

pst-stru

A PSTricks package to draw structural schemes in civil
engineering analysis (beams, portals, archs, piles)

ver. 0.11

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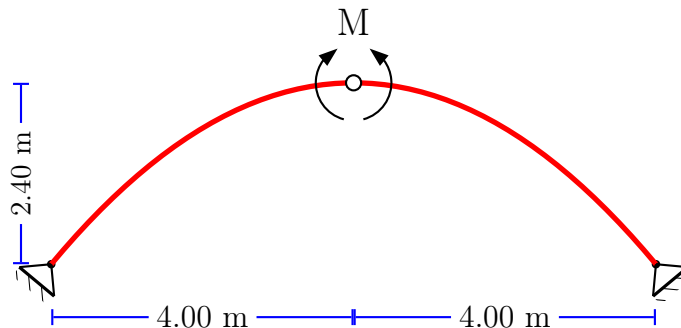
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*Thanks to Manuel Luque who inspired and initially supported this work.

Documentation revised by Herbert Voß

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Distributed from CTAN archives in directory macros/latex/base/lppl.txt.

1 Simple example



```

1 \psset{arrowsize=0.8mm,arrowinset=0}
2 \begin{pspicture}(-5,-1)(5,5)
3 \pnode(0,2.4) {00}
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}(00){\interhinge}
12 \rput{-5}(00){\clockCouple}
13 \rput{5}(00){\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}

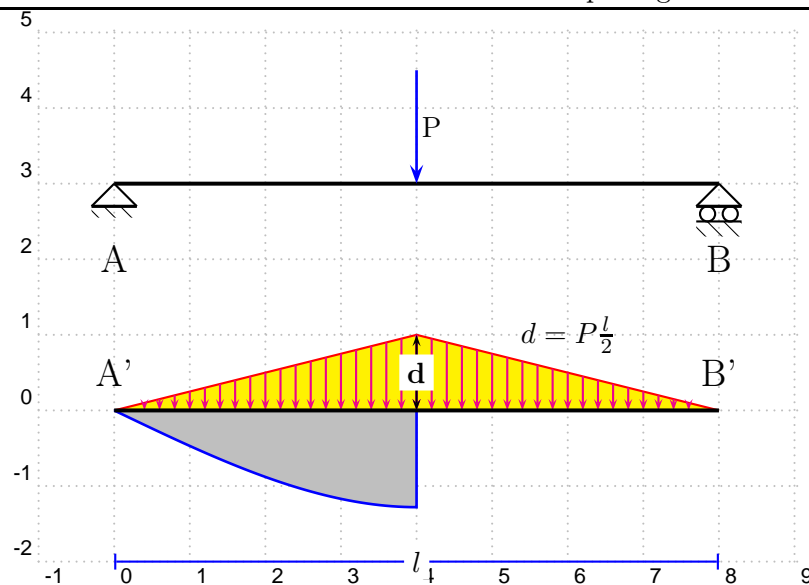
```

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 ($EJ=\text{const}$)

$$EJ \cdot \eta = \frac{Pl^2}{16}x - \frac{P}{12}x^3 \quad 0 \leq x \leq l/2$$

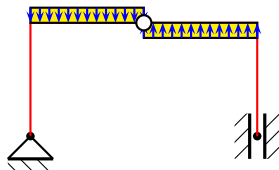


```

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

```

3 Antisymmetric distributed load



```

1 \begin{pspicture}(-3,-3)(4,3)
2 \pnode(0,1.5) {00}
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)(00){}
17   \psArrowCivil[RotArrows=180,length=0.2,start=\nStart,%
18     linecolor=blue](00)(C){}}
19 \rput{0}(00){\interhinge}
20 \end{pspicture}

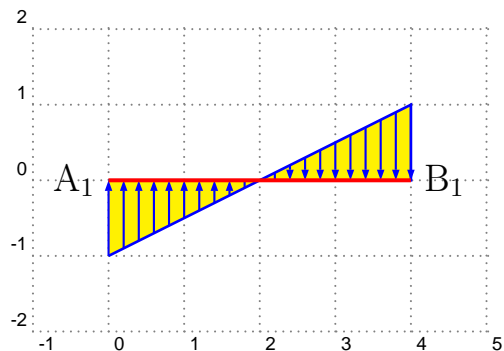
```

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)}

```

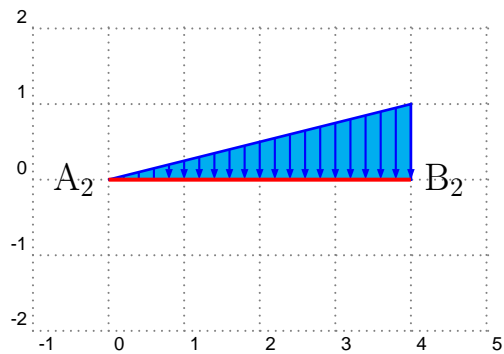


```

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 = m*x + 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

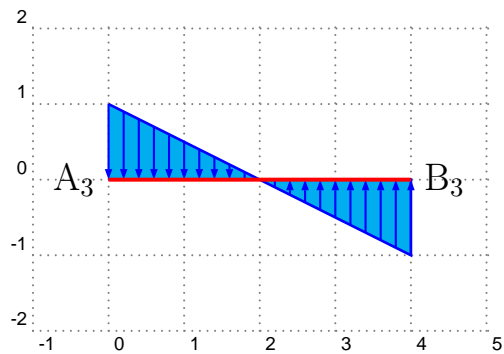


```

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 = m*x + 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

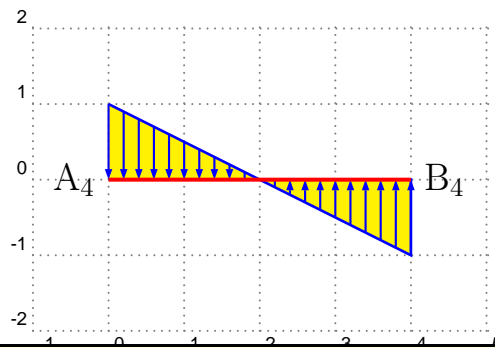


```

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 = m*x + 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

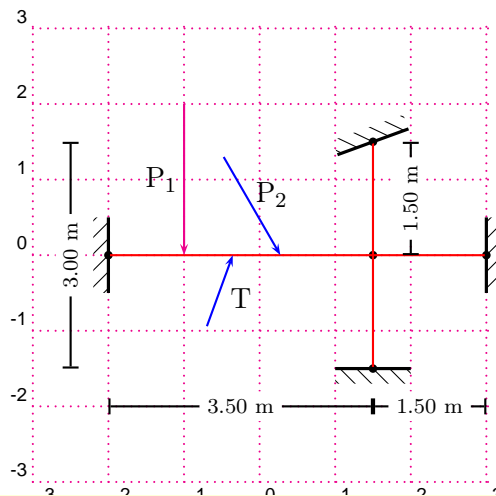


```

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 = m*x + 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

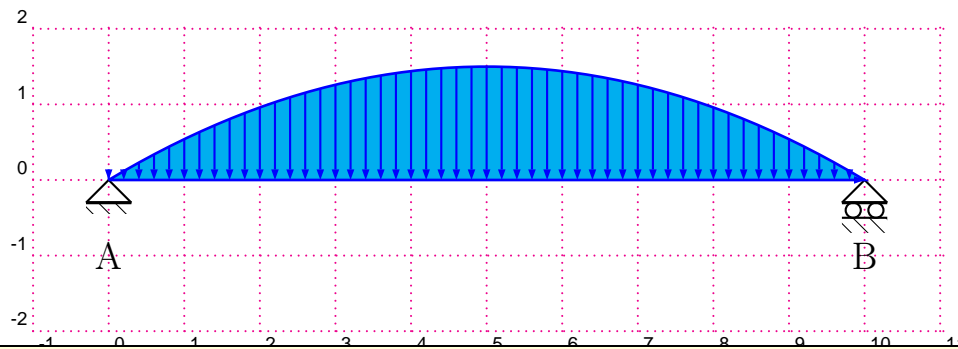


```

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}

```

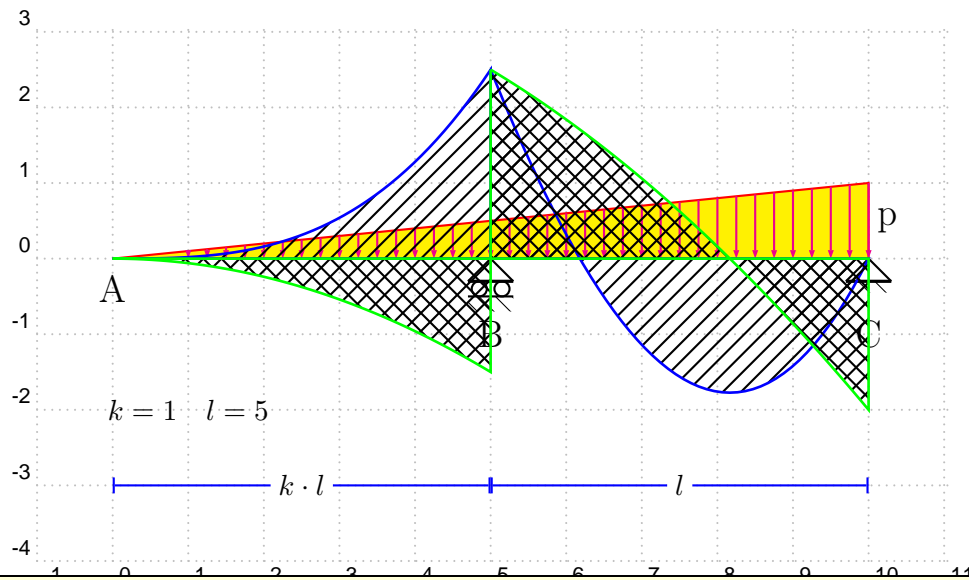
9 Distributed load



```

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 % Parameters
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}

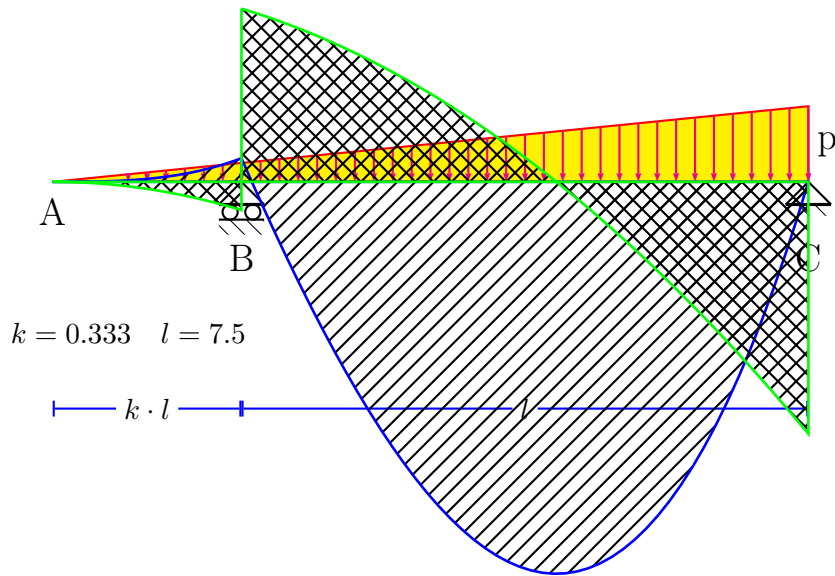
```

10 Macro `\triload`

```

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

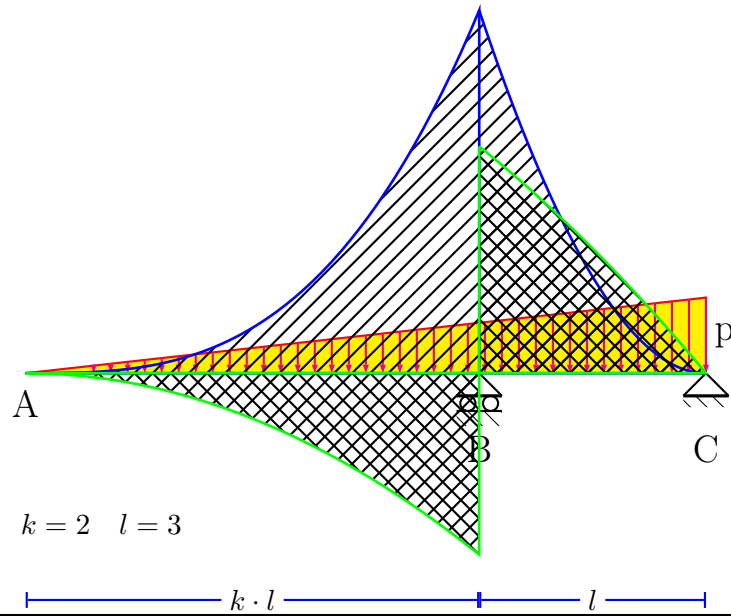
```



```

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}

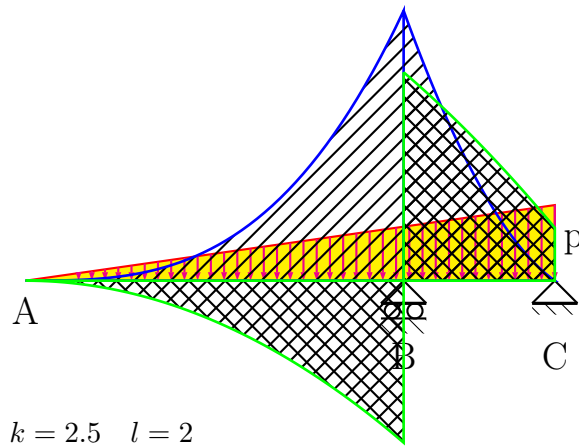
```



```

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}

```



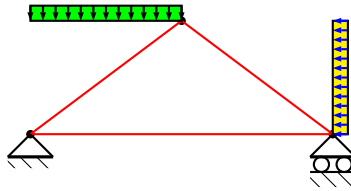
$k \cdot l$ l

```

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 % \triloader[K=1,P=8,L=5] % k=1 -> AB=BC
6 % \triloader[K=0.333,P=8,L=7.5] % k=1/3, like example 6
7 % \triloader[K=2,P=8,L=3] % k=2 -> BM always NEGATIVE in the whole structure
8 \triloader[K=2.5,P=8,L=2] % k>2 -> Reaction in C downwards
9 % -----
10 \end{pspicture}

```

11 Non-symmetric superimposed dead load

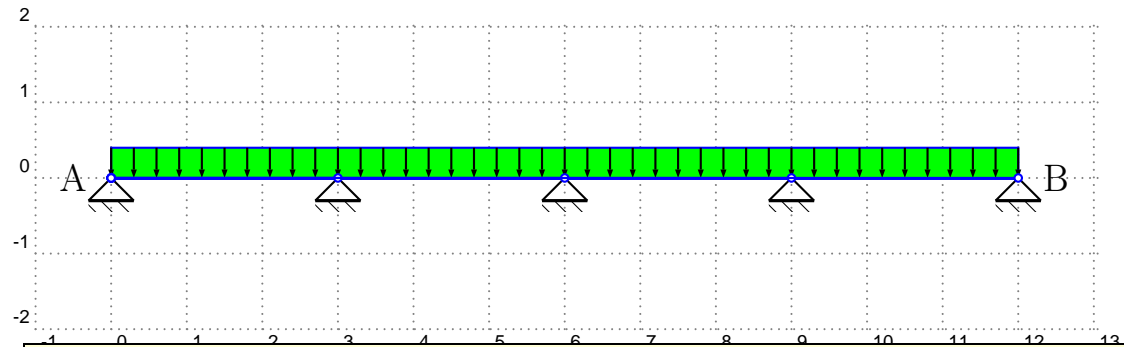


```

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

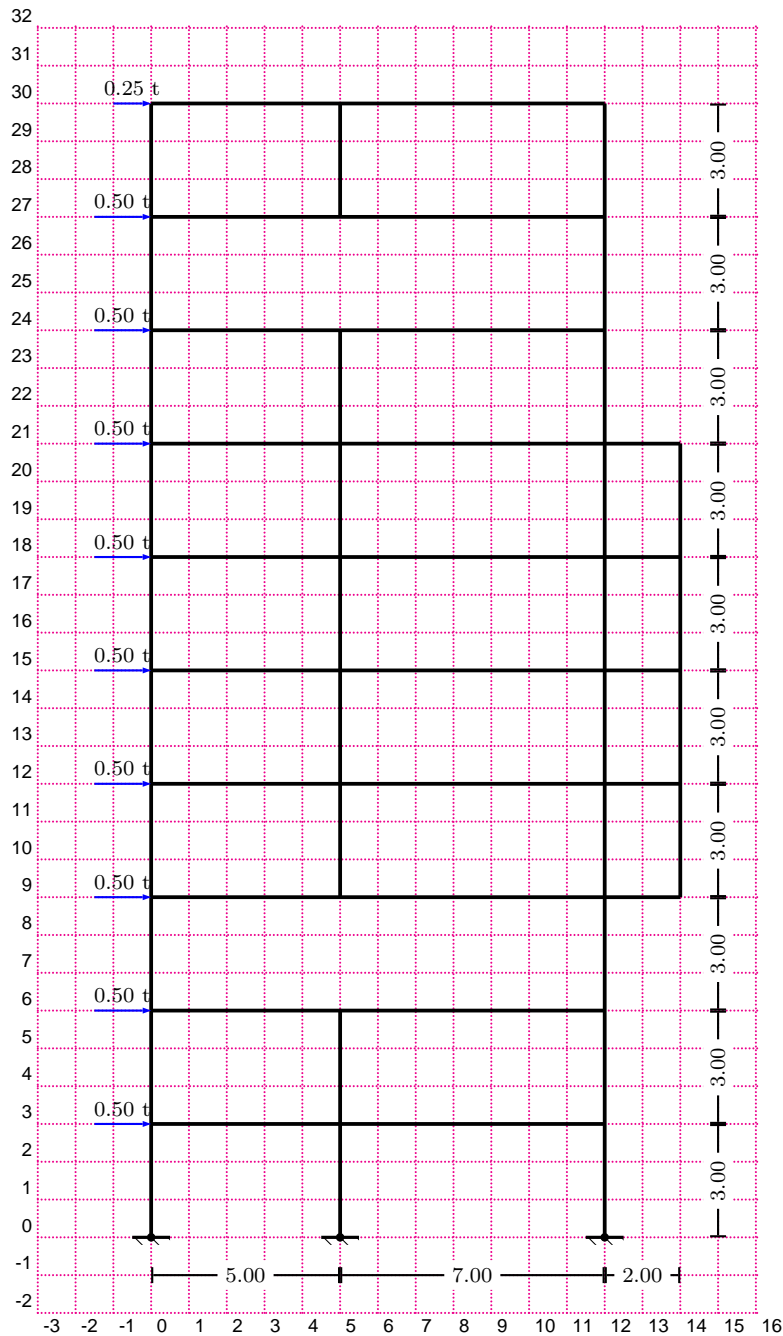


```

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}

```

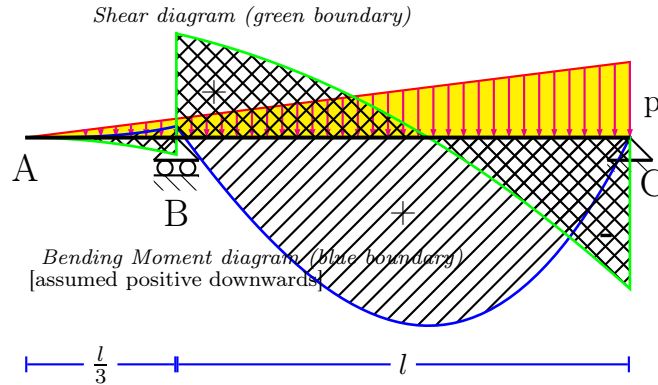
```

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



```

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 $\frac{1}{3}$}$}
11 \pcline[offset=0,linecolor=blue]{|-|}(2,-3)(8,-3) \lput*{:U}{\bf $l$}$}
12 %%%=====
13 % Parameters: #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[]{}{}{\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[]{}{}{\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[]{}{}{\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[]{}{}{\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}

```