pst-stru:
Structural schemes v0.12

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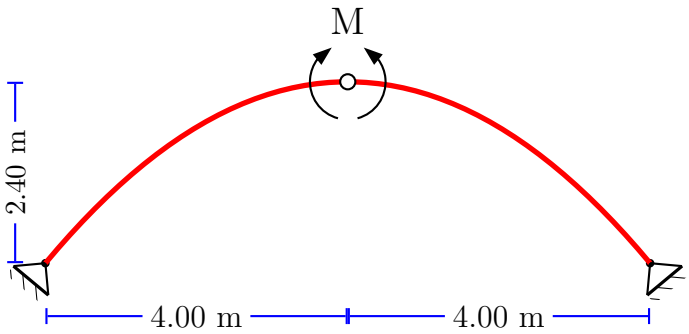
Abstract

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

Contents

*Thanks to Manuel Luque who inspired and initially supported this work.
Documentation revised by Herbert Voß

1 Simple example

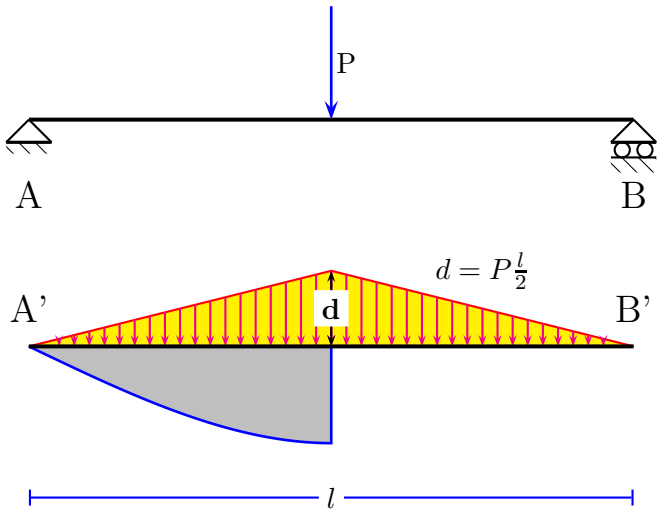



```
\psset{arrowsize=0.8mm,arrowinset=0}
\begin{pspicture}(-5,-1)(5,5)
  \pnode(0,2.4){OO}\pnode(-4,0){A}\pnode(4,0){B}
  \node(A)\node(B)
  \psplot[linecolor=red,linewidth=2pt]{-4}{4}{x neg x mul 0.15 mul 2.4
    add}
  \rput{-39.8}(A){\hinge}\rput{39.8}(B){\hinge}\rput{0}(OO){\interhinge}
  \rput{-5}(OO){\clockCouple}\rput{5}(OO){\noclockCouple}
  \rput(0,3.2){\Large M}
  \pcline [offset=-7mm,linecolor=blue]{|-|}(-4,0)(0,0)
  \lput*{:U}{\large 4.00 m}
  \pcline[offset=-7mm,linecolor=blue]{|-|}(0,0)(4,0)
  \lput*{:U}{\large 4.00 m}
  \pcline[offset=0pt,linecolor=blue]{|-|}(-4.4,0)(-4.4,2.4)
 \lput*{:U}{2.40 m}
\end{pspicture}
```

2 Elastic Line of a simple beam loaded with concentrated load P at the center line

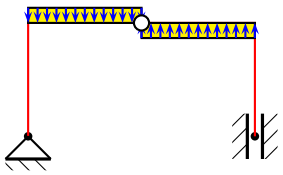
*B*ernoulli's Equation: $EJ\eta'' = -M$
The **elastic curve** of the assigned beam AB (P loaded at mid-span) is obtained by computing the Bending Moment of the auxiliary beam A'B' to which is applied the BM of AB (EJ=const)

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




```
\begin{pspicture}(-1,-2.4)(9,4.5)
  \pnode(0,3){A}\pnode(8,3){B}\pnode(0,0){A1}\pnode(8,0){B1}\pnode(4,0){M}
  \psline[linewidth=1.5pt](0,3)(8,3) % Beam AB
  \psArrowCivil[RotArrows=0,length=1.5,start=0.5,%
    linecolor=blue,arrowsize=1.8mm,OffsetLabel=0.2,linewidth=1pt](A)(B){\rput{90}{P}}
  \rput{0}(A){\hinge} \rput{0}(B){\roller}
  \psline[linecolor=red,fillcolor=yellow,fillstyle=solid](0,0)(4,1)(8,0)
  \rput(0,2){\Large A} \rput(8,2){\Large B}
  %% 1st half load
  \multido{\nStart=1.00+0.05}{-19}{%
   \psArrowCivil[RotArrows=0,length=\nStart,start=\nStart,linecolor=magenta](A1)(M){}}
  %% 2nd half load
  \multido{\nStart=1.00+0.05}{-19}{%
    \psArrowCivil[RotArrows=180,length=\nStart,start=\nStart,linecolor=magenta](B1)(M){}}
  \pcline{<->}(4,0)(4,1)\lput*{:R}{\bf d}
  \rput(6,1){$d=P\frac{l}{2}$} \rput(0,0.5){\Large A'} \rput(8,0.5){\Large B'}
  \pcline[linecolor=blue]{|-|}(0,-2)(8,-2)\lput*{:U}{\bf $l$}
  % Paramenters #1 P = 6 #2 l=8 #3 scale factor =0.02
  %----------- Elastic curve of beam AB ----------------------
  \def\ElasticAB#1#2#3{#1 16.0 div #2 #2 x mul mul mul
                  #1 -12.0 div x x x mul mul mul add #3 mul neg}
  \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=lightgray]{%
    \psplot[]{0.0}{4.0}{\ElasticAB{6}{8}{0.02}}
  \psline(4,0)(0,0)}
  \psline[linewidth=1.5pt](0,0)(8,0) % Beam A'B'
\end{pspicture}
```

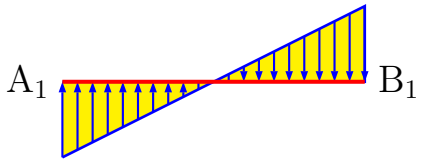
3 Antisymmetric distributed load



```
\begin{pspicture}(-3,-0.5)(4,2)
  \pnode(0,1.5){OO}\pnode(1.5,1.5){C}\pnode(-1.5,1.5){D}\pnode(-1.5,0) {A}\pnode
    (1.5,0){B}
  \node(A)\node(B)
  \psline[linecolor=red](A)(D)(C)(B)
  \rput{0}(A){\hinge}\rput{90}(B){\guide}
  \psframe[fillstyle=solid,fillcolor=yellow](-1.5,1.5)(0,1.7)
  \psframe[fillstyle=solid,fillcolor=yellow](0,1.3)(1.5,1.5)
  \multido{\nStart=0.0+0.0833}{13}{%
    \psArrowCivil[RotArrows=0,length=0.2,start=\nStart,linecolor=blue](D)(OO){}
    \psArrowCivil[RotArrows=180,length=0.2,start=\nStart,linecolor=blue](OO)(C){}}
  \rput{0}(OO){\interhinge}
\end{pspicture}
```

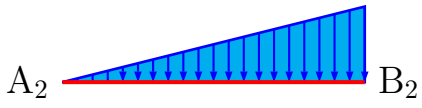
4 Antisymmetric load

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

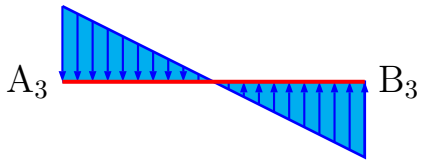



```
\begin{pspicture}(-1,-1.5)(5,1)
\pnode(0,0){A1}\pnode(4,0){B1}
\uput[180](A1){\Large A$_1$}\uput[0](B1){\Large B$_1$}
%----------------------------------------
% Parameters
% #1 m = 0.5      y = mùx + n      (1)
% #2 n = -1
%----------- line 1 ------- --------------------------
\pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=yellow]{
\psplot[linecolor=blue]{0}{4}{\retta{0.5}{-1}}
\psline(B1)(A1)}\rettaTeX{0.5}{-1}
\psline[linecolor=red,linewidth=1.5pt](A1)(B1) % Beam A1-B1
\end{pspicture}
```

5 Triangular load

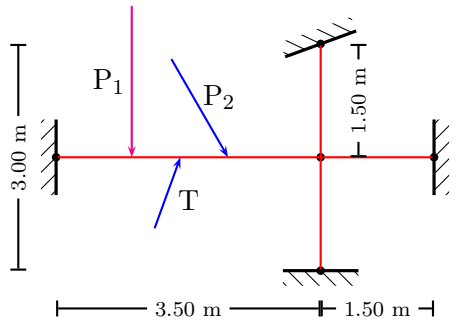



```
\begin{pspicture}(-1,-1)(5,1)
%----------------------------------------
% Parameters
% #1 m = 0.25      y = mùx + n      (2)
% #2 n = 0
%----------- line 2 ------- --------------------------
\pnode(0,0) {A2}
\pnode(4,0) {B2}
\uput[180](A2){\Large A$_2$}
\uput[0](B2){\Large B$_2$}
\pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=cyan]{
\psplot[linecolor=blue]{0}{4}{\retta{0.25}{0}}
\psline(B2)(A2)}
\rettaTeX{0.25}{0}
\psline[linecolor=red,linewidth=1.5pt](A2)(B2) % Beam A2-B2
\end{pspicture}
```



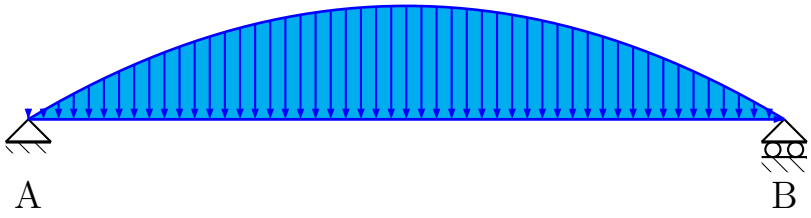

```
\begin{pspicture}(-1,-1)(5,1)
%----------------------------------------
% Parameters
% #1 m = -0.5     y = mùx + n     (2)
% #2 n = 1
%---------- line 2 ------- Triangular load --------------------------
  \pnode(0,0){A3}\pnode(4,0){B3}
  \uput[180](A3){\Large A$_3$}\uput[0](B3){\Large B$_3$}
  \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=cyan]{
    \psplot[linecolor=blue]{0}{4}{\retta{-0.5}{1}}
  \psline(B3)(A3)}\rettaTeX{-0.5}{1}
  \psline[linecolor=red,linewidth=1.5pt](A3)(B3) % Beam A3-B3
\end{pspicture}
```

6 Loads: Position and naming



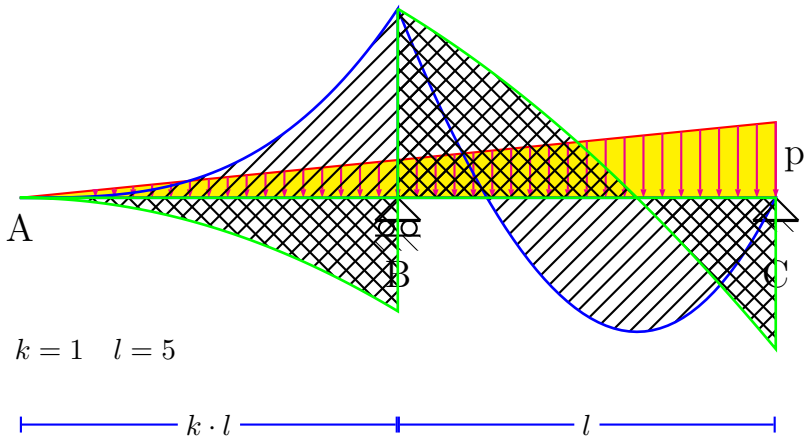

```
\begin{pspicture}(-3,-2.5)(3,2)
% ------ KNOTS definition -----------
\pnode(-2,0){A}\pnode(1.5,0){B}\pnode(1.5,-1.5){E}\pnode(1.5,1.5){F}\pnode(3,0){G}
\node(A) \node(E) \node(B) \node(F) \node(G)
% ------ Structure drawing and fixed ends position -----------
 \psline[linecolor=red](A)(G) \psline[linecolor=red](E)(F)
 \rput{-90}(A){\fixedend} %  left FE
 \rput{0}(E){\fixedend}   % bottom FE
 \rput{-160}(F){\fixedend} %  top FE
 \rput{90}(G){\fixedend}  %  right FE
% ------ Loads: Position and naming -----------
\psArrowCivil[RotArrows=0,length=2.0,start=0.286,%
   linecolor=magenta,OffsetLabel=-0.3](A)(B){\rput{90}{P$_1$}}
\psArrowCivil[RotArrows=30,length=1.5,start=0.65,%
   linecolor=blue,OffsetLabel=0.3](A)(B){\rput{60}{P$_2$}}
\psArrowCivil[RotArrows=-200,length=1.0,start=0.47,%
   linecolor=blue,OffsetLabel=-0.3](A)(B){\rput{-70}{T}}
% ------ Spans measures -----------
 \pcline [offset=-5mm]{|-|}(-2,-1.5)(1.5,-1.5)\lput*{:U}{\scriptsize 3.50 m}
 \pcline [offset=-5mm]{|-|}(1.5,-1.5)(3,-1.5) \lput*{:U}{\scriptsize 1.50 m}
 \pcline [offset=5mm]{|-|}(-2,-1.5)(-2,1.5) \lput*{:U}{\scriptsize 3.00 m}
 \pcline [offset=0mm]{|-|}(2,0)(2,1.5)   \lput*{:U}{\scriptsize 1.50 m}
\end{pspicture}
```

7 Distributed load

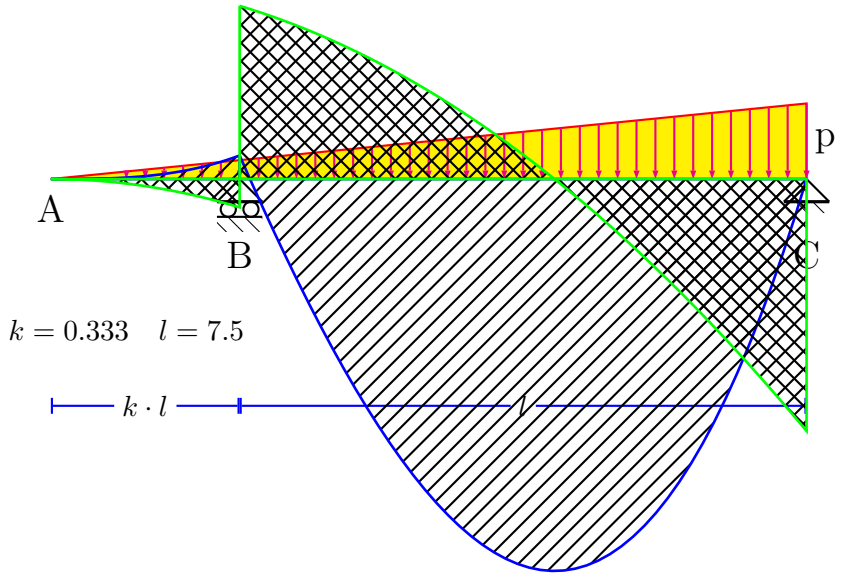



```
\def\BMdistributed#1#2#3{#2 x sub 0.5 #1 x mul mul mul #3 mul}
\begin{pspicture}(-1,-1.5)(11,2)
  \pnode(0,0){A}\pnode(10,0) {B}
  \rput{0}(A){\hinge}\rput{0}(B){\roller}\rput(0,-1){\Large A}\rput(10,-1){\Large B}
  \psline[linecolor=blue](A)(B)
%=============================================================================
% Paramenters
% #1 q = 12
% #2 l = 10
% #3 scale factor =0.01: to be multiplied by (10/l)^2 (when l<> 10)
%---------- BM distributed load ---------------------
  \pscustom[linecolor=blue,linewidth=1pt,fillstyle=solid,fillcolor=cyan]{
   \psplot[linecolor=blue]{0}{10}{\BMdistributed{12}{10}{0.01}}
   \psline[](10,0)(0,0)}
  \psset{arrowsize=1.5mm}
  \multido{\nStart=0.0+0.2}{51}{%
    \pnode(\nStart,0){E1}\pnode(! /x \nStart\space def x \BMdistributed{12}{10}{0.01}){E
      2}
    \psline[linecolor=blue,arrowinset=0,arrowsize=1mm]{->}(E2)(E1)}
\end{pspicture}
```

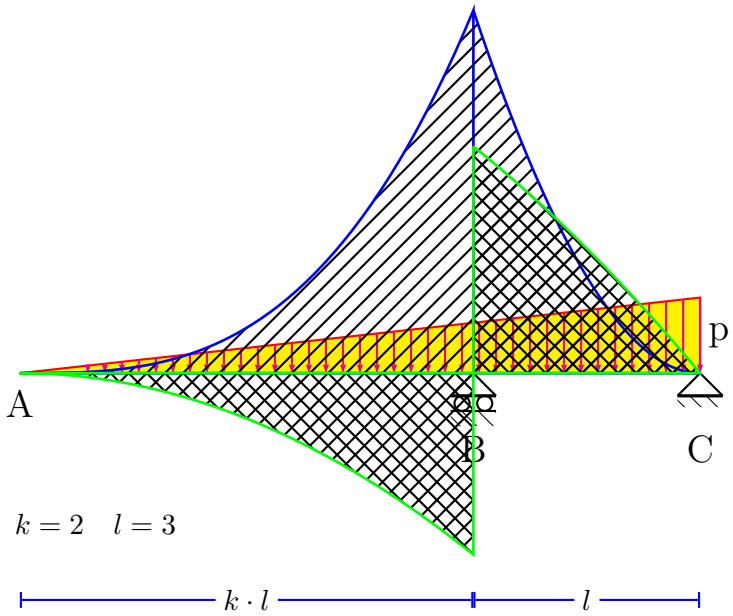
8 Macro \triload



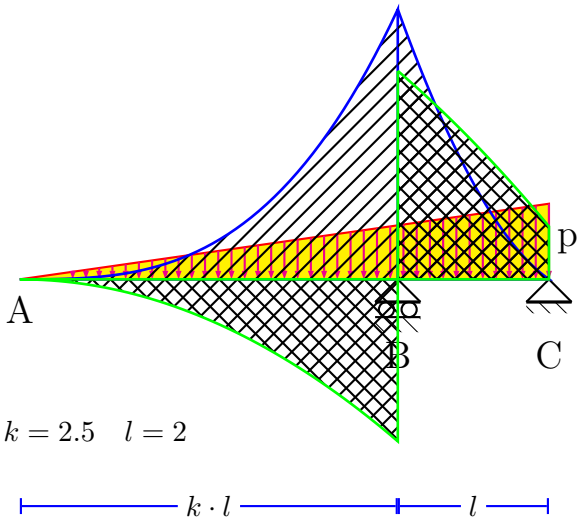

```
\begin{pspicture}(-1,-3.5)(11,3)
  % Total span is (K+1) times L, say AC=(K+1)*L [K=dimensionless value]
  \triload[K=1,P=8,L=5] % k=1 -> AB=BC
  % \triload[K=0.333,P=8,L=7.5] % k=1/3, like example 6
  % \triload[K=2,P=8,L=3] % k=2 -> BM always NEGATIVE in the whole
    structure
  % \triload[K=2.5,P=8,L=2] % k>2 -> Reaction in C downwards
\end{pspicture}
```




```
\begin{pspicture}(-1,-5.5)(11,2.5)
  % \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
  % 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}
```

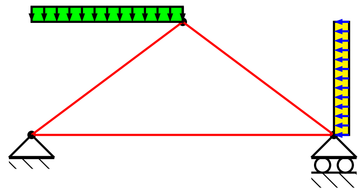



```
\begin{pspicture}(-1,-3)(11,5)
% \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
 % Total span is (K+1) times L, say AC=(K+1)*L [K=dimensionless value]
% -----------------------------------
% \triload[K=1,P=8,L=5] % k=1 -> AB=BC
% \triload[K=0.333,P=8,L=7.5] % k=1/3, like example 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}
```



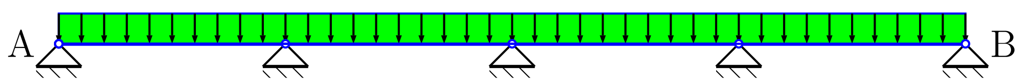

```
\begin{pspicture}(-1,-3)(11,4)
% \psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=magenta]
 % Total span is (K+1) times L, say AC=(K+1)*L [K=dimensionless value]
% -------------------------------------
% \triload[K=1,P=8,L=5] % k=1 -> AB=BC
% \triload[K=0.333,P=8,L=7.5] % k=1/3, like example 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}
```

9 Non-symmetric superimposed dead load



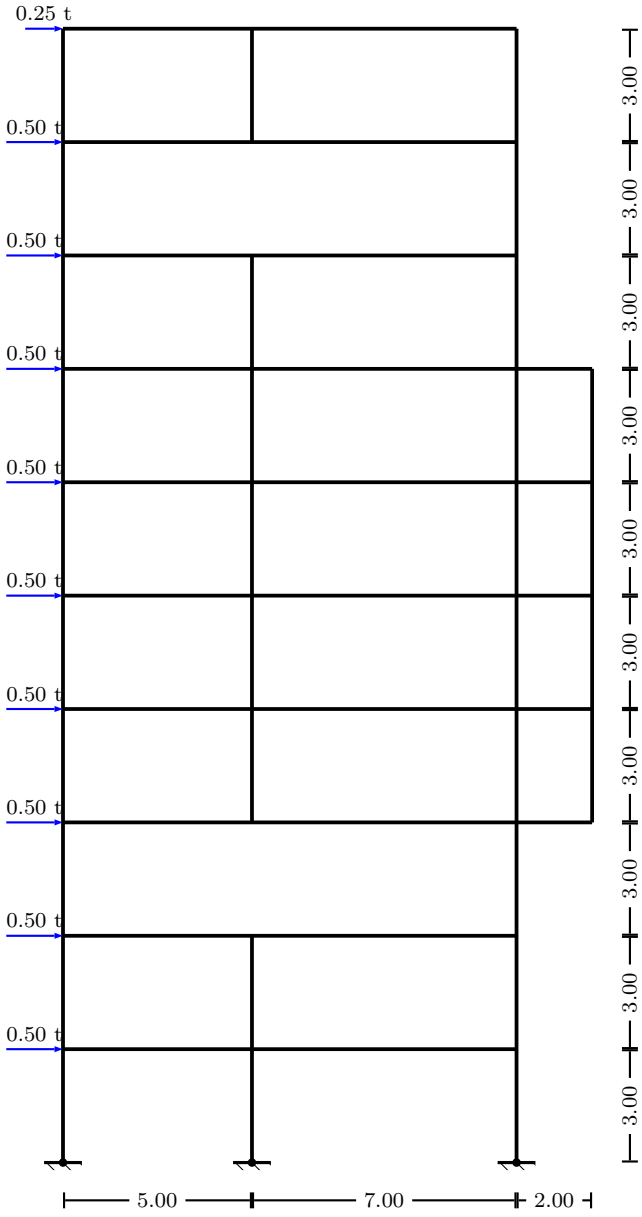
```
\begin{pspicture}(-3,-1)(3,2)
 \pnode(-2,0){A}\pnode(2,0){B}\pnode(0,1.5){V}\pnode(-2,1.5) {A0}\pnode(2,1.5){B0}
 \node(A)\node(B)\node(V)
 \psline[linecolor=red](A)(V)(B)(A)
 \rput{0}(A){\hinge} \rput{0}(B){\roller}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%        Non-symmetric superimposed dead load
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 \psframe[fillstyle=solid,fillcolor=green](-2,1.5)(0,1.7)
 \psframe[fillstyle=solid,fillcolor=yellow](2,0)(2.2,1.5)
 \multido{\nStart=0.0+0.0833}{13}{%
   \psArrowCivil[RotArrows=0,length=0.2,start=\nStart,linecolor=black](A0)(V){}
  %        Lateral load (i.e. wind)
 \psArrowCivil[RotArrows=180,length=0.2,start=\nStart,linecolor=blue](B)(B0){}}
\end{pspicture}
```

10 Distributed load for all beams




```
\begin{pspicture}(-1,-1)(13,1)
\pnode(0,0){A}\pnode(12,0){B}\pnode(12,0.4){B1}
 \node (A) \rput(-0.5,0){\Large A} \rput(12.5,0){\Large B}
\psline[linecolor=blue,linewidth=1.5pt](A)(B) % join A-B
%------------------------------------------------------------
 \psframe[linecolor=blue,fillcolor=green,fillstyle=solid](A)(B1)
%
% distributed load for all beams
 \multido{\nBegin=0+0.025}{41}{%
  \psArrowCivil[RotArrows=0,length=0.4,start=\nBegin,linecolor=black](A)(B){}}
%
% recursive routine
 \multido{\rStart=0.00+3.00}{5}{%
   \pnode(0,0){E1}\pnode(\rStart,0){E2}\rput{0}(E2){\hinge}
   \psline[linecolor=blue,arrowinset=0,arrowsize=1mm]{o-o}(E1)(E2)}
\end{pspicture}
```

11 Distributed load for all beams




```
\psset{xunit=0.5cm,yunit=0.5cm}    % Scaling
\begin{pspicture}(-3,-2)(16,32)
\psgrid[subgriddiv=0,griddots=10,gridlabels=7pt,gridcolor=
  magenta]
```

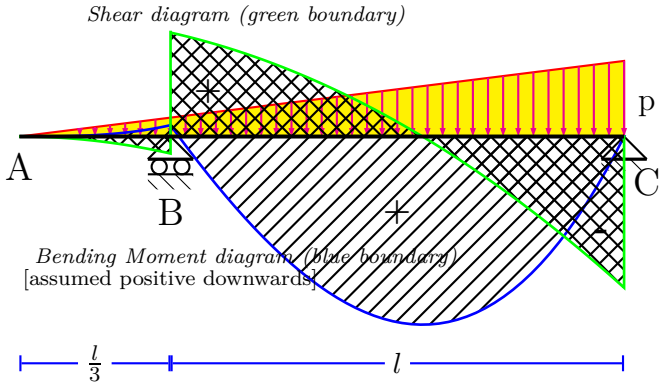
```
% ------ KNOTS definition -----------
\pnode(0,0) {A0}\pnode(5,0) {B0} \pnode(12,0) {C0}
  \node (A0)  \node (B0)  \node (C0)
\pnode(0,30) {A10} \pnode(5,30) {B10} \pnode(12,30) {C10}

%-------------------------
\pnode(5,27) {B9}\pnode(5,24) {B8}
\pnode(5,6) {B2} \pnode(5,9) {B3}
%-------------------------
\pnode(14,9) {D3} \pnode(14,12) {D4}
\pnode(14,15) {D5}\pnode(14,18) {D6}
\pnode(14,21) {D7}
%-------------------------
\pnode(0,27)  {A9}\pnode(12,27) {C9}
\pnode(0,24)  {A8}\pnode(12,24) {C8}
\pnode(0,21)  {A7}\pnode(12,21) {C7}
\pnode(0,18)  {A6}\pnode(12,18) {C6}
\pnode(0,15)  {A5}\pnode(12,15) {C5}
\pnode(0,12) {A4} \pnode(12,12) {C4}
\pnode(0,9)  {A3} \pnode(12,9) {C3}
\pnode(0,6)  {A2} \pnode(12,6) {C2}
\pnode(0,3)  {A1} \pnode(12,3) {C1}
%
% ------ Structure drawing and fixed ends position
  -----------
 \psline[linecolor=black,linewidth=0.05](A0)(A10)
 \psline[linecolor=black,linewidth=0.05](C0)(C10)
%
 \psline[linecolor=black,linewidth=0.05](B9)(B10)
 \psline[linecolor=black,linewidth=0.05](B3)(B8)
 \psline[linecolor=black,linewidth=0.05](B0)(B2)
%
 \psline[linecolor=black,linewidth=0.05](A10)(C10)
 \psline[linecolor=black,linewidth=0.05](A9)(C9)
 \psline[linecolor=black,linewidth=0.05](A8)(C8)
 \psline[linecolor=black,linewidth=0.05](A7)(D7)
 \psline[linecolor=black,linewidth=0.05](A6)(D6)
 \psline[linecolor=black,linewidth=0.05](A5)(D5)
 \psline[linecolor=black,linewidth=0.05](A4)(D4)
 \psline[linecolor=black,linewidth=0.05](A3)(D3)
 \psline[linecolor=black,linewidth=0.05](A2)(C2)
 \psline[linecolor=black,linewidth=0.05](A1)(C1)
%
 \psline[linecolor=black,linewidth=0.05](D3)(D7)
 \rput{0}(A0){\fixedend}      %  bottom FE, column A
 \rput{0}(B0){\fixedend}      %  bottom FE, column B
 \rput{0}(C0){\fixedend}      %  bottom FE, column C
% ------ Loads: Position and naming ----------
\psArrowCivil[RotArrows=90,length=1.0,start=0,%
```

```
    linecolor=blue,OffsetLabel=0.2](A10)(B10){\rput{0}{\
      scriptsize 0.25 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A9)(B9){\rput{0}{\
      scriptsize 0.50 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A8)(B8){\rput{0}{\
      scriptsize 0.50 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A7)(C7){\rput{0}{\
      scriptsize 0.50 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A6)(C6){\rput{0}{\
      scriptsize 0.50 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A5)(C5){\rput{0}{\
      scriptsize 0.50 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A4)(C4){\rput{0}{\
      scriptsize 0.50 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A3)(B3){\rput{0}{\
      scriptsize 0.50 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A2)(B2){\rput{0}{\
      scriptsize 0.50 t}}
\psArrowCivil[RotArrows=90,length=1.5,start=0,%
    linecolor=blue,OffsetLabel=0.2](A1)(C1){\rput{0}{\
      scriptsize 0.50 t}}
%
% ------ Spans measures -----------
 \pcline [offset=-0.5]{|-|}(0,0)(5,0)  \lput*{:U}{\scriptsize
    5.00}
 \pcline [offset=-0.5]{|-|}(5,0)(12,0) \lput*{:U}{\scriptsize
    7.00}
 \pcline [offset=-0.5]{|-|}(12,0)(14,0) \lput*{:U}{\
   scriptsize 2.00}
%------------------------
 \pcline [offset=-0.5]{|-|}(14,0)(14,3)  \lput*{:U}{\
   scriptsize 3.00}
 \pcline [offset=-0.5]{|-|}(14,3)(14,6)  \lput*{:U}{\
   scriptsize 3.00}
 \pcline [offset=-0.5]{|-|}(14,6)(14,9)  \lput*{:U}{\
   scriptsize 3.00}
 \pcline [offset=-0.5]{|-|}(14,9)(14,12) \lput*{:U}{\
   scriptsize 3.00}
 \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}
```

12 Simple Beam with one overhang: triangular distributed load p




```
\begin{pspicture}(-1,-3.5)(9,1.5)
\pnode(0,0) {A}\pnode(2,0) {B}\pnode(8,0) {C}
\rput{0}(C){\hinge}\rput{0}(B){\roller}
\psline[linecolor=red,fillcolor=yellow,fillstyle=solid](0,0)(8,0)(8,1)
  (0,0)
\multido{\nStart=1.00+0.025}{37}{%
   \psArrowCivil[RotArrows=0,length=\nStart,start=\nStart,%
     linecolor=magenta](A)(C){}}
\rput(8.3,0.4){\large p} \rput(0,-0.4){\Large A}
\rput(2,-1){\Large B} \rput(8.3,-0.6){\Large C}
\pcline[offset=0,linecolor=blue]{|-|}(0,-3)(2,-3) \lput*{:U}{\bf $\frac{l
  }{3}$}
\pcline[offset=0,linecolor=blue]{|-|}(2,-3)(8,-3) \lput*{:U}{\bf $l$}
%
  %%=========================================================================

% Paramenters: #1 p = 6 #2 l = 6 #3 scale factor =0.15
%---------- Bending Moment in span AB ---------------------
\def\MflettAB#1#2#3{#1 #2 div -.125 mul x mul x mul x mul #3 mul neg}
\pscustom[linecolor=blue,linewidth=1pt,fillstyle=hlines]{
  \psplot[]{0}{2}{\MflettAB{6}{6}{0.15}}\psline[](2,0)(0,0)}
%---------- Shear in span AB ---------------------
\def\TaglioAB#1#2#3{#1 #2 div -.375 mul x mul x mul #3 mul}
\pscustom[linecolor=green,linewidth=1pt,fillstyle=crosshatch]{
  \psplot[]{0}{2}{\TaglioAB{6}{6}{0.15}}\psline[](2,0)(0,0)}
%---------- Bending Moment in span BC ---------------------
\def\MflettBC#1#2#3{#1 #2 div -.125 mul x mul x mul x mul
 #1 3.375 div #2 mul x mul add #1 10.125 div #2 mul #2 mul sub #3 mul neg}
\pscustom[linecolor=blue,linewidth=1pt,fillstyle=hlines]{%
  \psplot[]{2}{8}{\MflettBC{6}{6}{0.15}}\psline[](8,0)(2,0)}
%---------- Shear in span BC ---------------------
\def\TaglioBC#1#2#3{#1 #2 div -.375 mul x mul x mul
    #1 3.375 div #2 mul add #3 mul}
\pscustom[linecolor=green,linewidth=1pt,fillstyle=crosshatch]{%
  \psplot[]{2}{8}{\TaglioBC{6}{6}{0.15}}\psline[](8,0)(2,0)(2,1.4)}
%
  %%=========================================================================

\psline[linewidth=1.5pt](0,0)(8,0) % Printing beam AC after diagrams BM/S
\rput(3,1.6){\em {\scriptsize Shear diagram (green boundary)}}
\rput(3,-1.6){\em {\scriptsize Bending Moment diagram (blue boundary)}}
\rput(2,-1.9){\scriptsize [assumed positive downwards]}
\rput(5,-1){\bf {\large +}} \rput(2.5,0.6){\bf {\large +}}
\rput(7.7,-1.3){\bf {\Large -}}
\end{pspicture}
```

References

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