Floor Vibrations: Methods of Control

Design Guide

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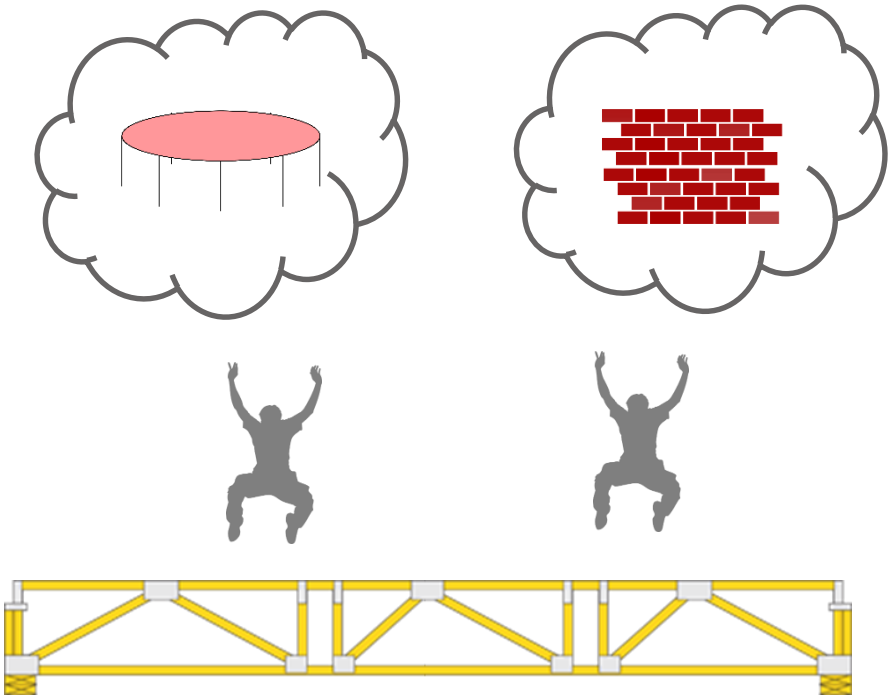
SBCA

SBCA has been the voice of the structural building components industry since 1983, providing educational programs and technical information, disseminating industry news, and facilitating networking opportunities for manufacturers of roof trusses, wall panels and floor trusses. **SBCA** endeavors to expand component manufacturers' market share and enhance the professionalism of the component manufacturing industry.

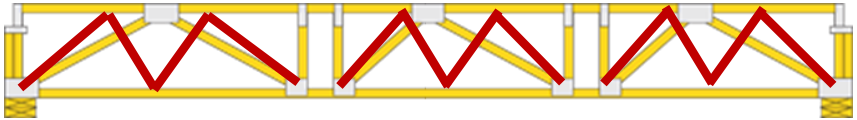
Introduction

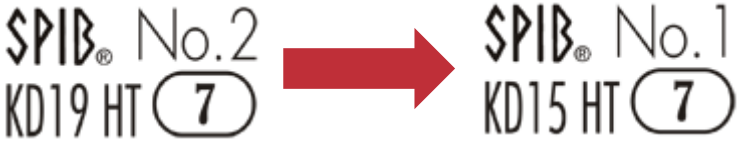
- Floor vibrations are a serviceability issue that can affect customer satisfaction.
- Occupant comfort can be compromised by vibrations and movements in a floor system, although it is often difficult to prevent all causes.
- The following are eight steps that can be taken to reduce vibrations in floor trusses



Step 1: Modify Truss Design

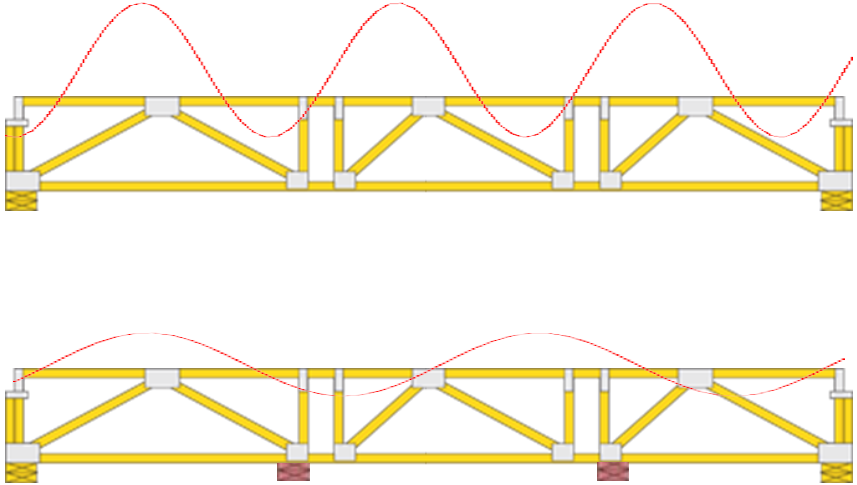
- Modify truss design to increase stiffness and reduce deflections
- Increase stiffness and reduce deflections
  - Higher strength members
  - Increased webbing





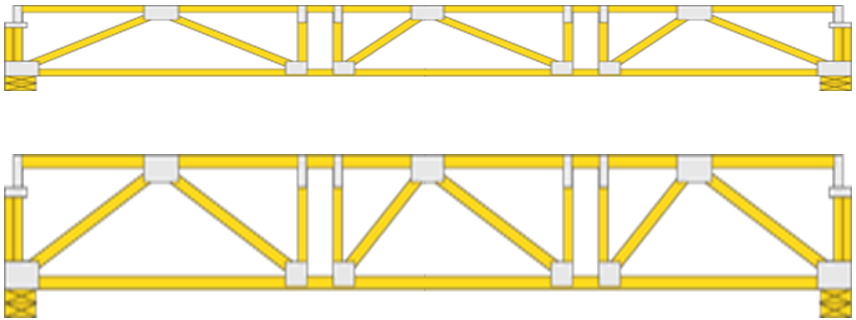
Step 2: Reduce Span Length

- Larger spans tend to display more vibrations than shorter span, usually as a result of larger deflections
- Add additional bearing walls or supports



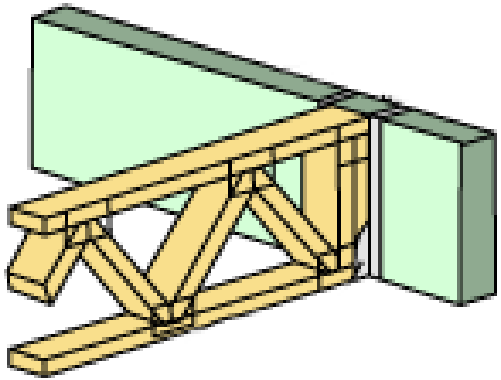
Step 3: Reduce Truss Depth

- Shallow joists or trusses tend to deflect more and exhibit more vibrations than deeper ones



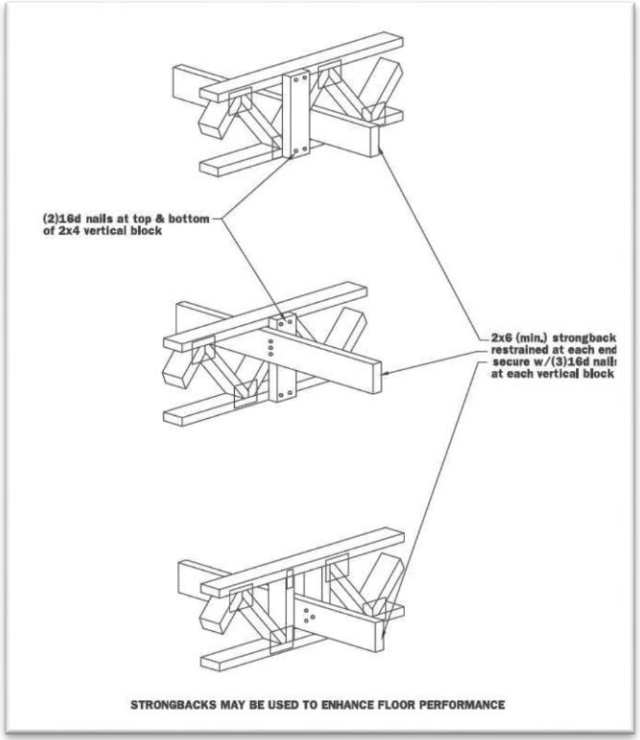
Step 4: Stiffness of Supports

- If a support is a beam or girder truss that will exhibit deflection this can cause an increase in the vibrations of the floor



Step 5: Add Strongbacks

- If the floor system is already installed:
  - Strongbacks tie multiple trusses together, allowing forces, deflections and vibrations to be shared among adjacent trusses
  - BCSI-B7 provides information regarding the requirements for and installation of strongbacks in metal plate connected wood truss floor systems



Step 6: Apply Rigid Ceiling

- Apply rigid ceiling on the bottom chord of the floor trusses:
  - The connection provided by the ceiling helps reduce the “twisting” of the truss and enhances truss stiffness

Step 7: Adhesive

- Use adhesive when installing the floor sheathing to the top chord of the truss:
  - The adhesive connection helps prevent slippage between the two surfaces and fills gaps creating a solid vertical connection for loads applied to the sheathing

Step 8: Floor Sheathing

- Finally, floor sheathing can be selected with a higher stiffness to aid in the overall perceived vibrations of a floor system
- Even when trusses installed in the floor system are properly designed, sheathing which allows too much deflection between trusses will hinder floor performance