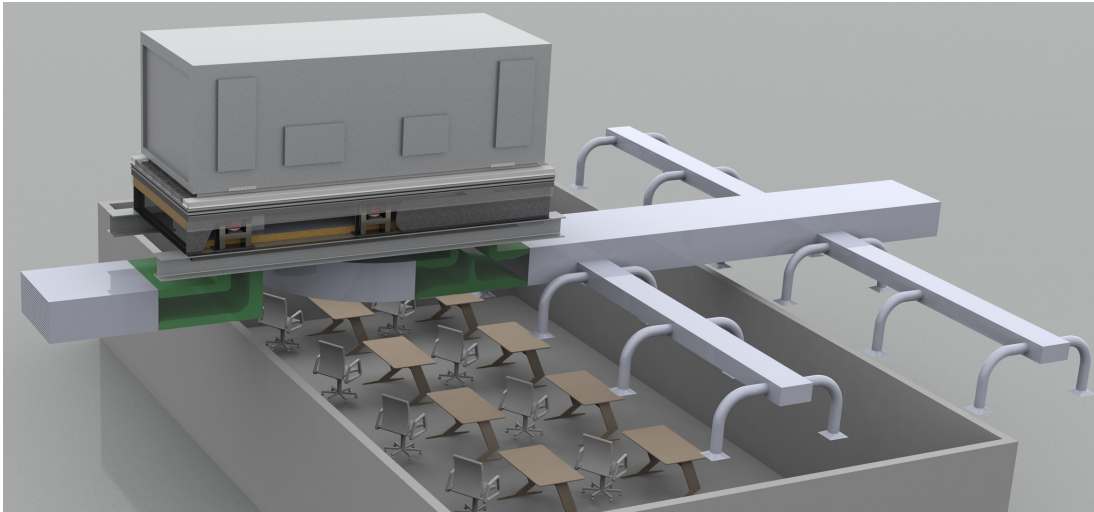


# Kick Vibration Isolation to the “Curb”



Anyone that has been on a jobsite to solve a vibration problem knows that it isn't easy. The vibrations can travel long distances through the structure and are often heard (or felt) in spaces far from the source - making the source difficult to identify and eliminate. Rooftop HVAC units (RTUs), which contain vibrating equipment such as fans and compressors, are a common cause of vibration problems in buildings. **In the absence of a proactive approach to vibration isolation, problems will eventually arise**, meaning additional cost, needless additional work for the consulting engineer and even damage to the engineer's reputation.

The standard design practice for vibration control of rooftop units is internal isolation, where “moving parts” within the unit are isolated individually. **Unfortunately, this approach treats the vibration sources within the RTU as silos, and does not adequately dampen vibrations from compressors or gas-fired burners.** Internal isolation also does not address air induced vibrations from coil banks, filter banks, and where airflow changes direction (discharge plenums), which are sometimes the base cause of tenant complaints. One other problem with internal isolation is misapplication, which happens all too often because suppliers are not in a position to analyze the HVAC system. Even if their products have vibration isolation options, the isolators are usually selected by checking a box on selection software. The suppliers, more often than not, are lacking the details on where their equipment will “live” - a driving factor for product selection, which will change based on whether the equipment is in close proximity to a boardroom

versus a washroom, for example. Product selection and application depends greatly on the roof deflection. As recommended by ASHRAE, **“if internal isolation is less than the roof deflection, this isolation is ineffective”**. ASHRAE also mentions that internal isolation might not be reliable due to the high potential for short-circuiting.

With owners now looking for “Green” building design within a tight budget, consulting engineers are under pressure to find cost and energy savings within their HVAC design. The option of locating rooftop units directly over the occupied spaces reduces ductwork (cost) and thermal energy loss (energy) – killing two birds with one stone. However, without the proper noise control solution this design practice can lead to disaster. Noise and vibration sources are now directly overhead of the tenant-space and since there is less natural attenuation (because of reduced ductwork) HVAC noise is more likely to be a problem in the occupied space, as is vibration.

Noise control curbs include a noise barrier and silencing system as well as spring isolators selected and positioned based on project specific criteria. This provides consulting engineers and installing contractors with single source responsibility for noise and vibration control performance. In addition, **providing an integrated solution, where vibration isolation and noise control are built into the roof curb, addresses all rooftop unit vibration sources**, not only the obvious ones which stem at the supply and return fans. This holistic approach also enables designers to reap the benefits of locating rooftop units directly over the occupied space without the risk of experiencing noise and vibration problems post-design. It is important to mention, however, that without the supplier performing proper analysis of the system and providing the necessary application engineering, product misapplication is still a risk. Having said this, “kicking vibration isolation to the curb” is still a more reliable approach to effectively isolating rooftop units, which is accompanied by many attractive benefits.

