

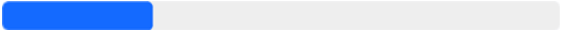


DOS2020_Design_and_Remedial

Number of participants: 12

1

In order to decrease the vibrations of a footbridge, the following remedial measures can be taken

| | | | |
|---|--|-----|---------|
| ✓ Softening of the bridge |  | 18% | 2 votes |
| ✓ Adding damping |  | 82% | 9 votes |
| Tuning the resonance of the footbridge to about 2Hz |  | 27% | 3 votes |

2

A tuned mass damper is

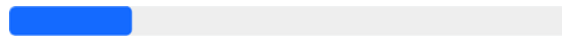
A viscoelastic damping layer added to a system



0%

0 votes

A hydraulic damper used to dissipate energy in a system



22%

2 votes

✓ An auxiliary dynamic system designed to absorb the energy in a narrow frequency band around the natural frequency of the primary system


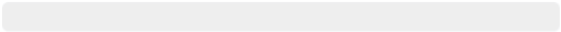
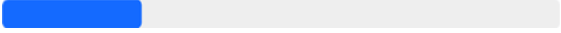


78%

7 votes

3

Tuning of a TMD consists in

| | | | |
|---|--|-----|---------|
| ✓ Finding the optimal values of its parameter to minimize the frequency response function of the primary system |  | 75% | 6 votes |
| Finding the optimal values of its parameters to minimize the frequency response function of the TMD |  | 0% | 0 votes |
| All of the above |  | 25% | 2 votes |

4

A pendulum tuned mass damper is designed to damp a resonance in

vertical direction



0%

0 votes

✓ horizontal direction



100%

8 votes

any direction

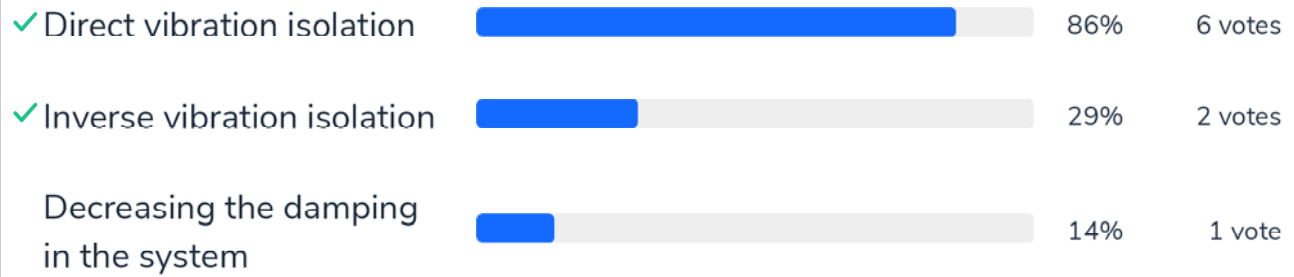


0%

0 votes

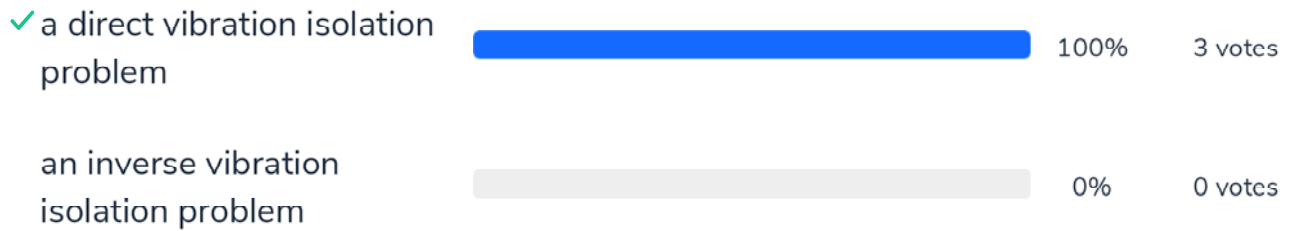
5

For traffic induced vibrations, the following solutions apply



6

The problem of transmission of vibrations from a tram to the surroundings should be treated as



7

In an isolation system, damping is

a good thing



0%

0 votes

a negative thing



0%

0 votes

✓ it depends on the
frequency of excitation
and the natural frequency
of the isolation system





100%


6 votes

8

For the direct isolation problem, the isolation domain corresponds to


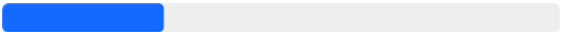


The location where the vibration is reduced in the system  25% 2 votes

✓ The frequency band in which the force transmitted to the floor is lower than the applied disturbance force  38% 3 votes

The frequency band in which the vibration of the source is reduced  38% 3 votes

9

For the inverse vibration isolation problem,
the isolation domain corresponds to

| | | | |
|--|--|-----|---------|
| ✓ A frequency band in which the sensitive equipment vibrates less than the structure to which it is attached |  | 71% | 5 votes |
| The domain in the system where the vibration is reduced |  | 29% | 2 votes |
| The domain for which thermal insulation is not necessary |  | 0% | 0 votes |
| A frequency band in which the the force transmitted to the environment is reduced |  | 0% | 0 votes |

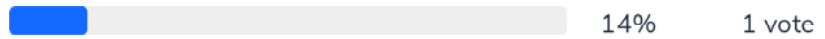
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To achieve isolation, the natural frequency of the mass-spring system should

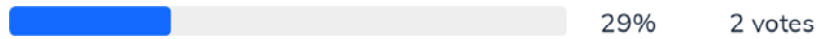
correspond to the frequency range of excitation



be much higher than the frequency of excitation

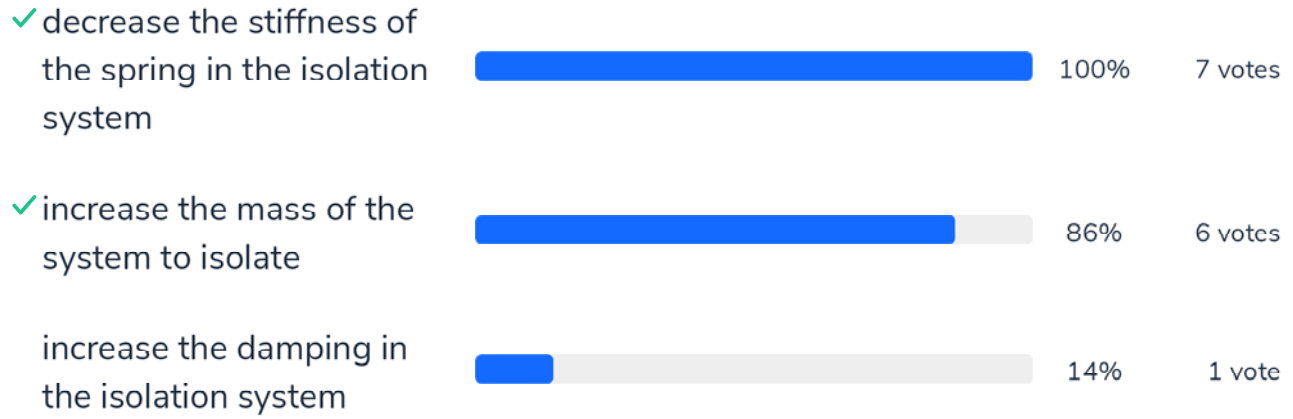


✓ be much lower than the frequency of excitation



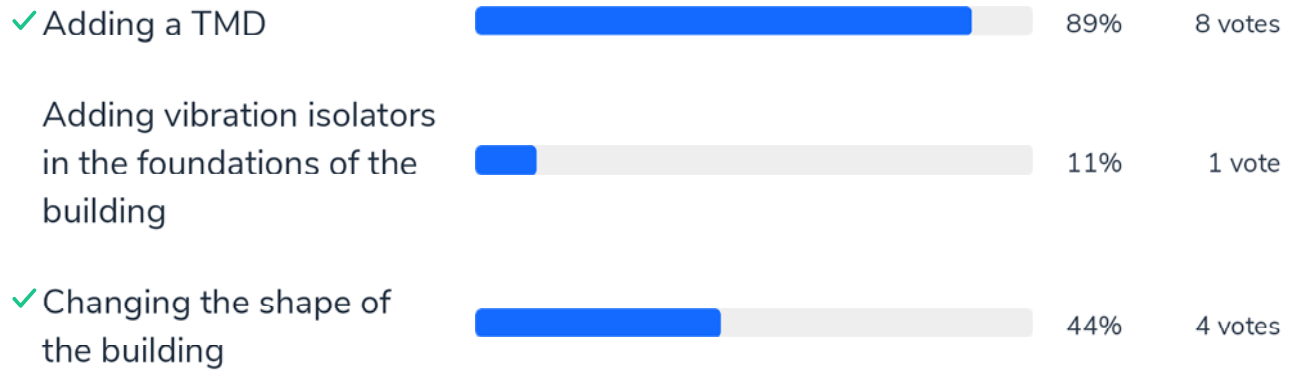
11

In order to increase the isolation domain,
one can



12


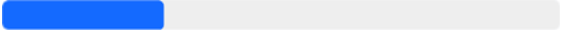

In order to prevent excessive vibrations due to wind, the following remedial measures can be taken



13



The figure illustrates

| | | | |
|---|--|-----|---------|
| ✓ Low tuning |  | 71% | 5 votes |
| High tuning |  | 29% | 2 votes |
| The effect of damping on the dynamic response |  | 0% | 0 votes |

