### Legend

<table>
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<tr>
<th>Architectural Elements</th>
<th>Component</th>
<th>Cross Section</th>
<th>Profile</th>
<th>Architectural Elements</th>
<th>Component</th>
<th>Cross Section</th>
<th>Architectural Material Symbols</th>
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<tr>
<td></td>
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<td>Polystyrene insulation</td>
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<td>Cement board</td>
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<td>Lath</td>
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<td>Poured gypsum</td>
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<td>Wood truss</td>
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<td></td>
<td>Gypsum board or plaster</td>
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<tr>
<td></td>
<td>Wood joist or stud</td>
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<td></td>
<td>Veneer finish</td>
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<td></td>
<td>Steel joist or stud</td>
<td></td>
<td></td>
<td>Tile</td>
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<tr>
<td></td>
<td>Steel truss</td>
<td></td>
<td></td>
<td>Concrete or precast concrete</td>
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<tr>
<td></td>
<td>RC-1 channel</td>
<td></td>
<td></td>
<td>Ceiling panel</td>
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<tr>
<td></td>
<td>Furring channel</td>
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This legend contains the symbols used throughout the Architectural Reference Library to represent various architectural elements. Profile and cross-section views are shown where appropriate, along with architectural material symbols.
## Steel Framed

### Non-loadbearing Acoustical Assemblies

<table>
<thead>
<tr>
<th>Construction Detail</th>
<th>Description</th>
<th>Acoustical Performance</th>
<th>Fire Performance</th>
<th>Reference</th>
</tr>
</thead>
</table>
| **wt. 6** | • 3/8" SHEETROCK® Brand FIRECODE® Core Gypsum Panels or IMPERIAL® Brand FIRECODE Core Abuse-Resistant Gypsum Base, FIRECODE® Brand Panels
  – 3-5/8" 25 gauge steel studs 24" o.c.
  – joints finished
  • optional veneer plaster | **STC** 40  49  51 | **Test Number** USG-860808  SA-870717  RAL-TL-90-166 | **Rating** 1 hour  Based on 3" SAFB in cavity  Based on same construction without THERMAFIBER SAFB | **Test Number** UL Des U419 or U465  SA700 or SA920  SA320 |
| **wt. 7** | • 1/2" SHEETROCK Brand FIRECODE C Core Gypsum Panels
  – 2-1/2" 25 gauge steel studs 24" o.c.
  – 1-1/2" THERMAFIBER SAFB
  – joints finished | **STC** 41  50 | **Test Number** RAL-TL-69-148  SA-800504 | **Rating** 1 hour  Based on 1-1/2" mineral wool batt and 2-1/2" studs | **Test Number** UL Des U419 or U448  SA320 |
| **wt. 7** | • Face layer 1/2" SHEETROCK Brand FIRECODE C Core Gypsum Panels
  – 1-5/8" 25 gauge steel studs 24" o.c.
  – base layer 1/4" SHEETROCK Brand Gypsum Panels
  – joints finished | **STC** 53 | **Test Number** CK-684-13 | **Rating** 1 hour  Based on 2" glass fiber | **Test Number** GA-WP-1090  GA-WP-1051 |
| **wt. 7** | Alternate based on 2-1/2" 25 gauge steel studs and 1/2" face layer laminated | **STC** 53 | **Test Number** NGC-2318 | **Rating** 1 hour  Based on 2-1/2" 25 gauge steel studs and 1/2" face layer laminated | **Test Number** GA-WP-1051  GA-WP-1051 |
| **wt. 5** | • 1/2" SHEETROCK Brand FIRECODE C Core Gypsum Panels
  – 3-5/8" 25 gauge steel studs 24" o.c.
  – 3" THERMAFIBER SAFB
  – RC-1 channel or equivalent one side spaced 24" o.c.
  • optional veneer plaster | **STC** 50  54 | **Test Number** RAL-TL-87-156  RAL-TL-83-216 | **Rating** 1 hour  Based on 5/8" thick panels | **Test Number** UL Des U419 or U451  SA320 |
| **cfg. wt. 5** | • 1/2" SHEETROCK Brand FIRECODE C Core Gypsum Panels
  – 6" 20 gauge steel studs 24" o.c.
  – 5" THERMAFIBER SAFB
  – RC-1 channel or equivalent one side spaced 24" o.c. | **STC** 56  56 | **Test Number** RAL-TL-87-139  RAL-TL-84-141 | **Rating** 1 hour  Based on 5/8" thick SHEETROCK Brand FIRECODE C Core Gypsum Panels | **Test Number** UL Des U419 or U451  SA320 |
| **wt. 14** | • 1/2" DURROCK Brand Cement Board and 1/4" ceramic tile
  – 3-5/8" 20 gauge steel studs 16" o.c.
  – 3" THERMAFIBER SAFB
  – alternate design 5/8" SHEETROCK Brand FIRECODE Core Gypsum Panels, one side | **STC** 48  50 | **Test Number** SA-840321  SA-840313 | **Rating** 1 hour  Based on alt design | **Test Number** UL Des U442  SA304 |
### Steel Framed

#### Non-loadbearing

<table>
<thead>
<tr>
<th>Construction Detail</th>
<th>Description</th>
<th>Acoustical Performance</th>
<th>Fire Performance</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>wt. 7</strong></td>
<td>• 1/2&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels&lt;br&gt;– 3-5/8&quot; 20 gauge studs 24&quot; o.c.&lt;br&gt;– 3&quot; THERMAFIBER SAFB&lt;br&gt;– RC-1 channel or equivalent one side spaced 24&quot; o.c.&lt;br&gt;– 2 layers gypsum panels&lt;br&gt;– face layer joints finished&lt;br&gt;• optional veneer plaster</td>
<td>STC 58 RAL-TL-83-215</td>
<td>1-1/2 hour</td>
<td>UL Des U452 &lt;br&gt;SA920 &lt;br&gt;A-8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STC 59 RAL-TL-84-140</td>
<td>6&quot; 20 ga struc studs and 5&quot; THERMAFIBER SAFB</td>
<td></td>
</tr>
<tr>
<td><strong>wt. 9</strong></td>
<td>• 1/2&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels each side&lt;br&gt;– 1-5/8&quot; 25 gauge steel studs 24&quot; o.c.&lt;br&gt;– face layer joints finished&lt;br&gt;• optional veneer plaster</td>
<td>STC 50 USG-840817</td>
<td>2 hour</td>
<td>UL Des U419&lt;br&gt;or U412&lt;br&gt;SA920 &lt;br&gt;A-9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Based on 3-5/8&quot; stud assembly without mineral wool batt</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SA-860932</td>
<td>Based on lamin. face layer, 1-1/2&quot; mineral wool batt and 2-1/2&quot; studs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CK-654-40</td>
<td>Based on 2-1/2&quot; studs, screw-attached face layer and 1-1/2&quot; mineral wool batt</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SA-800421</td>
<td>Based on 3-5/8&quot; studs and 1-1/2&quot; mineral wool batt</td>
<td></td>
</tr>
<tr>
<td><strong>wt. 11</strong></td>
<td>• 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels, or FIBEROCK Brand Panels&lt;br&gt;– 1-5/8&quot; 25 gauge steel studs 24&quot; o.c.&lt;br&gt;– face layer joints finished&lt;br&gt;• optional veneer plaster</td>
<td>STC 48 BBN-770408</td>
<td>2 hour</td>
<td>UL Des U419&lt;br&gt;or U411&lt;br&gt;SA920 &lt;br&gt;A-10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Based on 3-5/8&quot; studs and 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>USG-840818</td>
<td>Based on 3-5/8&quot; studs and 3&quot; mineral wool batt</td>
<td></td>
</tr>
<tr>
<td><strong>wt. 7</strong></td>
<td>• 3/4&quot; SHEETROCK Brand ULTRACODE Core Gypsum Panels&lt;br&gt;– 3-1/2&quot; 25 gauge steel studs 24&quot; o.c.&lt;br&gt;– joints finished</td>
<td>STC 50 USG-910617</td>
<td>2 hour</td>
<td>UL Des U419&lt;br&gt;or U491&lt;br&gt;SA920 &lt;br&gt;A-11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Based on 3-5/8&quot; thick panels, 6&quot; 20 gauge structural studs, 5&quot; mineral wool batt</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>wt. 7</strong></td>
<td>• 1/2&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels&lt;br&gt;– 3-5/8&quot; 20 gauge studs 24&quot; o.c.&lt;br&gt;– 3&quot; THERMAFIBER SAFB&lt;br&gt;– RC-1 channel or equivalent one side spaced 24&quot; o.c.&lt;br&gt;– single-layer gypsum panels screw-attached to studs&lt;br&gt;– double layer screw-attached to channel&lt;br&gt;– face layer joints finished&lt;br&gt;• optional veneer plaster</td>
<td>STC 59 RAL-TL-84-136</td>
<td>2 hour</td>
<td>UL Des U419&lt;br&gt;or U453&lt;br&gt;SA920 &lt;br&gt;A-12</td>
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<tr>
<td></td>
<td></td>
<td>Based on 5/8&quot; thick panels, 6&quot; 20 gauge structural studs, 5&quot; mineral wool batt</td>
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# Partitions

## Wood Framed

<table>
<thead>
<tr>
<th>Loadbearing</th>
<th>Acoustical Performance</th>
<th>Fire Performance</th>
<th>Reference</th>
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<tr>
<td><strong>Construction Detail</strong></td>
<td><strong>Description</strong></td>
<td><strong>STC</strong></td>
<td><strong>Test Number</strong></td>
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<tr>
<td>wt. 7</td>
<td>wt. 7</td>
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</tr>
<tr>
<td>4(\frac{1}{2})&quot;</td>
<td>• 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels or FIBEROCK Brand Panels</td>
<td>34</td>
<td>USG-30-FT-G&amp;H</td>
</tr>
<tr>
<td></td>
<td>– 2x4 wood stud 16&quot; o.c.</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>– joints finished</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• optional veneer plaster</td>
<td></td>
<td></td>
</tr>
<tr>
<td>wt. 7</td>
<td>wt. 7</td>
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<td></td>
</tr>
<tr>
<td>5(\frac{1}{4})&quot;</td>
<td>• 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels</td>
<td>50</td>
<td>BBN-760903</td>
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<tr>
<td></td>
<td>– 2x4 wood stud 16&quot; o.c.</td>
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<tr>
<td></td>
<td>– 3&quot; THERMAFIBER SAFB</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>– RC-1 channel or equivalent one side</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– joints finished</td>
<td></td>
<td></td>
</tr>
<tr>
<td>wt. 12</td>
<td>wt. 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot;</td>
<td>• 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels or SHEETROCK Brand Water-Resistant FIRECODE Core Gypsum Panels or FIREBOX Brand Panels</td>
<td>52</td>
<td>USG-810218</td>
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<tr>
<td></td>
<td>– 2x4 wood studs 16&quot; o.c.</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>– joints finished</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>• optional veneer plaster</td>
<td></td>
<td></td>
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<tr>
<td>Chase Walls</td>
<td>Chase Walls</td>
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</tr>
<tr>
<td></td>
<td>• 1/2&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels, both outside both walls double layer and inside single layer</td>
<td>57</td>
<td>RAL-TL-73-224</td>
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<td>• 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels, or FIREBOX Brand Panels</td>
<td>51</td>
<td>RAL-TL-69-214</td>
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<td></td>
<td>– 2 rows 2x4 wood studs 16&quot; o.c. on separate plates 1&quot; apart</td>
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<tr>
<td></td>
<td>– joints finished</td>
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<td>• 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels or Firebox Brand Panels</td>
<td>56</td>
<td>RAL-TL-69-211</td>
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<tr>
<td></td>
<td>– 2x4 wood studs 16&quot; o.c. on 2x6 common plate</td>
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<tr>
<td></td>
<td>– joints finished</td>
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#### Dimensional Lumber

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<tr>
<th>Construction Detail</th>
<th>Description</th>
<th>Acoustical Performance</th>
<th>Fire Performance</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 2 layers 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels – 5/8&quot; x 8&quot; ceramic tile – 1/2&quot; Durock Brand Exterior Cement Board – 1&quot; SHEETROCK Brand Gypsum Liner Panels – 1/2&quot; plywood – 2x10 wood joist 16&quot; o.c. – 3&quot; mineral wool batt – RC-1 channel or equivalent</td>
<td>Test Number: 52 RAL-IN-89-5</td>
<td>Test Number: 2 hour</td>
<td>UL Des L541 SA034 B-9</td>
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<tr>
<td></td>
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<td>Test Number: 58 RAL-TL-89-145</td>
<td>Based on vinyl tile over oriented strand board in place of ceramic tile and cement board</td>
<td>RAL-IN-89-7</td>
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<tr>
<td></td>
<td></td>
<td>Test Number: 59 RAL-TL-89-146</td>
<td>Based on carpet/pad over oriented strand board in place of ceramic tile and cement board</td>
<td>RAL-IN-89-8</td>
</tr>
<tr>
<td></td>
<td>• 2 layers 5/8&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels – 2x10 wood joists 16&quot; o.c. – 3&quot; mineral wool batt – RC-1 channel or equivalent</td>
<td>Test Number: 59 RAL-TL-90-40</td>
<td>Test Number: 2 hour</td>
<td>UL Des L541 B-10</td>
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<td></td>
<td>Test Number: 69 RAL-IN-90-5</td>
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<tr>
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<td>Test Number: 59 RAL-TL-90-40</td>
<td>Based on vinyl tile in place of carpet/pad</td>
<td>RAL-IN-90-6</td>
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#### Engineered Joist

<table>
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<tr>
<th>clg. wt. 3</th>
<th>12%</th>
<th>12%</th>
<th>Description</th>
<th>Acoustical Performance</th>
<th>Fire Performance</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>12%</td>
<td></td>
<td></td>
<td>• 2 layers 1/2&quot; SHEETROCK Brand FIRECODE C Core Gypsum Panels – optional SRM-25 or SRB sound mat – 19/32&quot; wood subfloor – 9-1/2&quot; deep &quot;I&quot; shaped wood joist 24&quot; o.c. – 14&quot; parallel chord wood truss 32&quot; o.c. – RC-1 or equivalent • 3/4&quot; LEVELROCK Brand Floor Underlayment</td>
<td>Test Number: 64 RAL-OT03-05/06</td>
<td>Test Number: 1 hour</td>
<td>UL Des L570</td>
</tr>
<tr>
<td>12%</td>
<td></td>
<td></td>
<td>• 1/2 LEVELROCK, vinyl, SRM-25, 3-1/2&quot; insulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12%</td>
<td></td>
<td></td>
<td>• 1/2 LEVELROCK, engineered wood-laminate floor, SRM-25, 3-1/2&quot; insulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12%</td>
<td></td>
<td></td>
<td>• 1/2 LEVELROCK, ceramic tile, SRM-25, 3-1/2&quot; insulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12%</td>
<td></td>
<td></td>
<td>• 3/4&quot; LEVELROCK, vinyl, SRB, 3-1/2&quot; insulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12%</td>
<td></td>
<td></td>
<td>• 3/4&quot; LEVELROCK, ceramic tile, SRB, 3-1/2&quot; insulation, crack isolation membrane</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Design Details

Wood Framed

Sound isolating partition

- 1/2" SHEETROCK Brand acoustical sealant
- 1/4" SHEETROCK Brand gypsum panel
- 1/2" SHEETROCK Brand FIRECODE core gypsum panels
- 2 x 4 wood studs
- Sound insulation

Sound isolating partition — chase wall

- 5/8" SHEETROCK Brand FIRECODE core gypsum panels
- 2 x 4 wood studs
- SHEETROCK Brand acoustical sealant
- RC-1 resilient channel or equivalent (may be inverted to ease attachment of base)

Ceiling/floor attachment — SHEETROCK Brand gypsum panel

- SHEETROCK Brand joint tape
- Sound insulation
- RC-1 resilient channel or equivalent

Ceiling/floor attachment/SHEETROCK Brand gypsum panel, FIRECODE C Core panel

- SHEETROCK Brand joint tape
- Sound insulation
- RC-1 resilient channel or equivalent

Floor attachment

- 2x4 wood stud
- 1/2" SHEETROCK Brand gypsum panel
- RC-1 resilient channel or equivalent (may be inverted to ease attachment of base)

Floor attachment

- 5/8" SHEETROCK Brand gypsum panels
- RC-1 resilient channel or equivalent (may be inverted to ease attachment of base)
### Design Details

#### Wood Framed

<table>
<thead>
<tr>
<th>Single-layer panels with RC-1 Channel</th>
<th>Double-layer panels with RC-1 Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x4 wood stud</td>
<td>2x4 wood stud</td>
</tr>
<tr>
<td>SHEETROCK Brand gypsum panel</td>
<td>SHEETROCK Brand gypsum panels</td>
</tr>
<tr>
<td>RC-1 resilient channel or equivalent</td>
<td>RC-1 resilient channel or equivalent</td>
</tr>
<tr>
<td>SHEETROCK Brand acoustical sealant</td>
<td>SHEETROCK Brand acoustical sealant</td>
</tr>
<tr>
<td>sound insulation</td>
<td>sound insulation</td>
</tr>
</tbody>
</table>

#### Ceiling and floor assemblies

| 1/2" plywood subfloor                 | 3" sound insulation                   |
| 2 x 10 joist 16" o.c.                 | arch wire between joists              |
| rosin paper                           |                                       |
| 1/8" SHEETROCK Brand FIRECODE C core gypsum panels | 1/8" SHEETROCK Brand FIRECODE C core gypsum panels |
| RC-1 resilient channel or equivalent--screw applied | |

#### Ceramic tile

<table>
<thead>
<tr>
<th>UL Design L541</th>
<th>Vinyl tile or carpet/pad</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; x 8&quot; ceramic tile</td>
<td>1 1/2&quot; pumped, self-leveling gypsum cement floor underlayment (type F)</td>
</tr>
<tr>
<td>1/8&quot; DUROCX Brand exterior cement board</td>
<td>SHEETROCK Brand acoustical sealant</td>
</tr>
<tr>
<td>DUROCX Brand ceramic tile adhesive</td>
<td>1/8&quot; plywood</td>
</tr>
<tr>
<td></td>
<td>2x10 wood joists 16&quot; o.c.</td>
</tr>
<tr>
<td>SHEETROCK Brand acoustical sealant</td>
<td>2 layers of 1/4&quot; SHEETROCK Brand FIRECODE C core gypsum panels</td>
</tr>
<tr>
<td>insulation pinned between joists</td>
<td>RC-1 resilient channel or equivalent 16&quot; o.c.</td>
</tr>
<tr>
<td>1/8&quot; plywood</td>
<td>1/2&quot; plywood</td>
</tr>
<tr>
<td>2 layers of 1/4&quot; SHEETROCK Brand FIRECODE C core gypsum panels</td>
<td>2x10 wood joists 16&quot; o.c.</td>
</tr>
<tr>
<td>RC-1 resilient channel or equivalent 16&quot; o.c.</td>
<td>3&quot; sound attenuation blankets 1&quot; above bottom of joists</td>
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Steel Framed

Corner wall partition

Sound isolating interrupted ceiling
# Interrupting Flanking Paths

<table>
<thead>
<tr>
<th>Resilient Channel Wall Framing – Avoid</th>
<th>Resilient Channel Wall Framing – Recommended</th>
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<tr>
<td><img src="image1.png" alt="Resilient Channel Wall Framing – Avoid" /></td>
<td><img src="image2.png" alt="Resilient Channel Wall Framing – Recommended" /></td>
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## Electrical Boxes – Avoid

![Electrical Boxes – Avoid](image3.png)

## Electrical Boxes – Better

![Electrical Boxes – Better](image4.png)

## Electrical Boxes – Recommended

![Electrical Boxes – Recommended](image5.png)

## Cabinet Cutout

![Cabinet Cutout](image6.png)
In most building design, the No. 1 acoustical goal is to specify wall partitions, ceiling systems and floor/ceiling assemblies that will minimize transmission of airborne and impact sound beyond their areas of origin. This performance can be achieved with a combination of materials, assembly designs and construction methods tested for acoustical performance on a variety of parameters. Here is an overview of design strategies for key components that can make spaces more pleasant, comfortable and productive.

### Ceilings

**Absorb Sound in Open Spaces**
Select high-NRC ceiling panels for open areas to absorb a significant amount of the sound generated within these spaces. Acoustics are further improved with partitions having high STC values to help block sound and prevent transmission across large spaces.

**Block Sound in Enclosed Spaces**
Choose high-CAC ceiling panels for private offices, meeting rooms and other enclosed areas to block sound from traveling up into the plenum and out to adjacent spaces. This approach will reduce distractions for those outside and improve speech privacy for those within.

**Cover Sound in All Areas**
Sound masking covers noise that is not absorbed or blocked by introducing uniform, ambient, background sound into the space. Sound masking produces an electronic sound spectrum similar to that of softly blowing air; it is amplified through speakers above the suspended ceiling to unobtrusively raise the background sound level. Sound masking makes noise in open spaces less distracting, increases speech privacy in enclosed spaces and provides greater acoustical balance throughout.

### Walls

**Increase mass**
As partition mass increases, sound waves lose more energy passing through the medium, reducing their ability to vibrate air on the other side. Relying on mass alone, however, poses limitations. Doubling the mass of a partition can reduce sound transmission by up to 5 dB. Thus, achieving a 60 dB reduction would require total mass of 320 pounds per square foot, the equivalent of approximately 3’ of solid concrete, not a feasible solution for most building designs.

**Enlarge air spaces**
Isolating air space within a partition can increase STC performance. But like increasing mass, performance increases are limited. Doubling partition air space can reduce sound transmission by up to 5 dB, so achieving a 60 dB reduction would require an isolated air space 4’ wide, hardly practical for most applications.
**Add sound insulation**

Adding a layer of fibrous sound-absorbing insulation material such as mineral wool into the partition cavity will dissipate sound by creating friction, which transforms a portion of sound wave energy into heat. However, sound attenuation blankets cannot completely counter the conductivity of the wood or steel studs in the framing assembly, which provide a path of least resistance for sound energy.

**Decouple wall panels**

Attaching the wall surface diaphragm (e.g. drywall panels) directly to framing members provides an uninterrupted path for sound travel. This route can be interrupted by mounting the surface diaphragm to resilient channels attached to the wall studs and placing sound insulation inside the partition cavity.

**Seal flanking paths**

Closing off gaps or penetrations in the wall assembly is critical to controlling noise. One of the most effective methods is to apply acoustical sealant at the intersection of the gypsum panel, floor system (wood or concrete), and the leg of the steel runner or wood sole plate; sealant should be applied at this location on both sides of the partition. A properly sealed wall assembly with one 5/8” gypsum panel on each side and a 1-1/2” thick sound attenuation blanket installed in the air cavity achieves an STC of 53. Without acoustical sealant, this assembly would produce an STC of only 29—a dramatic 45 percent reduction.

**Increase isolation with steel studs**

A single-layer partition with 5/8” gypsum panels and 3-5/8” stud achieves 40 STC with 25-ga. steel and 38 STC with 20-ga. steel. STC falls to 35 with a traditional 2’ x 4’ stud due to the greater stiffness of wood.

**Floor/Ceiling Assemblies**

**Isolate sound**

Whether constructed with joists, trusses or concrete slabs, floor systems can develop gaps or cracks, providing a flanking path for sound to travel between levels of a building. Even properly sealed assemblies can transmit noise from footsteps, falling objects, closing doors and other impacts. These acoustical problems can be significantly reduced with a flooring system that includes a layer of sound absorbing material topped with a poured cementitious underlayment. The poured underlayment finds and seals cracks and other sound channels, then hardens to form a solid barrier isolated from the structure below by the sound mat or board. This system can provide STC ratings as high as 66 and increase IIC by as much as 13 points, a significant improvement.
## STC Guidelines

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</tbody>
</table>

**Note**

(d) Current model building codes require a minimum STC (and IIC) separation of dwelling units. The 2003 International Building Code requires a minimum separation of 50 STC and 50 IIC for apartments, condominiums and townhouses. Local jurisdictions using the 2003 International Residential Code may require a minimum separation of 45 STC for townhouses.