PROPOSAL OF ACOUSTIC CLASSIFICATION SCHEME FOR RESIDENTIAL BUILDINGS IN SPAIN

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Background

In April 2009 came into enforcement the DB-HR (Basic Document of protection against noise) Spanish Building Code (CTE), that sets minimum insulation requirements mainly for:

- Airborne sound insulation from other spaces of the building to dwellings (horizontal and vertical): DnTA (dBA)
- Impact sound insulation from other spaces of the building to dwellings (vertical and horizontal): L’nTw (dB)
- Airborne sound insulation from outdoors to dwellings: D2m,ntW (dBA)

According to this Aecor has developed a proposal of acoustic classification scheme

Approach to the system

Two different and independent parts

1. Classification of building project

- Requirements for the design stage
- Early intention to reach a certain class in finished building.
- Classes: Q (mandatory) / HQ / HQ+ (highest quality)
- Assessment:
  - EN 12354 series
  - Calculation of all the adjoining rooms of the building
  - Global class is the minimum class reached

2. Classification of completed building

- Requirements for the completed building.
- Classes: A (highest quality) / B / C (mandatory)
- Different codification to distinguish from project classification
- Assessment:
  - Acoustic insulation tests (ISO 140-4;5,7)
  - Need of a reliable sampling plan
  - Global class is the minimum class reached
  - Tolerance allowance for tests: -3 dB (DB-HR criteria)

Example of project classification:

- Multistorey dwelling building.
- Concrete slab
- Room size: 3x3m²; Room height: 2.6m
- Internal walls:
  - Airborne noise insulation: Rₐ (dBA)
  - Airborne noise insulation between dwellings: DnTA (dBA)
  - Impact horizontal: L’nTw (dB)
  - Global class: HQ / HQ+ / HQ+ (highest quality)

Example of building classification:

- Multistorey dwelling building.
- Concrete slab
- Bedroom size: 10.5 m²; Livingroom size: 18.5 m²
- Airborne horizontal:
  - DnTA (dBA)
- Airborne vertical:
  - L’nTw (dB)
- Impact horizontal:
  - DnTA (dBA)
- Impact vertical:
  - L’nTw (dB)
- Indoor:
  - D2m,ntW (dBA)
- Global class: HQ / HQ+ / HQ+ (highest quality)

ACOUSTIC CLASSIFICATION PROPOSED VALUES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>REQUIREMENT</th>
<th>PROJECT CLASS</th>
<th>BUILDING CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal walls airborne noise insulation</td>
<td>Rₐ (dBA)</td>
<td>≥ 33</td>
<td>Q</td>
<td></td>
</tr>
<tr>
<td>Airborne noise insulation between dwellings</td>
<td>DnTA (dBA)</td>
<td>≥ 43</td>
<td>HQ</td>
<td></td>
</tr>
<tr>
<td>Impact noise level in a protected room from another adjoining rooms of the building.</td>
<td>L’nTw (dB)</td>
<td>≤ 65</td>
<td>HQ</td>
<td></td>
</tr>
<tr>
<td>Airborne noise insulation from outside in protected rooms</td>
<td>DnTA (dBA)</td>
<td>≥ 50</td>
<td>HQ+</td>
<td></td>
</tr>
<tr>
<td>Party walls (between buildings) Airborne noise insulation</td>
<td>Rₐ (dBA)</td>
<td>≥ 45</td>
<td>Q</td>
<td></td>
</tr>
<tr>
<td>Airborne noise insulation between a protected room and activity/facility room.</td>
<td>DnTA (dBA)</td>
<td>≥ 55</td>
<td>HQ+</td>
<td></td>
</tr>
<tr>
<td>Impact noise level in a protected room from an adjoining activity/facility room.</td>
<td>L’nTw (dB)</td>
<td>≤ 60</td>
<td>HQ</td>
<td></td>
</tr>
</tbody>
</table>

Building solutions:

1. Lower class matches with the mandatory requirements of DB-HR
2. Protected rooms are Bedrooms, living rooms.
3. Habitable rooms are kitchens, bathrooms, halls, distribution space

Example of building classification:

- Concrete slab
- Room size: 3x3m²; Room height: 2.6m
- Airborne noise insulation: Rₐ (dBA)
- Airborne noise insulation between dwellings: DnTA (dBA)
- Vertical impact: L’nTw (dB)
- Global class: HQ / HQ+ / HQ+ (highest quality)