wind)
17 \psArrowCivil[RotArrows=180,length=0.2,start=\nStart,%
18    linecolor=blue](B)(B0){}}
19 \end{pspicture}
```
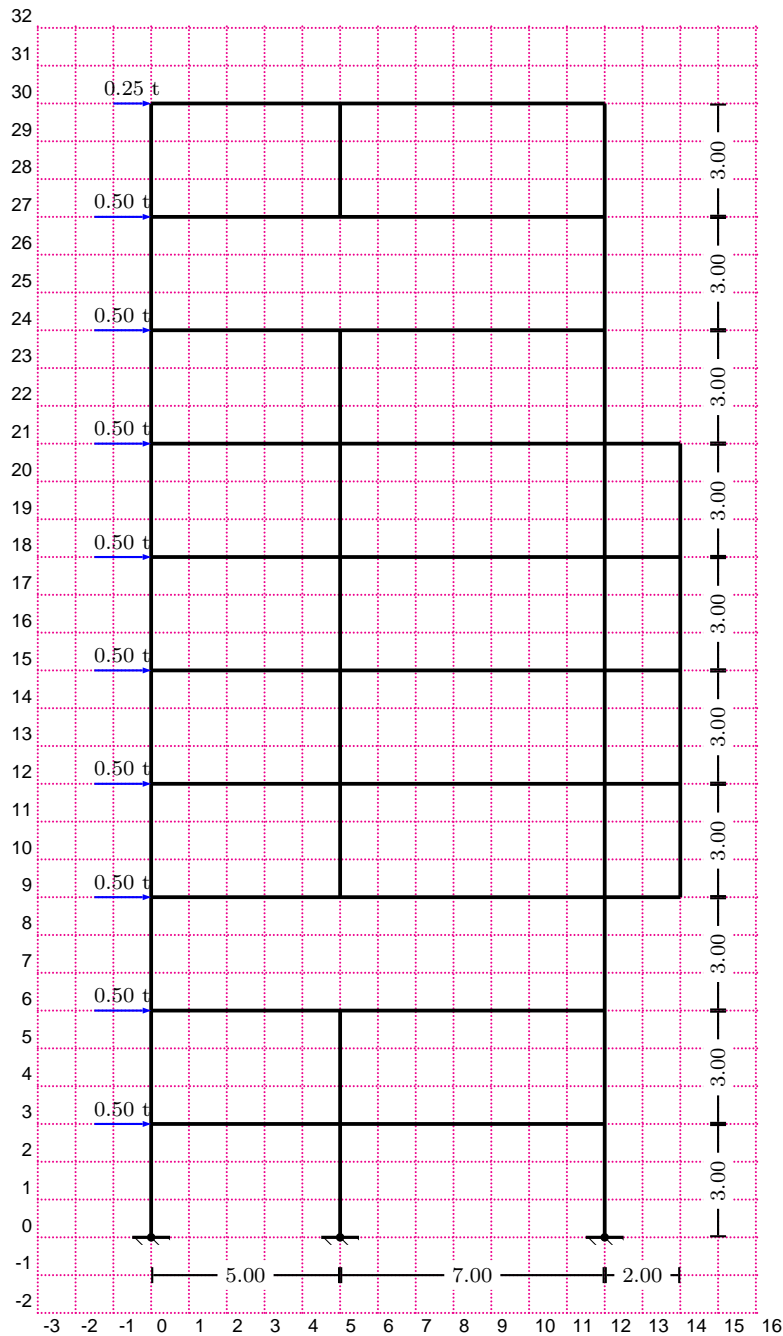
12   Distributed load for all beams


```
1  \begin{pspicture}(-1,-2)(13,2)
2  \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=gray]
3  \pnode(0,0) {A} \pnode(12,0) {B} \pnode(12,0.4) {B1}
4  \node (A)
5  \rput(-0.5,0){\Large A}
6  \rput(12.5,0){\Large B}
7  \psline[linecolor=blue,linewidth=1.5pt](A)(B) % join A-B
8  %-----------------------------------------------------------
9  \psframe[linecolor=blue,fillcolor=green,fillstyle=solid](A)(B1)
10 %
11 % distributed load for all beams
12 \multido{\nBegin=0+0.025}{41}{%
13 \psArrowCivil[RotArrows=0,length=0.4,start=\nBegin,%
14    linecolor=black](A)(B){}}
15 %
16 % recursive routine
17 \multido{\rStart=0.00+3.00}{5}{%
18 \pnode(0,0){E1}
19 \pnode(\rStart,0){E2}
20  \rput{0}(E2){\hinge}
21 \psline[linecolor=blue,arrowinset=0,arrowsize=1mm]{o-o}(E1)(E2)}
22 \end{pspicture}
```

13 Distributed load for all beams


```
1  \psset{xunit=0.5cm,yunit=0.5cm}    % Scaling
2  \begin{pspicture}(-3,-2)(16,32)
3  \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
4  % ------ KNOTS definition -----------
5  \pnode(0,0) {A0}\pnode(5,0) {B0} \pnode(12,0) {C0}
6    \node (A0)  \node (B0)  \node (C0)
7  \pnode(0,30) {A10} \pnode(5,30) {B10} \pnode(12,30) {C10}
8
9  %-----------------------
10 \pnode(5,27) {B9}\pnode(5,24) {B8}
11 \pnode(5,6) {B2} \pnode(5,9) {B3}
12 %-----------------------
13 \pnode(14,9) {D3} \pnode(14,12) {D4}
14 \pnode(14,15) {D5}\pnode(14,18) {D6}
```
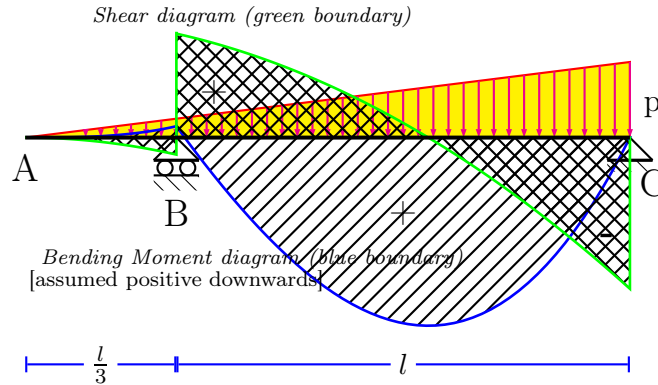
```
15 \pnode(14,21) {D7}
16 %-----------------------
17 \pnode(0,27)  {A9}\pnode(12,27) {C9}
18 \pnode(0,24)  {A8}\pnode(12,24) {C8}
19 \pnode(0,21)  {A7}\pnode(12,21) {C7}
20 \pnode(0,18)  {A6}\pnode(12,18) {C6}
21 \pnode(0,15)  {A5}\pnode(12,15) {C5}
22 \pnode(0,12) {A4} \pnode(12,12) {C4}
23 \pnode(0,9)  {A3} \pnode(12,9) {C3}
24 \pnode(0,6)  {A2} \pnode(12,6) {C2}
25 \pnode(0,3)  {A1} \pnode(12,3) {C1}
26 %
27 % ------ Structure drawing and fixed ends position -----------
28  \psline[linecolor=black,linewidth=0.05](A0)(A10)
29  \psline[linecolor=black,linewidth=0.05](C0)(C10)
30 %
31  \psline[linecolor=black,linewidth=0.05](B9)(B10)
32  \psline[linecolor=black,linewidth=0.05](B3)(B8)
33  \psline[linecolor=black,linewidth=0.05](B0)(B2)
34 %
35  \psline[linecolor=black,linewidth=0.05](A10)(C10)
36  \psline[linecolor=black,linewidth=0.05](A9)(C9)
37  \psline[linecolor=black,linewidth=0.05](A8)(C8)
38  \psline[linecolor=black,linewidth=0.05](A7)(D7)
39  \psline[linecolor=black,linewidth=0.05](A6)(D6)
40  \psline[linecolor=black,linewidth=0.05](A5)(D5)
41  \psline[linecolor=black,linewidth=0.05](A4)(D4)
42  \psline[linecolor=black,linewidth=0.05](A3)(D3)
43  \psline[linecolor=black,linewidth=0.05](A2)(C2)
44  \psline[linecolor=black,linewidth=0.05](A1)(C1)
45 %
46  \psline[linecolor=black,linewidth=0.05](D3)(D7)
47  \rput{0}(A0){\fixedend}      %  bottom FE, column A
48  \rput{0}(B0){\fixedend}      %  bottom FE, column B
49  \rput{0}(C0){\fixedend}      %  bottom FE, column C
50 % ------ Loads: Position and naming -----------
51 \psArrowCivil[RotArrows=90,length=1.0,start=0,%
52     linecolor=blue,OffsetLabel=0.2](A10)(B10){\rput{0}{\scriptsize 0.25 t}}
53 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
54     linecolor=blue,OffsetLabel=0.2](A9)(B9){\rput{0}{\scriptsize 0.50 t}}
55 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
56     linecolor=blue,OffsetLabel=0.2](A8)(B8){\rput{0}{\scriptsize 0.50 t}}
57 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
58     linecolor=blue,OffsetLabel=0.2](A7)(C7){\rput{0}{\scriptsize 0.50 t}}
59 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
60     linecolor=blue,OffsetLabel=0.2](A6)(C6){\rput{0}{\scriptsize 0.50 t}}
61 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
62     linecolor=blue,OffsetLabel=0.2](A5)(C5){\rput{0}{\scriptsize 0.50 t}}
63 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
64     linecolor=blue,OffsetLabel=0.2](A4)(C4){\rput{0}{\scriptsize 0.50 t}}
65 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
66     linecolor=blue,OffsetLabel=0.2](A3)(B3){\rput{0}{\scriptsize 0.50 t}}
67 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
68     linecolor=blue,OffsetLabel=0.2](A2)(B2){\rput{0}{\scriptsize 0.50 t}}
69 \psArrowCivil[RotArrows=90,length=1.5,start=0,%
70     linecolor=blue,OffsetLabel=0.2](A1)(C1){\rput{0}{\scriptsize 0.50 t}}
71 %
```

```
72  % ------ Spans measures -----------
73  \pcline [offset=-0.5]{|-|}(0,0)(5,0)   \lput*{:U}{\scriptsize 5.00}
74  \pcline [offset=-0.5]{|-|}(5,0)(12,0)  \lput*{:U}{\scriptsize 7.00}
75  \pcline [offset=-0.5]{|-|}(12,0)(14,0) \lput*{:U}{\scriptsize 2.00}
76  %----------------------
77  \pcline [offset=-0.5]{|-|}(14,0)(14,3)   \lput*{:U}{\scriptsize 3.00}
78  \pcline [offset=-0.5]{|-|}(14,3)(14,6)   \lput*{:U}{\scriptsize 3.00}
79  \pcline [offset=-0.5]{|-|}(14,6)(14,9)   \lput*{:U}{\scriptsize 3.00}
80  \pcline [offset=-0.5]{|-|}(14,9)(14,12) \lput*{:U}{\scriptsize 3.00}
81  \pcline [offset=-0.5]{|-|}(14,12)(14,15)\lput*{:U}{\scriptsize 3.00}
82  \pcline [offset=-0.5]{|-|}(14,15)(14,18)\lput*{:U}{\scriptsize 3.00}
83  \pcline [offset=-0.5]{|-|}(14,18)(14,21)\lput*{:U}{\scriptsize 3.00}
84  \pcline [offset=-0.5]{|-|}(14,21)(14,24)\lput*{:U}{\scriptsize 3.00}
85  \pcline [offset=-0.5]{|-|}(14,24)(14,27)\lput*{:U}{\scriptsize 3.00}
86  \pcline [offset=-0.5]{|-|}(14,27)(14,30)\lput*{:U}{\scriptsize 3.00}
87  \end{pspicture}
```

14   Simple Beam with one overhang: TRIANGULAR distributed load p

Shear diagram (green boundary)

p

A

B

C

Bending Moment diagram (blue boundary)
[assumed positive downwards]

$\frac{l}{3}$ l

```
1   \begin{pspicture}(-1,-3.5)(9,1.5)
2   \pnode(0,0) {A}\pnode(2,0) {B}\pnode(8,0) {C}
3   \rput{0}(C){\hinge}\rput{0}(B){\roller}
4   \psline[linecolor=red,fillcolor=yellow,fillstyle=solid](0,0)(8,0)(8,1)(0,0)
5   \multido{\nStart=1.00+0.025}{-37}{%
6      \psArrowCivil[RotArrows=0,length=\nStart,start=\nStart,%
7        linecolor=magenta](A)(C){}}
8   \rput(8.3,0.4){\large p} \rput(0,-0.4){\Large A}
9   \rput(2,-1){\Large B} \rput(8.3,-0.6){\Large C}
10  \pcline[offset=0,linecolor=blue]{|-|}(0,-3)(2,-3) \lput*{:U}{\bf $\frac{l
      }{3}$}
11  \pcline[offset=0,linecolor=blue]{|-|}(2,-3)(8,-3) \lput*{:U}{\bf $l$}
12  %%%=====================================================================
13  % Paramenters: #1 p = 6 #2 l = 6 #3 scale factor =0.15
14  %----------- Bending Moment in span AB ---------------------
15  \def\MflettAB#1#2#3{#1 #2 div -.125 mul x mul x mul x mul #3 mul neg}
16  \pscustom[linecolor=blue,linewidth=1pt,fillstyle=hlines]{
17   \psplot[]{0}{2}{\MflettAB{6}{6}{0.15}}\psline[](2,0)(0,0)}
18  %----------- Shear in span AB ---------------------
19  \def\TaglioAB#1#2#3{#1 #2 div -.375 mul x mul x mul #3 mul}
20  \pscustom[linecolor=green,linewidth=1pt,fillstyle=crosshatch]{
21   \psplot[]{0}{2}{\TaglioAB{6}{6}{0.15}}\psline[](2,0)(0,0)}
22  %----------- Bending Moment in span BC ---------------------
23  \def\MflettBC#1#2#3{#1 #2 div -.125 mul x mul x mul x mul
24   #1 3.375 div #2 mul x mul add #1 10.125 div #2 mul #2 mul sub #3 mul neg}
25  \pscustom[linecolor=blue,linewidth=1pt,fillstyle=hlines]{%
26   \psplot[]{2}{8}{\MflettBC{6}{6}{0.15}}\psline[](8,0)(2,0)}
27  %----------- Shear in span BC ---------------------
28  \def\TaglioBC#1#2#3{#1 #2 div -.375 mul x mul x mul
29     #1 3.375 div #2 mul add #3 mul}
30  \pscustom[linecolor=green,linewidth=1pt,fillstyle=crosshatch]{%
31   \psplot[]{2}{8}{\TaglioBC{6}{6}{0.15}}\psline[](8,0)(2,0)(2,1.4)}
32  %%%=====================================================================
33  \psline[linewidth=1.5pt](0,0)(8,0) % Printing beam AC after diagrams BM/S
34  \rput(3,1.6){\em {\scriptsize Shear diagram (green boundary)}}
35  \rput(3,-1.6){\em {\scriptsize Bending Moment diagram (blue boundary)}}
36  \rput(2,-1.9){\scriptsize [assumed positive downwards]}
37  \rput(5,-1){\bf {\large +}} \rput(2.5,0.6){\bf {\large +}}
38  \rput(7.7,-1.3){\bf {\Large -}}
39  \end{pspicture}
```