Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Student number\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assignment 2**

*L*

*x*

*g*

Find the displacement  of the column shown by using the boundary value problem

 ,  when ,  when .

Assume that the cross-sectional area *A*, Young’s modulus *E* of the material, density  of the material, and acceleration by gravity *g* are constants.

**Solution template**

First, repeated integrations with the differential equation are used to find the generic solution. Let the integration constants be  and :

  .

Second, boundary conditions are used to find the values of the integration constants  and :

 and    and .

Finally, the values of the integration constants are substituted into the generic solution to get the displacement solution:

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