VIBRATION ISOLATION OF POWERED OVERHEAD DOORS

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Powered overhead doors are becoming more and more prevalent in commercial and high density residential buildings. Unfortunately, a large majority of the installations result in vibration induced noise in adjacent areas, in particular the space directly above the installation. The continual annoyance of this mechanical noise results in tenants complaining to the Building Owners and Developers, holding payments and, in some cases, litigation.

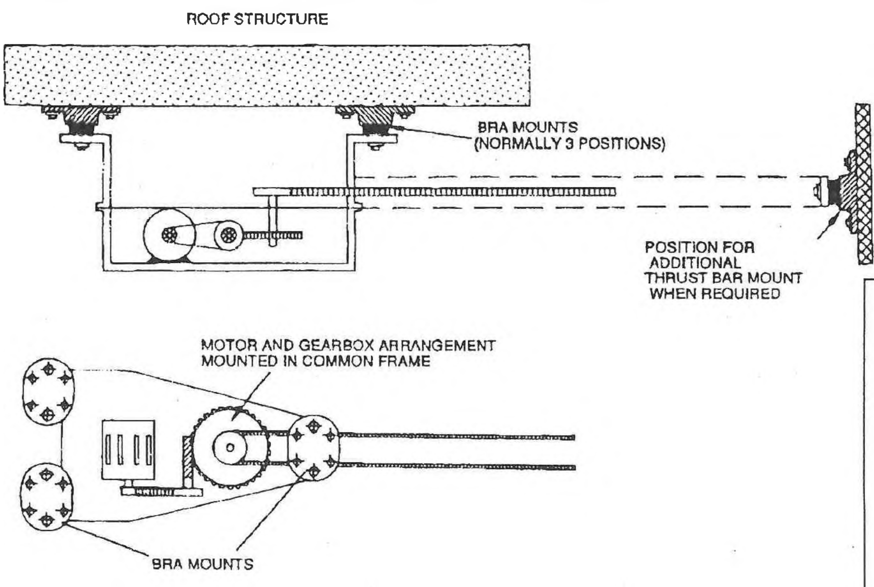
The sources of the noise are strictly due to the vibration of the drive assembly and the rollers running in the track, transmitting energy directly into the structure. Of the two sources, the former is generally the more significant.

The obvious solution to both problems is simply to break the energy path between the vibrating component and the structure. However, during site inspections, vibration isolation materials were often found to be installed on drive assemblies, yet there were still noise complaints. Closer inspections revealed that the 'isolation' materials were simply inadequate or poorly installed. Typical problems found were as follows:

- Electrical grommets that were never intended as vibration isolators were used.
- Resilient materials were placed above and/or below the vibrating frame of the drive assembly, but either the shank or the nut of the attachment bolt was contacting the vibrating attachment point.
- Where a proper isolation grommet or two rubber washers and a cylinder were used, the cylinder section had been torn away or seriously deformed by the threads of the anchor bolt due to the torque created by the drive/chain assembly during operation.
- Contractor had over-torqued the anchor bolts and extruded the isolation component.
- Armoured electrical conduit carrying the power cables to the drive were flexed to a point that it provided a vibration path to the structure.

The solution was to have appropriate vibration isolation mounts, such as Mason series BRA, installed as they eliminate Contractor installation errors, have bridge bearing elastomeric elements for longevity, and are 'fail safe' and seismically rated. Although these mounts may be significantly under-loaded in some applications, they are still effective due to the impedance mis-match through the thick elastomeric elements. A typical mounting of the drive assembly is shown in Figure 1 below, with a cut-away of the typical mount recommended in these applications shown in Figure 2.

The secondary problem of the rollers running in the tracks has been successfully addressed by either isolating the track from structure using grommets (or pad/cylinder isolation components) or by replacing the standard steel rollers with nylon rollers. The latter is considerably less expensive and usually effective. In the rare case that nylon rollers do not solve the problem, isolating the track as well, has effected the solution, without exception.



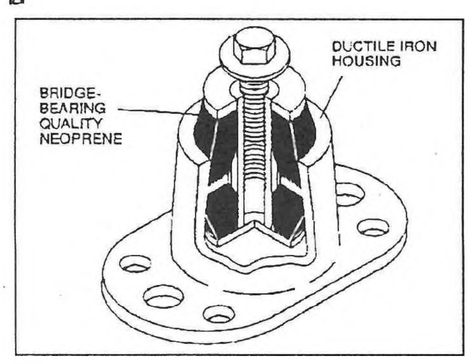


FIGURE 1: Elevation and Plan View of Typical Installation

FIGURE 2: Typical BRA-type Isolation Mount