Documentation for the use of the *tikzcivil* package

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0.1 Introduction

Chapter 1

Drawing for the Structural Analysis

1.1 Commands

1.1.1 `\Support` command

This command is used to generate different types of supports, like fixed, pined or sliding supports. They can also be rotated.

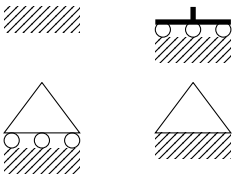


Figure 1.1: Types of supports available.

```
\begin{tikzpicture}[scale=1.0]
  \Support[width = 1cm, type=fixed]
  \Support[position={2cm,0cm}, angle=0,
           width = 1cm, type=fixedsliding]
  \Support[position={0cm,-2cm}, angle=0,
           width = 1cm, type=sliding]
  \Support[position={2cm,-2cm}, angle=0,
           width = 1cm, type=pinned]
\end{tikzpicture}
```

Option	Description	default
`widht`	defines de width of the support	**1cm**
`position`	(tuple) defines the position of the support	**{0,0}**
`type`	defines the type of support. Alternatives: `fixed`, `pinned`, `sliding`, `fixedsliding`	**fixed**
`angle`	rotation in degrees of the support (counterclockwise)	**0**

Table 1.1: Options for the `\Support` command

1.1.2 `\MassWithSpring` command

This command draws a typical mass-spring system. It supports also an optional damper and displacement. The basic behavior of this command is shown in fig. 1.2.

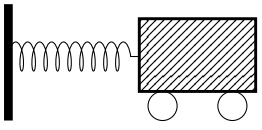


Figure 1.2: Mass-Spring system

```
\begin{tikzpicture}[scale=1]
  \MassWithSpring[]
\end{tikzpicture}
```

In many situations we would like to describe more interesting systems. This can be achieved applying the optional key values and using the command multiple times, as shown in fig 1.3. As it can bee seen, creating this kind of drawings is very easy and straightforward.

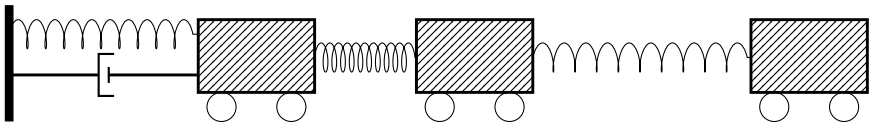
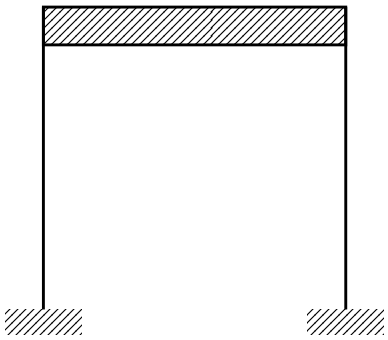


Figure 1.3: More complex mass-spring system

```
  \begin{tikzpicture}[scale=1]
\MassWithSpring[displacement = 2em, with damper = true]
\MassWithSpring[displacement = -1em,  with wall = false,
                position = {10.5em,0em}]
\MassWithSpring[displacement = 3em,  with wall = false,
                position = {18.0em,0em}]
  \end{tikzpicture}
```

1.1.3 \Frame command

Thus command draws a frame with its mass concentrated above. It is a very common model to describe later a multi-story building in 2D. This command has many options, useful to change the displacement, position, use of supports, damper, among others. In the fig. 1.4 can be seen the normal output of the command without any options.



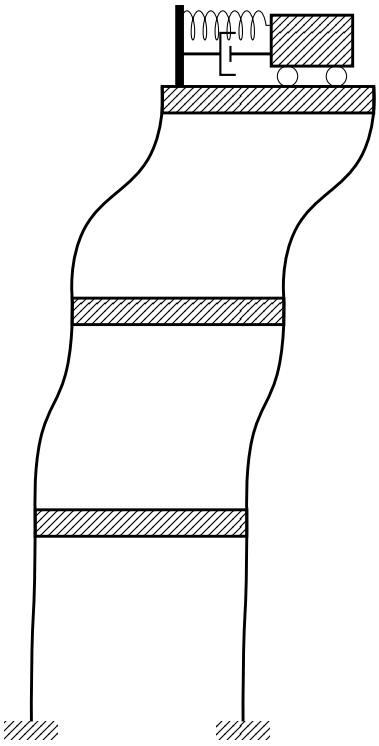
```
  \begin{tikzpicture}[scale=1]
\Frame[]
  \end{tikzpicture}
```

Figure 1.4: A frame with the mass concentrated at the top.

As with the \MassWithSpring command, we can create more complex structures, and even add some displacement to it or add a tuned mass damper on the top (why not?). This can be seen on fig. 1.5.

Option	Description	default
`height`	defines the height of the frame/story	**4cm**
`widht`	defines de width of the frame	**4cm**
`mass thickness`	defines the thickness of the concentrated mass	**0.4cm**
`position`	(tuple) defines the position of the base of the left column	**{0,0}**
`with support`	boolean option, that allows to show supports or not	**true**
`with damper`	boolean option, that defines the presence of a damper in the system	**false**
`displacement`	defines the amount of horizontal displacement on the top of the frame	**0cm**

Table 1.2: Options for the `\Frame` command



```
\begin{tikzpicture}[scale=0.7]
  \Frame[position = {0em,0em}, displacement=0.07cm]
  \Frame[position = {0.07cm,4cm}, with support=false,
      displacement=0.7cm]
  \Frame[position = {0.77cm,8cm}, with support=false,
      displacement=1.7cm]
  \MassWithSpring[position={2.8cm,12cm}, with damper=
      true]
\end{tikzpicture}
```

Figure 1.5: A set of frames put one above he other.

1.1.4 `\FrameSimple` command

Chapter 2

Dibujos relacionados con la mecánica de suelos