When to Use Combination Isolator/Restraints

Most isolated equipment can be restrained independently of resilient supports or by devices that include both resilient support and seismic restraint capabilities. There are pros and cons to using combined elements. Identified in this section are those occasions when combination restraints will offer benefits over separate components.

1) Cost is typically the biggest benefit of combination isolator/restraints. 90% of the time, a combination device will be less costly than separate elements. 10% of the time there will be a large enough mismatch between the capabilities of the combined component and the demands of the application that breaking the two elements apart and selecting independent components can actually save money.

   For example, a typical rating for a seismically rated isolator might be 1g. This means that it is designed to withstand a lateral seismic force that is approximately equal to its support capacity (using the largest spring coil for which the unit is designed). In some applications, however, only a .5g restraint capacity (the horizontal load requirement is half the vertical load) is actually needed. Also in some of these applications, the weight is such that the actual spring used is toward the smaller end of the isolator's capacity range. When these occur simultaneously, the combination isolator/restraint used might have a capacity well in excess of what is needed (possibly 5 to 10 times). This added capacity costs money.

2) Space is also an issue that is most efficiently addressed using a combination device. A combination restraint/isolator will take up about the same amount of room as a stand-alone isolator. Thus the need for added space to locate separate restraints is eliminated.

3) Alignment is usually simpler with combination restraints as there are fewer components to align.

4) When restraints and resilient elements are separated, the force generated by the spring can and does, when exposed to seismic activity, act on the restraint and its anchorage. This can greatly reduce the restraint system's capacity. Most combination isolator/restraint components are designed to "trap" all spring forces within the isolator housing itself. This keeps added tensile forces out of the anchorage and, as a result, the effective restraint capacity of the system can be higher than would be obtained from combination elements.

5) If the equipment is mounted on a raised platform the ability to add connection points for independent restraints is often not present. In these cases the isolator component must include the restraint feature.

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