The sound control requirements of the National and Provincial Building Codes don’t have to be complicated. There are SilentFX® NRC tested assemblies that don’t require concrete toppings and increase the speed of construction.

The National Building Code of Canada (NBCC) and provincial codes, including Alberta, British Columbia, Ontario and Nova Scotia, have introduced new requirements for the apparent sound transmission class rating (ASTC). The ASTC rating is a better descriptor than the STC rating for the control of sound transmission in a building for the health and well-being of occupants in the living space as it also addresses flanking transmission paths through the many junctions at the floor, ceiling and adjacent wall assemblies.

Concrete floor toppings are often used to achieve both the fire protection and the acoustic performance required by codes but they come with risks and the potential for costly delays and repairs. The additional labour and materials required for damming, sealing and pouring a concrete topping are significant. Cracking, delamination and water damage are all dangers associated with concrete toppings.

The National Research Council (NRC) has published a report on the use of CertainTeed's SilentFX® QuickCut™ in mid-rise wood construction. In it, SilentFX QuickCut Type X is shown to meet or exceed the ASTC requirements of building codes while maintaining the same fire rating. It installs faster than concrete, doesn’t require drying time or special protections to install and the work is completed by trades already onsite. A link to the full report is at the bottom of this page.

1. For the full NRC report on all 56, please go to the NRC report [https://doi.org/10.4224/40001230]
**ASTC ACOUSTIC SOLUTIONS FOR HEALTH**

NRC Tested Wood I-Joist Floors with Gypsum Walls and Ceilings without Concrete Topping

**Sound Flanking Paths**

Flanking paths are all the routes, other than directly through the wall, that sound travels along to get from one room to another.

Figure 1. shows the possible flanking paths that sound can use to circumvent wall or floor/ceiling assemblies. In addition to structural flanking paths, air gaps caused by missing caulks and sealants and electrical outlets are responsible for flanking sound transmission. ASTC measurements in the field are able to account for these in addition to the direct sound transmission.

By addressing flanking paths during design and construction, fire, smoke and odour spread may also be reduced. These paths are more abundant in wood frame construction, but with SilentFX® products, you’ve found a direct solution to meeting ASTC and STC ratings required by codes. SilentFX products can contribute to the construction of more affordable mid-rise wood buildings.

**Typical Sound Flanking Paths for Wood Frame Construction**

![Diagram showing typical sound flanking paths for wood frame construction](image)

**ASTC Ratings of Mid-Rise Wood Construction Using CertainTeed’s SilentFX® Acoustic System**

The ASTC compliance paths in the Codes require a minimum ASTC rating of 47 between suites. The Codes allow for calculations to demonstrate compliance or in situ measurement post construction which poses a risk of non-compliance. The ASTC solutions that follow are typical examples of smarter building practices and products. The ASTC ratings have been calculated by the National Research Council based on laboratory testing of SilentFX®. Please check out the link at the bottom of page 1 for all 56 wood floor and wall system solutions in the NRC report.

**The ASTC 50 Rating Applies to the Floor Whether the Joists are Oriented Parallel or Perpendicular to the Adjoining Walls.** For wall and floor construction details, refer to Example 52 in the full NRC report noted on page 1.
Unlike STC ratings, which are independent of any other assembly selections, ASTC ratings are impacted by the walls or floors an assembly adjoins. This is because each assembly will have a unique impact on the flanking paths noise uses to travel. When measuring a wall assembly’s ASTC rating, the floor it sits on will determine the efficiency with which noise is able to travel as structure borne sound.

But we’ve got you covered. The ASTC 50 floor from Table 1 can be combined with either of the walls in Table 2 below. Table 2 offers both loadbearing and non-loadbearing wall options.

### ASTC Ratings are Impacted by Combined Floor/Ceiling and Wall Design

Combined, these systems can be incorporated in the field to help achieve code compliance with the ASTC ratings listed. The NRC has calculated the performance of these assemblies so you don’t have to.

For details on the examples included here and more, please see the full NRC report The ASTC Ratings of Mid-Rise Wood Constructions Using CertainTeed SilentFX® QuickCut™ Gypsum Board [3rd ed.] [https://nrc-publications.canada.ca/eng/view/fulltext/?id=c2f55937-bb80-4d14-a3f4-111e7aaa2311](https://nrc-publications.canada.ca/eng/view/fulltext/?id=c2f55937-bb80-4d14-a3f4-111e7aaa2311).

### Table 1: ASTC rated floor assembly with no concrete topping

<table>
<thead>
<tr>
<th>Wood</th>
<th>SUSTAINABLE HABITAT - PERFORMANCE BENEFITS</th>
<th>TESTING/APPROVALS</th>
<th>CERTAINTEED PRODUCT LIST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Check with your authority having jurisdiction regarding Codes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Ask your Certainteed representative for other system solutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Check with building designer</td>
</tr>
<tr>
<td></td>
<td><strong>ASTC 50</strong></td>
<td>✔️</td>
<td>Base layer of 15.9 mm SilentFX® QuickCut™ drywall installed perpendicular to resilient channels</td>
</tr>
<tr>
<td></td>
<td>1 hr</td>
<td>ULC Design BXUV M535</td>
<td>Face layer of 12.7 mm (1/2&quot;) CertainTeed Type C fire resistant drywall installed perpendicular to resilient channels for the floor/ceiling assembly</td>
</tr>
<tr>
<td></td>
<td>cUL/ULC wall design</td>
<td>✔️</td>
<td>One layer of 15.9 mm (5/8&quot;) SilentFX™ QuickCut™ drywall installed directly on the wood stud wall above and below SilentFX Noiseproofing Sealant</td>
</tr>
</tbody>
</table>

* Better than the minimum requirement of ASTC 47 or STC 50.

(Please refer to table 2 for associated wall assemblies)

### Table 2: ASTC Rated Loadbearing and Non-Loadbearing Wall Assemblies. Examples 44 and 50 from the NRC Report

<table>
<thead>
<tr>
<th>Wood</th>
<th>SUSTAINABLE HABITAT - PERFORMANCE BENEFITS</th>
<th>TESTING/APPROVALS</th>
<th>CERTAINTEED PRODUCT LIST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Check with your authority having jurisdiction regarding Codes</td>
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<td></td>
<td>2. Ask your Certainteed representative for other system solutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Check with building designer</td>
</tr>
<tr>
<td></td>
<td><strong>ASTC 54</strong></td>
<td>✔️</td>
<td>One layer of 15.9 mm (5/8&quot;) SilentFX® QuickCut™ on each side of the non-loadbearing assembly</td>
</tr>
<tr>
<td></td>
<td><strong>ASTC 50</strong></td>
<td>✔️</td>
<td>CertainTeed’s Sustainable Insulation™ in the wall cavity</td>
</tr>
<tr>
<td></td>
<td><strong>PARALLEL TO JOISTS</strong></td>
<td>✔️</td>
<td>One layer of 15.9 mm (5/8&quot;) SilentFX® QuickCut™ on each side of the loadbearing assembly</td>
</tr>
<tr>
<td></td>
<td><strong>PERPENDICULAR TO JOISTS</strong></td>
<td>✔️</td>
<td>CertainTeed’s Sustainable Insulation™ in the wall cavity</td>
</tr>
</tbody>
</table>

Refer to table 1 for the floor assembly that both of these walls were paired with during testing at NRC.
The ASTC ratings of these fire rated wall assemblies have been evaluated by the NRC for ASTC as part of a building system including floors that are constructed without concrete toppings. Design professionals should keep in mind that the orientation of the wall to the joists and whether shear elements are incorporated, along with other factors, will impact the ASTC rating. Variations of these wall assemblies, with and without shear elements, are available in the full NRC report.

Example 44 is a single staggered stud wall with no shear elements oriented parallel to the floor joists.

Example 50 is a triple staggered stud wall with shear elements oriented perpendicular to the floor joists.

Other SilentFX® products that address flanking paths are Noiseproofing Sealant and Noiseproofing Putty.

**SilentFX® Noiseproofing Sealant**
Acoustic caulk used to reduce sound transmissions by filling gaps between walls, ceilings and floors.

**SilentFX® Noiseproofing Putty**
Heavy mastic acoustic putty formulated to completely seal electrical outlet boxes, ducts, cables, etc. that could jeopardize acoustic-rated wall assemblies.

Building Knowledge and LEED

Please also see the ASTC/STC Acoustic Solutions – Wood and Steel Stud Assemblies [https://www.certainteed.com/resources/CT714L%20SFX%20WOOD%20STEEL%20ASM%20Bro%20E-7.pdf](https://www.certainteed.com/resources/CT714L%20SFX%20WOOD%20STEEL%20ASM%20Bro%20E-7.pdf)

The information contained in this document is for general purposes only. Product features and specifications are subject to change. The installation details and stated ASTC ratings are meant to serve only as a guide. Actual ASTC or STC ratings will be dependent on construction practices, flanking sound patterns and the integrity of the wall. CertainTeed Gypsum cannot guarantee actual ASTC or STC ratings. SilentFX® QuickCut™ Type X should be stored and handled in accordance with the recommended practices outlined in the data submittal sheet. Assemblies with sound ratings from the NBCC tables or these NRC Code Alternative Tests require acoustical sealant applied around electrical boxes, other openings and at junctions of intersecting walls and floors. Check your local Codes.

For LEED and sustainable projects, EPD = CertainTeed Type X (Montreal, Toronto and Vancouver plants) and Sustainable Insulation™

HPD = CertainTeed SilentFX® QuickCut™, Type X and Sustainable Insulation™

learn more at: [www.certainteed.ca/drywall](http://www.certainteed.ca/drywall)