

Acoustics, Noise and Vibration in Residential Projects

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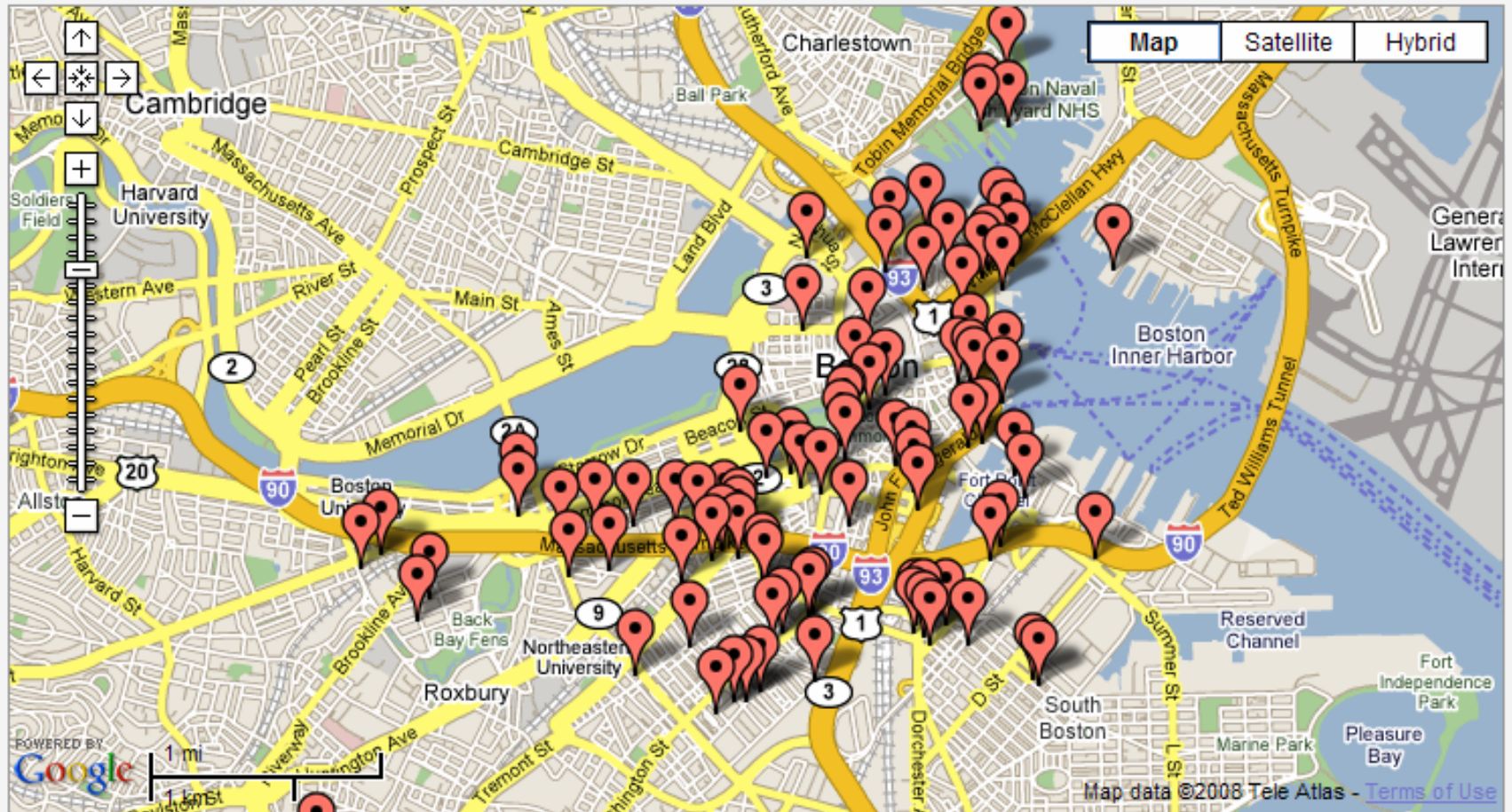
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Austin Energy Green Building Seminar Series

January 18, 2008

So, what about densification?

Boston Condo Developments



“Clean lines, contemporary style, and light-filled spaces”

- Clean lines, contemporary style, and **light-filled spaces**. At The Shore, a variety of luxurious finishing schemes reflect Austin’s new urban lifestyle. Kitchens are defined by **brushed stainless steel** appliances, granite countertops, backsplashes in porcelain brick tile, and solid wood cabinets. For flooring in living areas, envision rich chocolate **bamboo** or light ash **wood** plank. Bedrooms feature elegant carpet in an understated linear pattern for comfort underfoot. And bathrooms finished with **granite** countertops, warm wood cabinetry, and **porcelain brick tile** present an opulent retreat.



Credit: Macallen / Court Square Press / Pappas Properties

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Residential projects may be near major environmental noise sources



Robert Calzada AMERICAN-STATESMAN

East Avenue | Concordia Site



AMERICAN-STATESMAN

Novare Block 52 | Post Office Site



Crestview Station



Side Dissection

Credit: Constellation / Star Riverside / BOKA Powell

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Overland Partners, Architects/Elizabeth Day

Credit: Overland Partners / Elizabeth Day

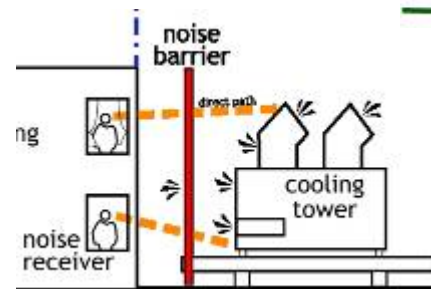
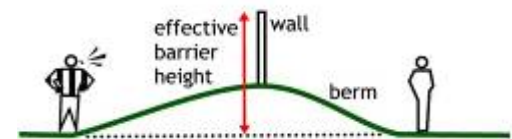
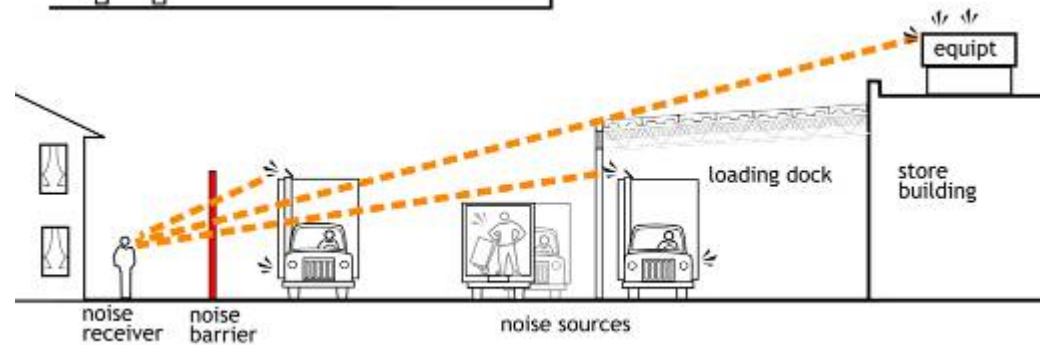
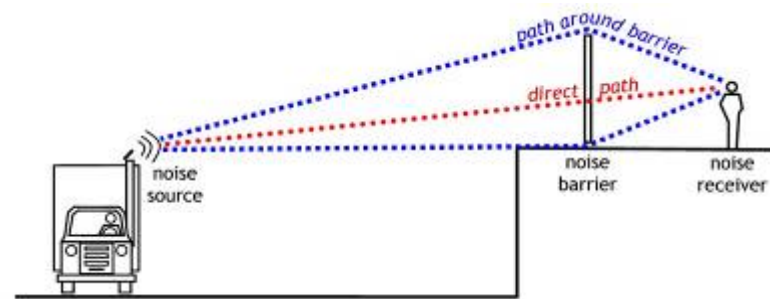
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Outdoor sources of noise and vibration

- Highways and roadways (“canyon” effects)
- Railways and transit stations, buses (train horns)
- Airports
- Mixed use retail, restaurant, grocery store (loading)
- Recreational areas, terraces, pool decks,
- Sports fields, playing fields (Crestview Station)
- Amplified music, entertainment districts
- Outdoor mechanical equipment, rooftop equipment





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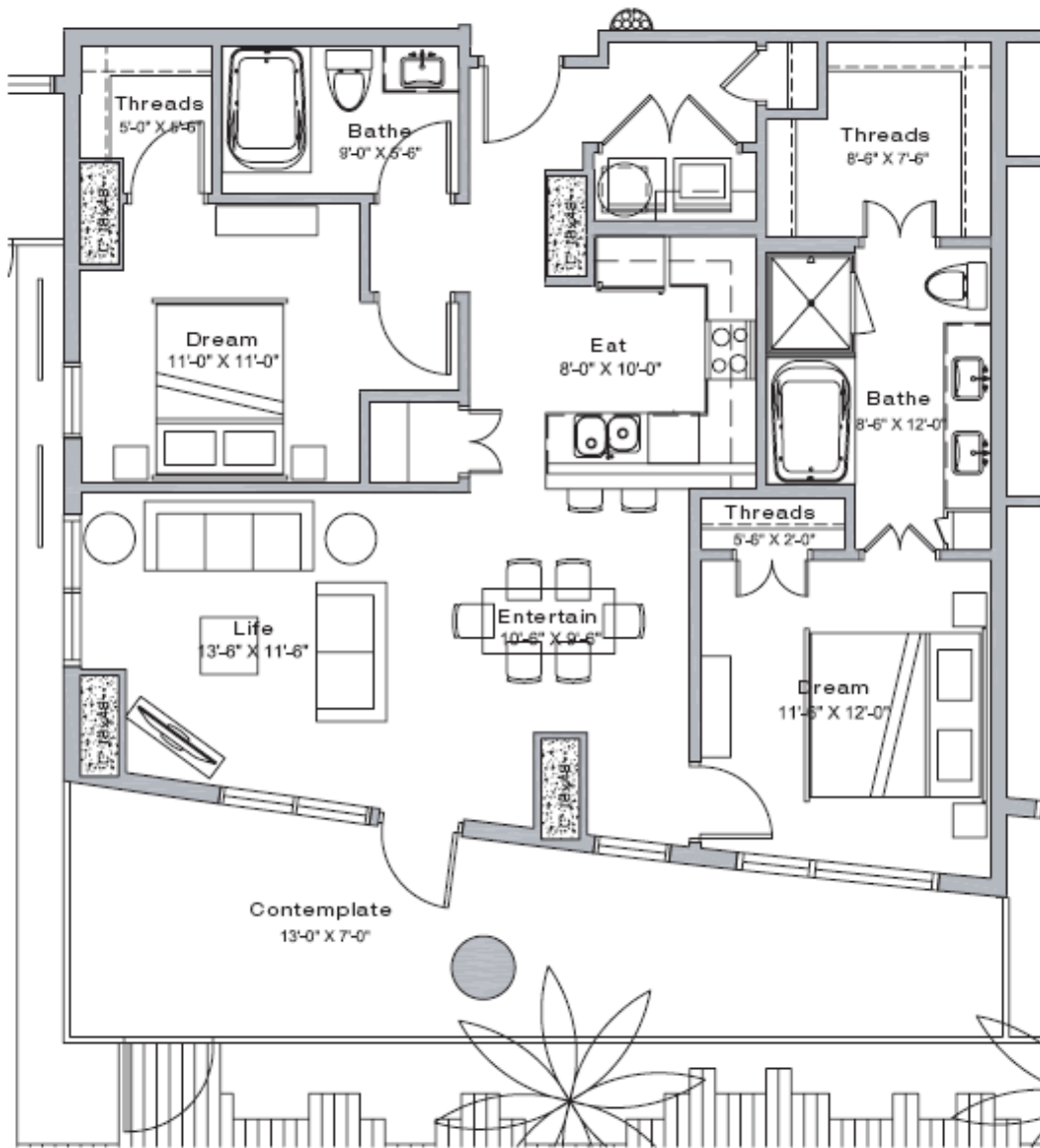


Credit: Macallen / Court Square Press / Pappas Properties



Credit: Trammell Crow Co. / High Street Residential

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Credit: Trammell Crow Co. / High Street-Rainey / WDG Architects

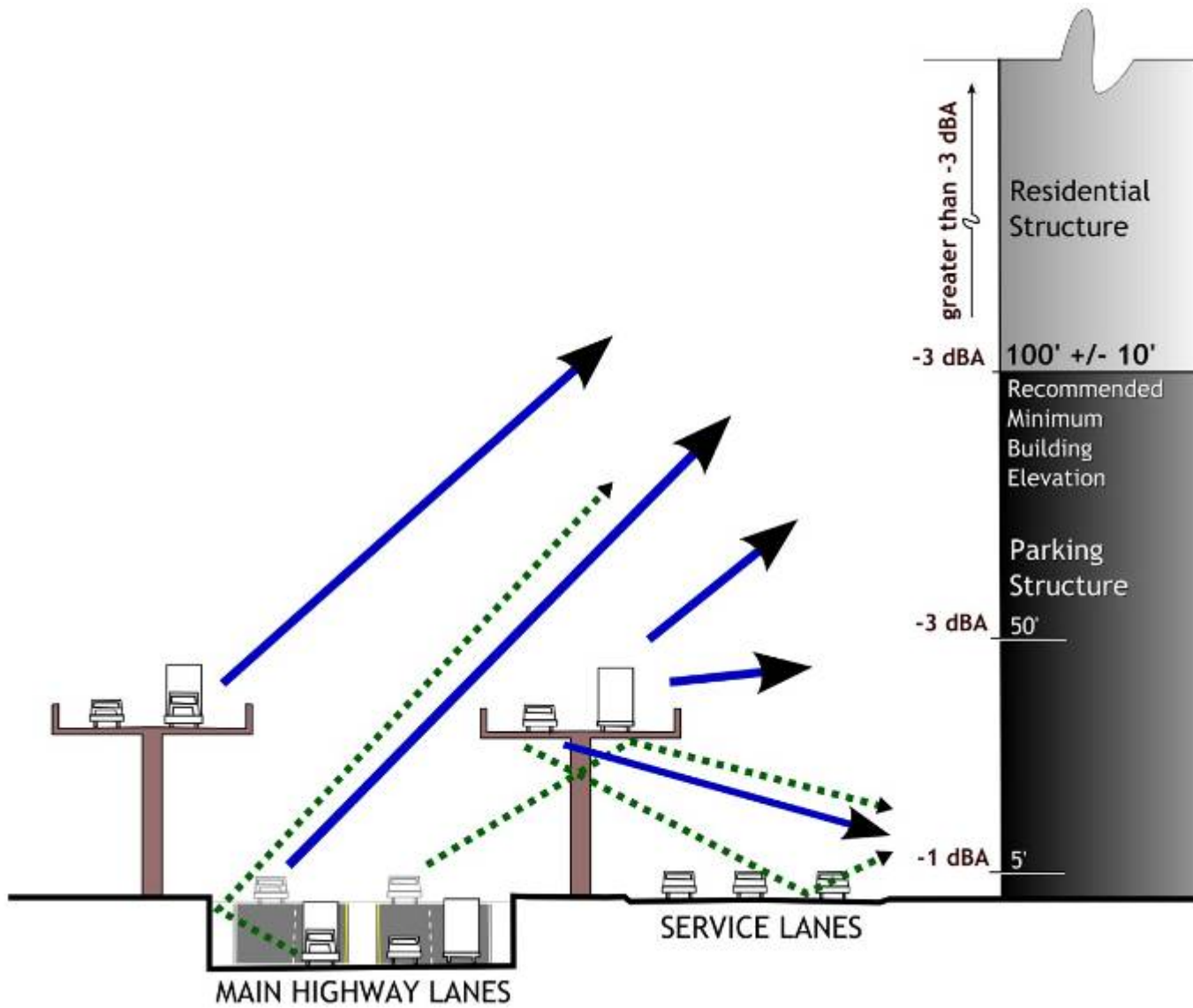
Objectives for outdoor noise

- Use non-sensitive portions of mixed uses to shield sensitive portions from noise – **paths to windows/doors; make protected courtyards.**
- Plan outdoor equipment locations away from sensitive – **paths to windows/doors; vibration isolation.**
- Improve exterior building shell design for sound isolation.
 - Window glazing, door seals, penetrations
- Apply/encourage acoustically absorptive indoor materials.
- Demand “quiet zones” for rail transit.
- Utilize effective noise ordinance for entertainment districts.

Railway Quiet Zones



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Star Riverside project

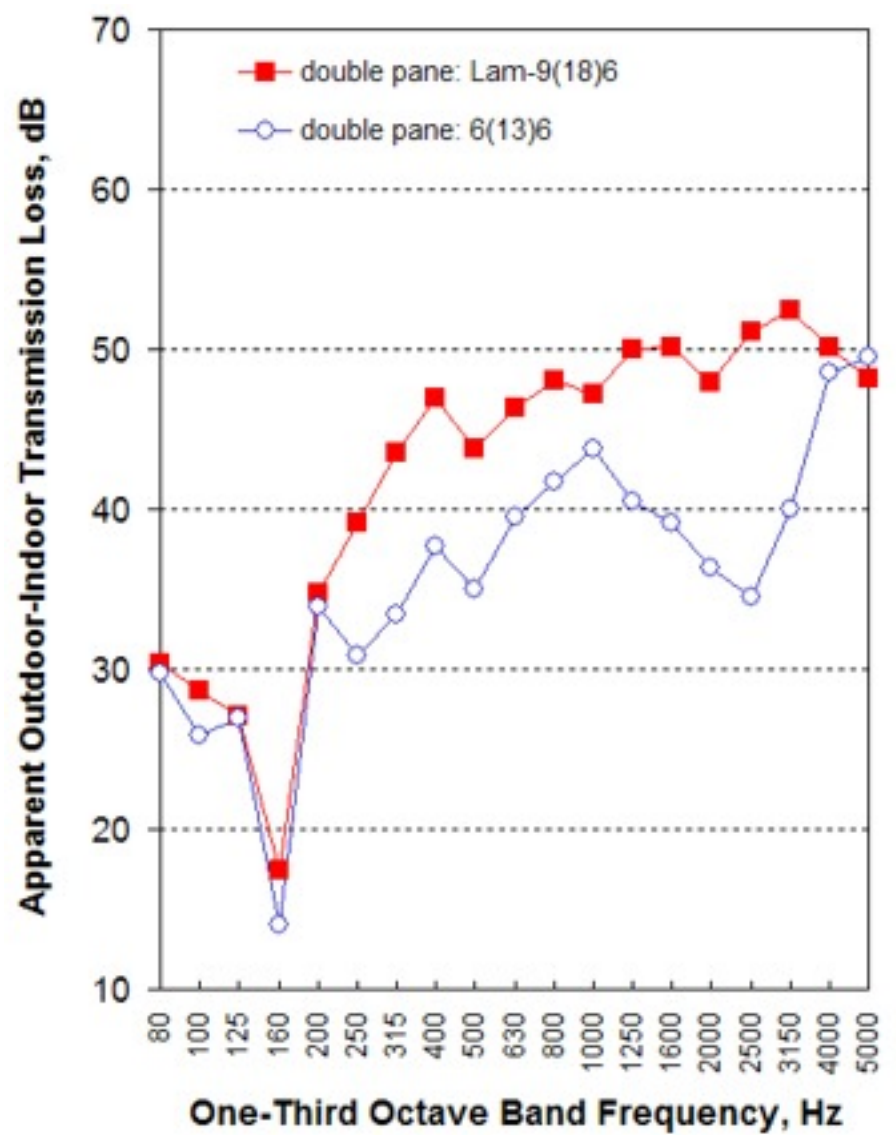
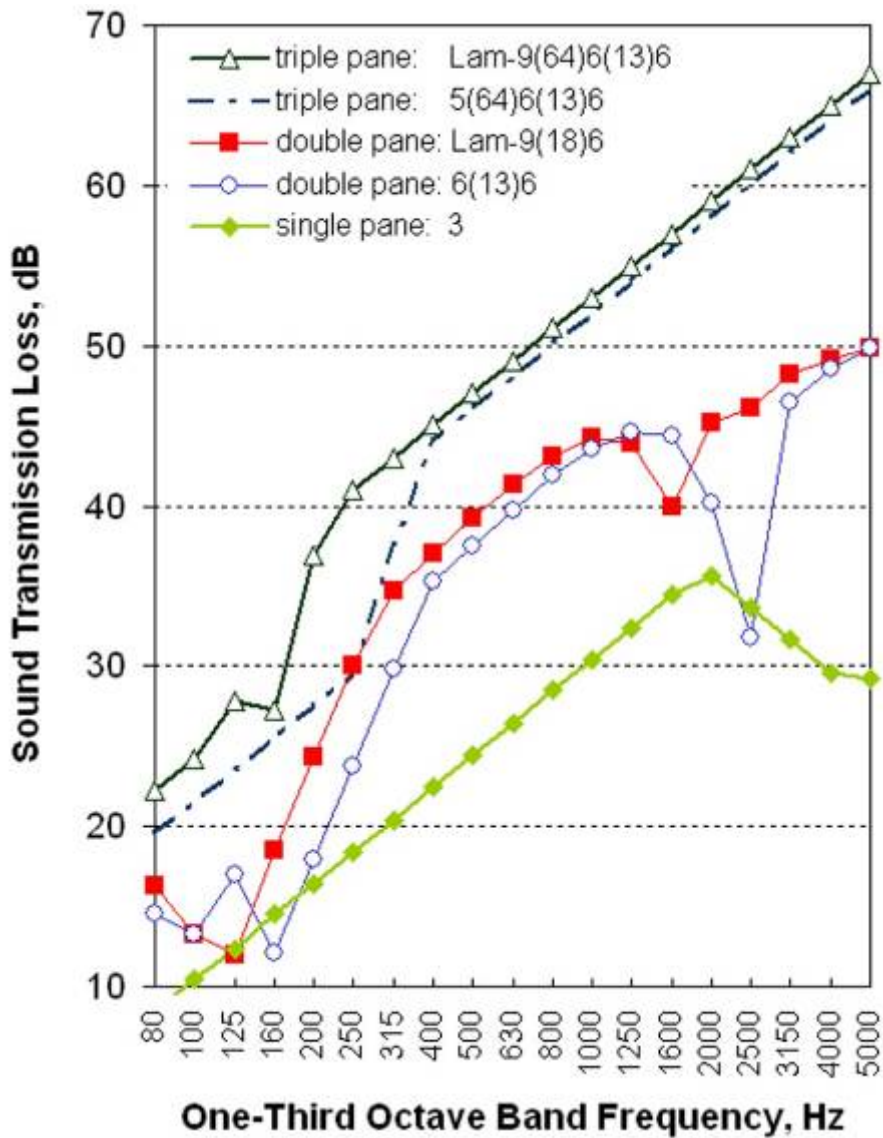
Constellation Property Group plans to build more than 250 condominiums in four buildings on the site of the former Wellesley Inn & Suites near the northeast corner of East Riverside Drive and Interstate 35.



Linda Scott AMERICAN-STATESMAN

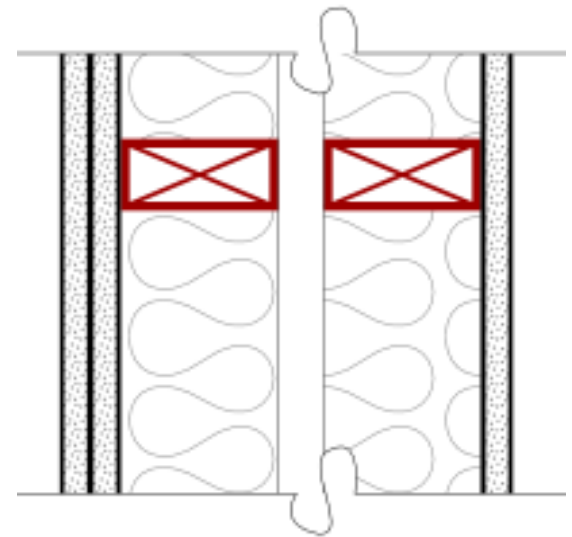
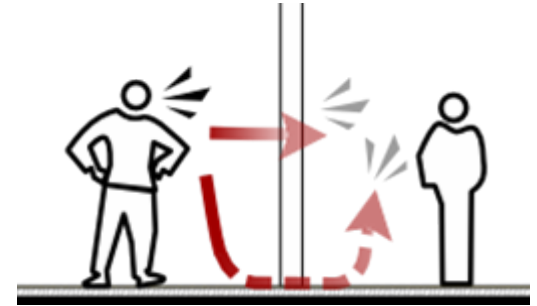


Credit: Pirate Design care of Alexandria

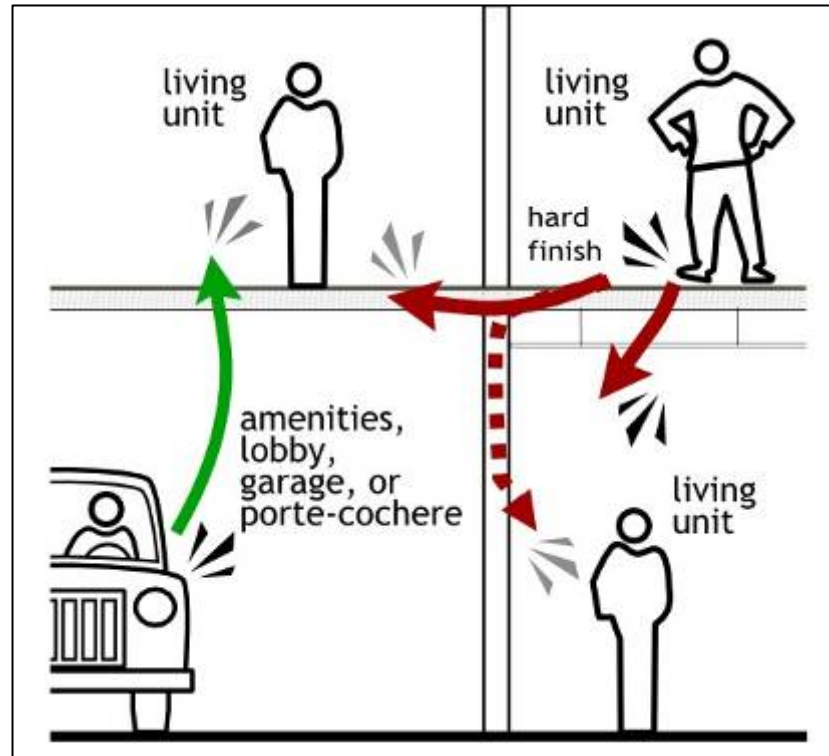


Indoor sound separation

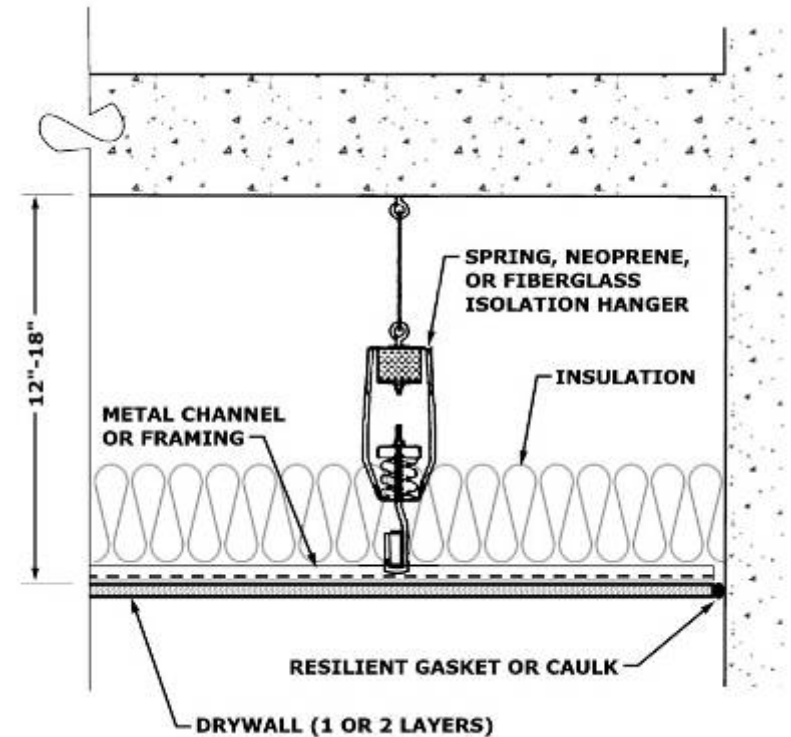
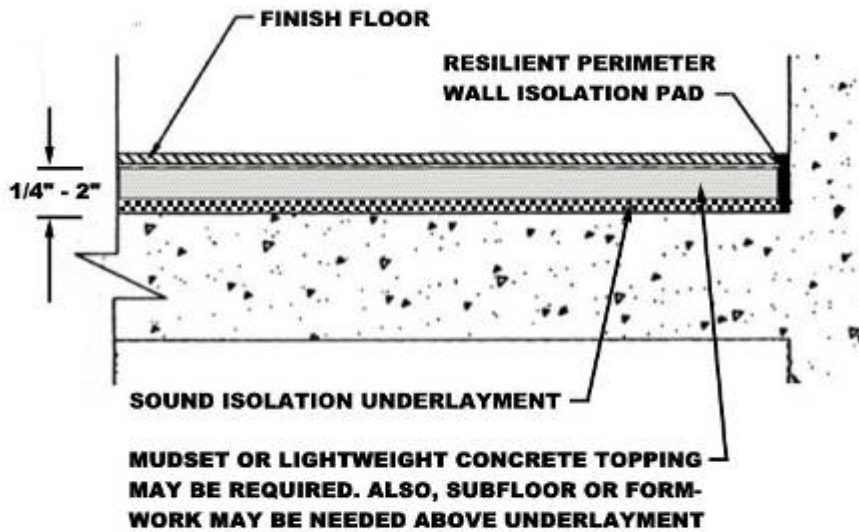
- IBC criteria (STC 50, IIC 50) should be considered bare minimum for **low end apartments**.
- Other multifamily residential and condominium projects should implement designs and goals of **STC 55-65, IIC 55-65 or higher**.



Concrete floor slabs

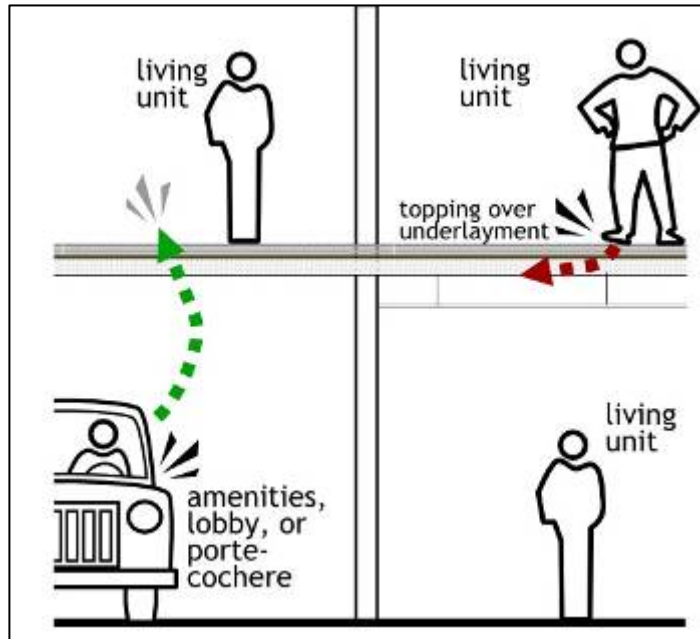


- Durable
- Sustainable
- Photogenic
- **Transmit impact noises**

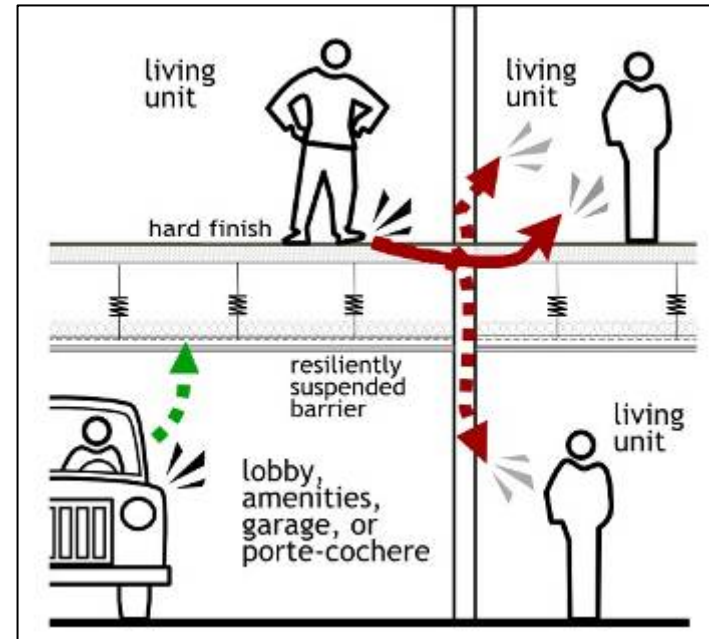


- Bare concrete: IIC 27-33
- Design goal: IIC 55-65

Isolated floor toppings

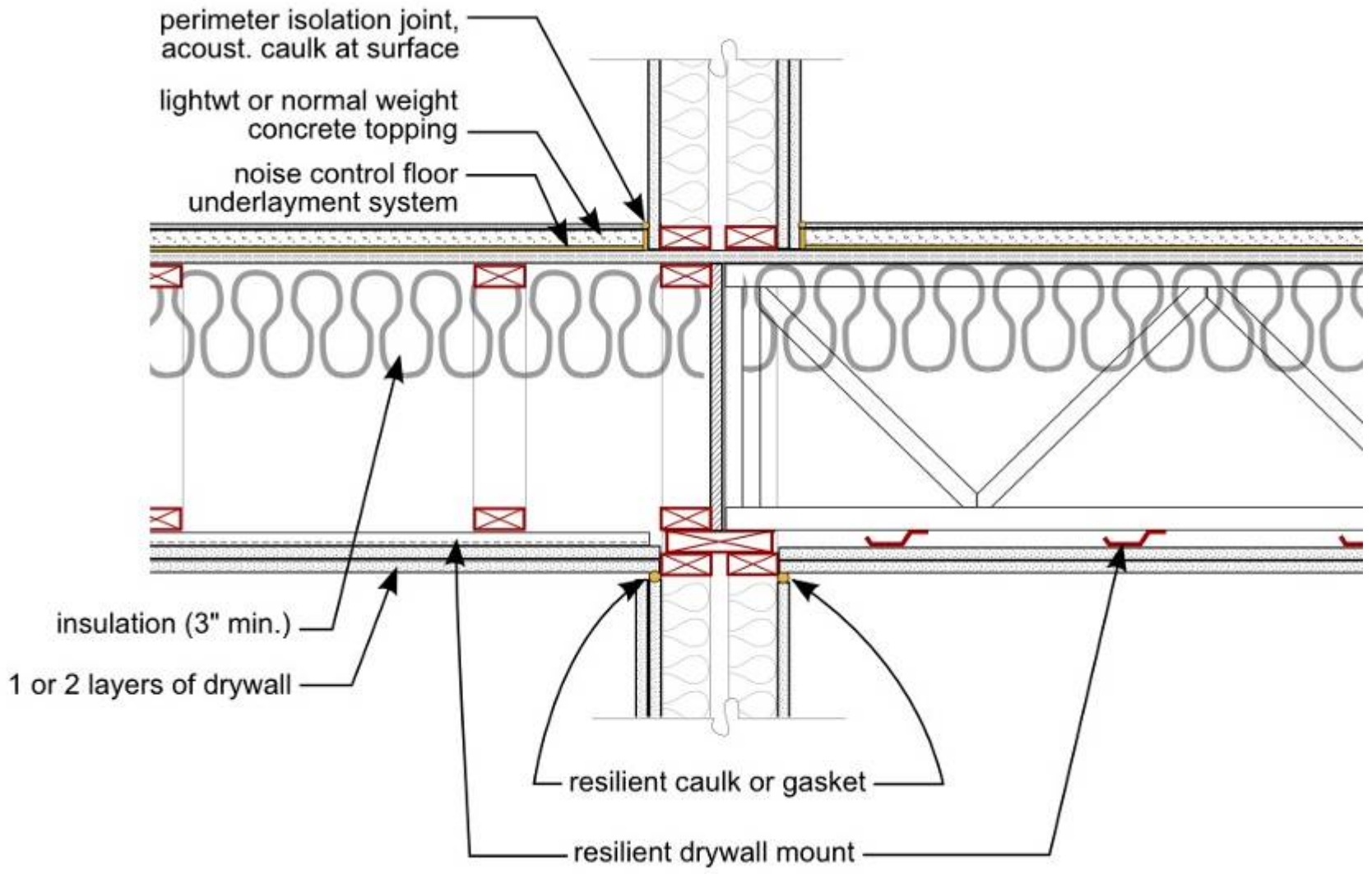


Resiliently suspended noise barrier ceilings

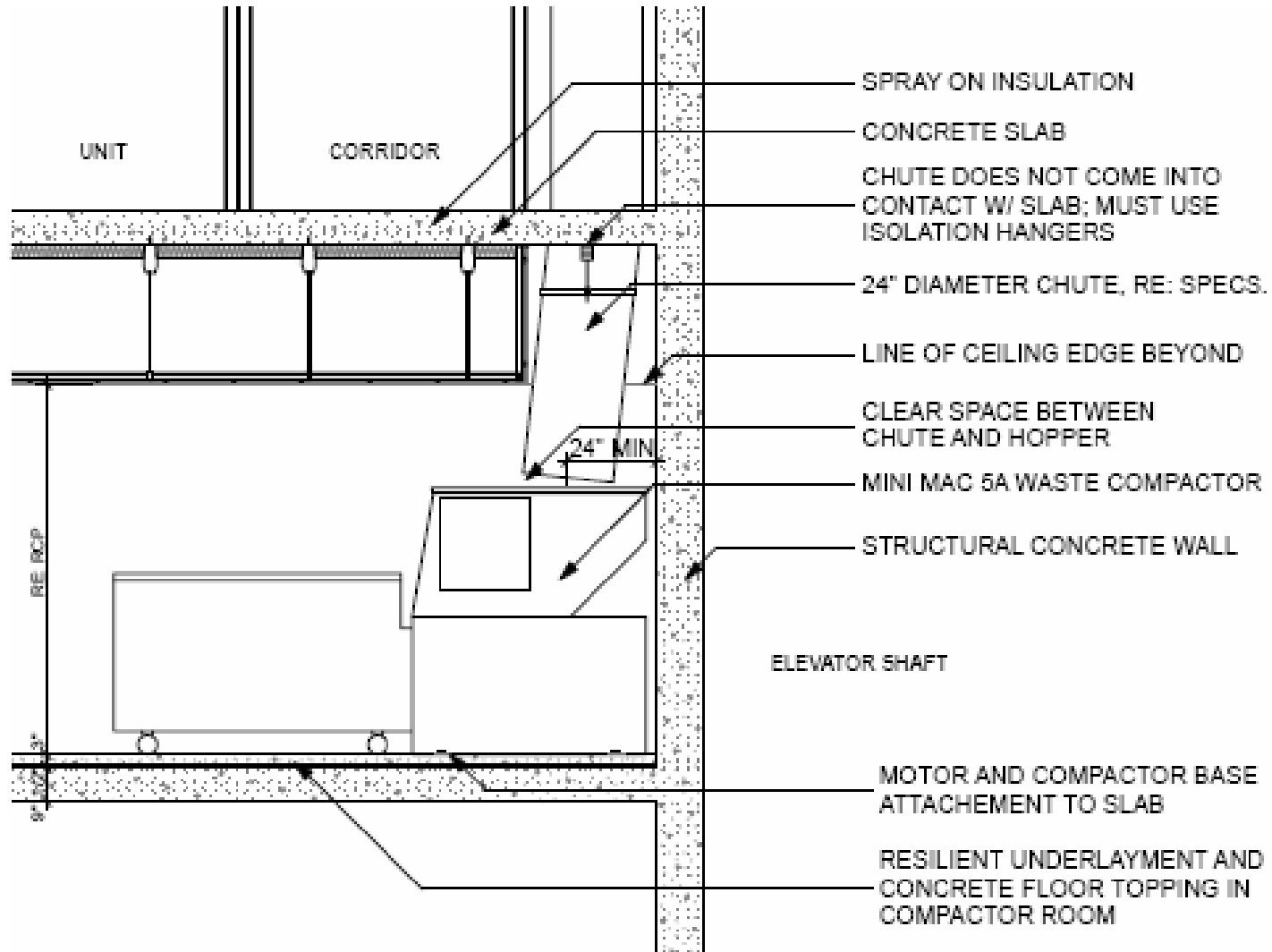


for better sound separation between tenants and:

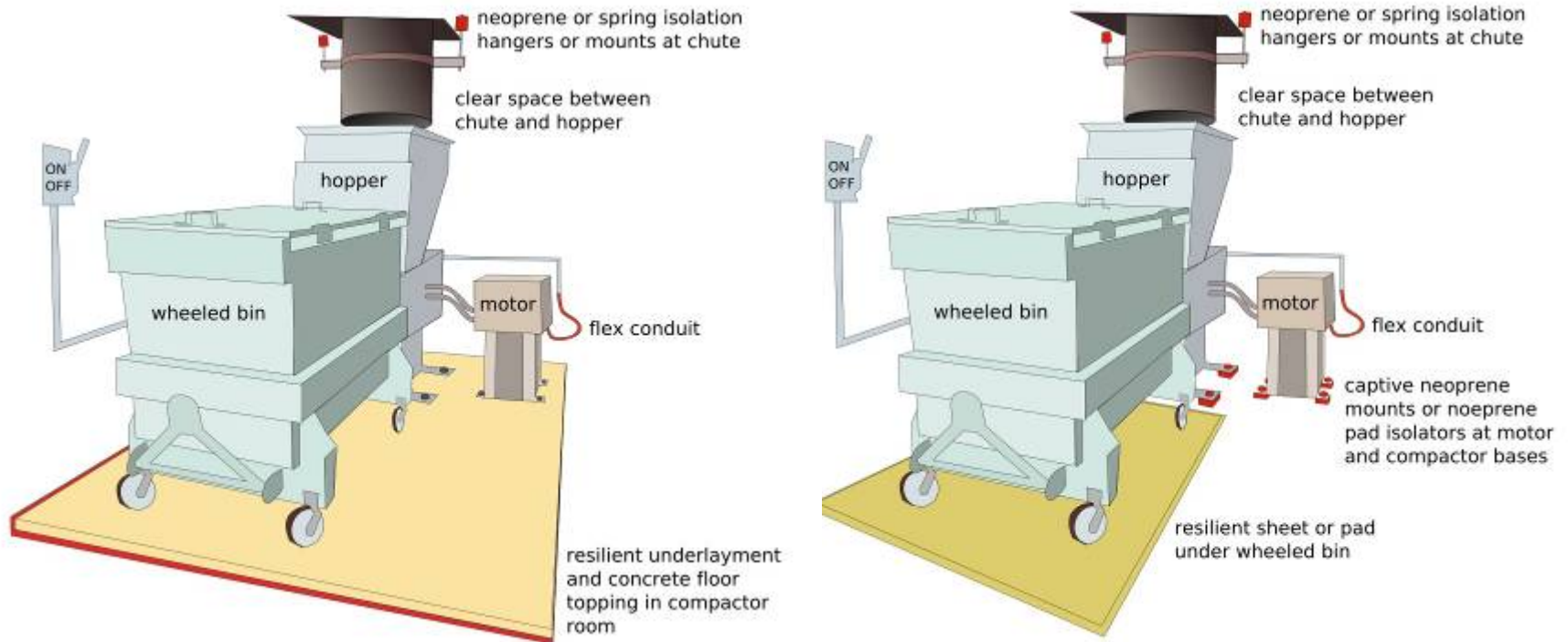
- Tenants
- Retail
- Amenities
- Public roof decks
- Parking garages
- Equipment rooms



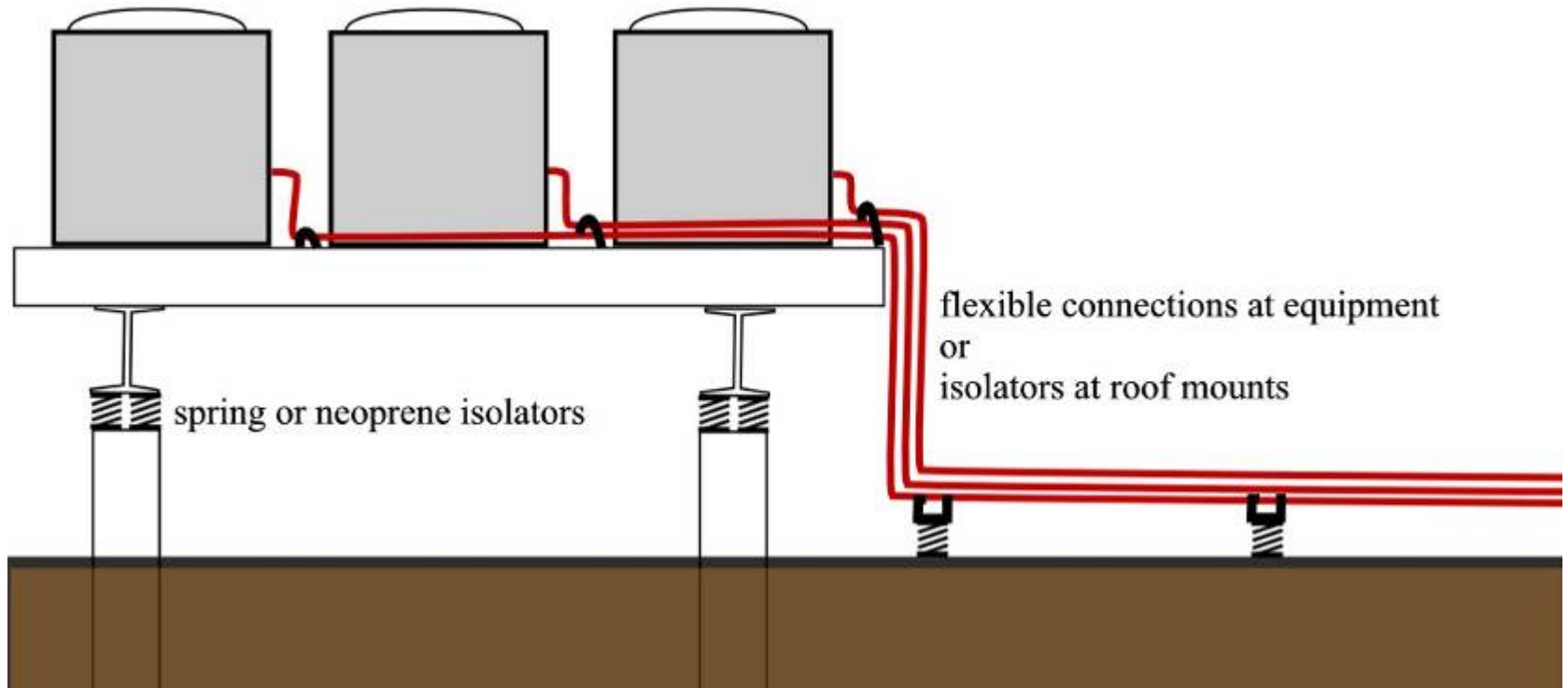
Trash compactors



Trash compactor isolation



Rooftop equipment



Objectives for indoor noise

- Identify noisy mixed uses and amenities, and address sound separation in building design.
- Plan ahead for sound separation and demising assemblies that achieve **better than IBC minimum** requirements.
- Plan equipment locations away from sensitive uses – **buffer zones; use vibration isolation**
- Use acoustically absorptive indoor materials.