Application Details

Use the tables on pages 3 through 25 to:
1. Identify the type of system the Firestop product will be used in
2. Identify the type of material
3. Identify the penetration item (size and type)
4. Select the proper Nelson drawing number from the right hand column. Each Number has a hyperlink to bring you to the correct drawing.

Concrete Floor or Wall Systems ................................................................................................................. 3-8
Floor - Ceiling Systems (Concrete & Membrane) ......................................................................................... 9
Concrete / Masonry Wall Systems ............................................................................................................. 10-16
Gypsum Wallboard Wall Systems ............................................................................................................. 17-20
Wood-Joist Floor Systems ......................................................................................................................... 21-22
Joint Treatment Systems .......................................................................................................................... 23-25

NOTES:
1. Any pipe or conduit with a diameter smaller than the listed value may be used.
2. Any pipe or conduit with a wall thickness heavier than the listed value may be used.
3. Any cable tray with a width and / or loading depth narrower than the listed value may be used.
4. Any cable with similar insulation / jacketing and smaller size or gauge may be used.
5. A rated Firestop system “F” rating may be applied to a wall or floor of equal or lesser “F” rating, the system then is rated at the lesser “F” rating

6. References to tested systems are as follows:
   UL indicates Underwriters Laboratories, Inc. (US)
   cUL indicates Underwriters Laboratories, Inc to Canadian Standards (Canada)
   FM indicates Factory Mutual Research
   SP indicates Underwriters Laboratories of Canada
   SWR indicates Southwest Research Institute
   ITS indicates Intertek Testing Services (formerly Warnock Hersey)

<table>
<thead>
<tr>
<th>NELSON PRODUCT ABBREVIATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLK - Silicone Non - Intumescent Sealant</td>
</tr>
<tr>
<td>CMP - Firestop Mortar Compound</td>
</tr>
<tr>
<td>CPS - Composite Sheet</td>
</tr>
<tr>
<td>ES1399 - Endothermoic Sealant</td>
</tr>
<tr>
<td>FSC - Intumescent Cable Coating</td>
</tr>
<tr>
<td>FSC3 - Elastomeric Joint Coating</td>
</tr>
<tr>
<td>FSP - Flameshield Putty</td>
</tr>
<tr>
<td>------------------------------</td>
</tr>
<tr>
<td><strong>STEEL PIPE</strong></td>
</tr>
<tr>
<td>¾&quot; / 2&quot;, Sch. 10 multiple</td>
</tr>
<tr>
<td>1&quot; Sch. 10, multiple, also 6&quot; thick hollow-core</td>
</tr>
<tr>
<td>2&quot; Sch. 5, multiple, also 6&quot; thick hollow-core</td>
</tr>
<tr>
<td>2&quot; Sch. 5 (top or bottom)</td>
</tr>
<tr>
<td>3&quot; Sch. 5</td>
</tr>
<tr>
<td>4&quot; Sch. 5 (top or bottom)</td>
</tr>
<tr>
<td>4&quot; Sch. 10, also 6&quot; thick hollow-core</td>
</tr>
<tr>
<td>4&quot; Sch. 5, multiple (max 24)</td>
</tr>
<tr>
<td>4&quot; Sch. 5</td>
</tr>
<tr>
<td>4&quot; Sch. 10, also 6&quot; thick hollow-core</td>
</tr>
<tr>
<td>6&quot; Sch. 40, multiple</td>
</tr>
<tr>
<td>6&quot; Sch. 5</td>
</tr>
<tr>
<td>6&quot; Sch. 5, multiple</td>
</tr>
<tr>
<td>8&quot; Sch. 40, also 6&quot; thick hollow-core</td>
</tr>
<tr>
<td>8&quot; Sch. 40, also 6&quot; thick hollow-core (bottom)</td>
</tr>
<tr>
<td>8&quot; Sch. 40, also 6&quot; thick hollow-core (bottom)</td>
</tr>
<tr>
<td>8&quot; Sch. 10, also 6&quot; thick hollow-core (bottom)</td>
</tr>
<tr>
<td>10&quot; Sch. 5 multiple</td>
</tr>
<tr>
<td>10&quot; Sch. 40</td>
</tr>
<tr>
<td>10&quot; Sch. 10, w/ cable trays</td>
</tr>
<tr>
<td>12&quot; Sch. 10</td>
</tr>
<tr>
<td>12&quot; Sch. 10</td>
</tr>
<tr>
<td>12&quot; Sch. 30</td>
</tr>
<tr>
<td>12&quot; Sch. 40</td>
</tr>
<tr>
<td>24&quot; Sch. 5</td>
</tr>
<tr>
<td>24&quot; Sch. 10, also 6&quot; thick hollow-core</td>
</tr>
<tr>
<td>24&quot; Sch. 30</td>
</tr>
<tr>
<td>24&quot; Sch. 10</td>
</tr>
<tr>
<td>INSULATED STEEL PIPE</td>
</tr>
<tr>
<td>¾&quot; / 2&quot; Sch. 10, 1&quot; AB/PVC, multiple</td>
</tr>
<tr>
<td>1½ Sch. 5, ¾&quot; AB/PVC</td>
</tr>
<tr>
<td>2&quot; Sch. 5, 1&quot; AB/PVC</td>
</tr>
<tr>
<td>3&quot; Sch. 5, multiple, ¾&quot; AB/PVC</td>
</tr>
<tr>
<td>4&quot; Sch. 40, 2&quot; FIBERGLASS, also for hollow core floor</td>
</tr>
<tr>
<td>4&quot; Sch. 5, 1&quot; AB/PVC</td>
</tr>
<tr>
<td>4&quot; Sch. 10, 1½&quot; FIBERGLASS</td>
</tr>
<tr>
<td>4&quot; Sch. 5, 1&quot; FIBERGLASS/MINERAL FIBER</td>
</tr>
<tr>
<td>4&quot; Sch. 5, 2&quot; MINERAL FIBER</td>
</tr>
<tr>
<td>6&quot; Sch. 5, 1&quot; FIBERGLASS/MINERAL FIBER, multiple</td>
</tr>
<tr>
<td>6&quot; Sch. 10, 1&quot; AB/PVC</td>
</tr>
<tr>
<td>8&quot; Sch. 30, 1&quot;-3&quot; CELLULAR GLASS</td>
</tr>
<tr>
<td>8&quot; Sch. 10, 2&quot; FIBERGLASS/MINERAL FIBER</td>
</tr>
<tr>
<td>8&quot; Sch. 40, 2&quot; FIBERGLASS/MINERAL FIBER</td>
</tr>
<tr>
<td>10&quot; Sch. 10, 2&quot; FIBERGLASS/MINERAL FIBER</td>
</tr>
<tr>
<td>10&quot; Sch. 40, 1&quot; CELLULAR GLASS</td>
</tr>
<tr>
<td>10&quot; Sch. 5, 1&quot; AB/PVC</td>
</tr>
<tr>
<td>12&quot; Sch. 10, 1&quot; FIBERGLASS</td>
</tr>
<tr>
<td>12&quot; Sch. 40, 2&quot; MINERAL WOOL</td>
</tr>
<tr>
<td>24&quot; Sch. 20, 2&quot; FIBERGLASS</td>
</tr>
</tbody>
</table>

**CONCRETE FLOORS OR WALLS**

Rev. 36, April 2009
Page 3

2009 Nelson Firestop Products
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE FLOORS OR WALLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper Pipe / Tubing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾” / 2” copper, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1” copper, multiple, also 6” thick hollow-core</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1” copper, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½” copper, multiple (max. 24)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” copper, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, also 6” thick hollow-core</td>
<td>O</td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, multiple</td>
<td>O</td>
<td>2½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, also 6” thick hollow-core</td>
<td>O-X</td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, also 6” thick hollow-core (bottom)</td>
<td>O-X</td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, also 6” thick hollow-core (bottom)</td>
<td>O-X</td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, also 6” thick hollow-core (bottom)</td>
<td>O-X</td>
<td>4½, 2½</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, w/ cable trays</td>
<td></td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper</td>
<td></td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, also 6” thick hollow-core</td>
<td>O-PVC</td>
<td>4½, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6” copper, also 6” thick hollow-core</td>
<td>O-X</td>
<td>4½, 2 or 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulated Copper Pipe / Tubing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾” / 2” copper, 1” AB/PVC w/multiple other pipes</td>
<td>X</td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1” copper, ¾” AB/PVC, mult., 6” thick hollow-core</td>
<td>X</td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” copper, 1” AB/PVC</td>
<td></td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” copper, 1” FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td>3½, 2,3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” copper, 1” FIBERGLASS/MINERAL FIBER, multiple</td>
<td></td>
<td>3½, 2,3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3” copper, mult., ¾” AB/PVC</td>
<td></td>
<td>4½, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, 1” AB/PVC</td>
<td></td>
<td>2½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, 1½” FIBERGLASS</td>
<td></td>
<td>4½, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” copper, 2” MINERAL FIBER</td>
<td>X</td>
<td>4½, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6” copper, 2” FIBERGLASS</td>
<td>O</td>
<td>4½, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6” copper, 1” AB/PVC</td>
<td></td>
<td>4½, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10” copper, 1” AB/PVC</td>
<td></td>
<td>4½, 1½</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigeration Lines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” copper/steel, 1” AB/PVC</td>
<td></td>
<td>4½, 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2009 Nelson Firestop Products</td>
</tr>
</tbody>
</table>

Rev. 36, April 2009
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE FLOORS OR WALLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NON-METALLIC PIPE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; PEX, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-2461</td>
<td>FS-0529</td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 40 PVC, CPVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-2096</td>
<td>FS-0116</td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 40 PVC, CPVC, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-2463</td>
<td>FS-0531</td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 40 PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-2462</td>
<td>FS-0530</td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-8141</td>
<td>FS-0544</td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-2102</td>
<td>FS-0117</td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC, ENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-BJ-2022</td>
<td>FS-0546</td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC, ENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-2525</td>
<td>FS-0647</td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC, ENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-2525</td>
<td>FS-0647</td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 40 PVC, ABS, CPVC, 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-2489</td>
<td>FS-0638</td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 40 PVC, CPVC, ABS, 6&quot; thick hollow-core</td>
<td>R</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-2472</td>
<td>FS-0613</td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 PVC, ABS, CPVC, 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2596</td>
<td>FS-0668</td>
<td></td>
</tr>
<tr>
<td>5&quot; Sch. 40 PVC, CPVC, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2596</td>
<td>FS-0668</td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 40 PVC, CPVC, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>2½</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2475</td>
<td>FS-0616</td>
<td></td>
</tr>
<tr>
<td><strong>STEEL CONDUIT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾&quot; / 2&quot; EMT multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ES1399</td>
<td>FS-0377</td>
<td></td>
</tr>
<tr>
<td>2&quot; EMT/RMC, multiple, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-1192</td>
<td>FS-0134</td>
<td></td>
</tr>
<tr>
<td>2&quot; EMT, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1420</td>
<td>FS-0376</td>
<td></td>
</tr>
<tr>
<td>2&quot; EMT/RMC (top or bottom)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1004</td>
<td>FS-0008</td>
<td></td>
</tr>
<tr>
<td>3&quot; EMT/RMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1046</td>
<td>FS-0091</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1415</td>
<td>FS-0353</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT, also 6&quot; thick hollow-core</td>
<td>O-PVC</td>
<td>X</td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-1581</td>
<td>ES-0666</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT, also 6&quot; thick hollow-core</td>
<td>O-PVC</td>
<td>X</td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-1580</td>
<td>ES-0666</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC (top or bottom)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1054</td>
<td>FS-0092</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-1191</td>
<td>FS-0129</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC, multiple (max 24)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1441</td>
<td>FS-0458</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>2½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-1485</td>
<td>FS-0524</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC, also 6&quot; thick hollow-core (bottom)</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1486</td>
<td>FS-0525</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC, also 6&quot; thick hollow-core (bottom)</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1439</td>
<td>FS-0456</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LBS3</td>
<td>C-AJ-8141</td>
<td>FS-0544</td>
</tr>
<tr>
<td>4&quot; EMT/RMC, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-1197</td>
<td>FS-0258</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC, also 6&quot; thick hollow-core (bottom)</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2½</td>
<td>LBS3</td>
<td>C-AJ-1489</td>
<td>FS-0528</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1193</td>
<td>FS-0135</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1203</td>
<td>FS-0145</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1219</td>
<td>FS-0125</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-8049</td>
<td>FS-0149</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC, also 6&quot; thick hollow-core</td>
<td>X</td>
<td>2½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1487</td>
<td>FS-0526</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1003</td>
<td>FS-0001</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-AJ-1124</td>
<td>FS-0103</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C-BJ-1051</td>
<td>FS-0545</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2½</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1483</td>
<td>FS-0522</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3½, 7, 3, 4</td>
<td>FS-0084</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>----------------</td>
<td>-------------------</td>
<td>----------</td>
<td>----------------</td>
<td>-------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td><strong>CONCRETE FLOORS OR WALLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FLEXIBLE METALLIC CONDUIT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; FMC, mult. steel, also 6&quot; thick hollow-core</td>
<td>R</td>
<td>X</td>
<td>4½</td>
<td>3 LBS3</td>
<td>C-AJ-1488</td>
<td>FS-0527</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; FMC, mult. Steel or Al, 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½, 2, 3</td>
<td>ES1399</td>
<td>C-AJ-1512</td>
<td>FS-0517</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NON-METALLIC CONDUIT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; ENT</td>
<td></td>
<td></td>
<td>6, 2, 3</td>
<td>LBS3</td>
<td>C-BJ-2022</td>
<td>FS-0546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; RNC</td>
<td></td>
<td></td>
<td>4½, 2</td>
<td>FSB</td>
<td>C-AJ-2096</td>
<td>FS-0116</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; RNC, also 6&quot; thick hollow-core</td>
<td>O</td>
<td>X</td>
<td>4½, 2, 3</td>
<td>LBS3</td>
<td>C-AJ-2463</td>
<td>FS-0531</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td>O</td>
<td></td>
<td>4½, 2</td>
<td>LBS3</td>
<td>C-AJ-2462</td>
<td>FS-0530</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td></td>
<td></td>
<td>6, 2, 3</td>
<td>LBS3</td>
<td>C-BJ-2022</td>
<td>FS-0546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td>O</td>
<td>X</td>
<td>4½, 3</td>
<td>ES1399</td>
<td>C-AJ-2525</td>
<td>FS-0647</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch 40 Pvc, RNC, ENT, Closed PVC</td>
<td>O</td>
<td>X</td>
<td>4½, 2, 3</td>
<td>LBS3</td>
<td>C-AJ-2596</td>
<td>FS-0668</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; RNC, also 6&quot; thick hollow-core</td>
<td></td>
<td></td>
<td>4½, 2, 3</td>
<td>PCS</td>
<td>C-AJ-2086</td>
<td>FS-0111</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; RNC, steel plate</td>
<td>X</td>
<td></td>
<td>2½, 2</td>
<td>WRS3/LBS3</td>
<td>F-A-2159</td>
<td>FS-0658</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CABLE TRAY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18&quot; x 4&quot; - 39% fill</td>
<td>4½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-4001</td>
<td>FS-0020</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24&quot; x 4&quot; - 25% fill</td>
<td>4½</td>
<td>2</td>
<td>Brick/FSP</td>
<td>C-AJ-4086</td>
<td>FS-0672</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24&quot; x 4&quot; - 40% fill</td>
<td>4½</td>
<td>2</td>
<td>PLW/FSP</td>
<td>C-AJ-4013</td>
<td>FS-0100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24&quot; x 4&quot; - 30% fill</td>
<td>4½</td>
<td>2</td>
<td>CMP/PLW</td>
<td>C-AJ-4033</td>
<td>FS-0148</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24&quot; x 3&quot; - 38% fill</td>
<td>8</td>
<td>3</td>
<td>CMP</td>
<td>C-BJ-4034</td>
<td>FS-0064</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36&quot; x 4&quot; - 30% fill, multiple w/pipe</td>
<td>4½</td>
<td>2</td>
<td>CMP</td>
<td>C-AJ-8049</td>
<td>FS-0149</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36&quot; x 6&quot; - 40% fill</td>
<td>4½</td>
<td>2</td>
<td>PLW/FSP</td>
<td>C-AJ-4032</td>
<td>FS-0147</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36% fill, 750 MCM (18&quot; x 24&quot;)</td>
<td>8</td>
<td>2</td>
<td>CPS/FSP</td>
<td>C-BJ-4016</td>
<td>FS-0094</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>POWER CABLE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max 4C #5awg Al. or Stl. METAL CLAD</td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-3149</td>
<td>FS-0501</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 MCM</td>
<td>3½</td>
<td>2</td>
<td>MPS</td>
<td>C-AJ-3047</td>
<td>FS-0087</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15% fill, 300MCM / #2 AWG multi cond.</td>
<td>4½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-3003</td>
<td>FS-0002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>350 MCM</td>
<td>4½</td>
<td>2, 3</td>
<td>MCT</td>
<td>C-AJ-3048</td>
<td>FS-0114</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15% fill, 350 MCM</td>
<td>R</td>
<td>4½</td>
<td>2 PLW</td>
<td>C-AJ-3093</td>
<td>FS-0130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% fill, 350 MCM</td>
<td>4½</td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-3235</td>
<td>FS-0518</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33% fill, 350 MCM, also 6&quot; hollow-core</td>
<td>O</td>
<td>4½</td>
<td>2 LBS3</td>
<td>C-AJ-3225</td>
<td>FS-0532</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45% fill, 350 MCM</td>
<td>O-PVC</td>
<td>4½</td>
<td>3 LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0669</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C #2/0, max. 2 bundles w/ other penetrants</td>
<td>2½</td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-8118</td>
<td>FS-0377</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45% fill, 4C #2/0, COPPER, STEEL, AL., MC</td>
<td>O-PVC</td>
<td>4½</td>
<td>3 LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0669</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% fill, 3C #2/0 SER</td>
<td>O-PVC</td>
<td>4½</td>
<td>3 ES1399</td>
<td>C-AJ-3235</td>
<td>FS-0518</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45% fill, 3C #2/0 SER</td>
<td>O-PVC</td>
<td>4½</td>
<td>3 LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0669</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% fill, 3C #2/0 METAL CLAD</td>
<td>4½</td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-3235</td>
<td>FS-0518</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22% fill, 3C #12 METAL CLAD</td>
<td>4½</td>
<td>3</td>
<td>PLUG</td>
<td>C-AJ-3299</td>
<td>FS-0673</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45% fill, 3C #12 ROMEX</td>
<td>45%</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0669</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C #2 AWG armored, METAL CLAD, 6&quot; hollow-core</td>
<td>O</td>
<td>4½</td>
<td>2 LBS3</td>
<td>C-AJ-3226</td>
<td>FS-0534</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C #18 AWG or 1C #3 AWG</td>
<td>R</td>
<td>8</td>
<td>3 CLK</td>
<td>C-BJ-3014</td>
<td>FS-0192</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4C #2 AWG armored, METAL CLAD, 6&quot; hollow-core</td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-3090</td>
<td>FS-0127</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36% fill, 750 MCM</td>
<td>8</td>
<td>2</td>
<td>CPS/FSP</td>
<td>C-BJ-4016</td>
<td>FS-0094</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38% fill, 750 MCM</td>
<td>O</td>
<td>2½</td>
<td>LBS3</td>
<td>C-AJ-3224</td>
<td>FS-0533</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40% fill, 750 MCM</td>
<td>O</td>
<td>4½</td>
<td>LBS3</td>
<td>C-AJ-3227</td>
<td>FS-0535</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70% fill, 750 MCM</td>
<td>O</td>
<td>4½</td>
<td>PCS/FSP</td>
<td>C-AJ-3118</td>
<td>FS-0196</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### CONCRETE FLOORS OR WALLS

#### CONTROL CABLE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2C #10 AWG</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-8162</td>
<td>FS-0641</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C #18 AWG or 1C #3 AWG</td>
<td>R</td>
<td>8</td>
<td>3</td>
<td>CLK</td>
<td>C-BJ-3014</td>
<td>FS-0192</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4C #2 AWG armored, METAL CLAD, 6&quot; hollow-core</td>
<td>O</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-3225</td>
<td>FS-0532</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4C #12 AWG</td>
<td>R</td>
<td>3½</td>
<td>2</td>
<td>PLW</td>
<td>C-AJ-3093</td>
<td>FS-0130</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% fill, 7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15% fill, #2-14 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7C #16 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7C #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16C #16 AWG, also 6&quot; hollow-core</td>
<td>O</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-3225</td>
<td>FS-0532</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### COMMUNICATIONS CABLE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 pr. #18 AWG, multiple</td>
<td>X</td>
<td>2½</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-A-8026</td>
<td>FS-0660</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15% fill, 25 pr. #24 AWG</td>
<td>R</td>
<td>4½</td>
<td>2</td>
<td>PLW</td>
<td>C-AJ-3093</td>
<td>FS-0130</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15% fill, 25 pr. #24 AWG</td>
<td>R</td>
<td>4½</td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-3094</td>
<td>FS-0131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 pr. #24 AWG, also 6&quot; hollow-core</td>
<td>O</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-3225</td>
<td>FS-0532</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 pr. 72 Fiber optic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13% fill, 100 pr. #24 telephone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36% fill, 240 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 pr. #24 AWG comm. Cable bundles w/ more</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 pr. #24 AWG telecomm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 pr. #24 AWG telecomm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45% fill, 400 pr. #24 AWG telecomm.</td>
<td>O-PVC</td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0669</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45% fill, RG59/U, RG/6 COAX</td>
<td>O-PVC</td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0669</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62.5/125 Fiber optic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 Fiber optic</td>
<td>R</td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-3089</td>
<td>FS-0126</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 Fiber optic</td>
<td>O</td>
<td>2½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-3224</td>
<td>FS-0533</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 Fiber optic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 Fiber optic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 Fiber optic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rev. 36, April 2009  Page 7  2009 Nelson Firestop Products
<table>
<thead>
<tr>
<th>Penetration Item (Size &amp; Type)</th>
<th>Sleeve O-Opt. Req'd</th>
<th>Point Contact</th>
<th>Assembly Thickness</th>
<th>F Rating</th>
<th>Nelson Product</th>
<th>U.L. System</th>
<th>Nelson FS Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS DUCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; x 15&quot;, 3000A Copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; x 27&quot;, 4000A Aluminum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; x 19&quot;, 4000A Aluminum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HVAC DUCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; diameter, 28 GA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; x 30&quot;, 24 GA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; x 24&quot;, 24 GA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; x 24&quot;, 24 GA, also 6&quot; thick hollow-core</td>
<td>R</td>
<td>4½ 3</td>
<td>PLW</td>
<td>C-AJ-0054</td>
<td>FS-0177</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; x 24&quot;, 28 GA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20&quot; x 36&quot; OVAL, 24 GA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24&quot; diameter, 22 GA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KITCHEN EXHAUST / AIR DUCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. 24&quot; x 48&quot;, 20 GA Air Duct &amp; Grease Duct</td>
<td>R</td>
<td>4½ 3</td>
<td>PLW</td>
<td>C-AJ-0054</td>
<td>FS-0177</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blanket Types Thermal Ceramics, ETS Schaefer and Vesuvius</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO PENETRATING ITEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5½&quot; x 11½&quot; top mounted</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; diameter, sleeved above floor</td>
<td>R</td>
<td>4½ 3</td>
<td>PLW</td>
<td>C-AJ-0054</td>
<td>FS-0177</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15&quot; diameter</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18&quot; x 7&quot;, top mounted, also 6&quot; thick hollow-core</td>
<td>R</td>
<td>4½ 3</td>
<td>PLW</td>
<td>C-AJ-0054</td>
<td>FS-0177</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18&quot; x 7&quot;, bottom mounted</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; x 30&quot;, also 6&quot; thick hollow-core</td>
<td>R</td>
<td>4½ 3</td>
<td>PLW</td>
<td>C-AJ-0054</td>
<td>FS-0177</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40&quot; x 48&quot;</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penetration Item (Size &amp; Type)</td>
<td>Point Contact</td>
<td>Assembly Thickness</td>
<td>F Rating</td>
<td>Nelson Product</td>
<td>U.L. System</td>
<td>Nelson FS Drawing</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------</td>
<td>---------------------</td>
<td>---------</td>
<td>----------------</td>
<td>-------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>STEEL PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-1007</td>
<td>FS-0409</td>
<td></td>
</tr>
<tr>
<td>COPPER PIPE / TUBING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; copper</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-1007</td>
<td>FS-0409</td>
<td></td>
</tr>
<tr>
<td>STEEL CONDUIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-1007</td>
<td>FS-0409</td>
<td></td>
</tr>
<tr>
<td>POWER CABLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C #2 AWG SER</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-3007</td>
<td>FS-0410</td>
<td></td>
</tr>
<tr>
<td>3C #12 AWG</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-3007</td>
<td>FS-0410</td>
<td></td>
</tr>
<tr>
<td>7C #12 AWG</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-3007</td>
<td>FS-0410</td>
<td></td>
</tr>
<tr>
<td>CONTROL CABLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C #2 AWG SER</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-3007</td>
<td>FS-0410</td>
<td></td>
</tr>
<tr>
<td>3C #12 AWG</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-3007</td>
<td>FS-0410</td>
<td></td>
</tr>
<tr>
<td>7C #12 AWG</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-3007</td>
<td>FS-0410</td>
<td></td>
</tr>
<tr>
<td>COMMUNICATIONS CABLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 pr. #24 AWG</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-3007</td>
<td>FS-0410</td>
<td></td>
</tr>
<tr>
<td>STEEL DUCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; diameter, 30 GA</td>
<td>X</td>
<td>G500 design</td>
<td>1</td>
<td>ES1399</td>
<td>F-E-7004</td>
<td>FS-0411</td>
<td></td>
</tr>
<tr>
<td>INSULATED STEEL PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 10, 1&quot; FIBERGLASS or ¾” AB/PVC</td>
<td>G500 design</td>
<td>1</td>
<td>LBS3</td>
<td>F-E-5007</td>
<td>FS-0566</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSULATED COPPER PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; copper, 1&quot; FIBERGLASS or ¾” AB/PVC</td>
<td>G500 design</td>
<td>1</td>
<td>LBS3</td>
<td>F-E-5007</td>
<td>FS-0566</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NON-METALLIC PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾” max. dia. multiple, SDR9 (PEX)</td>
<td>G500 design</td>
<td>1</td>
<td>LBS3</td>
<td>F-E-2020</td>
<td>FS-0565</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” Sch. 40 PVC, ABS, CPVC</td>
<td>G500 design</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-E-2024</td>
<td>FS-0627</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” Sch. 40 PVC, ABS, CPVC</td>
<td>G500 design</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-E-2025</td>
<td>FS-0628</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLEXIBLE METALLIC CONDUIT / PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½” FMC, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------</td>
<td>----------------</td>
<td>---------------</td>
<td>--------------------</td>
<td>----------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>STEEL PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾&quot;, / 2&quot;, Sch. 10 multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; Sch. 10 multiple</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-8162</td>
<td>FS-0641</td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 5 multiple</td>
<td>O</td>
<td>5</td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-1192</td>
<td>FS-0134</td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 10 multiple</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-1150</td>
<td>FS-0568</td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 10, multiple</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>ES1399</td>
<td>W-J-1119</td>
<td>FS-0351</td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 5</td>
<td>7½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-1046</td>
<td>FS-0091</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 5</td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-1054</td>
<td>FS-0092</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10</td>
<td>O</td>
<td>5</td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-1191</td>
<td>FS-0129</td>
<td></td>
</tr>
<tr>
<td>4&quot;, Sch. 5, multiple (max 24)</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>FSC3</td>
<td>C-AJ-1441</td>
<td>FS-0458</td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 5</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-8141</td>
<td>FS-0544</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10</td>
<td>5½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-1197</td>
<td>FS-0258</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10</td>
<td>O-PVC</td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-1581</td>
<td>FS-0666</td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10</td>
<td>O-PVC</td>
<td>4½</td>
<td>3</td>
<td>LBS3/ES1399</td>
<td>C-AJ-1580</td>
<td>FS-0666</td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 10, multiple</td>
<td>O</td>
<td>3</td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-1420</td>
<td>FS-0376</td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 5</td>
<td>4½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-1003</td>
<td>FS-0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 5, multiple</td>
<td>3½, 7</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-1040</td>
<td>FS-0084</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 40</td>
<td>O</td>
<td>2½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-1485</td>
<td>FS-0524</td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 40</td>
<td>O</td>
<td>4½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1486</td>
<td>FS-0525</td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 10, (one side application)</td>
<td>O</td>
<td>4½</td>
<td>2½</td>
<td>LBS3</td>
<td>C-AJ-1489</td>
<td>FS-0528</td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 40 (one side application)</td>
<td>O</td>
<td>4½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1439</td>
<td>FS-0456</td>
<td></td>
</tr>
<tr>
<td>10&quot; Sch. 5, multiple</td>
<td>4½</td>
<td>2</td>
<td>CMP</td>
<td>C-AJ-1219</td>
<td>FS-0125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; Sch. 40,</td>
<td>O</td>
<td>2½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-1484</td>
<td>FS-0523</td>
<td></td>
</tr>
<tr>
<td>10&quot; Sch. 10, multiple</td>
<td>4½</td>
<td>2</td>
<td>CMP</td>
<td>C-AJ-8049</td>
<td>FS-0149</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; Sch. 10</td>
<td>O</td>
<td>5</td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-1193</td>
<td>FS-0135</td>
<td></td>
</tr>
<tr>
<td>12&quot; Sch. 10</td>
<td>O</td>
<td>4½</td>
<td>3</td>
<td>CLK</td>
<td>C-AJ-1124</td>
<td>FS-0103</td>
<td></td>
</tr>
<tr>
<td>12&quot; Sch 30</td>
<td>O</td>
<td>4½</td>
<td>3</td>
<td>FSC3</td>
<td>C-AJ-1458</td>
<td>FS-0492</td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 5</td>
<td>5</td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-1203</td>
<td>FS-0145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 10</td>
<td>X</td>
<td>2½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1487</td>
<td>FS-0526</td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 30</td>
<td>O</td>
<td>4½</td>
<td>3</td>
<td>ES1399</td>
<td>C-AJ-1415</td>
<td>FS-0353</td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 10</td>
<td>6</td>
<td>3</td>
<td>LBS3</td>
<td>C-BJ-1051</td>
<td>FS-0545</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 10</td>
<td>O</td>
<td>4½</td>
<td>2 or 3</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1483</td>
<td>FS-0522</td>
<td></td>
</tr>
</tbody>
</table>
### CONCRETE / MASONRY WALLS

#### INSULATED STEEL PIPE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>¾&quot; / 2&quot; Sch. 10, 1&quot; AB/PVC, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 5, ⅝&quot; AB/PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 5, 1&quot; AB/PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 5, mult., ⅝&quot; AB/PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40, 2&quot; FIBERGLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 5, 1&quot; AB/PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10, ½&quot; AB/PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10, 1½&quot; FIBERGLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 5, 1&quot; FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 5, 2&quot; MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 10, 2&quot; FIBERGLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 10, 3&quot; FIBERGLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 10, 1&quot; AB/PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 5, 1&quot; FIBERGLASS/MINERAL FIBER, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 10, 1½&quot; CALCIUM SILICATE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 30, 1-3&quot; CELLULAR GLASS insulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 10, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 40, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; Sch. 10, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; Sch. 10, 3&quot; CELLULAR GLASS insulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; Sch. 40, 1&quot; CELLULAR GLASS insulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; Sch. 10, 1&quot; FIBERGLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot;, Sch. 30, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot;, Sch. 30, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot;, Sch. 10, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot;, Sch. 30, ½&quot; AB / PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 20, 2&quot; FIBERGLASS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### COPPER PIPE / TUBING

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>¾&quot; / 2&quot; copper, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; copper, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1¼&quot; copper, multiple (max. 24)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; copper, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper w/cable trays</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper (one side application)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper (one side application)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Penetration Item (Size & Type)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCRETE / MASONRY WALLS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSULATED COPPER PIPE / TUBING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>⅛&quot; / 2&quot; copper, 1&quot; AB/PVC w/multiple other pipes</td>
<td>3</td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-8118</td>
<td>FS-0377</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; copper, ¾&quot; AB/PVC, multiple</td>
<td>X</td>
<td>4½</td>
<td>ES1399/1BS3</td>
<td>C-AJ-8162</td>
<td>FS-0641</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; copper, ⅝&quot; AB/PVC</td>
<td>6</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-5054</td>
<td>FS-0107</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; copper, 1&quot; AB/PVC</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-8141</td>
<td>FS-0544</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; copper, 1&quot; FIBERGLASS/MINERAL FIBER</td>
<td>3½</td>
<td>2,3</td>
<td>CMP</td>
<td>C-AJ-5008</td>
<td>FS-0027</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; copper, 1&quot; FIBERGLASS/MINERAL FIBER, multiple</td>
<td>3½</td>
<td>2,3</td>
<td>CMP</td>
<td>C-AJ-6007</td>
<td>FS-0084</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; copper, multi., ¾&quot; AB/PVC</td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-5259</td>
<td>FS-0540</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, 2&quot; FIBERGLASS</td>
<td>2½</td>
<td>1½</td>
<td>WRS3/LBS3</td>
<td>C-AJ-5268</td>
<td>FS-0618</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, 1&quot; AB/PVC</td>
<td>2½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-5257</td>
<td>FS-0538</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-5108</td>
<td>FS-0582</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, ⅝&quot; AB/PVC</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-5109</td>
<td>FS-0583</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, 1½&quot; FIBERGLASS</td>
<td>6</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-5066</td>
<td>FS-0115</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, 2&quot; MINERAL FIBER</td>
<td>X</td>
<td>4½</td>
<td>ES1399</td>
<td>C-AJ-1532</td>
<td>FS-0646</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 2&quot; FIBERGLASS</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>ES1399</td>
<td>W-J-5076</td>
<td>FS-0393</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td>O</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>ES1399</td>
<td>W-J-5086</td>
<td>FS-0469</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 2&quot; FIBERGLASS</td>
<td>O</td>
<td>X</td>
<td>5&quot;</td>
<td>3</td>
<td>ES1399/LBS3</td>
<td>C-AJ-5288</td>
<td>FS-0648</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, ¾&quot; AB / PVC</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>ES1399</td>
<td>W-J-5087</td>
<td>FS-0470</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 1&quot; AB / PVC</td>
<td>4½</td>
<td>3</td>
<td>WRS3/LBS3</td>
<td>C-AJ-5269</td>
<td>FS-0619</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 3&quot; FIBERGLASS/MINERAL FIBER</td>
<td>R</td>
<td>X</td>
<td>6</td>
<td>1/8</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-J-5110</td>
<td>FS-0584</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; copper, 1&quot; AB/PVC</td>
<td>4½</td>
<td>1½</td>
<td>LBS3</td>
<td>C-AJ-5255</td>
<td>FS-0536</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REFRIGERATION LINES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; copper/steel, 1&quot; AB/PVC</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-8141</td>
<td>FS-0544</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NON-METALLIC PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>⅛&quot; PEX, multiple</td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-2148</td>
<td>FS-0573</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; PEX</td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-2148</td>
<td>FS-0573</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; PEX, multiple</td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-2461</td>
<td>FS-0529</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 40 PVC, CPVC</td>
<td>6</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-2306</td>
<td>FS-0116</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 40 ABS or PEX</td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-2146</td>
<td>FS-0571</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 40 PVC, CPVC</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2,3</td>
<td>LBS3</td>
<td>C-AJ-2463</td>
<td>FS-0531</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC</td>
<td>O</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-2462</td>
<td>FS-0530</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC</td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-8141</td>
<td>FS-0544</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, ABS, CPVC</td>
<td>6</td>
<td>2</td>
<td>ES1399</td>
<td>W-J-2104</td>
<td>FS-0392</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC</td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-2146</td>
<td>FS-0571</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 FRPP, ABS</td>
<td>4½</td>
<td>3</td>
<td>PCS</td>
<td>C-AJ-2102</td>
<td>FS-0117</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC</td>
<td>6</td>
<td>2,3</td>
<td>LBS3</td>
<td>C-BJ-2022</td>
<td>FS-0546</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC, ENT</td>
<td>O</td>
<td>X</td>
<td>5&quot;</td>
<td>3</td>
<td>ES1399</td>
<td>C-AJ-2525</td>
<td>FS-0647</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 40 PVC, CPVC, ABS</td>
<td>R</td>
<td>4½</td>
<td>2</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2474</td>
<td>FS-0615</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 40 PVC, CPVC</td>
<td>6</td>
<td>2</td>
<td>WRS3/LBS3</td>
<td>W-J-2155</td>
<td>FS-0630</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 40 PVC, CPVC, ABS</td>
<td>R</td>
<td>4½</td>
<td>3</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2472</td>
<td>FS-0613</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 40 PVC, RNC, ENT, Closed PVC</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2,3</td>
<td>LBS3</td>
<td>C-AJ-2596</td>
<td>FS-0668</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; glass pipe</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-2147</td>
<td>FS-0572</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 PVC, ABS</td>
<td>X</td>
<td>4½</td>
<td>2</td>
<td>ES1399</td>
<td>F-A-2122</td>
<td>FS-0511</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 PVC, ABS, CPVC</td>
<td>4½</td>
<td>2</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2476</td>
<td>FS-0617</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 PVC, ABS, CPVC</td>
<td>X</td>
<td>6</td>
<td>2</td>
<td>WRS3/LBS3</td>
<td>W-J-2154</td>
<td>FS-0629</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 PVC, ABS, FRPP, CPVC</td>
<td>O</td>
<td>X</td>
<td>2½</td>
<td>2,3</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2473</td>
<td>FS-0614</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 PVC, CPVC, PB</td>
<td>4½</td>
<td>2</td>
<td>PCS</td>
<td>C-AJ-2086</td>
<td>FS-0111</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 ABS</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2,3</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2489</td>
<td>FS-0638</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5&quot; Sch. 40 PVC, CPVC</td>
<td>O</td>
<td>X</td>
<td>4½</td>
<td>2,3</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2489</td>
<td>FS-0638</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; glass pipe</td>
<td>6</td>
<td>2</td>
<td>ES1399</td>
<td>W-J-2103</td>
<td>FS-0391</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 40 PVC, CPVC</td>
<td>O</td>
<td>X</td>
<td>2½</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>C-AJ-2475</td>
<td>FS-0616</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### STEEL CONDUIT

<table>
<thead>
<tr>
<th>Penetration Item (Size &amp; Type)</th>
<th>Sleeve</th>
<th>Point Contact</th>
<th>Assembly Thickness</th>
<th>F. Rating</th>
<th>Nelson Product</th>
<th>U.L. System</th>
<th>Nelson FS Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONCRETE / MASONRY WALLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½&quot; / 2&quot; EMT multiple</td>
<td>O</td>
<td></td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-8118</td>
<td>FS-0377</td>
<td></td>
</tr>
<tr>
<td>2&quot; EMT/RMC, multiple</td>
<td>O</td>
<td></td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-1192</td>
<td>FS-0134</td>
<td></td>
</tr>
<tr>
<td>2&quot; EMT/RMC, multiple</td>
<td>X</td>
<td></td>
<td>2</td>
<td>LBS3</td>
<td>W-J-1150</td>
<td>FS-0568</td>
<td></td>
</tr>
<tr>
<td>2&quot; EMT/RMC</td>
<td>4½</td>
<td>3 FSP</td>
<td></td>
<td></td>
<td></td>
<td>FS-0008</td>
<td></td>
</tr>
<tr>
<td>3&quot; EMT multiple</td>
<td>X</td>
<td></td>
<td>2</td>
<td>ES1399</td>
<td>W-J-1119</td>
<td>FS-0351</td>
<td></td>
</tr>
<tr>
<td>3&quot; EMT/RMC</td>
<td>7½</td>
<td>3 FSP</td>
<td></td>
<td></td>
<td></td>
<td>FS-0091</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC</td>
<td>O</td>
<td></td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-1191</td>
<td>FS-0129</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC, multiple (max 24)</td>
<td>X</td>
<td></td>
<td>2½</td>
<td>LBS3</td>
<td>C-AJ-1485</td>
<td>FS-0524</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC</td>
<td>O</td>
<td></td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1486</td>
<td>FS-0525</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC</td>
<td>5</td>
<td>2 CLK</td>
<td></td>
<td></td>
<td></td>
<td>FS-0099</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC (one side application)</td>
<td>O</td>
<td></td>
<td>2½</td>
<td>LBS3</td>
<td>C-AJ-1489</td>
<td>FS-0528</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC (one side application)</td>
<td>O</td>
<td></td>
<td>2½</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1439</td>
<td>FS-0456</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>O</td>
<td></td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-1193</td>
<td>FS-0135</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>5</td>
<td>2 CLK</td>
<td></td>
<td></td>
<td></td>
<td>FS-0145</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC, multiple</td>
<td>4½</td>
<td>2 CMP</td>
<td></td>
<td></td>
<td></td>
<td>FS-0125</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>O</td>
<td></td>
<td>2½</td>
<td>LBS3</td>
<td>C-AJ-1484</td>
<td>FS-0523</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>X</td>
<td></td>
<td>2½</td>
<td>ES1399/LBS3</td>
<td>C-AJ-1487</td>
<td>FS-0526</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>4½</td>
<td>2 CMP</td>
<td></td>
<td></td>
<td></td>
<td>FS-0099</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC/2&quot; FIBERGLASS/ MIN. FIBER</td>
<td>X</td>
<td>6</td>
<td>2 ES1399</td>
<td>W-J-5085</td>
<td>FS-0468</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC/2&quot; FIBERGLASS/ MIN. FIBER</td>
<td>O</td>
<td>6</td>
<td>2 ES1399</td>
<td>W-J-5086</td>
<td>FS-0469</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC/2½ AB/ PVC insulation</td>
<td>X</td>
<td>6</td>
<td>2 ES1399</td>
<td>W-J-5087</td>
<td>FS-0470</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>4½</td>
<td>3 FSP</td>
<td></td>
<td></td>
<td></td>
<td>FS-0001</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>4½</td>
<td>3 CLK</td>
<td></td>
<td></td>
<td></td>
<td>FS-0103</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>6</td>
<td>3 LBS3</td>
<td></td>
<td></td>
<td></td>
<td>FS-0545</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC, multiple</td>
<td>3½, 7</td>
<td>3,4 CMP</td>
<td></td>
<td></td>
<td></td>
<td>FS-0084</td>
<td></td>
</tr>
</tbody>
</table>

### FLEXIBLE METALLIC CONDUIT / PIPING

<table>
<thead>
<tr>
<th>Penetration Item (Size &amp; Type)</th>
<th>Sleeve</th>
<th>Point Contact</th>
<th>Assembly Thickness</th>
<th>F. Rating</th>
<th>Nelson Product</th>
<th>U.L. System</th>
<th>Nelson FS Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot; FMT, aluminum pipe, multiple</td>
<td>X</td>
<td></td>
<td>2</td>
<td>LB3</td>
<td>W-J-1152</td>
<td>FS-0570</td>
<td></td>
</tr>
<tr>
<td>1½&quot; FMC, mltp. Steel</td>
<td>X</td>
<td></td>
<td>2</td>
<td>ES1399</td>
<td>W-J-1162</td>
<td>FS-0520</td>
<td></td>
</tr>
<tr>
<td>1½&quot; FMC, mltp. Steel</td>
<td>R</td>
<td></td>
<td>2</td>
<td>LB3</td>
<td>C-AJ-1488</td>
<td>FS-0527</td>
<td></td>
</tr>
<tr>
<td>1½&quot; FMC, mltp. Steel, Al</td>
<td>O</td>
<td></td>
<td>2,3</td>
<td>ES1399</td>
<td>C-AJ-1512</td>
<td>FS-0517</td>
<td></td>
</tr>
</tbody>
</table>
## CONCRETE / MASONRY WALLS

### NON- METALLIC CONDUIT

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>½&quot; ENT</td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-J-2003</td>
<td>FS-0078</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; RNC</td>
<td>6</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-2096</td>
<td>FS-0116</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; ENT</td>
<td>6</td>
<td>2</td>
<td>LB3</td>
<td>W-J-2146</td>
<td>FS-0571</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td>6</td>
<td>2</td>
<td>ES199</td>
<td>W-J-2104</td>
<td>FS-0392</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td>6</td>
<td>2</td>
<td>LB3</td>
<td>W-J-2146</td>
<td>FS-0571</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td>O</td>
<td>X</td>
<td>5&quot;</td>
<td>ES199</td>
<td>C-AJ-2525</td>
<td>FS-0647</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; RNC</td>
<td>6</td>
<td>2</td>
<td>WRS3/LBS3</td>
<td>W-J-2155</td>
<td>FS-0630</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 40 PVC, RNC, ENT, Closed PVC</td>
<td>O</td>
<td>X</td>
<td>4½, 2</td>
<td>LBS3</td>
<td>C-AJ-2596</td>
<td>FS-0668</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; RNC</td>
<td>6</td>
<td>2</td>
<td>WRS3/LBS3</td>
<td>W-J-2154</td>
<td>FS-0629</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; RNC</td>
<td>4½</td>
<td>2</td>
<td>PCS</td>
<td>C-AJ-2086</td>
<td>FS-0111</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CABLE TRAY

| 18" x 4" steel tray - 39% fill | 4½     | 3              | FSP           | C-AJ-4001          | FS-0020 |
| 18" x 5" aluminum tray - 20% fill | 5      | 2              | LB3           | W-J-4045          | FS-0579 |
| 24" x 4" steel tray - 30% fill | 4½     | 2              | CMP/PLW       | C-AJ-4033          | FS-0148 |
| 24" x 4" steel or aluminum - 40% fill | X | 4½     | 2              | PLW/FSP           | C-AJ-4013 | FS-0100 |
| 24" x 3" steel tray - 38% fill | 8      | 3              | CMP           | C-BJ-4034         | FS-0064 |
| 24" x 4" steel tray - 40% fill | X      | 6              | Fire Brick    | W-J-4058          | FS-0643 |
| 36" x 4" steel tray - 30% fill, multiple w/pipe | 4½     | 2              | CMP           | C-AJ-8049         | FS-0149 |
| 36" x 6" steel tray - 36% fill | 4½     | 2              | PLW/FSP       | C-AJ-4032         | FS-0147 |
| 18" x 4" steel sleeve - 36% fill, 350 MCM | R       | 6              | PLW/FSP       | W-J-3100          | FS-0491 |

### POWER CABLE

| Max 4C #5awg Al. or Stl. METAL CLAD | 6    | 2    | FSP | C-AJ-3149 | FS-0501 |
| 18 AWG RG6/U | 6     | 2/18  | 1.2 | LB3      | W-J-3119 | FS-0576 |
| 41% fill, 2C #12 AWG ROMEX | X     | 6  | 2 | LB3 | W-J-3118          | FS-0577 |
| 3C #12 AWG ROMEX | X  | 6  | 2 | LB3 | W-J-3116          | FS-0575 |
| 3C #2/0 AL SER | X      | 6  | 2 | LB3 | W-J-3117          | FS-0576 |
| 3C #2/0 AL SER | X      | 6  | 2 | ES199  | C-AJ-3235 | FS-0631 |
| 3C #2/0, max. 2 bundles w/ other penetrants | X | 6  | 2 | ES199  | C-AJ-8118 | FS-0377 |
| 45% fill, 3C #2/0 SER | O-PVC | 4½  | 3 | LB3 | C-AJ-3289 | FS-0669 |
| 45% fill, 4C #2/0, COPPER, STEEL, AL., MC | O-PVC | 4½  | 3 | LB3 | C-AJ-3289 | FS-0669 |
| 3C-2 AWG ROMEX | X      | 6  | 2 | LB3 | W-J-3117          | FS-0576 |
| 3C #18 AWG or 1C #3 AWG | R      | 8½  | 3 | CLK | C-BJ-3014  | FS-0192 |
| 25% fill, 3C #2/0 AWG METAL CLAD (Ai, St) | X    | 6 | 2 | LB3 | W-J-3116          | FS-0575 |
| 40% fill, 3C #2/0 AL SER | X      | 6  | 2 | LB3 | W-J-3116          | FS-0575 |
| 40% fill, 3C #12 AWG ROMEX | X | 6  | 2 | LB3 | W-J-3116          | FS-0575 |
| 4C-2 AWG armored, METAL CLAD | X     | 6 | 2 | FSP | C-AJ-3090 | FS-0127 |
| 41% fill, 4C-2/0 AWG armored, METAL CLAD (Ai, St) | X | 6  | 2 | LB3 | W-J-3118          | FS-0577 |
| 45% fill, 3C #12 ROMEX | O-PVC | 4½  | 3 | LB3 | C-AJ-3289 | FS-0669 |
| 3C #12 AWG METAL CLAD | X     | 6  | 2 | Fire Brick | W-J-3159 | FS-0664 |
| 55.8% fill, 4C #12 AWG | R | 6 1/8 | 1.2 | LB3 | W-J-3119 | FS-0578 |
| 19% fill, 7C #16, 4pr #24 AWG, 2C #12 AWG | X | 6  | 2 | ES199 | W-J-3086 | FS-0467 |
| 300 MCM | 3½     | 2 | MPS | C-AJ-3047 | FS-0087 |
| 15% fill, 300MCM / #2 AWG multi cond. | 4½    | 3 | FSP | C-AJ-3003 | FS-0002 |
| 350 MCM | R      | 4½  | 2 | PLW | C-AJ-3093 | FS-0130 |
| 350 MCM | R      | 4½  | 2, 3 | MCT | C-AJ-3048 | FS-0114 |
| 350 MCM copper conductor | 6  | 2 | Fire Brick | W-J-3159 | FS-0664 |
| 25% fill, 350 MCM | O | 6  | 2 | ES199 | C-AJ-3235 | FS-0631 |
| 33% fill, 350 MCM | R      | 6  | 2 | PLW/FSP | W-J-3100 | FS-0491 |
| 36% fill, 350 MCM | X      | 6  | 2 | LB3 | W-J-3116          | FS-0575 |
| 41% fill, 350 MCM | X      | 6  | 2 | LB3 | W-J-3118          | FS-0577 |
| 45% fill, 350 MCM | O-PVC | 4½  | 3 | LB3 | C-AJ-3289 | FS-0669 |
| 55.8% fill, 350 MCM | R | 6 1/8 | 1.2 | LB3 | W-J-3119 | FS-0578 |
| 36% fill, 750 MCM | 8  | 2 | CPS/FSP | C-BJ-4016 | FS-0094 |
| 38% fill, 750 MCM | O | 2½ | 2 | LB3 | C-AJ-3224 | FS-0533 |
| 40% fill, 750 MCM | O | 4½ | 3 | LB3 | C-AJ-3227 | FS-0535 |
| 70% fill, 750 MCM | O | 5  | 2 | PCS/FSP | C-AJ-3118 | FS-0196 |
### CONCRETE / MASONRY WALLS

**CONTROL CABLE**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2C #10 AWG, multiple</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-8162</td>
<td>FS-0641</td>
</tr>
<tr>
<td>(7) 2C #20 AWG</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-J-3008</td>
<td>FS-0080</td>
</tr>
<tr>
<td>3C #18 AWG or 1C #3 AWG</td>
<td>R</td>
<td></td>
<td></td>
<td>8½</td>
<td>3</td>
<td>CLK</td>
<td>C-BJ-3014</td>
<td>FS-0192</td>
</tr>
<tr>
<td>3C #2 AWG aluminum armored, METAL CLAD, multiple</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-3117</td>
<td>FS-0576</td>
</tr>
<tr>
<td>3C #2/0 AWG al or stl armored/METAL CLAD</td>
<td>O</td>
<td>X</td>
<td></td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-3226</td>
<td>FS-0534</td>
</tr>
<tr>
<td>4C #2 AWG armored, METAL CLAD</td>
<td>O</td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-3090</td>
<td>FS-0127</td>
</tr>
<tr>
<td>7C #12 AWG</td>
<td>R</td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>PLW</td>
<td>C-AJ-3093</td>
<td>FS-0130</td>
</tr>
<tr>
<td>25% fill, 7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-3235</td>
<td>FS-0631</td>
</tr>
<tr>
<td>15% fill, 7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-3003</td>
<td>FS-0002</td>
</tr>
<tr>
<td>36% fill, 7C #12 AWG</td>
<td>R</td>
<td></td>
<td></td>
<td>6</td>
<td>2</td>
<td>PLW/FSP</td>
<td>W-J-3100</td>
<td>FS-0491</td>
</tr>
<tr>
<td>100% fill, 7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td>3¼</td>
<td>2</td>
<td>MPS</td>
<td>C-AJ-3047</td>
<td>FS-0087</td>
</tr>
<tr>
<td>7C #24 AWG, multiple</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2.3</td>
<td>MCT</td>
<td>C-AJ-3048</td>
<td>FS-0114</td>
</tr>
<tr>
<td>25% fill, 7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-3003</td>
<td>FS-0002</td>
</tr>
<tr>
<td>15% fill, 7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-3003</td>
<td>FS-0002</td>
</tr>
<tr>
<td>100% fill, 7C #12 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-3003</td>
<td>FS-0002</td>
</tr>
<tr>
<td>7C #24 AWG, multiple</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>ES1399/LBS3</td>
<td>C-AJ-8162</td>
<td>FS-0641</td>
</tr>
</tbody>
</table>

**COMMUNICATIONS CABLE**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25 pr. pvc insulated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>CLK</td>
<td>W-J-3010</td>
<td>FS-0101</td>
</tr>
<tr>
<td>15% fill, 25 pr. #24 AWG</td>
<td>R</td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>PLW</td>
<td>C-AJ-3093</td>
<td>FS-0130</td>
</tr>
<tr>
<td>15% fill, 25 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-3003</td>
<td>FS-0002</td>
</tr>
<tr>
<td>50 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-J-3007</td>
<td>FS-0079</td>
</tr>
<tr>
<td>200 pr. #24 AWG copper conductor</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>2</td>
<td>Fire Brick</td>
<td>W-J-3159</td>
<td>FS-0664</td>
</tr>
<tr>
<td>13% fill, 100 pr. #24 telephone</td>
<td></td>
<td></td>
<td></td>
<td>7½</td>
<td>3</td>
<td>FSP</td>
<td>C-AJ-3004</td>
<td>FS-0014</td>
</tr>
<tr>
<td>400 pr. #24 AWG comm.</td>
<td>X</td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-3118</td>
<td>FS-0577</td>
</tr>
<tr>
<td>400 pr. #24 AWG comm. Cable bundles w/ more</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-8118</td>
<td>FS-0377</td>
</tr>
<tr>
<td>38% fill, 400 pr. #24 AWG</td>
<td>O</td>
<td></td>
<td></td>
<td>2½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-3224</td>
<td>FS-0533</td>
</tr>
<tr>
<td>40% fill, 400 pr. #24 AWG</td>
<td>O</td>
<td></td>
<td></td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3227</td>
<td>FS-0535</td>
</tr>
<tr>
<td>40% fill, 5 pr. #24 AWG</td>
<td>R</td>
<td></td>
<td></td>
<td>5</td>
<td>2</td>
<td>CLK</td>
<td>C-AJ-3094</td>
<td>FS-0131</td>
</tr>
<tr>
<td>25% fill, 25 pr. #24 AWG</td>
<td>R</td>
<td></td>
<td></td>
<td>5</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-3115</td>
<td>FS-0574</td>
</tr>
<tr>
<td>25% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>2</td>
<td>ES1399</td>
<td>C-AJ-3235</td>
<td>FS-0631</td>
</tr>
<tr>
<td>33% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>LBS3</td>
<td>C-AJ-3225</td>
<td>FS-0532</td>
</tr>
<tr>
<td>40% fill, 100 pr. #24 AWG</td>
<td>R</td>
<td></td>
<td></td>
<td>6</td>
<td>2</td>
<td>FSP</td>
<td>W-J-3075</td>
<td>FS-0383</td>
</tr>
<tr>
<td>70% fill, 100 pr. #24 AWG</td>
<td>O</td>
<td></td>
<td></td>
<td>5</td>
<td>2</td>
<td>PCS/FSP</td>
<td>C-AJ-3118</td>
<td>FS-0196</td>
</tr>
<tr>
<td>100% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>3¼</td>
<td>2</td>
<td>MPS</td>
<td>C-AJ-3047</td>
<td>FS-0087</td>
</tr>
<tr>
<td>100% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>MCT</td>
<td>C-AJ-3048</td>
<td>FS-0114</td>
</tr>
<tr>
<td>100% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>MCT</td>
<td>C-AJ-3048</td>
<td>FS-0114</td>
</tr>
<tr>
<td>100% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>MCT</td>
<td>C-AJ-3048</td>
<td>FS-0114</td>
</tr>
<tr>
<td>100% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>MCT</td>
<td>C-AJ-3048</td>
<td>FS-0114</td>
</tr>
<tr>
<td>100% fill, 100 pr. #24 AWG</td>
<td></td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>MCT</td>
<td>C-AJ-3048</td>
<td>FS-0114</td>
</tr>
<tr>
<td>40% fill, 400 pr. #24 AWG</td>
<td>O</td>
<td></td>
<td></td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0069</td>
</tr>
<tr>
<td>45% fill, 400 pr. #24 AWG</td>
<td>O-PVC</td>
<td></td>
<td></td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0069</td>
</tr>
<tr>
<td>45% fill, RG59/U, RG/6 COAX</td>
<td>O-PVC</td>
<td></td>
<td></td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0069</td>
</tr>
<tr>
<td>45% fill, 62.5/125 Fiber optic</td>
<td>O-PVC</td>
<td></td>
<td></td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3289</td>
<td>FS-0069</td>
</tr>
<tr>
<td>24 Fiber optic</td>
<td>X</td>
<td></td>
<td></td>
<td>6</td>
<td>2</td>
<td>LBS3</td>
<td>W-J-3116</td>
<td>FS-0575</td>
</tr>
<tr>
<td>62.5/125 Fiber optic</td>
<td>R</td>
<td>X</td>
<td></td>
<td>6 1/8</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-J-3119</td>
<td>FS-0578</td>
</tr>
<tr>
<td>40% fill, 62.5/125 Fiber optic</td>
<td>O</td>
<td></td>
<td></td>
<td>4½</td>
<td>3</td>
<td>LBS3</td>
<td>C-AJ-3227</td>
<td>FS-0535</td>
</tr>
<tr>
<td>72 Fiber optic</td>
<td>R</td>
<td></td>
<td></td>
<td>4½</td>
<td>2</td>
<td>FSP</td>
<td>C-AJ-3089</td>
<td>FS-0126</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>-------------------</td>
<td>--------</td>
<td>---------------</td>
<td>-------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td><strong>CONCRETE / MASONRY WALLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BUS DUCT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; x 15&quot;, 3000A Copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; x 19&quot;, 4000A Aluminum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; x 27&quot;, 4000A Aluminum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HVAC DUCT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; x 30&quot;, 24 GA</td>
<td></td>
<td></td>
<td>4½ 3</td>
<td></td>
<td>ES1399</td>
<td></td>
<td>C-AJ-7079</td>
<td></td>
</tr>
<tr>
<td>12&quot; x 12&quot;, 24 GA</td>
<td></td>
<td></td>
<td>5 2</td>
<td></td>
<td>LBS3</td>
<td></td>
<td>W-J-7061</td>
<td></td>
</tr>
<tr>
<td>12&quot; x 24&quot;, 24 GA</td>
<td></td>
<td>X</td>
<td>4½ 2</td>
<td></td>
<td>ES1399</td>
<td></td>
<td>C-AJ-7077</td>
<td></td>
</tr>
<tr>
<td>12&quot; x 24&quot;, 28 GA</td>
<td></td>
<td></td>
<td>6 2</td>
<td></td>
<td>FSP</td>
<td></td>
<td>C-AJ-7010</td>
<td></td>
</tr>
<tr>
<td>12&quot; x 24&quot;, 24 GA</td>
<td></td>
<td></td>
<td>4½ 1½</td>
<td></td>
<td>LBS3</td>
<td></td>
<td>C-AJ-7091</td>
<td></td>
</tr>
<tr>
<td>18&quot; x 67&quot;, 24 GA</td>
<td></td>
<td>X</td>
<td>6 2</td>
<td></td>
<td>ES1399</td>
<td></td>
<td>W-J-7048</td>
<td></td>
</tr>
<tr>
<td>20&quot; x 36&quot; OVAL, 24 GA</td>
<td></td>
<td>X</td>
<td>5 2</td>
<td></td>
<td>ES1399</td>
<td></td>
<td>C-AJ-7078</td>
<td></td>
</tr>
<tr>
<td>20&quot; x 20&quot;, 24 GA</td>
<td></td>
<td>X</td>
<td>6 2</td>
<td></td>
<td>FSC3</td>
<td></td>
<td>W-J-7047</td>
<td></td>
</tr>
<tr>
<td>24&quot; x 30&quot;, 24 GA, 1½ fiberglass</td>
<td></td>
<td></td>
<td>6 2</td>
<td></td>
<td>ES1399</td>
<td></td>
<td>W-J-7049</td>
<td></td>
</tr>
<tr>
<td>40&quot; x 20&quot;, 24 GA</td>
<td></td>
<td></td>
<td>6 2</td>
<td></td>
<td>LBS3</td>
<td></td>
<td>W-J-7062</td>
<td></td>
</tr>
<tr>
<td><strong>KITCHEN EXHAUST / AIR DUCT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. 24&quot; x 48&quot;, 20 GA Air Duct &amp; Grease Duct</td>
<td></td>
<td></td>
<td>4½ 2</td>
<td>FSP</td>
<td>C-AJ-7018</td>
<td>C-AJ-7024</td>
<td>C-AJ-7025</td>
<td></td>
</tr>
<tr>
<td>Blanket Types Thermal Ceramics, ETS Schaefer and Vesuvius</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEEL DUCT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; diameter* 30 GA</td>
<td></td>
<td>X</td>
<td>6 2</td>
<td></td>
<td>LBS3</td>
<td></td>
<td>W-J-7063</td>
<td></td>
</tr>
<tr>
<td>6&quot; diameter* 28 GA</td>
<td></td>
<td>X</td>
<td>6 2</td>
<td></td>
<td>ES1399</td>
<td></td>
<td>W-J-7051</td>
<td></td>
</tr>
<tr>
<td>10&quot; diameter* 28 GA</td>
<td></td>
<td>5 2</td>
<td></td>
<td></td>
<td>LBS3</td>
<td></td>
<td>C-AJ-7092</td>
<td></td>
</tr>
<tr>
<td>24&quot; diameter, 22 GA</td>
<td></td>
<td>X</td>
<td>4½ 3</td>
<td></td>
<td>ES1399</td>
<td></td>
<td>C-AJ-7093</td>
<td></td>
</tr>
<tr>
<td><strong>NO PENETRATING ITEMS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5½&quot; x 11½&quot; top mounted</td>
<td></td>
<td></td>
<td>4½ 3</td>
<td></td>
<td>Plate</td>
<td></td>
<td>C-AJ-0010</td>
<td></td>
</tr>
<tr>
<td>6&quot; diameter, sleeved</td>
<td></td>
<td>R</td>
<td>4½ 3</td>
<td></td>
<td>PLW</td>
<td></td>
<td>C-AJ-0054</td>
<td></td>
</tr>
<tr>
<td>6&quot; diameter, sleeved</td>
<td></td>
<td>R</td>
<td>4½ 3</td>
<td></td>
<td>PLW</td>
<td></td>
<td>C-AJ-0099</td>
<td></td>
</tr>
<tr>
<td>15&quot; diameter</td>
<td></td>
<td>O</td>
<td>4½ 3</td>
<td></td>
<td>ES1399</td>
<td></td>
<td>C-AJ-0104</td>
<td></td>
</tr>
<tr>
<td>18&quot; x 7&quot;, top mounted</td>
<td></td>
<td></td>
<td>4½ 2</td>
<td></td>
<td>CPS</td>
<td></td>
<td>C-AJ-0049</td>
<td></td>
</tr>
<tr>
<td>18&quot; x 7&quot;, bottom mounted</td>
<td></td>
<td></td>
<td>4½ 2</td>
<td></td>
<td>CPS</td>
<td></td>
<td>C-AJ-0050</td>
<td></td>
</tr>
<tr>
<td>10&quot; x 30&quot;</td>
<td></td>
<td>3½ 7 3, 4</td>
<td></td>
<td></td>
<td>CMP</td>
<td></td>
<td>C-AJ-0030</td>
<td></td>
</tr>
<tr>
<td>40&quot; x 48&quot;</td>
<td></td>
<td>4½ 3</td>
<td></td>
<td></td>
<td>CMP</td>
<td></td>
<td>C-AJ-0043</td>
<td></td>
</tr>
</tbody>
</table>

Rev.36, April 2009  
2009 Nelson Firestop Products
<table>
<thead>
<tr>
<th>Penetration Item (Size &amp; Type)</th>
<th>Sleeve O-Ch-R-Reqd</th>
<th>Point Contact</th>
<th>Assembly Thickness</th>
<th>F Rating</th>
<th>Nelson Product</th>
<th>U.L. System</th>
<th>Nelson FS Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEEL PIPE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; Sch. 5</td>
<td></td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-L-1006</td>
<td>FS-0041</td>
<td></td>
</tr>
<tr>
<td>1&quot; Sch. 10, multiple</td>
<td></td>
<td>5</td>
<td>1,2</td>
<td>FSP</td>
<td>W-L-1031</td>
<td>FS-0098</td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 10, multiple</td>
<td></td>
<td>X</td>
<td>3,4, 5</td>
<td>LBS3</td>
<td>W-L-1335</td>
<td>FS-0591</td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 10, multiple</td>
<td></td>
<td>X</td>
<td>3,4, 5</td>
<td>ES1399</td>
<td>W-L-1277</td>
<td>FS-0349</td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 5</td>
<td></td>
<td>3,4, 5</td>
<td>1,2</td>
<td>CLK</td>
<td>W-L-1030</td>
<td>FS-0095</td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10</td>
<td>R</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>CLK</td>
<td>W-L-1083</td>
<td>FS-0133</td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 5, multiple</td>
<td></td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-8051</td>
<td>FS-0612</td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 10</td>
<td></td>
<td>X</td>
<td>3,4, 5</td>
<td>ES1399</td>
<td>W-L-1276</td>
<td>FS-0348</td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 10</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-1334</td>
<td>FS-0590</td>
<td></td>
</tr>
<tr>
<td>24&quot; Sch. 5</td>
<td>R</td>
<td>X</td>
<td>3,4, 5</td>
<td>ES1399/LBS3</td>
<td>W-L-1405</td>
<td>FS-0657</td>
<td></td>
</tr>
<tr>
<td><strong>INSULATED STEEL PIPE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 5, 1&quot; AB/PVC, 1/4&quot; MINERAL FIBER</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-8051</td>
<td>FS-0612</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-5213</td>
<td>FS-0605</td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 10, 1/4&quot; AB/PVC</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-5214</td>
<td>FS-0606</td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 10, 1/4&quot; FIBERGLASS/MINERAL FIBER</td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-L-5036</td>
<td>FS-0108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 10, 2&quot; FIBERGLASS</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>ES1399</td>
<td>W-L-5161</td>
<td>FS-0399</td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 10, 3&quot; FIBERGLASS</td>
<td>R</td>
<td>X</td>
<td>3,4, 5</td>
<td>LBS3</td>
<td>W-L-5216</td>
<td>FS-0608</td>
<td></td>
</tr>
<tr>
<td>6&quot; Sch. 10, 3&quot; CELLULAR GLASS</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>ES1399</td>
<td>W-L-5212</td>
<td>FS-0516</td>
<td></td>
</tr>
<tr>
<td>8&quot; Sch. 10, 1/4&quot; CALCIUM SILICATE</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-5211</td>
<td>FS-0603</td>
<td></td>
</tr>
<tr>
<td>10&quot; Sch. 10, 3&quot; CELLULAR GLASS</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-5212</td>
<td>FS-0604</td>
<td></td>
</tr>
<tr>
<td>12&quot; Sch. 30, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>ES1399</td>
<td>W-L-5178</td>
<td>FS-0463</td>
<td></td>
</tr>
<tr>
<td>12&quot; Sch. 30, 3&quot; FIBERGLASS/MINERAL FIBER</td>
<td>R</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>ES1399</td>
<td>W-L-5179</td>
<td>FS-0464</td>
</tr>
<tr>
<td>12&quot; Sch. 30, 3/4&quot; AB / PVC</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>ES1399</td>
<td>W-L-5180</td>
<td>FS-0465</td>
<td></td>
</tr>
<tr>
<td>12&quot; Sch. 30, 2&quot; FIBERGLASS</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-5215</td>
<td>FS-0607</td>
<td></td>
</tr>
<tr>
<td><strong>COPPER PIPE / TUBING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; copper</td>
<td></td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-L-1006</td>
<td>FS-0041</td>
<td></td>
</tr>
<tr>
<td>2&quot; copper</td>
<td></td>
<td>5</td>
<td>1,2</td>
<td>FSP</td>
<td>W-L-1031</td>
<td>FS-0098</td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, multiple</td>
<td></td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-8051</td>
<td>FS-0612</td>
<td></td>
</tr>
<tr>
<td>6&quot; copper</td>
<td></td>
<td>X</td>
<td>3,4, 5</td>
<td>ES1399</td>
<td>W-L-1276</td>
<td>FS-0348</td>
<td></td>
</tr>
<tr>
<td>6&quot; copper</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-1334</td>
<td>FS-0590</td>
<td></td>
</tr>
<tr>
<td>6&quot; copper</td>
<td>R</td>
<td>X</td>
<td>3,4, 5</td>
<td>ES1399/LBS3</td>
<td>W-L-1405</td>
<td>FS-0657</td>
<td></td>
</tr>
<tr>
<td><strong>INSULATED COPPER PIPE / TUBING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; copper, 1&quot; AB/PVC, 1/4&quot; MINERAL FIBER</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-8051</td>
<td>FS-0612</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, 1/4&quot; FIBERGLASS/MINERAL FIBER</td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-L-5036</td>
<td>FS-0108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, 2&quot; FIBERGLASS/MINERAL FIBER</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-5213</td>
<td>FS-0605</td>
<td></td>
</tr>
<tr>
<td>4&quot; copper, 1/4&quot; AB/PVC</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-5214</td>
<td>FS-0606</td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 2&quot; FIBERGLASS</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>ES1399</td>
<td>W-L-5161</td>
<td>FS-0399</td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 2&quot; FIBERGLASS</td>
<td>R</td>
<td>X</td>
<td>3,4, 5</td>
<td>ES1399</td>
<td>W-L-5179</td>
<td>FS-0464</td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 3/4&quot; AB / PVC</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>ES1399</td>
<td>W-L-5180</td>
<td>FS-0465</td>
<td></td>
</tr>
<tr>
<td>6&quot; copper, 3&quot; CELLULAR GLASS</td>
<td>X</td>
<td>3,4, 5</td>
<td>1,2</td>
<td>LBS3</td>
<td>W-L-5216</td>
<td>FS-0608</td>
<td></td>
</tr>
<tr>
<td>Penetration Item (Size &amp; Type)</td>
<td>Sleeve</td>
<td>O-Ring</td>
<td>Point Contact</td>
<td>Assembly Thickness</td>
<td>F Rating</td>
<td>Nelson Product</td>
<td>U.L. System</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>---------------</td>
<td>--------------------</td>
<td>----------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>NON-METALLIC PIPE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾&quot; PEX, multiple</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2383</td>
<td>FS-0596</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; PEX</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2383</td>
<td>FS-0596</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; PEX</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2381</td>
<td>FS-0594</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; Sch. 40 ABS</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2381</td>
<td>FS-0594</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 FRPP</td>
<td>3/4, 5</td>
<td>1.2 PCS</td>
<td>W-L-2081</td>
<td>FS-0118</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, ABS, CPVC</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-2291</td>
<td>FS-0398</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2381</td>
<td>FS-0594</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, CPVC R</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2470</td>
<td>FS-0659</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; Sch. 40 PVC, multiple</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-8051</td>
<td>FS-0612</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; PEX</td>
<td>3/4, 5</td>
<td>1.2 WRS3/LBS3</td>
<td>W-L-2389</td>
<td>FS-0633</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; Sch. 40 PVC, CPVC</td>
<td>3/4, 5</td>
<td>1.2 WRS3/LBS3</td>
<td>W-L-2469</td>
<td>FS-0662</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 PVC, CPVC</td>
<td>3/4, 5</td>
<td>1.2 PCS</td>
<td>W-L-2071</td>
<td>FS-0110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; Sch. 40 PVC, ABS, CPVC</td>
<td>O</td>
<td>3/4, 5</td>
<td>1.2 WRS3/LBS3</td>
<td>W-L-2468</td>
<td>FS-0661</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; glass pipe</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2382</td>
<td>FS-0595</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; glass pipe</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-2290</td>
<td>FS-0397</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEEL CONDUIT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; EMT/RMC</td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-L-1006</td>
<td>FS-0041</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; EMT/RMC, multiple</td>
<td>R</td>
<td>5</td>
<td>1.2 FSP</td>
<td>W-L-1031</td>
<td>FS-0098</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; EMT/RMC, multiple</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-1335</td>
<td>FS-0591</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; EMT multiple</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-1277</td>
<td>FS-0349</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT/RMC</td>
<td>3/4, 5</td>
<td>1.2 CLK</td>
<td>W-L-1030</td>
<td>FS-0095</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2 CLK</td>
<td>W-L-1083</td>
<td>FS-0133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-1276</td>
<td>FS-0348</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC w/ 2&quot; fiberglass/min. wool</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-2178</td>
<td>FS-0463</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC w/ 2&quot; fiberglass/min. wool</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-2179</td>
<td>FS-0464</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC w/ 3/4&quot; AB / PVC</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-2180</td>
<td>FS-0465</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / 6&quot; RMC</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2 ES1399/LBS3</td>
<td>W-L-1405</td>
<td>FS-0657</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FLEXIBLE METALLIC CONDUIT / PIPE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½&quot; FMC, steel or alum conduit</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-1275</td>
<td>FS-0347</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½&quot; FMC, steel or alum conduit</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-1332</td>
<td>FS-0588</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; FMC, steel or aluminum pipe, multiple</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-1337</td>
<td>FS-0593</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; FMC, steel</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2 ES1399/LBS3</td>
<td>W-L-1405</td>
<td>FS-0657</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1/4½&quot; FMC, steel conduit</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2 ES1399/LBS3</td>
<td>W-L-1429</td>
<td>FS-0670</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; FMC, steel conduit, multiple</td>
<td>3/4, 5</td>
<td>1.2 ES1399</td>
<td>W-L-1352</td>
<td>FS-0519</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NON-METALLIC CONDUIT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½&quot; ENT</td>
<td></td>
<td>5</td>
<td>2 FSP</td>
<td>W-L-2011</td>
<td>FS-0042</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; ENT</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2470</td>
<td>FS-0659</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½&quot; ENT</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2381</td>
<td>FS-0594</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2381</td>
<td>FS-0594</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td>O</td>
<td>3/4, 5</td>
<td>1.2 LBS3</td>
<td>W-L-2381</td>
<td>FS-0594</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; RNC</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2 WRS3/LBS3</td>
<td>W-L-2389</td>
<td>FS-0633</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; RNC</td>
<td>O</td>
<td>3/4, 5</td>
<td>1.2 WRS3/LBS3</td>
<td>W-L-2469</td>
<td>FS-0662</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; RNC</td>
<td>O</td>
<td>3/4, 5</td>
<td>1.2 WRS3/LBS3</td>
<td>W-L-2388</td>
<td>FS-0632</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; RNC</td>
<td></td>
<td>3/4, 5</td>
<td>1.2 WRS3/LBS3</td>
<td>W-L-2468</td>
<td>FS-0661</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------</td>
<td>---------------</td>
<td>--------------------</td>
<td>---------</td>
<td>----------------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td><strong>GYPSUM WALLBOARD WALLS</strong> (BASED ON 2-1/2 IN. STUDS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CABLE TRAY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18” x 4” AL or 18” x 6” steel - 30% fill</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>PLW/FSP</td>
<td>W-L-4003</td>
<td>FS-0097</td>
<td></td>
</tr>
<tr>
<td>18” x 4” - steel tray, 39% fill</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>FSP</td>
<td>W-L-4051</td>
<td>FS-0636</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18” x 5” aluminum tray - 20% fill</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-4045</td>
<td>FS-0602</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24” x 4” steel tray - 40% fill</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>Fire Brick</td>
<td>W-L-4061</td>
<td>FS-0642</td>
<td></td>
</tr>
<tr>
<td>18” X 4”, steel sleeve, 26% fill</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>PLW/FSP</td>
<td>W-L-3055</td>
<td>FS-0106</td>
<td></td>
</tr>
<tr>
<td><strong>POWER CONTROL OR COMMUNICATIONS CABLE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 AWG RG6/U</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3242</td>
<td>FS-0600</td>
<td></td>
</tr>
<tr>
<td>18 AWG RG6/U</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3243</td>
<td>FS-0601</td>
<td></td>
</tr>
<tr>
<td>64% fill, 18 AWG RG6/U</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0649</td>
<td></td>
</tr>
<tr>
<td>25 pr. #24 AWG</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>CLK</td>
<td>W-L-3026</td>
<td>FS-0096</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) 25pr #24AWG comm.</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-8051</td>
<td>FS-0612</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% fill, 25 pr. #24 AWG</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3239</td>
<td>FS-0597</td>
<td></td>
</tr>
<tr>
<td>50 pr. #24 AWG</td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-L-3003</td>
<td>FS-0044</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40% fill, 100 pr. #24 AWG</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>FSP</td>
<td>W-L-3190</td>
<td>FS-0382</td>
<td></td>
</tr>
<tr>
<td>40% fill, 100pr #24 AWG</td>
<td>O</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>FSP/PCS</td>
<td>W-L-3227</td>
<td>FS-0509</td>
<td></td>
</tr>
<tr>
<td>200pr #24AWG copper conductor</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>Fire Brick</td>
<td>W-L-3311</td>
<td>FS-0663</td>
<td></td>
</tr>
<tr>
<td>41% fill, 400 pr. #24 AWG comm.</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3242</td>
<td>FS-0600</td>
<td></td>
</tr>
<tr>
<td>64% fill, 400 pr. #24 AWG comm.</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0649</td>
<td></td>
</tr>
<tr>
<td>(7) 2C #20 AWG</td>
<td>R</td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-L-3004</td>
<td>FS-0043</td>
<td></td>
</tr>
<tr>
<td>41% fill, 2C #12 AWG ROMEX</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3242</td>
<td>FS-0600</td>
<td></td>
</tr>
<tr>
<td>3C #2/0 AWG Aluminum SER</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3240</td>
<td>FS-0598</td>
<td></td>
</tr>
<tr>
<td>64% 3C #2/0 AWG copper or Al SER</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0649</td>
<td></td>
</tr>
<tr>
<td>3C #12 AWG METAL CLAD</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>Fire Brick</td>
<td>W-L-3311</td>
<td>FS-0663</td>
<td></td>
</tr>
<tr>
<td>(2) 3C #2 AWG Al armored/METAL CLAD</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3240</td>
<td>FS-0598</td>
<td></td>
</tr>
<tr>
<td>40% fill, 3C #12 AWG ROMEX</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3241</td>
<td>FS-0599</td>
<td></td>
</tr>
<tr>
<td>40% fill, 3C #2/0 Al SER</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3242</td>
<td>FS-0600</td>
<td></td>
</tr>
<tr>
<td>41% fill, 4C #2/0 AWG armored (Al, St)</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3242</td>
<td>FS-0600</td>
<td></td>
</tr>
<tr>
<td>64% fill, 4C #2/0 AWG METAL CLAD (Al, St)</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0649</td>
<td></td>
</tr>
<tr>
<td>64% fill, 4C #2/0 AWG armored, (Al, St)</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0649</td>
<td></td>
</tr>
<tr>
<td>55.6% fill, 4C #12 AWG</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3243</td>
<td>FS-0601</td>
<td></td>
</tr>
<tr>
<td>64% fill, 3C #12 AWG ROMEX</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0649</td>
<td></td>
</tr>
<tr>
<td>19% fill, 7C #16, 4pr #24 awg, 2C #12 awg</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3204</td>
<td>FS-0462</td>
<td></td>
</tr>
<tr>
<td>64% fill, 7C #12awg</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0649</td>
<td></td>
</tr>
<tr>
<td>34% fill, power, control, comm.</td>
<td>5</td>
<td>2</td>
<td>MCT</td>
<td>W-L-3054</td>
<td>FS-0105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/C 350 MCM copper conductor</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>Fire Brick</td>
<td>W-L-3311</td>
<td>FS-0663</td>
<td></td>
</tr>
<tr>
<td>40% fill, 350 MCM</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3241</td>
<td>FS-0599</td>
<td></td>
</tr>
<tr>
<td>41% fill, 350 MCM</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3242</td>
<td>FS-0600</td>
<td></td>
</tr>
<tr>
<td>55.6% fill, 350 MCM</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0601</td>
<td></td>
</tr>
<tr>
<td>64% fill, 350 MCM</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0601</td>
<td></td>
</tr>
<tr>
<td>70% fill, 750MCM</td>
<td>O</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>FSP/PCS</td>
<td>W-L-3227</td>
<td>FS-0509</td>
<td></td>
</tr>
<tr>
<td>62.5/125 Fiber optic</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3241</td>
<td>FS-0599</td>
<td></td>
</tr>
<tr>
<td>62.5/125 Fiber optic</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-3243</td>
<td>FS-0601</td>
<td></td>
</tr>
<tr>
<td>64% 62.5/125 Fiber optic</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-3270</td>
<td>FS-0649</td>
<td></td>
</tr>
<tr>
<td>26% fill, pwr,cntrl, comm.</td>
<td>R</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>PLW/FSP</td>
<td>W-L-3055</td>
<td>FS-0106</td>
<td></td>
</tr>
<tr>
<td>Penetration Item (Size &amp; Type)</td>
<td>Sleeve O-C/H-Rect</td>
<td>O-R</td>
<td>Point Contact</td>
<td>Assembly Thickness</td>
<td>F Rating</td>
<td>Nelson Product</td>
<td>U.L. System</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------</td>
<td>-----</td>
<td>---------------</td>
<td>--------------------</td>
<td>---------</td>
<td>---------------</td>
<td>------------</td>
</tr>
<tr>
<td>GYPSUM WALLBOARD WALLS (BASED ON 2-1/2 IN. STUDS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUS DUCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5&quot; X 15&quot; 300A Copper</td>
<td>5</td>
<td>2</td>
<td>FSP</td>
<td>W-L-6003</td>
<td>FS0132</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HVAC DUCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; x 12&quot; 24 GA</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-7104</td>
<td>FS-0609</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18&quot; x 67&quot; 24 GA</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-7084</td>
<td>FS-0401</td>
<td></td>
</tr>
<tr>
<td>20&quot; x 20&quot; 24 GA</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>FSC3</td>
<td>W-L-7083</td>
<td>FS-0400</td>
<td></td>
</tr>
<tr>
<td>24&quot; x 30&quot; 24 GA, 1½ FIBERGLASS</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-7085</td>
<td>FS-0402</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40&quot; x 20&quot;, 24 GA</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-7105</td>
<td>FS-0610</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEEL DUCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; diameter&quot; 30 GA</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>LBS3</td>
<td>W-L-7106</td>
<td>FS-0611</td>
<td></td>
</tr>
<tr>
<td>6&quot; diameter 28 GA or 20&quot; diameter 22 GA.</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>ES1399</td>
<td>W-L-7106</td>
<td>FS-0466</td>
<td></td>
</tr>
<tr>
<td>20&quot; diameter 28 GA (Insulated-Fiberglass)</td>
<td>X</td>
<td>3/4, 5</td>
<td>1.2</td>
<td>WRS3/ES1399</td>
<td>W-L-7126</td>
<td>FS-0650</td>
<td></td>
</tr>
<tr>
<td>ELECTRICAL OUTLET BOX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; x 4&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-11/16&quot; x 4-11/16&quot;</td>
<td>3/4</td>
<td>1</td>
<td>FSP Pads</td>
<td>R10764</td>
<td>FS-0216</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------</td>
<td>---------------</td>
<td>--------------------</td>
<td>----------</td>
<td>----------------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>STEEL PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾” Sch. 10 multiple</td>
<td>10 truss</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-C-8034</td>
<td>FS-0626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” Sch. 10 multiple</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>LBS3</td>
<td>F-C-8033</td>
<td>FS-0563</td>
</tr>
<tr>
<td>4” Sch. 5</td>
<td></td>
<td></td>
<td>10 joist</td>
<td>2</td>
<td>CLK</td>
<td>F-C-1012</td>
<td>FS-0113</td>
</tr>
<tr>
<td>4” Sch. 10</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399</td>
<td>F-C-1100</td>
<td>FS-0486</td>
</tr>
<tr>
<td>4” Sch. 10</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>LBS3</td>
<td>F-C-1116</td>
<td>FS-0548</td>
</tr>
<tr>
<td>INSULATED STEEL PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½” Sch. 10, 1/2” FIBERGLASS</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>LBS3</td>
<td>F-C-8033</td>
<td>FS-0563</td>
</tr>
<tr>
<td>¾” Sch. 10, ¾” AB/PVC</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-C-8034</td>
<td>FS-0626</td>
</tr>
<tr>
<td>1½” Sch. 10, 1” FBRGLS, MINWL or ¾” AB/PVC</td>
<td>10 truss</td>
<td>1</td>
<td>LBS3</td>
<td>F-C-5070</td>
<td>FS-0560</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½” Sch. 10, 1” FIBERGLASS</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>2</td>
<td>LBS3</td>
<td>F-C-5069</td>
<td>FS-0559</td>
</tr>
<tr>
<td>2” Sch. 10, ½” AB/PVC</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2</td>
<td>WRS3/LBS3</td>
<td>F-C-5071</td>
<td>FS-0625</td>
</tr>
<tr>
<td>3” Sch. 10, 1” FIBERGLASS</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399</td>
<td>F-C-5061</td>
<td>FS-0478</td>
</tr>
<tr>
<td>COPPER PIPE / TUBING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾” copper multiple</td>
<td>10 truss</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-C-8034</td>
<td>FS-0626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” copper</td>
<td></td>
<td>10 joist</td>
<td>2</td>
<td>CLK</td>
<td>F-C-1012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3” copper</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399</td>
<td>F-C-1100</td>
<td>FS-0486</td>
</tr>
<tr>
<td>3” copper</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2</td>
<td>LBS3</td>
<td>F-C-1116</td>
<td>FS-0548</td>
</tr>
<tr>
<td>INSULATED COPPER PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½” copper, ½” FIBERGLASS</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>LBS3</td>
<td>F-C-8033</td>
<td>FS-0563</td>
</tr>
<tr>
<td>¾” copper, ¾” AB/PVC</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-C-8034</td>
<td>FS-0626</td>
</tr>
<tr>
<td>1½” copper, 1” FIBERGLASS or ¾” AB/PVC</td>
<td>10 truss</td>
<td>1</td>
<td>LBS3</td>
<td>F-C-5070</td>
<td>FS-0560</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1½” copper, 1” FIBERGLASS</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>2</td>
<td>LBS3</td>
<td>F-C-5069</td>
<td>FS-0559</td>
</tr>
<tr>
<td>2” copper, ½” AB/PVC</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2</td>
<td>WRS3/LBS3</td>
<td>F-C-5071</td>
<td>FS-0625</td>
</tr>
<tr>
<td>3” copper, 1” FIBERGLASS</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399</td>
<td>F-C-5061</td>
<td>FS-0478</td>
</tr>
<tr>
<td>NON-METALLIC PIPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾” max. dia. multiple, SDR9 (PEX)</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399/LBS3</td>
<td>F-C-2282</td>
<td>FS-0557</td>
</tr>
<tr>
<td>1¼” Sch. 40 PVC, CPVC</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-C-8034</td>
<td>FS-0626</td>
</tr>
<tr>
<td>1½” Sch. 40 PVC, ABS</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1</td>
<td>ES1399/LBS3</td>
<td>F-C-2279</td>
<td>FS-0554</td>
</tr>
<tr>
<td>2” Sch. 40 PVC, ABS, CPVC</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2</td>
<td>WRS3/LBS3</td>
<td>F-C-2291</td>
<td>FS-0621</td>
</tr>
<tr>
<td>2” Sch. 40 PVC, CPVC</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399/LBS3</td>
<td>F-C-2276</td>
<td>FS-0551</td>
</tr>
<tr>
<td>4” Sch. 40 PVC, ABS (closet flange)</td>
<td>10 truss</td>
<td>1</td>
<td>ES1399/LBS3</td>
<td>F-C-2278</td>
<td>FS-0553</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” Sch. 40 PVC, ABS, CPVC</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>WRS3/LBS3</td>
<td>F-C-2293</td>
<td>FS-0623</td>
</tr>
<tr>
<td>4” Sch. 40 PVC, CPVC</td>
<td></td>
<td>10 solid</td>
<td>2</td>
<td>PCS/CLK</td>
<td>F-C-2031</td>
<td></td>
<td>FS-0137</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
<td>---------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>----------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>WOOD JOIST FLOOR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEEL CONDUIT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>¾&quot; EMT/RMC multiple</td>
<td>10 truss</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-C-8034</td>
<td>FS-0626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; EMT / RMC multiple</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2 LBS3</td>
<td>F-C-8033</td>
<td>FS-0563</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / RMC</td>
<td>10 joist</td>
<td>2</td>
<td>CLK</td>
<td>F-C-1012</td>
<td>FS-0113</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / RMC</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2 ES1399</td>
<td>F-C-1100</td>
<td>FS-0486</td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT / RMC</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2 LBS3</td>
<td>F-C-1116</td>
<td>FS-0548</td>
<td></td>
</tr>
<tr>
<td><strong>FLEXIBLE METALLIC CONDUIT / PIPE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½&quot; FMC, steel pipe, multiple</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2 LBS3</td>
<td>F-C-1118</td>
<td>FS-0550</td>
<td></td>
</tr>
<tr>
<td>1½&quot; FMC, steel conduit, multiple</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2 ES1399</td>
<td>F-C-1129</td>
<td>FS-0521</td>
<td></td>
</tr>
<tr>
<td><strong>NON-METALLIC CONDUIT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1¼&quot; RNC</td>
<td>10 truss</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-C-8034</td>
<td>FS-0626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; RNC</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399/LBS3</td>
<td>F-C-2276</td>
<td>FS-0551</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; RNC</td>
<td>10 solid</td>
<td>2</td>
<td>PCS/CLK</td>
<td>F-C-2031</td>
<td>FS-0137</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>POWER CONTROL OR COMMUNICATIONS CABLE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 pr #24 AWG</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399/LBS3</td>
<td>F-C-3078</td>
<td>FS-0558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 pr #24 AWG</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2 LBS3</td>
<td>F-C-8033</td>
<td>FS-0563</td>
<td></td>
</tr>
<tr>
<td>3-1/2&quot; bund. 100 pr #24 AWG</td>
<td></td>
<td></td>
<td>10 truss</td>
<td>1 or 2 ES1399</td>
<td>F-C-3078</td>
<td>FS-0488</td>
<td></td>
</tr>
<tr>
<td>2C #12 AWG</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399/LBS3</td>
<td>F-C-3078</td>
<td>FS-0558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2C #24 AWG</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399/LBS3</td>
<td>F-C-3078</td>
<td>FS-0558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C 2/0 SER</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399/LBS3</td>
<td>F-C-3078</td>
<td>FS-0558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C 2/0 SER</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399</td>
<td>F-C-3073</td>
<td>FS-0488</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3C #12 ROMEX</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399</td>
<td>F-C-3073</td>
<td>FS-0488</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7C #12 AWG</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399</td>
<td>F-C-3073</td>
<td>FS-0488</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) 7C #12 AWG</td>
<td>10 truss</td>
<td>1</td>
<td>WRS3/LBS3</td>
<td>F-C-8034</td>
<td>FS-0626</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEEL DUCT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; diameter 28 GA</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>LBS3</td>
<td>F-C-7027</td>
<td>FS-0561</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; x 10&quot; 24 GA</td>
<td>10 truss</td>
<td>1</td>
<td>LBS3</td>
<td>F-C-7028</td>
<td>FS-0562</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; diameter 30 GA</td>
<td></td>
<td>X</td>
<td>10 truss</td>
<td>1 or 2 ES1399</td>
<td>F-C-7020</td>
<td>FS-0408</td>
<td></td>
</tr>
<tr>
<td>24&quot;x 7&quot; 26 Ga Vent or 16 GA Grease Cuct, Insul.</td>
<td>10 truss</td>
<td>1 or 2</td>
<td>ES1399</td>
<td>F-C-7036</td>
<td>FS-0655</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
<td>-------------------------</td>
<td>----------</td>
<td>---------------</td>
<td>-------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/roof assy to gyp. wall</td>
<td>¾</td>
<td>33</td>
<td>2</td>
<td>FSC3</td>
<td>HW-D-0288</td>
<td>FS-0483</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to conc. wall</td>
<td>1</td>
<td>25</td>
<td>2</td>
<td>ES1399</td>
<td>HW-D-0230</td>
<td>FS-0375</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/roof assy to conc. wall</td>
<td>1</td>
<td>25</td>
<td>2</td>
<td>ES1399</td>
<td>HW-D-0287</td>
<td>FS-0482</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/roof assy to conc. wall</td>
<td>1</td>
<td>12.5</td>
<td>2</td>
<td>FSC3</td>
<td>HW-D-0394</td>
<td>FS-0645</td>
<td></td>
</tr>
<tr>
<td>Conc. floor also hollow core to conc. wall</td>
<td>1</td>
<td>12.5</td>
<td>2</td>
<td>ES1399</td>
<td>HW-D-0232</td>
<td>FS-0379</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck or stl deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>2</td>
<td>FSC3</td>
<td>HW-D-0239</td>
<td>FS-0389</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/stl deck to conc. wall</td>
<td>1</td>
<td>25</td>
<td>2</td>
<td>FSC3</td>
<td>HW-D-0240</td>
<td>FS-0390</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck w/ &quot;I&quot; beam to conc. wall</td>
<td>1</td>
<td>25</td>
<td>2</td>
<td>FSC3</td>
<td>HW-D-0311</td>
<td>FS-0496</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2</td>
<td>FSC3</td>
<td>CEJ249H</td>
<td>FS-0319</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2</td>
<td>FSC3</td>
<td>CEJ251H</td>
<td>FS-0321</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/roof assy to gyp. wall</td>
<td>1</td>
<td>12.5</td>
<td>1,2</td>
<td>FSC3</td>
<td>HW-D-0393</td>
<td>FS-0644</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2</td>
<td>ES1399</td>
<td>HW-D-0224</td>
<td>FS-0371</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2</td>
<td>ES1399</td>
<td>HW-D-0229</td>
<td>FS-0372</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2</td>
<td>ES1399</td>
<td>HW-D-0226</td>
<td>FS-0373</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2</td>
<td>ES1399</td>
<td>HW-D-0231</td>
<td>FS-0374</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2</td>
<td>ES1399</td>
<td>HW-D-0360</td>
<td>FS-0512</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck w/ &quot;I&quot; beam to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2</td>
<td>FSC3</td>
<td>CEJ249H</td>
<td>FS-0495</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck w/ &quot;I&quot; beam to conc. wall</td>
<td>1</td>
<td>18.75</td>
<td>1,2</td>
<td>FSC3</td>
<td>HW-D-0310</td>
<td>FS-0321</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck w/ &quot;I&quot; beam to gyp. wall</td>
<td>1</td>
<td>18.75</td>
<td>1,2,3</td>
<td>FSC3</td>
<td>HW-D-0290</td>
<td>FS-0485</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/stl deck to gyp. wall</td>
<td>1</td>
<td>25</td>
<td>1,2,3</td>
<td>FSC3</td>
<td>HW-D-0309</td>
<td>FS-0388</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/stl deck to conc. wall</td>
<td>1</td>
<td>25</td>
<td>1,2,3</td>
<td>FSC3</td>
<td>HW-D-0305</td>
<td>FS-0386</td>
<td></td>
</tr>
<tr>
<td>Conc. floor also hollow core to gyp. wall</td>
<td>1½</td>
<td>25</td>
<td>1</td>
<td>FSC3</td>
<td>HW-D-0304</td>
<td>FS-0385</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/stl deck to gyp. wall</td>
<td>1½</td>
<td>25</td>
<td>1</td>
<td>FSC3</td>
<td>HW-D-0305</td>
<td>FS-0368</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/stl deck to conc. wall</td>
<td>1½</td>
<td>25</td>
<td>1</td>
<td>FSC3</td>
<td>HW-D-0306</td>
<td>FS-0386</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/roof assy to gyp. wall</td>
<td>1½</td>
<td>25</td>
<td>1</td>
<td>FSC3</td>
<td>HW-D-0307</td>
<td>FS-0370</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>1½</td>
<td>25</td>
<td>1</td>
<td>FSC3</td>
<td>HW-D-0308</td>
<td>FS-0386</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/roof assy to conc. wall</td>
<td>2</td>
<td>25</td>
<td>2</td>
<td>FSC3</td>
<td>HW-D-0289</td>
<td>FS-0484</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>2</td>
<td>25</td>
<td>2</td>
<td>FSC3</td>
<td>HW-D-0227</td>
<td>FS-0378</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/roof assy to conc. wall</td>
<td>2</td>
<td>12.5</td>
<td>3</td>
<td>FSC3</td>
<td>HW-D-0362</td>
<td>FS-0514</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/roof assy to conc. wall</td>
<td>2</td>
<td>12.5</td>
<td>3</td>
<td>FSC3</td>
<td>HW-D-0361</td>
<td>FS-0515</td>
<td></td>
</tr>
<tr>
<td>Conc. floor also hollow core to conc. wall</td>
<td>2</td>
<td>25</td>
<td>2,3</td>
<td>FSC3</td>
<td>HW-D-0306</td>
<td>FS-0369</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to conc. wall</td>
<td>2</td>
<td>25</td>
<td>2,3</td>
<td>FSC3</td>
<td>HW-D-0307</td>
<td>FS-0370</td>
<td></td>
</tr>
<tr>
<td>Conc. floor also hollow core to gyp. wall</td>
<td>2</td>
<td>25</td>
<td>2,3,4</td>
<td>FSC3</td>
<td>HW-D-0305</td>
<td>FS-0368</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck/stl deck to gyp. wall</td>
<td>2</td>
<td>25</td>
<td>2,3,4</td>
<td>FSC3</td>
<td>HW-D-0304</td>
<td>FS-0386</td>
<td></td>
</tr>
<tr>
<td>Conc. floor to conc. wall</td>
<td>2</td>
<td>Static</td>
<td>4</td>
<td>CLK</td>
<td>HW-S-1003</td>
<td>FS-0143</td>
<td></td>
</tr>
<tr>
<td>Conc. floor also hollow core to conc. wall</td>
<td>3-1/2</td>
<td>15</td>
<td>3</td>
<td>ES1399</td>
<td>HW-D-1035</td>
<td>FS-0380</td>
<td></td>
</tr>
<tr>
<td>Conc. floor also hollow core to conc. wall</td>
<td>3-1/2</td>
<td>15</td>
<td>3</td>
<td>ES1399</td>
<td>HW-D-1036</td>
<td>FS-0381</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to conc. wall</td>
<td>3-5/8</td>
<td>Static</td>
<td>2</td>
<td>FSC</td>
<td>OPL 15670-103058</td>
<td>FS-0168</td>
<td></td>
</tr>
<tr>
<td>Conc. fluted deck to gyp. wall</td>
<td>3-5/8</td>
<td>Static</td>
<td>1,2</td>
<td>CLK</td>
<td>WHI-495-PSV-1122</td>
<td>FS-0166</td>
<td></td>
</tr>
<tr>
<td>Conc. floor to conc. wall</td>
<td>4</td>
<td>Static</td>
<td>2</td>
<td>CLK</td>
<td>HW-S-1002</td>
<td>FS-0141</td>
<td></td>
</tr>
<tr>
<td>Conc. floor to conc. wall</td>
<td>4</td>
<td>Static</td>
<td>2</td>
<td>CLK</td>
<td>HW-S-1013</td>
<td>FS-0653</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
<td>-------------------------</td>
<td>---------</td>
<td>----------------</td>
<td>-------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td><strong>FLOOR TO FLOOR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. 4-1/2&quot; concrete</td>
<td>1</td>
<td>25</td>
<td>2</td>
<td>ES1399</td>
<td>FF-D-0027</td>
<td>FS-0357</td>
<td></td>
</tr>
<tr>
<td>Min. 2-1/2&quot; concrete</td>
<td>2</td>
<td>12.5</td>
<td>1</td>
<td>FSC3</td>
<td>FF-D-0034</td>
<td>FS-0480</td>
<td></td>
</tr>
<tr>
<td>Min. 6&quot; concrete</td>
<td>2</td>
<td>12.5</td>
<td>4</td>
<td>ES1399</td>
<td>FF-D-0026</td>
<td>FS-0356</td>
<td></td>
</tr>
<tr>
<td>Min. 4-1/2&quot; concrete</td>
<td>3-1/2</td>
<td>14</td>
<td>2</td>
<td>CLK</td>
<td>FF-D-1037</td>
<td>FS-0304</td>
<td></td>
</tr>
<tr>
<td>Min. 4-1/2&quot; concrete</td>
<td>3-1/2</td>
<td>15</td>
<td>3</td>
<td>FSC3</td>
<td>FF-D-1040</td>
<td>FS-0358</td>
<td></td>
</tr>
<tr>
<td>Min. 4-1/2&quot; concrete</td>
<td>4</td>
<td>Static</td>
<td>2</td>
<td>CLK</td>
<td>FF-S-1016</td>
<td>FS-0138</td>
<td></td>
</tr>
<tr>
<td>Min. 4-1/2&quot; concrete</td>
<td>4</td>
<td>Static</td>
<td>2</td>
<td>CLK</td>
<td>FF-S-1032</td>
<td>FS-0651</td>
<td></td>
</tr>
<tr>
<td>Min. 5-1/2&quot; concrete</td>
<td>4</td>
<td>Static</td>
<td>4</td>
<td>CLK</td>
<td>FF-S-1011</td>
<td>FS-0119</td>
<td></td>
</tr>
<tr>
<td>Min. 6&quot; concrete</td>
<td>4</td>
<td>Static</td>
<td>4</td>
<td>CLK</td>
<td>FF-S-1036</td>
<td>FS-0665</td>
<td></td>
</tr>
</tbody>
</table>

| WALL TO WALL | 3/4 | 0 | 2 | ES1399 | WW-S-0044 | FS-0635 |
| Min. 4-1/2" concrete | 1 | 12.5 | 2 | ES1399 | WW-D-0030 | FS-0360 |
| Min. 4-1/2" concrete | 3-1/2 | 15 | 3 | FSC3 | WW-D-1038 | FS-0361 |
| Min. 4-1/2" concrete | 3-1/2 | 15 | 3 | ES1399 | WW-D-1039 | FS-0362 |
| Min. 4-1/2" concrete | 4 | Static | 2 | CLK | WW-S-1020 | FS-0139 |
| Min. 5" concrete   | 4 | Static | 2 | CLK | WW-S-1021 | FS-0140 |
| Min. 5-1/2" concrete | 4 | Static | 4 | CLK | WW-S-1013 | FS-0120 |
| Min. 4-1/2" concrete | 4 | Static | 4 | CLK | WW-S-1014 | FS-0121 |
| Min. 5" concrete   | 4 | Static | 2 | CLK | WW-S-1034 | FS-0654 |

<p>| <strong>FLOOR TO WALL</strong> | 1 | 25 | 2 | ES1399 | FW-D-0022 | FS-0365 |
| Conc. Floor to conc. Wall | 1 | 0 | 1 or 2 | ES1399/LBS3 | BW-S-0012 | FS-0637 |
| Min. 2-1/2&quot; concrete floor to 4-1/2&quot; wall | 2 | 12.5 | 1 | FSC3 | FW-D-0029 | FS-0479 |
| Conc. Floor to conc. Wall | 2 | 12.5 | 4 | FSC3 | FW-D-0020 | FS-0363 |
| Conc. Floor to conc. Wall | 2 | 12.5 | 4 | ES1399 | FW-D-0021 | FS-0364 |
| Min. 4-1/2&quot; conc. Floor to conc. Wall | 3-1/2 | 14 | 2 | CLK | FW-D-1034 | FS-0303 |
| Conc. Floor to conc. Wall | 3-1/2 | 15 | 3 | FSC3 | FW-D-1038 | FS-0366 |
| Conc. Floor to conc. Wall | 3-1/2 | 15 | 3 | ES1399 | FW-D-1039 | FS-0367 |
| Min. 4-1/2&quot; conc. Floor to conc. Wall | 4 | Static | 2 | CLK | FW-S-1003 | FS-0142 |
| Min. 4-1/2&quot; conc. Floor to conc. Wall | 4 | Static | 2 | CLK | FW-S-1017 | FS-0652 |</p>
<table>
<thead>
<tr>
<th>Min. 5-1/2&quot; conc. Floor to conc. Wall</th>
<th>4</th>
<th>Static</th>
<th>4</th>
<th>CLK</th>
<th>FW-S-1004</th>
<th>FS-0144</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIFS Wall</td>
<td>4</td>
<td>15</td>
<td>1</td>
<td>FSC3/CLK</td>
<td>CEJ258P</td>
<td>FS-0318</td>
</tr>
<tr>
<td>Steel Panels</td>
<td>8</td>
<td>16.7</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ236P</td>
<td>FS-0311</td>
</tr>
<tr>
<td>Steel Panels</td>
<td>8</td>
<td>16.7</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ237P</td>
<td>FS-0312</td>
</tr>
<tr>
<td>Steel Panels</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ253P</td>
<td>FS-0313</td>
</tr>
<tr>
<td>Concrete Tilt-Up Panels</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ254P</td>
<td>FS-0314</td>
</tr>
<tr>
<td>Concrete Panels steel frame</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ255P</td>
<td>FS-0315</td>
</tr>
<tr>
<td>Concrete Panels steel frame</td>
<td>8</td>
<td>16.7</td>
<td>2-1/2</td>
<td>FSC3/CLK</td>
<td>CEJ235P</td>
<td>FS-0310</td>
</tr>
<tr>
<td>Concrete Panels alum. Frame</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ256P</td>
<td>FS-0316</td>
</tr>
<tr>
<td>Glass Panels</td>
<td>8</td>
<td>15</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ257P</td>
<td>FS-0317</td>
</tr>
<tr>
<td>EIFS (Ext. Foam &amp; cementious finish)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ278P</td>
<td>FS-0412</td>
</tr>
<tr>
<td>EIFS (Ext. Foam &amp; plaster)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ279P</td>
<td>FS-0413</td>
</tr>
<tr>
<td>EIFS (Stone &amp; Mortar)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ280P</td>
<td>FS-0414</td>
</tr>
<tr>
<td>EIFS (Brick &amp; Mortar)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ281P</td>
<td>FS-0415</td>
</tr>
<tr>
<td>EIFS (Exterior gypsum)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ282P</td>
<td>FS-0416</td>
</tr>
<tr>
<td>EIFS Vision Glass (Ext. Foam &amp; cementious finish)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ283P</td>
<td>FS-0417</td>
</tr>
<tr>
<td>EIFS Vision Glass (Ext. Foam &amp; plaster)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ284P</td>
<td>FS-0418</td>
</tr>
<tr>
<td>EIFS Vision Glass (Stone &amp; Mortar)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ285P</td>
<td>FS-0419</td>
</tr>
<tr>
<td>EIFS Vision Glass (Brick &amp; Mortar)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ286P</td>
<td>FS-0420</td>
</tr>
<tr>
<td>EIFS Vision Glass (Ext. gyp.)</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ287P</td>
<td>FS-0421</td>
</tr>
<tr>
<td>Glass Spandrell Alum mullion, vision glass</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ298P</td>
<td>FS-0489</td>
</tr>
<tr>
<td>Alum Spandrell Alum mullion, vision glass</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ299P</td>
<td>FS-0490</td>
</tr>
<tr>
<td>Steel Panels, vision glass</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ291P</td>
<td>FS-0497</td>
</tr>
<tr>
<td>Concrete Panels steel frame, vision glass</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ292P</td>
<td>FS-0498</td>
</tr>
<tr>
<td>Concrete Panels alum. Frame, vision glass</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ293P</td>
<td>FS-0499</td>
</tr>
<tr>
<td>Concrete Tilt-Up Panels, vision glass</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ294P</td>
<td>FS-0500</td>
</tr>
<tr>
<td>Glass Spandrell Alum I mullion, hat chnl</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ304P</td>
<td>FS-0506</td>
</tr>
<tr>
<td>Glass Spandrell Alum mullion, hat chnl</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ305P</td>
<td>FS-0507</td>
</tr>
<tr>
<td>Alum Spandrell Alum mullion, hat channel</td>
<td>8</td>
<td>12.5</td>
<td>2</td>
<td>FSC3/CLK</td>
<td>CEJ306P</td>
<td>FS-0508</td>
</tr>
</tbody>
</table>
CONCRETE FLOOR OR WALL  
METALLIC PIPE OR CONDUIT  

F Rating 3 Hr.  
(2) Pipe  
(1) Floor or Wall  
(3) Forming Material  
(4) Putty  

T Rating 0, 1/2, 3/4 Hr.  

(2) Pipe  
(1) Floor or Wall  
(4) Putty  

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall.

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   
   (C) CONDUIT- Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" diameter (or smaller) steel conduit.

3. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter) mineral wool batt or loose ceramic fiber insulation into the annular space at the required depth as indicated below. Recess from top and/or bottom surface(s) of floor or both or one surface(s) of wall to accommodate the required thickness of putty as indicated below.

4. NELSON FSP PUTTY (part # AA445) - Apply FSP to the required thickness shown below, flush with top and/or bottom surface(s) of floor or both or one surface(s) of wall.

<table>
<thead>
<tr>
<th>Max. Pipe Size</th>
<th>Forming Mat. Thickness</th>
<th>Annular Space (Nom)</th>
<th>T Rating (Hr.)</th>
<th>Putty Thickness (in)</th>
<th>No. Surfaces Required to Firestop</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; (152mm) Steel or RMC</td>
<td>2-1/2&quot; (64mm)</td>
<td>11/16&quot; (17mm)</td>
<td>0</td>
<td>1&quot; (25mm)</td>
<td>2 Surfaces</td>
</tr>
<tr>
<td>4&quot; (102mm) EMT</td>
<td>2-1/2&quot; (64mm)</td>
<td>2&quot; (51mm)</td>
<td>0</td>
<td>1&quot; (25mm)</td>
<td>2 Surfaces</td>
</tr>
<tr>
<td>2&quot; (51mm) Steel, RMC, EMT</td>
<td>3&quot; (76mm)</td>
<td>13/16&quot; (21mm)</td>
<td>3/4</td>
<td>3/4&quot; (19mm)</td>
<td>2 Surfaces</td>
</tr>
<tr>
<td>2&quot; (51mm) Steel, RMC, EMT</td>
<td>5-1/2&quot; (140mm)</td>
<td>13/16&quot; (21mm)</td>
<td>3/4</td>
<td>1&quot; (25mm)</td>
<td>1 Surface, Top of floor</td>
</tr>
<tr>
<td>2&quot; (51mm) Steel, RMC, EMT</td>
<td>5-1/2&quot; (140mm)</td>
<td>13/16&quot; (21mm)</td>
<td>1/2</td>
<td>1&quot; (25mm)</td>
<td>1 Surface, Bottom of floor</td>
</tr>
<tr>
<td>2&quot; (51mm) Steel, RMC, EMT</td>
<td>5-1/2&quot; (140mm)</td>
<td>13/16&quot; (21mm)</td>
<td>1/2</td>
<td>1&quot; (25mm)</td>
<td>1 Surface, Wall</td>
</tr>
</tbody>
</table>

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.  
C-AJ-1003, C-AJ-1004

DWG NO. FS-0001R3

DATE: 07/14/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 3 Hr.  T Rating 0, 1/2, 2, 3 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 8" (152mm) thick wall, or CMU block wall. Max. diameter of opening to be 4" (102mm).

2. CABLES - Max. 15% cable fill of opening in any combination of:

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Cable Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Max. #2 awg, multi-conductor power &amp; control cable XLPE &amp; PVC insul.</td>
</tr>
<tr>
<td>b</td>
<td>Max. #12 awg, multi-conductor control cable XLPE &amp; PVC insul.</td>
</tr>
<tr>
<td>c</td>
<td>Max. #14 awg, multi-conductor control cable XLPE &amp; PVC insul.</td>
</tr>
<tr>
<td>d</td>
<td>Max. 300MCM, 1/C, power cable XLPE insul.</td>
</tr>
<tr>
<td>e</td>
<td>Max. 25pr. telephone cable, PVC insul.</td>
</tr>
</tbody>
</table>

Cable combinations of a, b, c, d & e, the T-Rating=0. Cable combinations of a, b, c & e, the T-Rating = 1/2 hr. Cable combinations of b, c & e, the T Rating = 2 Hr. Cable combinations of c & e, the T Rating = 3 Hr.

3. FORMING MATERIAL - Tightly pack, min. 3" (76mm) tk, min. 6pcf (96 kg/cubic meter) mineral wool insulation into the opening. Recess from top or both surfaces of wall as required for putty.

4. NELSON FSP PUTTY (part # AA445) - Apply FSP over the forming material to a min. 1-1/2" (38mm) depth, flush with the top surface of the floor, or both ends of the wall. Putty to be forced into interstices of cable group to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-3003

DWG NO. FS-0002 R3

DATE: 07/14/06

BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 3 Hr.  T Rating 1/2 or 3/4 Hr.

(2) Pipe
(4) Putty
(1) Floor or Wall
(3) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) concrete floor or wall or CMU block wall. The max. diameter of the opening is 4" (102mm).

2. METALLIC PIPE or CONDUIT - The following types of metallic pipes, conduits or tubing may be used:
   
   (A) STEEL PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   
   (B) IRON PIPE - Nom 2" (51mm) diameter (or smaller) cast or ductile iron pipe.
   
   (C) CONDUIT - Nom 2" (51mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   
   The nom annular space is 13/16" (21mm).

3. FORMING MATERIAL - Min. 5-1/2" (140mm) depth of min. 6pcf (96 kg/cubic meter) mineral wool or ceramic fiber. Pack to extend a min. of 2" (51mm) above top surface of floor and recess 1" (25mm) from bottom surface of floor or pack the material a min. of 2" (51mm) below bottom surface of the floor and recess 1" (25mm) from the top of the floor. In walls, pack the material to extend 2" (51mm) from one surface of wall and recess 1" (25mm) from other wall surface.

4. NELSON FSP PUTTY (part # AA445) - Min. 1" (25mm) thickness of putty applied within the annulus, flush with top or bottom surface of floor, or both surfaces of wall. In floors, the T Rating is 3/4 Hr. If the FSP is flush with top of floor. If the FSP is installed flush to the bottom surface of the floor the T Rating is 1/2 Hr. In walls the T Rating is 1/2 Hr.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-1004

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

Date: 07/14/06
By: RL

MEA # 196-84 Vol.3
CONCRETE FLOOR OR WALL CABLES

F Rating 3 Hr.  T Rating 1/2, 1, 1-1/2, 3 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) concrete floor or min. 7-1/2" (191mm) wall or CMU block wall. The max. diameter of the opening is 4" (102mm).

2. CABLES - Max. 13% cable fill of opening in any combination of:
   (A) max. 3/c #2 awg cable w/ linked polyethylene (XLPE) insulation and polyvinyl chloride (PVC) jacket.
   (B) max. 7/C #12 awg cable w(XLPE) insulation and (PVC) jacket.
   (C) max. 2/C #14 awg cable w(XLPE) insulation and (PVC) jacket.
   (D) max. 100pr. #24 awg telephone cable w/ PVC insulation and jacket.

3. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter), mineral wool batt insulation to fill the annular space to a 4-3/4" (121mm) depth, and recess 1-1/4" (32mm) from floor surface or from both surfaces of the wall.

4. NELSON FSP PUTTY (part # AA445) - Min. 1-1/4" (32mm) depth in the annular space around the pipe flush with the floor surface or flush with both surfaces of the wall. T Rating is 1/2 Hr. for combinations of A, B, C & D. T Rating is 1 Hr. for A, B & C combinations. T Rating is 1-1/2 Hr. for combinations of A & B. T Rating is 3 Hr for C type cables only.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-3004

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0014 R4</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>07/14/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLE TRAY

F Rating 3 Hr.       T Rating 0, 3/4 & 2 Hr.

(1) Wall

(5) Putty

(3) Cables

(2) Cable Tray

(4) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) lightweight or normal weight concrete floor or wall or CMU block wall. The max. size of the opening is 7" x 21" (178mm x 533mm).

2. CABLE TRAY - Max. 18" x 4" (457mm x 102mm) open ladder type, steel, cable tray. Center tray in the opening. The annular space between cable tray and edge of the opening is 1-1/2" (38mm).

3. CABLES - Max. 20-39% cable fill in any combination of:
   (A) max. #2awg multiconductor power and control cable w/cross linked polyethylene (XLPE) insulation and polyvinyl chloride (PVC) jacket. When these cables are used exclusively, the T rating is 3/4 Hr.
   (B) max. #12awg multiconductor control cable w/(XLPE) insulation and jacket. When these cables are used exclusively, the T rating is 2 Hr.
   (C) max. 300 kcmil single conductor power cable w/(XLPE) insulation. When these cables are used exclusively, the T rating is 0 Hr.

4. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter) mineral wool in and around cables for separation of cables to a 3" (76mm) depth. Recess 3/4" (19mm) from each floor or wall surface.

5. NELSON FSP PUTTY (part # AA445) - Apply FSP within the annulus on both surfaces, within and around the cables over forming material to a min. depth of 3/4" (19mm) depth, with an additional 1" (25mm) crown around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-4001

DWG NO. FS-0020 R2

DATE: 07/14/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
METALLIC PIPE OR CONDUIT

1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of the opening is 2" (51mm).

2. METALLIC PIPE or CONDUIT - The following types of metallic pipes, conduits or tubing may be used:

   (A) STEEL PIPE - Nom 1" (25mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.

   (B) IRON PIPE - Nom 1" (25mm) diameter (or smaller) cast or ductile iron pipe.

   (C) CONDUIT - Nom 1" (25mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.

   (D) COPPER TUBING or PIPE - Nom 1" (25mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   The max. annular space is 5/16" (8mm).

3. NELSON FSP PUTTY (part # AA445) - Min. 1-1/2" (38mm) depth in the annular space around the pipe. Apply an additional 1/8" (3mm) crown around the pipe where it exits the wall on both sides.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No.
W-L-1006

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Signature:    |                      |

DWG NO. FS-0041 R5
DATE: 07/14/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL NONMETALLIC TUBING

F Rating 2 Hr.  T Rating 2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 series designs as shown in the UL Fire Resistance Directory. The max. annular space is 5/8" (16mm). The max. diameter of opening is 2" (51mm).

2. NONMETALLIC TUBING - Max. 1/2" (13mm) diameter or smaller Electrical Nonmetallic Tubing (ENT).

3. NELSON FSP PUTTY (part # AA445) - Min. 1-1/2" (38mm) depth in the annular space around the pipe. Apply an additional 1/8" (3mm) crown around the pipe where it exits the wall on both sides.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0042 R3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>07/14/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>Project Name:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
SLEEVED CABLES

F Rating 2 Hr.     T Rating 2 Hr.

1. WALL ASSEMBLY - Construct as specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. diameter of the opening is 3" (76mm).

2. METALLIC SLEEVE - Nom 3" (76mm) diameter or smaller, steel sleeve with 3/4" - 3" (19mm - 76mm) long tabs. Sleeve fabricated from 27 GA galv sheet steel.

3. CABLES - (7) 2/C No. 20awg or smaller cables with polyethylene insulation and polyvinyl jacket. Min. separation between cables is 1/8" (3mm). The annular space between cables and the periphery of opening shall be 3/8" (10mm).

4. FORMING MATERIAL - Tightly pack min. 8pcf (96 kg/cubic meter) mineral wool batt insulation into the sleeve at a min. 3" (76mm) depth. Recess the fiber 1" (25mm) from both ends of the sleeve.

5. NELSON FSP PUTTY (part # AA445) - Apply over the forming material to a min. 1" (25mm) depth, flush with both ends of the wall. Additional material to be installed such that a min. 1/8" (3mm) crown is formed around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0043 R2

Project Name: ____________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________

Signature: ______________________________

DATE: 07/14/06
BY: RL

MEA # 135-00-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL CABLE

F Rating 2 Hr.  T Rating 2 Hr.

1. WALL ASSEMBLY - As specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. size of the opening is 1" (25mm).

2. CABLE - Max. 50pr. # 24awg., PVC insulated telecommunications cable. The cable is to be centered in the opening.

3. NELSON FSP PUTTY (part # AA445) - Apply to fill the annular space around the cable to a min. 1-1/2" (38mm) depth. Additional material to be installed such that a min. 1/8" (3mm) crown is formed around the penetrating item.

-tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-3003

Project Name: ___________________________  Address: ___________________________
Installer: _______________________________  Address: ___________________________
Signature: ______________________________

DWG NO. FS-0044 R2  DATE: 07/14/06  BY: RL

MEA # 135-00-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
CABLE TRAYS

F Rating 3 Hr.  T Rating 1/2, 1, 1-1/2, 2 & 3 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 8" (200mm) concrete floor or wall or CMU block wall. The max. size of the opening is 45" x 39" (1155mm x 990mm).

2. CABLE TRAY - Max. (2) max. 24" x 3" (610mm x 75mm) steel ladder type or solid bottom tray with a min. separation of 20" (500mm) between cable trays and with a min. separation of 11" (280mm) between the cable trays and the perimeter of the opening. Cable trays rigidly supported on both sides of opening a max. of 18" (460mm) from floor or wall.

3. CABLES - Max. 38% cross-sectional fill area per tray in any combination of:
   (A) max. (1) 500 MCM single conductor power control cable, with XLPE jacketing.
   (B) max. (1) #2/0awg multicore conductor power cables with fire retardant XLPE insulation and PVC jacketing. When used, T rating is 1 Hr.
   (C) max. (1) #2/0awg welding cable with hypalon jacketing. When used, T rating is 1-1/2 Hr.
   (D) max. (1) #4/0awg single conductor cable with XLPE jacketing. When used, T rating is 1-1/2 Hr.
   (E) max. (1) #4awg multicore power cable with PVC insulation and jacketing. When used, T rating is 2 Hr.
   (F) max. (1) #8awg multicore power cable with XLPE insulation and PVC jacketing. When used, T rating is 2 Hr.
   (G) max. (1) #1/0awg Teck cable with XLPE insulation and jacketing. When used, T rating is 2 Hr.
   (H) max. (5) #8awg multicore teck cable with interlocked aluminium armour. When used, T rating is 2 Hr.
   (I) max. #2awg multicore power and control cables with fire retardant PVC insulation and jacketing or fire retardant XLPE insulation and PVC jacketing. When used, T rating is 3 Hr.

4. NELSON CMP COMPOUND (part # AA476) - Apply CMP to fill the void within the floor or wall between the cables and cable tray and the periphery of the opening. Min. thickness is 8" (200mm).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0064 R5

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 10/23/06
BY: RL

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
METALLIC PIPE

F Rating 2 or 3 Hr.  T Rating 1/2 Hr.

(1) Floor or Wall
(2) Pipe
(3) Insulation
(4) Compound

1. FLOOR or WALL ASSEMBLY - Min. 3-1/4" (83mm) concrete floor or wall or CMU block wall. The max. size of opening is 10" x 30" (254mm x 762mm).

2. METALLIC PIPE - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 2" (51mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Max. 1" (25mm) thick FIBERGLASS or MINERAL FIBER pipe insulation. Annular space within the firestop system shall be 3/4" to 16" (19mm to 406mm).

4. NELSON CMP COMPOUND (part # AA476) - Min. 3-1/4" (83mm) depth for 2 or 3 hr F- Rating. Use of forming material such as plywood or polystyrene, cut close to the contour of opening, will aid in installation.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-5008

DWG NO.  FS-0070 R1
DATE:  07/14/06
BY:  RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
ELECTRICAL NONMETALLIC TUBING

F Rating 2 Hr.  T Rating 2 Hr.

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall or CMU wall. The max. diameter of opening is 2" (51mm).

2. ELECTRICAL NONMETALLIC TUBING - Nominal 1/2" (13mm) diameter electrical nonmetallic tubing centered in opening. Annular space of 5/8" (16mm) is required.

3. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter) mineral wool or ceramic fiber within annular space. Recess from both surfaces of wall 1-1/2" (38mm) to accommodate putty.

4. NELSON FSP PUTTY (part # AA445) - Apply FSP over the forming material, within the annular space, to a min. 1-1/2" (38mm) depth. Apply an additional 1/8" (3mm) crown around the penetrating item. Apply in same manner on both surfaces of the wall.

Tested in accordance with:
ASTM E–814
ANSI/UL 1479

Nelson Firestop

System No. W-J-2003

DWG NO. FS-0078 R2

Project Name: ____________________________
Address: _______________________________________
Installer: ____________________________
Address: _______________________________________
Signature: ____________________________

DATE: 07/14/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL TELEPHONE CABLE

F Rating 2 Hr.          T Rating 2 Hr.

(1) Wall
(2) Cable
(3) Forming Material
(4) Putty

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall or CMU wall. The max. diameter of opening is 2" (51mm).

2. CABLE - One 50 pair, #24 awg or smaller telephone cable with PVC insulation. Cable to be centered in opening and rigidly supported on both sides of wall.

3. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter) mineral wool or ceramic fiber within annular space. Recess from both surfaces of wall 1-1/2" (38mm) to accommodate putty.

4. NELSON FSP PUTTY (part # AA445) - Apply FSP over the forming material within the annular space, to a min. 1-1/2" (38mm) depth. Apply an additional 1/8" (3mm) crown around the penetrating item. Apply in same manner on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-3007

DWG NO. FS-0079 R2

Project Name: __________________________
Address: ______________________________
Installer: ______________________________
Address: ______________________________
Signature: ____________________________

DATE: 03/01/02
BY: RCE

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL CABLES

F Rating 2 Hr.        T Rating 2 Hr.

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 3" (76mm).

2. METALLIC SLEEVE (optional) - Nom 3" (76mm) diameter or smaller steel sleeve. Sleeve fabricated from 27 GA galv sheet steel.

3. CABLES - (7) 2/C No. 20awg or smaller cables with polyethylene insulation and polyvinyl jacket. Min. separation between cables is 1/8" (3mm). The annular space between cables and the periphery of opening shall be 3/8" (10mm).

4. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter) mineral wool batt insulation into the sleeve at a min 3" (76mm) depth. Recess the fiber 1" (25mm) from both ends of the sleeve.

5. NELSON FSP PUTTY (part # AA445) - Apply over the forming material to a min. 1" (25mm) depth, flush with both ends of the wall. Additional material to be installed such that a min. 1/8" (3mm) crown is formed around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-3008

DWG NO. FS-0080 R2

DATE: 07/14/06
BY: RL

MEA # 135-00-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
MULTIPLE METALLIC PIPE

F Rating 2, 3, 4 Hr.       T Rating 0 or 1/2 Hr.

(2) Pipes                          (1) Floor or Wall
(4) Compound
(3) Insulation

1. FLOOR or WALL ASSEMBLY - Min 3-1/4" (83mm) concrete floor or wall or CMU block wall. The max. size of opening is 10" x 30" (254mm x 762mm).

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used: Max. (5) conduits or tubing to be installed within the opening.
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" diameter (or smaller) rigid steel conduit.
   (D) COPPER TUBING OR PIPE - Nom 2" (51mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   Annular space between pipes and the periphery of opening is 3/4" to 4-3/4" (19mm to 121mm). Spacing between pipes or conduits is 3/4" to 1-1/2" (19mm to 38mm).

3. PIPE INSULATION (optional), Max. 1" (25mm) thick FIBERGLASS or MINERAL WOOL. For FIBERGLASS: F- Rating = 2 Hr. & T- Rating = 1/2 Hr. For MINERAL WOOL: F- Rating = 3 Hr. & the T- Rating = 1-1/2 Hr. No insulation: T- Rating = 0 Hr. Only one pipe, 4" (102mm) diameter or less, may have insulation and spaced a min 3/4" - 1-3/4" (19mm - 44mm) between pipes or conduits. Annular space between pipe and the periphery of opening is 1-1/2" - 3-3/4" (38mm - 95mm).

4. NELSON CMP COMPOUND (part # AA476) - Min. 3-1/4" (83mm) depth for 2 or 3 hr F- Rating or 7" (178mm) depth for 4 hr F- Rating. Use of forming material such as plywood or polystyrene, cut close to the contour of opening, will aid in installation.

5. WRAP MATERIAL (optional-not shown) - Thermal Ceramics type FP60, single layer ceramic fiber w/ foil facing each side. Extend min. 6" (152mm) beyond both surfaces of floor or wall. Secure w/ min 12 ga. steel wire. If this wrap material is applied to pipe or conduit the T-Rating is 1/2 Hr. if omitted then T rating is 0 Hrs.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-1040
C-AJ-8007
FM-44

DWG NO. FS-0084 R6
DATE: 07/14/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NO PENETRATING ITEM

F Rating 3 or 4 Hr.  T Rating 2 Hr.

(2) CMP
(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 3-1/4" (83mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. The max. size of the opening is 10" X 30" (254mm x 762mm). Max. diameter of opening is 7" (178mm) within a HOLLOW-CORE floor.

2. NELSON FIRESTOP CMP COMPOUND (part # AA476) - Min. 3-1/4" (83mm) thick floor or wall assembly and thickness of CMP will provide a 3 hr. F rating. A 7" (178mm) thickness will provide a 4 hr. F rating.

3. FORMING MATERIAL (not shown) - Plywood or polystyrene boards cut close to the contour of the opening. Remove after CMP cures (approx. 48 hours).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. C-AJ-0030

Nelson Firestop

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

DWG NO. FS-0085 R6

DATE: 07/14/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 2 Hr.  T Rating 0, 1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 3-1/4" (83mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of the opening is 6" or 8" (152mm or 203mm) dependent on the size of the multiplug device.

2. CABLES - Max. 100% cable fill, as limited by available modules:
   (A) max. 300MCM power cable.
   (B) max. 7C-12awg control cable.
   (C) max. 100pr. - 24awg communication cable with PVC or PE insulation and jacket.

Where control cable only is used, the T rating is 1/2 Hr. For all other cable types, the T rating is 0 Hr.

3. NELSON MPG MULTIPLUG DEVICES - Install in pre-drilled or pre formed openings of floors or walls. Select and install modules for each cable per manufacturer's instructions. Tighten compression bolts uniformly until modules are securely held.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NO PENETRATING ITEM

F Rating 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. area of the opening is 63-1/4 sq. inches (408 sq. cm) with a max. dimension of 11-1/2" (292mm).

2. TECRON GASKET MATERIAL - Nominal 2-1/4" (52mm) wide, 1/8" (3mm) thick Tecron gasket is placed between the underside of the cover plate and the top surface of the concrete floor or both surfaces of the wall.

3. COVER PLATE - Constructed of min. 16 gauge (.057" thick) (1.44mm thick) galvanized sheet steel, sized to overlap the edge of the opening on all sides by a min. of 2-1/2 " (64mm). Applied to the top side of the floor or on both sides of the wall.

4. CONCRETE ANCHORS - Nominal 3/8" (10mm) diameter by 3-1/4" (83mm) long steel expansion anchors, or equivalent. Spacing is not to exceed 4" (102mm) on center.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-0010

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 07/14/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td>BY: RL</td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 3 Hr.

(5) Cover Plate
(6) Concrete Anchors

T Rating 0 Hr.

(4) Putty

(1) Floor or Wall
(2) Pipe
(3) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The min. wall thickness is 7-1/4" (184mm). The max. area of the opening is 63-1/4 sq. inches (408 sq. cm) with a max. dimension of 11-1/2" (292mm). The annular space between the penetrating item and the periphery of the opening may range from 3/8" to 7-5/8" (10mm to 194mm).

2. METALLIC PIPE or CONDUIT - The following types of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 3" (76mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 3" (76mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   The annular space between the penetrating item and the periphery of the opening may range from 3/8" to 7-5/8" (10mm to 194mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool or ceramic fiber within the opening to a min. thickness of 5-3/4" (146mm). In floor assemblies, the forming material is to be domed a min. of 2" (51mm) below the bottom surface of the floor. Recess the fiber 3/4" (19mm) from the top surface of the floor or from both surfaces of the wall.

4. NELSON FSP PUTTY (part # AA445) - Apply a min. 3/4" (19mm) depth of FSP over the forming material, flush with the top surface of the floor or with both surfaces of the wall.

5. COVER PLATE - Constructed of min. 28 gauge (.021" thick) (.533mm thick) galvanized steel sheet, cut to fit the contour of the penetrating item and sized to overlap the edge of the opening on all sides by a min. of 2-3/8" (60mm). Applied to the top side of the floor or on both sides of the wall.

6. CONCRETE ANCHORS - Nominal 3/8" (10mm) diameter by 3-1/4" (83mm) long steel expansion anchors, or equivalent. Spacing is not to exceed 4" (102mm) on center.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0091 R4

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DATE: 07/14/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of the opening is 5" (127mm).

2. METALLIC PIPE or CONDUIT - The following types of metallic pipe, conduit or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   The max. annular space is 1/4" (6mm).

3. NELSON FSP PUTTY (part # AA445) - Min. 1" (25mm) thick layer of FSP recessed 1" (25mm) from the top surface of the floor or from both surfaces of the wall.

4. STEEL TIE WIRE - Nominal 12 gauge steel tie wire tightly wrapped around the pipe and placed over the top surface of the FSP putty in floor applications or both surfaces in wall applications.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

SYSTEM NO. C-40-1054

DWG NO. FS-0092 R3

DATE: 07/14/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or 5-1/2" (140mm) wall or CMU block wall. The max. opening diameter is 8" (203mm).

2. METALLIC PIPE or CONDUIT - The following types of metallic pipes or conduits may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 1" (25mm) thick, or thinner, FIBERGLASS or MINERAL FIBER pipe insulation. The max. annular space is 3/4" (19mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3-1/2" (89mm) depth, and recess 1" (25mm) from the top surface of the floor or from both surfaces of the wall.

5. NELSON FSP PUTTY (part # AA445) - Apply over the forming material to a min. depth of 1" (25mm), flush with the top surface of the floor or with both surfaces of the wall with an additional 3/4" (19mm) crown around the pipe where it penetrates the floor or wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-5012

DWG NO. FS-0093 R4

DATE: 07/14/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 2 Hr.  T Rating 0, 3/4 or 2 Hr.

(3) Cable Rack
(6) Putty
(7) Cover Plate
(5) Composite Sheet
(2) Sheathing
(4) Cables
(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 8" (203mm) thick lightweight or normal weight concrete floor or wall. The max. size of the opening is 18" X 24" (457mm x 610mm).
2. SHEATHING - Nominal 1-1/2" X 4" X 3/8" (38mm x 102mm x 10mm) steel channel enclosing the perimeter of the opening at the top surface of the floor, one surface of wall (asymmetrical) or both surfaces of wall (symmetrical).
3. CABLE RACK - Max. 20" (508mm) wide open ladder type cable rack, welded to the top surface of the sheathing.
4. CABLES - Max. 36% cable fill of opening in any combination of:
   (A) max. 240pr. #24awg telephone cable w/PVC insulation and jacket.
   (B) max. 750 kcmil power cable w/XLPE insulation and PVC jacket.
In floor or wall asymmetrical configuration, when cables (A) or NONE are used, the T rating is 2 or 0 hr. When cables (B) are used, the T rating is 3/4 or 0 hr. In wall symmetrical configuration, when cables (A), (B) or NONE are used the T rating is 2, 3/4 or 2 hr respectively.
The annular space between cable bundle and the periphery of opening is 1/2" (13mm) to 5-1/2" (140mm).
5. NELSON CPS COMPOSITE SHEET - Cut to the contour of the cables at the top and bottom of the opening and secure to the frame with 1/4" (6mm) diameter x 1" (25mm) steel bolts and nuts.
6. NELSON FSP PUTTY (part # AA445) - Pack to seal voids between the composite sheet, cables, and the periphery of the opening. Apply a min. 1/2" (13mm) bead around the periphery of the opening at the bottom, and around the cable bundle at both the top after installation of the cover plate (Item 6C). Apply a min. 1/4" (6mm) bead between the top layer of CPS and the underside of the cover plate. Apply a min. 1-1/2" (38mm) X 2" (51mm) bead around the cable bundle at the bottom of the opening.
7. COVER PLATE - Constructed of min. 12 gauge sheet steel, cut to fit the contour of the cable bundle and installed over the CPS sheet (top layer for floor) or (one surface for asymmetrical wall) or (both surfaces for symmetrical wall) and secured with min. 3/16" (5mm) diameter bolts.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
C-BJ-4016

Nelson Firestop

DWG NO. FS-0094 R3

DATE: 07/14/06
BY: RL

MEA # 228-95-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL METALLIC PIPE OR CONDUIT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. opening diameter is 5" (127mm).

2. METALLIC PIPE or CONDUIT - The following types of metallic pipe, conduit or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or rigid steel conduit.
      The nom annular space is 1/4" (6mm).

3. NELSON CLK SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth, with an additional 3/8" (10mm) bead around the pipe, on the surface of the wall. Nominal 1/2" diameter polyurethane backer rod may be used to control the depth of the sealant.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-1030

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

DWG NO. FS-0095 R4
DATE: 07/14/06
BY: RL

MEA # 236-87-M Vol.2
GYPSUM WALL CABLES

F Rating 1 or 2 Hr.  T Rating 1 or 2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 1/2".

2. CABLES - Max. 25pr. 24 awg (or smaller), telephone cable with polyvinyl chloride insulation and jacket. The annular space is 1/8" (3mm).

3. NELSON CLK SEALANT - Apply to fill the annular space around the cable to a min. 5/8" (16mm) depth, flush with both surfaces of the wall. Additional sealant shall be applied such that a min. 3/8" (10mm) bead is formed around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-3026

DWG NO. FS-0096 R6

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

DATE: 05/01/07
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
**Gypsum Wall Cable Tray**

**F Rating 1 or 2 Hr.**

1. **Wall Assembly** - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. area of opening is 160 sq. in. (1032 sq. cm) with a max. dimension of 20" (508mm). The annular space between the cable tray and top and bottom of the opening shall range from 0" (point of contact) to 2" (51mm).

2. **Cable Tray** - Max. 18" (457mm) wide x 4" (102mm) deep aluminum or 18" (457mm) x 6" (152mm) steel, open ladder type cable tray. The annular space between the cable tray and each side shall be a nom 1" (25mm).

3. **Cables** - Max. 18-30% cable fill of opening in any combination of:
   - (A) max. 1/C #300 kcmil cable w/cross linked polyethylene (XLPE) jacket.
   - (B) max. 7/C #12 awg cable w/polyvinyl chloride (PVC) or (XLPE) insulation and PVC jacket.
   - (C) max. 100pr #24 awg cable w/PVC insulation and jacket.

   The F rating is 0 hr. for 1 fr. rated walls.

4. **Steel Channel** - Fabricated from 50 ga. galv. steel. Channel is to bridge the stud cavity on both sides of the opening with a min. 3" (76mm) flange on both sides of wall. Secure with steel screws and fender washers, spaced 4" (102mm) OC. on both sides of wall.

5. **Nelson PLW Pillows** (part # AA478 or AA479) - Pillows to be installed horizontally through the wall and centered within the opening of the wall. Pillows tightly packed into the opening to fill the annular space between cables and periphery of opening and between cable tray and periphery of opening.

6. **Nelson FSP Putty** (part # AA445) - After installation of the pillows, putty shall be applied to seal any voids between the cables and the pillows and between the cable tray and the pillows on both sides of wall.

7. **Wire Lath** - Nominal 2" (51mm), 19awg. galv. steel wire lath, cut to fit the contour of the opening with a min. 3" (76mm) lap beyond the periphery of the opening. Wire lath secured to both surfaces of wall assembly with 2-1/4" (57mm) long Type S self-drilling, self-tapping bugle head steel screws and 1/4" (6mm) by 1-1/2" (38mm) diameter steel fender washers, spaced 6" (152mm) OC.

   Tested in accordance with:
   - ASTM E-814
   - ANSI/UL 1479

---

**Nelson Firestop**

**DWG NO.** FS-0097 R5

**DATE:** 07/14/06

**BY:** RL

**MEA # 196-84-M Vol. 3**

**Nelson Firestop**

800 331-7325   Fax: 918 627-2941

Tulsa, Ok.
GYPSUM WALL
MULTIPLE METALLIC PIPES

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. opening is 11" x 3" (279mm x 76mm).

2. METALLIC PIPES or CONDUITS - Max. (5) pipes of which only (2) can have a diameter greater than 1" (25mm).
   (A) STEEL PIPE - Nom 1" (25mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 1" (25mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 1" (25mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING or PIPE - Nom 2" (51mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

The pipes and conduits shall be spaced a nom 1/2" (13mm) apart and a nom 3/4" (83mm) from each side of the opening. The annular space between pipes, the conduits or tubing and the top and bottom of the opening may range from 0" (point of contact) to a max. of 1-15/16" (49mm).

3. STEEL FRAME - Constructed of 7/8" x 7/8", (22mm x 22mm) nominal 16 ga. steel angles that extend a min. of 7-1/2" (191mm) beyond the periphery of the opening and secured to studs with 2-1/4" (57mm) long Type S self tapping bugle head screws in conjunction with 1/4" x 1-1/2" (6mm x 38mm) diameter steel fender washers.

4. WIRE MESH - Diamond shaped steel mesh or metal fabric cut to fit the contour of the metallic pipes and conduit and installed between steel framing unit and the gypsum board on both surfaces of the wall. Mesh to be secured to both the horizontal and vertical members of the steel framing unit by means of #8 x 1/2" (13mm) long panhead sheet metal screws located at each corner of the steel framing unit.

5. NELSON FSP PUTTY (part # A4445) - Min. 1" (25mm) thickness of putty applied over metal lath flush with top surface of steel framing unit on both surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-1031

DWG NO. FS-0098 R4

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
BY: ____________________

DATE: 07/14/06

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall or CMU wall.

2. METALLIC PIPE or CONDUIT - The following types of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or rigid steel conduit.
   The max. annular space is 1/4" (6mm).

3. NELSON CLK SEALANT - Apply CLK to fill the annular space to a min. 5/8" (16mm) depth, with an additional 3/8" (10mm) bead around pipe on both wall surfaces. Nominal 1/2" (13mm) backer rod may be used to control the depth of the sealant.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. W-J-1014

Nelson Firestop
DWG NO. FS-0099 R4

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/14/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLE TRAY

F Rating 2 Hr.  T Rating 1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. area of opening is 189 sq. in. (1219 sq. cm) with max. dimension of 27" (686mm).

2. CABLE TRAY - Max. 24" (610mm) wide x 4" (102mm) deep steel or aluminum, open ladder type cable tray. Annular space between side rails of cable tray and periphery of opening shall be 1-1/2" (38mm). Annular space between the back of cable tray and periphery of opening may range from 0" (point of contact) to 2-3/4" (70mm).

3. CABLES - Max. 40% cable fill of opening in any combination of:
   (A) max. 1/C #300 kcmil cable w/cross linked polyethylene (XLPE) jacket,
   (B) max. 7/C #12 awg cable w/polyvinyl chloride (PVC) or (XLPE) insulation and PVC jacket,
   (C) max. 100pr #24 awg cable w/PVC insulation and PVC jacket.

4. NELSON PLW PILLOWS (part # AA478 or AA479) - Pillows to be installed horizontally within the opening in such a manner that the ends project beyond each surface of floor or wall. Pillows tightly packed into opening to fill the annular space between cables and periphery of opening and between cable tray and periphery of opening.

5. NELSON FSP PUTTY (part # AA445) - At the point of contact location between the cable tray and concrete, a min. 1" (25mm) bead of putty shall be hand packed at concrete/cable tray interface on top surface of floor and on both surfaces of wall.

6. WIRE LATH - Nominal 2" (51mm), 19awg, galv. steel wire lath, cut to fit the contour of the opening with a min 3" (76mm) lap beyond the periphery of the opening. Wire lath secured to top surface of floor and both surfaces of wall assembly with 1/4" (6mm) diameter by 1" (25mm) long concrete anchors in conjunction with 1/4" (6mm) by 1-1/2" (38mm) diameter steel fender washers, spaced 8" (203mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. C-AJ-4013

Nelson Firestop

DWG NO. FS-0100 R5

DATE: 07/14/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

Project Name: 
Address: 
Installer: 
Address: 
Signature: 
CONCRETE WALL CABLE

F Rating 2 Hr.  T Rating 2 Hr.

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall or CMU wall.

2. CABLE - Max. 25pr. PVC insulated telecommunications or data cable. The nom annular space is 1/8" (3mm).

3. NELSON CLK SEALANT - Apply CLK to fill the annular space around the cable to a min. 5/8" (16mm) depth with an additional 3/8" (10mm) bead around the cable where it exits both sides of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-3010

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0101 R4

DATE: 07/14/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
# CONCRETE FLOOR OR WALL BUS DUCT

## F Rating 2 Hr.  

### (1) Floor or Wall  
### (2) Bus Duct  
### (3) Cover Plate  
### (4) Forming Material  
### (5) Sealant

## T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. area of opening is 119 sq. in. (786 sq. cm) and a max. dimension of 17" (432mm).

2. BUS DUCT ASSEMBLY - Nom 15" x 6" (381mm x 152mm) "I" shaped steel and aluminum enclosure containing factory mounted copper bars rated for 600V / 3000A. The annular space between the flange of the busway and the periphery of the opening shall be 5/8" (16mm). The annular space between the web of the busway and the periphery of the opening shall be 1-3/8" (35mm).

3. COVER PLATE ASSEMBLY (not shown) - A min. 1/8" (3mm) thick steel cover plate provided by busway manufacturer shall be installed on top surface of floor and both surfaces of wall assembly. Steel cover plate secured in accordance with busway manufacturer's installation instructions.

4. FORMING MATERIAL - Tightly pack min. 8pcf (96 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3-5/8" (92mm) depth, and recess 7/16" (11mm) from top of floor surface or from both surfaces of wall.

5. NELSON CLK SEALANT - Apply over forming material, within the annular space to a min. 7/16" (11mm) depth, flush with the top surface of the floor or with both surfaces of the wall.

Tested in accordance with:
- ASTM E-814
- ANSI/UL 1479

---

**Nelson Firestop**

**System No.** C-AJ-6004  
**DWG NO.** FS-0102 R7

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
</tbody>
</table>

| Signature:    |  |

**DATE:** 02/06/07  
**BY:** RL  
**MEA # 236-87-M Vol.2**

**Nelson Firestop**

800 331-7325  
Fax: 918 627-2941  
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of the opening is 18" (457mm).

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes or conduits may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3-1/2" (89mm) depth, and recess 1/2" (13mm) from top surface of floor or both wall surfaces.

4. NELSON CLK SEALANT - Apply over forming material, within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall. At areas of point contact, apply a 1/2" (13mm) bead at the pipe to concrete interface. Where CLK non-sag caulk is used, the annular space is 2 to 3-1/4" (51mm to 83mm). Where CLK self leveling caulk is used, the annular space is 0" to 3-1/4" (83mm).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
C-AJ-1124

Nelson Firestop

DWG NO. FS-0103 R5

Project Name: __________________________  DATE: 07/17/06
Address: ____________________________________
Installer: ____________________________________  BY: rl
Address: ____________________________________
Signature: ____________________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 2 Hr.    T Rating 1-1/2 Hr.    L Rating - < 1 SCFM

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 16" (406mm).

2. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 10" (254mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 10" (254mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick or thinner, FIBERGLASS or MINERAL FIBER pipe insulation.
   Annular space is 5/8" (16mm).

4. FORMING MATERIAL - Tightly pack min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3-1/2" (89mm) depth, and recess 1/2" (13mm) from top of floor surface or both wall surfaces.

5. NELSON CLK SEALANT - Apply within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. C-AJ-5059

Nelson Firestop
DWG NO. FS-0104 R6

DATE: 07/17/06
BY: rl

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL CABLES

F Rating 2 Hr.  T Rating 1/2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory.

2. SUPPORT - Constructed from steel stud and track mat'l, designed to provide backing for mounting screws on all sides of MCT Frame assembly.

3. CABLES - Max. 33.3% cable fill of opening of:
   (A) max. 1/C #0awg power cable w/moisture and thermoplastic insulation and jacket.

4. FRAME ASSEMBLY - Nelson RGM frame, size 8 or smaller with a max. opening of 64 sq. in. (413 sq. cm). Max. diameter of 11-5/8" (295mm). The firestop device may be installed on either side of the wall.

5. MOUNTING SCREWS - 1/4 x 5" (6mm x 127mm) lg. hex drive roofing screws w/fender washers at each bolt hole in flange.

6. TECRON MODULES - Sized to fit each cable in accordance with Nelson instructions.

7. FRAME HARDWARE - Stay Plates, Compression Plates and End Packing as required by Nelson instructions.

8. FORMING MATERIAL - Tightly pack min. 4pcf mineral wool insulation to fill the annular space to a min. 5" (127mm) depth between the cables and periphery of opening flush with surface of wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-3054

DWG NO. FS-0105 R4

DATE: 07/17/06
BY: RL

Project Name: ____________________________
Address: ________________________________
 Installer: ________________________________
Address: ________________________________
Signature: _______________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL CABLES

F Rating 1 or 2 Hr.  T Rating 0 or 1 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 or V400 series designs as shown in the UL Fire Resistance Directory. Max. opening size is 83-1/4 sq. in. (337 sq. cm) with a max. dimension of 18-1/2" (470mm).

2. CABLES - Max. 26% cable fill of opening in any combination of:
   (A) max. 350 kcmil single conductor power cables w/PVC insulation.
   (B) max. 7C #12 awg copper conductor control cables w/PVC insulation jacket.
   (C) max. 100pr. #24 awg copper conductor communication cables w/polyvinyl chloride (PVC) insulation and jacket.

3. METALLIC SLEEVE - Metallic sleeve consists of a rectangular shaped sleeve and a cover plate fabricated from 14MSG (0.072 in.) (2mm) thick galv. steel. The rectangular shaped sleeve consists of a cover 18" (457mm) wide by 4" (102mm) high by 20" (508mm) long sleeve with a 2-3/4" (70mm) wide mounting plate. The cover plate consists of a 2-3/4" (70mm) wide leg and 1-1/2" (38mm) high flange. The rectangular shaped sleeve to be inserted into the opening from either side of wall. Cover plate to be surface mounted on opposite side of wall. Both rectangular shaped sleeve and cover plate secured to wall by means of 2-1/2" (64mm) long Type S, self-drilling, self-tapping bugle head steel screws in conjunction with 1/4" (6mm) by 1-1/4" (32mm) diameter steel fender washers installed in pre-drilled holes spaced 7-1/2" (191mm) OC along the mounting plate and cover plate. The max. width of the steel sleeve is 12" (305mm), if installed in a wood stud/gypsum wallboard assembly. 
P-W INDUSTRIES INC. - Type P-W COOPER B-LINE INC - Wall Penetration Sleeve

4. NELSON PLW PILLOWS (part # AA478 or AA479) - Tightly pack pillows into opening to fill annular space between cables and periphery of opening. Install pillows flat with nom 9-1/2" (241mm) length of each pillow passing through the wall opening with ends projecting a min. of 2-1/2" (57mm) beyond each side of the wall.

5. NELSON FSP PUTTY (part # AA445) - (not shown) After installation of the pillows, putty shall be applied to seal any voids between the cables and the pillows and the metallic sleeve on both sides of wall assembly. 
   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

| Project Name: | DATE: 11/29/06 |
| Address: | |
| Installer: | |
| Address: | |
| Signature: | |

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 2 Hr.  
T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor min 6" (152mm) thick concrete wall or CMU block wall.

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 1-1/2" (38mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 3/4" (19mm) thick or thinner, AB/PVC (ARMAFLEX) flexible foam pipe insulation or mineral wool pipe insulation. The max. annular space is 15/16" (24mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3" (76mm) depth, and recess 1-1/2" (38mm) from top surface of floor or from both wall surfaces.

5. NELSON FSP PUTTY (part # AA445) - Apply over forming material, within the annular space to a min. 1-1/2" (38mm) depth, flush with top surface of floor or with both surfaces of the wall with an additional 1/8" (3mm) crown around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.  
C-AJ-5054

Nelson Firestop  
DWG NO. FS-0107 R5

Project Name: ___________________________  DATE: 07/17/06
Address: _________________________________
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

BY: RL  
MEA # 196-84-M Vol.3

Nelson Firestop  
800 331-7325   Fax: 918 627-2941  
Tulsa, Ok.
GYPSUM WALL
INSULATED METALLIC PIPE

F Rating 2 Hr.          T Rating 0 or 2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 10" (254mm).

2. METALLIC PIPE - The following types and sizes of metallic pipes may be used:
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   For steel or cast iron pipe the T rating is 2 hrs, for copper tubing or pipe the T rating is 0 hr.

3. PIPE INSULATION - Nom 1-1/2" thick (38mm) (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation.
   The max. annular space for pipe larger than 4" diameter is 3/16" (5mm) and 3/4" (19mm) otherwise.

4. NELSON FSP PUTTY (part # AA445) - Apply FSP to fill the annular space to a nominal 1-3/4" (44mm) depth on both sides of the wall. Additional material to be installed such that a 1/2" (13mm) thick crown is formed around the penetrating item.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No.
W-L-5036

Project Name:
Address:
Installer:
Address:
Signature:

DWG NO. FS-0108 R6
DATE: 07/17/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL NONMETALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 1/2, 1 or 2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory.

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 SOLID CORE PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   (C) RIGID NONMETALLIC CONDUIT - Nom 4" (102mm) diameter (or smaller) Sch. 40 PVC conduit.

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>F Rating (Hr.)</th>
<th>T Rating (Hr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; (102mm)</td>
<td>1 or 2</td>
<td>1 or 2</td>
</tr>
<tr>
<td>3&quot; (76mm)</td>
<td>1 or 2</td>
<td>1 or 2</td>
</tr>
<tr>
<td>2&quot; (51mm)</td>
<td>1 or 2</td>
<td>1/2 or 2</td>
</tr>
</tbody>
</table>

The nom annular space is 1/4" to 5/16" (6mm to 8mm) for 2" (51mm) diameter or less pipes or conduits and the annular space is 1/4" (6mm) for pipes or conduits greater than 2" (51mm).

3. NELSON PCS PIPECHOKE - Install the appropriate sized pipechoke around the pipe on both sides of the wall and secure the choke to the wall with 1/8" (3mm) diameter by 1-3/4" (44mm) toggle bolts in conjunction with 1/4" (6mm) by 3/4" (19mm) diameter and 1/4" (6mm) by 1-1/4" (32mm) diameter steel fender washers.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. W-L-2071

DWG NO. FS-0110 R5

Project Name: ___________________________  DATE: 07/17/06
Address: ___________________________________________________
Installer: ___________________________  BY: RL
Address: ___________________________________________________
Signature: ________________________________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 2 or 3 Hr. T Rating 0,1-1/2, or 2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 5" (127mm).

2. NONMETALLIC PIPE or CONDUIT - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter, (or smaller), Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) RIGID NONMETALLIC CONDUIT - Nom 4" (102mm) diameter, (or smaller), Sch. 40 PVC conduit.
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter, (or smaller), SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (D) POLYBUTYLENE (PB) PIPE - Nom 4" (102mm) diameter, (or smaller), SDR11 PB pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

The max. annular space is 1/4" (6mm).

<table>
<thead>
<tr>
<th>Pipe Size/Description</th>
<th>F Rating (Hr.)</th>
<th>T Rating (Hr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2&quot; (38mm) Solid Core PVC</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2&quot; - 4&quot; (51mm - 102mm) Solid Core PVC</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2&quot; - 4&quot; (51mm - 102mm) Cellular Core PVC</td>
<td>2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>1-1/2&quot; - 4&quot; (38mm - 102mm) CPVC</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>1-1/2&quot; - 4&quot; (38mm - 102mm) PB</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>1-1/2&quot; - 4&quot; (38mm - 102mm) RNC</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

3. NELSON PCS PIPECHOKE - Apply the appropriate sized pipechoke around the pipe on the underside of the floor, or on both sides of the wall. Secure to the concrete with steel masonry anchors and fender washers.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

---

Nelson Firestop

DWG NO. FS-0111R9

DATE: 07/17/06

BY: RL

MEA # 173-99-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD JOIST FLOOR
METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  T Rating 3/4 or 1 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in Design No. L505, L511, or L536 in the UL Fire Resistance Directory, as summarized below:
Diameter of opening to be 1/2" (13mm) larger than the outside diameter of through pentranat.
(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood joists between first and second layers of wallboard and spaced 24" O.C.
(C) GYPSUM BOARD - First layer of wallboard nailed to wood joists. Second layer of wallboard screw-attached to furring channels.

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes or conduits may be used:
(A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
(B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
(C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
(D) COPPER TUBING or PIPE - Nom 2" (51mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

For steel or cast iron pipe the T rating is 1 hr., for copper tubing or pipe the T rating is 3/4 hr.

3. NELSON CLK N/S SEALANT - Sealant forced into annulus to max. extent possible on both surfaces of floor-ceiling assembly. Additional sealant to be installed such that a min. 1/8" (3mm) thick crown is formed around the penetrant on bottom side of floor-ceiling assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-1012

DWG NO. FS-0113 R5

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 10/23/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 2 or 3 Hr.  T Rating 1/2 or 1 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall.

2. CABLES - Max. 100% cable fill, as limited by available modules, of:
   (A) max. 350 kcmil single conductor w/polyvinyl chloride (PVC) insulation and jacket.
   (B) max. 7/C #12 awg multi conductor w/PVC or cross linked polyethylene (XLPE) insulation and PVC jacket.
   (C) max. 100pr. #24 awg w/PVC insulation and jacket.
   (D) max. 72 fibers - 62.5/125 fiber-optic cable w/ PVC insulation and jacket.
   (E) max. 50pr. #24 awg w/PVC insulation and jacket.
When 350kcmil or 100 pr. 24awg cables are used the F rating is 3 hrs. and the T rating is 1/2 hr. When 7C-12awg cables are used the F rating is 3 hrs. and the T rating is 1 hr. When fiber optic cables are used the F rating is 2 hrs. and the T rating is 1 hr.

3. NELSON MCT FRAME ASSEMBLY - Type RGM8 or smaller frame with one or more openings/ assy. Tecron insert blocks are sized to fit closely around each individual cable installed together with blank modules, stayplates, compression plates and end packing units to fill the entire frame assy. MCT frame is to be installed on the top surface of floor or both surfaces of the wall.

4. TECRON GASKET - (not shown) 2-1/8" (54mm) wide x 1/8" (3mm) tk. gasket as supplied by Nelson Firestop Products, is installed between the flange of the MCT frame and the wall or floor.

5. MOUNTING ANCHORS - Steel masonry anchors with fender washers are required to secure frame to the wall or floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-3048

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

DWG NO. FS-0114 R4
DATE: 07/17/06
BY: RL
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 3 Hr.    T Rating 1/2 or 1-1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 6" (152mm) thick wall or CMU block wall.

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nom 1-1/2" (38mm) thick or thinner FIBERGLASS or MINERAL FIBER pipe insulation. For insulation 1/2" to 1" (13mm to 25mm) thick the T rating is 1/2 hr. For 1-1/2" (38mm) thick insulation the T rating is 1-1/2 hr. The annular space is to be 1/8" to 3/4" (3mm to 19mm).

4. FORMING MATERIAL - Tightly pack min 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a nominal 3" (76mm) depth, and recess 1-1/2" (38mm) from TOP or BOTTOM surface of floor or from both wall surfaces.

5. NELSON FSP PUTTY (part # AA445) - Min. 1-1/2" (38mm) thickness of putty applied within the annular space, flush with TOP or BOTTOM surface of floor or both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO. FS-0115 R6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>Installer:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
</tr>
<tr>
<td>DATE: 02/01/07</td>
</tr>
<tr>
<td>BY: RL</td>
</tr>
</tbody>
</table>

NELSON FIRESTOP
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NONMETALLIC PIPE

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or 6" (152mm) thick wall or CMU block wall.

2. NONMETALLIC PIPE OR CONDUIT - The following types and sizes of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented, (drain, waste or vent) piping systems.
   (B) RIGID NONMETALLIC CONDUIT - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 40 PVC conduit.
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 1-1/2" (38mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems. The nom annular space is 13/16" (21mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3" (76mm) depth, and recess 1-1/2" (38mm) from topside or underside of floor or from both wall surfaces.

4. NELSON FSP PUTTY (part # AA445) - Apply within the annular space, over or under the forming material to a min. 1-1/2" (38mm) depth, flush with the topside or underside of the floor or with both sides of the wall. Additional putty to be installed such that a min. 1/4" (6mm) crown is formed around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

CLASSIFIED
UL
System No. C-AJ-2096

Project Name: __________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

DWG NO. FS-0116 R6
DATE: 07/17/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NONMETALLIC PIPE

F Rating 3 Hr.  T Rating 0 or 3 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall.

2. NONMETALLIC PIPE or CONDUIT - The following types of nonmetallic pipes may be used:
   (A) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 foamed core ABS pipe for use inclosed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) FIRE RETARDANT POLYPROPYLENE (FRPP) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

When ABS pipe is used the T rating is 0 hr. When FRPP pipe is used the T rating is 3 hrs.
The max. annular space is 5/16" (8mm).

3. NELSON PCS PIPECHOKE - Apply the appropriate sized pipechoke around the pipe on the underside of the floor, or on both sides of the wall. Secure to the concrete with steel masonry anchors and hanger washers.

4. PIPE COVERING - Apply a nominal 1" (25mm) thick, 7-1/2" (191mm) long hollow cylindrical heavy density glass fiber pipe insulation, butted against the bottom of the PCS device. In wall penetrations, apply to both sides. Secure to pipe with steel tie wire.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-2102

DWG NO. FS-0117 R4

DATE: 07/17/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The nom annular space is 5/16" (8mm).

2. NONMETALLIC PIPE - Nominal 2" (51mm) diameter, or smaller, Sch. 40 Flame Retardant Polypropylene FRPP pipe.

3. NELSON PCS PIPECHOKE - Apply the appropriate sized pipe choke around the pipe on both sides of the wall. Secure to the wall with drywall anchors and washers.

4. PIPE COVERING - Apply a nominal 1" (25mm) thick, 7-1/2" (191mm) long hollow cylindrical heavy density glass fiber pipe insulation, butted against the PCS devices on both sides of the wall. Secure to pipe with steel tie wire.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 4 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 5-1/2" (140mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 4" (102mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 5" (127mm) depth, and recess 1/2" (13mm) from the top surface of the floor.

3. NELSON CLK SEALANT - Apply CLK over the forming material to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-S-1011
DWG NO. FS-0119 R5

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/28/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
WALL TO WALL
(Limited to Fire Exposure on Interior Face)
F Rating 4 Hr.
Nominal Joint Width - 4" (102mm)

(2) Forming Material
(3) Sealant
(1) Wall

1. WALL ASSEMBLY - Min. 5-1/2" (140mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 4" (102mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 5" (127mm) depth, and recess 1/2" (13mm) from the external face of the wall.

3. NELSON CLK SEALANT - Apply CLK over the forming material on the external face, to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. WW-S-1013
DWG NO. FS-0120 R6

Project Name: __________________________
Address: ______________________________
Installer: ______________________________
Address: ______________________________
Signature: _____________________________

DATE: 11/28/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
WALL TO WALL

F Rating 4 Hr.
Nominal Joint Width - 4" (102mm)

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The max joint width at the time of installation is 4" (102mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 5" (127mm) depth, and recess 1/2" (13mm) from both surfaces of the wall.

3. NELSON CLK SEALANT - Apply CLK over the forming material, on both sides of the wall, to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No.
WW-S-1014

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop

DWG NO. FS-0121 R6

DATE: 11/28/06

BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
LARGE OPENING

F Rating 3 Hr.  T Rating 2 Hr.

(1) Floor or Wall
(2) Compound

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. size of the opening is 40" x 48" (1016mm x 1219mm).

2. NELSON CMP COMPOUND (part # AA476) - Install to a min. 4-1/2" (114mm) depth, flush with the top surface of the floor or with both surfaces of the wall.

3. FORMING MATERIAL - (not shown) - Use plywood or polystyrene forming board cut close to contour of opening. Remove after curing of CMP, min. 48 hrs.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. C-AJ-0043

Nelson Firestop

Date: 07/18/06
By: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
METALLICPIPES OR CONDUITS

F Rating 2 Hr.                  T Rating 0 Hr.

(2) Pipe

(1) Floor or Wall

(3) Compound

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. size of opening is 40" x 48" (1016mm x 1219mm).

2. METALLIC PIPE or CONDUIT - A max. of (2) pipes, conduits or tubing to be installed within the opening. The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 10" (254mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 10" (254mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 6" (152mm) diameter (or smaller) rigid galv steel conduit.
   (D) EMT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing.
   (E) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

Only (1) pipe may be larger than 4" (102mm). Annular space to opening edge is min. 1" to 37" (25mm to 940mm), between pipes is 2" to 40" (51mm to 1016mm).

3. NELSON CMP COMPOUND (part # AA476) - Install to min. 4-1/2" (114mm) depth, flush with the top surface of the floor or with both surfaces of the wall.

4. FORMING MATERIAL - (not shown) - Use plywood or polystyrene forming board, cut close to contour of opening. Remove after cure, approx. 48 hrs.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-1219

DWG NO.  FS-0125 R5

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL SLEEVED CABLES

F Rating 2 Hr.  T Rating 3/4 or 1 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall.

2. METALLIC SLEEVE - Max. nominal 6" (152mm) diameter (or smaller) Sch 10 (or heavier), steel sleeve cast or grouted into the floor or wall, and extending a nominal 2" (51mm) beyond surfaces.

3. CABLES - Max. 40% cable fill of opening of:
   (A) max. 600pr. 24awg or smaller, PVC jacketed telecommunications cable.

   CABLES - Max. 26% cable fill of opening of:
   (A) max. 72 fiber PVC jacketed fiber optic cable
   For telecommunications cable the T rating is 3/4 hr., for fiber optic cable the T rating is 1 hr.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 5-1/4" (133mm) depth, and recess 3/4" (19mm) from top surface of sleeve in floors or from both surfaces of sleeve in walls.

5. NELSON FSP PUTTY (part # AA445) - Apply within the annular space to a min.
   3/4" (19mm) depth, flush with the top surface of the sleeve, or with both ends of sleeve in walls.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

System No. C-AJ-3089

Nelson Firestop

Project Name: ____________________________
Address: ________________________________

Installer: ______________________________
Address: ________________________________

Signature: _____________________________

DATE: 07/18/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL ARMORED OR METAL CLAD CABLE

F Rating 2 Hr. T Rating 0,1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or 6" (152mm) thick wall or CMU block wall. The floor may be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete. The nom annular space is 7/8" (22mm). T rating is 0 hour with HOLLOW-CORE assembly only.

2. CABLE - Max. 4/C-2awg copper conductor, aluminum or steel ARMORED cable or METAL CLAD cable.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3" (76mm) depth, and recess 1-1/2" (38mm) from top surface of floor or from both wall surfaces or from both floor surfaces in a HOLLOW-CORE floor.

4. NELSON FSP PUTTY (part # AA445) - Apply within the annular space to a min. 1-1/2" (38mm) depth, flush with the top surface of the floor or with both surfaces of the wall or from both floor surfaces in a HOLLOW-CORE floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-3090, C-AJ-3158

Project Name: ___________________________ Address: ___________________________
Installer: ___________________________ Address: ___________________________
Signature: ___________________________

DWG NO. FS-0127 R4
DATE: 07/18/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
HVAC DUCT

F Rating 2 Hr. T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 6" (152mm) thick wall, or CMU block wall. The nom annular space is 1/2" (13mm).

2. HVAC DUCT - Max. 12" x 24" (305mm x 610mm), 28 gauge or heavier, galv., sheet steel HVAC duct, centered in opening.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3" (76mm) depth, and recess 1-1/2" (38mm) from top surface of floor or from both wall surfaces.

4. NELSON FSP PUTTY (part # AA445) - Apply within the annular space to a min. 1-1/2" (38mm) depth, flush with the top surface of the floor or with both surfaces of the wall.

5. STEEL ANGLE - Min. 1-1/2" x 1-1/2" (38mm x 38mm) x .030" (.8mm) (22 ga.) steel angle cut to fit the contour of the duct and secured to the duct with #12 sheet metal screws, spaced max. of 4" (102mm) on center.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
C-AJ-7010

Nelson Firestop
DWG NO. FS-0128 R3

DATE: 07/18/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 2 Hr. T Rating 0 Hr.

(1) Floor or Wall
(2) Sleeve
(3) Pipe
(4) Forming Material
(5) Sealant

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or 6" (127mm) thick wall or CMU block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units.

2. METALLIC SLEEVE (optional) - Max. nominal 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel sleeve cast or grouted into the floor or wall, flush with both surfaces. Max. annular space within the sleeve is 15/16" (24mm).

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   The max. annular space is 1/4" (6mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool or ceramic fiber into the annular space to a min. 4" (102mm) depth. Recess fiber 1/2" (13mm) from top surface of floor or from both wall or HOLLOW-CORE floor surfaces.

5. NELSON CLK SEALANT - Apply over forming material, within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall or HOLLOW-CORE floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
C-AJ-1191

Nelson Firestop

DWG NO. FS-0129 R4

DATE: 07/18/06

BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL SLEEVED CABLES

F Rating 2 Hr.  T Rating 1/2 Hr.

(1) Floor or Wall
(2) Sleeve
(3) Cables
(4) Pillows

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 6" (152mm).

2. METALLIC SLEEVE - Max. nominal 6" (152mm) diameter, Sch. 10 (or heavier), steel sleeve cast or grouted into the floor or wall, and extending a nominal 2" (51mm) beyond surfaces.

3. CABLES - Max. 15% cable fill in any combination of:
   (A) max. 350 kcmil single conductor cable with cross linked polyethylene (XLPE) insulation and jacket.
   (B) max. 7/C #12 awg cable w/polyvinyl chloride (PVC) or (XLPE) insulation and PVC jacket.
   (C) max. 25pr. 24awg telecommunications cable with PVC jacking.

4. NELSON PLW PILLOWS (part # AA478 or AA479) - Pillows tightly compressed within the annular space between the cables and the periphery of the opening. Pillows to be installed flush with top surface of sleeve in floor or with both surfaces of sleeve in wall.

5. NELSON FSP PUTTY (part # AA445) (not shown) - Putty to be forced into interstices of cable group and gaps between pillows and cables to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-3093

DWG NO. FS-0130 R4

Project Name: __________________________
Address: ______________________________
Installer: ______________________________
Address: ______________________________
Signature: ____________________________

DATE: 07/18/06
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL SLEEVED CABLES

F Rating 2 Hr.                          T Rating 1 Hr.

(3) Cables                           (5) Sealant

(1) Floor or Wall

(4) Forming Material

(2) Sleeve

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or 5" (127mm) thick wall or CMU block wall.

2. METALLIC SLEEVE - Max. nominal 6" (152mm) diameter, Sch. 10 or heavier, steel sleeve cast or grouted into the floor or wall, and extending a nominal 2" (51mm) beyond surfaces.

3. CABLES - Max. 30% fill of 25pr. 24awg or smaller, PVC jacketed telecommunications cable.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 8" (203mm) depth, and recess 1/2" (13mm) from top surface of sleeve in floors or from both surfaces of sleeve in walls.

5. NELSON CLK SEALANT - Apply over the forming material, within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of the sleeve, or with both ends of sleeve in walls.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
BUS DUCT

F Rating 1 or 2 Hr.  T Rating 1/2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Opening is to be framed on all sides with like stud material.

2. BUS DUCT - Max. 15" x 5" (381mm) x 127mm) "I" shaped aluminum and steel enclosure containing factory mounted copper bars rated for 600V / 3000 A. The annular space between the flange tip of the busway and periphery of the opening shall be a nom 1/2" (13mm). The annular space between the web section of the busway and the periphery of the opening shall be a nom 2-1/4" (57mm).

3. COVER PLATE ASSEMBLY (not shown) - A min. 1/8" (3mm) thick steel cover plate provided by busway manufacturer shall be installed on both surfaces of wall assembly. Steel cover plate secured in accordance with busway manufacturer’s installation instructions.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space between the bus duct and wall to min. 2-3/8" (60mm) depth for a 1 hr. wall or 2-1/2" (64mm) depth for a 2 hr. wall. Recess fiber 1-1/4" (32mm) from wall surfaces.

5. NELSON FSP PUTTY (part # AA445) - Apply putty over the forming material to a min. 1-1/4" (32mm) depth, flush with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-6003

Project Name: ____________________________
Address: _______________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DWG NO. FS-0132 R4

DATE: 02/06/07
BY: RL

MEA # 196-84-M Vol.3

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory.

2. METALLIC SLEEVE - Nominal 6-1/2" (165mm) diameter, or smaller, steel sleeve fabricated from .018" (.457) (26 ga.) galv. sheet steel, with a 2" (51mm) overlap along longitudinal seam and 1-1/2" (38mm) long anchor tabs spaced a max. 6" (152mm) on center. Secure to both sides of wall with toggle bolts and fender washers.

3. METALLIC PIPE or CONDUIT - The following types of metallic pipes, tubing or conduits may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.

Annular space range is min. 0" (point contact) to max. 2" (51mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to min. 3-7/8" (98mm) depth for 1 hr. walls or 4" (102mm) depth for 2 hr. walls. Recess fiber 1/2" (13mm) from both surfaces of wall.

5. NELSON CLK SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with wall. At areas of point contact, apply a 1/4" (6mm) bead at the interface of the pipe and sleeve on both wall surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-1083

DWG NO. FS-0133 R3

DATE: 07/18/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
MULTIPLE METALLIC PIPES

F Rating 2 Hr.  (3) Pipe  T Rating 1/2 Hr.

(5) Sealant
(1) Floor or Wall
(2) Sleeve

(4) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall or CMU Block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units.

2. METALLIC SLEEVE (optional) - Max. nominal 6" (152mm) diameter or smaller, Sch. 10 or heavier, steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPES or CONDUITS - A max. of (3) penetrants to be installed within opening and only (1) of the (3) penetrants may be greater than 1" (25mm) in diameter. The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 2" (51mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 2" (51mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.

   The space between penetrating items may be 0" (point of contact) to 1-1/2" (38mm). Annular space between penetrants and periphery of opening is 0" (point contact) to 3-7/8" (98mm). Of the three pipes, conduits or tubing, only two shall be in point contact.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64kg/cubic meter) mineral wool batt insulation into the annular space to a min 4" depth and recess 1/2" (13mm) from top surface of floor or both wall or HOLLOW-CORE floor surfaces.

5. NELSON CLK SEALANT - Apply over forming material, within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall or HOLLOW-CORE floor. At areas of point of contact, apply a 3/8" (10mm) bead of sealant at the interface between the pipes and the top surface of the floor or both surfaces of the wall or HOLLOW-CORE floor.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-1192

DWG NO.  FS-0134 R5

DATE:  02/15/07
BY:  RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall or CMU Block wall.

2. METALLIC SLEEVE (optional) - Max. nominal 16" (406mm) diameter (or smaller) Sch. 10 (or heavier) steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   Annular space may range from 1/2" to 2-1/4" (13mm to 57mm).

4. FORMING MATERIAL - Tightly pack min 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from top surface of floor or both wall surfaces.

5. NELSON CLK SEALANT - Apply over forming material, within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1193

.dwgn. FS-0135 R3

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/18/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
WOOD JOIST FLOOR
NONMETALLIC PIPE

F Rating 2 Hr.  T Rating 0 Hr.

(2) Pipe  (4) Sealant
(1) Wood Floor  (3) Pipe Choke

1. WOOD FLOOR ASSEMBLY - The fire rated wood joist floor-ceiling assembly shall be constructed in the manner specified in Design L505, L511 or L536 in the UL Fire Resistance Directory.
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood joists between first and second layers of wallboard and spaced 24" O.C.
   (C) GYPSUM BOARD - First layer of wallboard nailed to wood joists. Second layer of wallboard screw-attached to furring channels.

2. NONMETALLIC PIPE - The following types and sizes of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter, Sch. 40 (or heavier) PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) RIGID, NONMETALLIC CONDUIT - Nom 4" (102mm) diameter, Sch. 40 (or heavier) PVC conduit.
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space is 1/2" (13mm).

3. NELSON PCS PIPECHOKE - Apply appropriate sized pipechoke around pipe and secure to underside of gypsum ceiling using 1/8" (3mm) diameter by 3" (76mm) long toggle bolts in conjunction with 1/4" (6mm) by 1" (25mm) diameter steel fender washers.

4. NELSON CLK SEALANT - Apply CLK to fill the annular space where the pipe penetrates the floor to the max. extent possible with an additional 1/4" (6mm) bead around pipe above the floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. F-C-2031

Nelson Firestop
DWG NO. FS-0137 R4

DATE: 11/07/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 2 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 4" (102mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from the top surface of the floor.

3. NELSON CLK SEALANT - Apply CLK over the forming material to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-S-1016
DWG NO. FS-0138 R4

Project Name: __________________________
Address: ________________________________________
Installer: __________________________
Address: ________________________________________
Signature: __________________________

DATE: 11/28/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
WALL TO WALL
(Limited to Fire Exposure on Interior Face)

F Rating 2 Hr.
Nominal Joint Width - 4" (102mm)

1. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall. The max. joint width at the time of installation is 4" (102mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from the external face of the wall.

3. NELSON CLK SEALANT - Apply CLK over the forming material on the external face, to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
DWG NO. FS-0139 R5

Project Name: ________________________
Address: ____________________________
Installer: ____________________________
Address: ____________________________
Signature: __________________________

DATE: 11/28/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
WALL TO WALL

F Rating 2 Hr.
Nominal Joint Width - 4" (102mm)

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall. The max. joint width at the time of installation is 4" (102mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from both surfaces of the wall.

3. NELSON CLK SEALANT - Apply CLK over the forming material on both sides of the wall to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

 Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. WW-S-1021

DWG NO. FS-0140 R5
DATE: 11/28/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 4" (102mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from both surfaces of the wall.

4. NELSON CLK SEALANT - Apply CLK over the forming material on both sides of the wall to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. HW-S-1002
DWG NO. FS-0141 R4

Project Name: ____________________________
Address: ____________________________
Installer: ____________________________
Address: ____________________________
Signature: ____________________________

DATE: 11/28/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 2 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 4" (102mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from the surface of the floor.

4. NELSON CLK SEALANT - Apply CLK over the forming material, flush with the top surface of the floor, to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FW-S-1003
DWG NO. FS-0142 R4

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/28/6
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 4 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 5-1/2" (140mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 4" (102mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 5" (127mm) depth, and recess 1/2" (13mm) from both surfaces of the wall.

4. NELSON CLK SEALANT - Apply CLK over the forming material on both sides of the wall to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. HW-S-1003

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0143 R4</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>DATE</th>
<th>11/28/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>BY</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 4 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 5-1/2" (140mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 5-1/2" (140mm) thick, lightweight or normal weight concrete wall or CMU wall. The max. joint width at the time of installation is 4" (102mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 5" (127mm) depth, and recess 1/2" (13mm) from the top surface of the floor.

4. NELSON CLK SEALANT - Apply CLK over the forming material, flush with the top surface of the floor, to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No. F-WS-1004

Nelson Firestop
DWG NO. FS-0144 R4

DATE: 11/28/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (14mm) lightweight or normal weight concrete floor or 5" (127mm) thick wall or CMU block wall.

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" diameter (or smaller) steel conduit.
      The annular space is 1/2" to 1-1/2" (13mm to 38mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf, (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from floor surface or from both surfaces of the wall.

4. NELSON CLK SEALANT - Min. 1/2" (13mm) depth in the annular space around the pipe flush with the floor surface or flush with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-1203

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td></td>
<td>Signature:</td>
</tr>
</tbody>
</table>

DWG NO. FS-0145 R5

DATE: 07/18/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLE TRAY

F Rating 2 Hr.        T Rating 0 Hr.

(1) Floor or Wall

(4) Compound

(3) Cables

(2) Cable Tray

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) lightweight or normal weight concrete floor or wall or CMU block wall. The annular range is 1" to 12" (25mm to 305mm). The max. size of the opening is 40" x 48" (1016mm to 1219mm).

2. CABLE TRAY - Max. 36" x 4" (914mm x 102mm) open ladder type, steel, cable tray. A max. 3 trays per opening with a min 8" (203mm) separation between trays.

3. CABLES - Max. 30% cable fill of opening of:
   (A) max. 1/C - 350 kcmil cable with polyvinyl chloride (PVC) insulation and jacket.
   (B) max. 7/C - No. 12 awg cable with PVC-nylon insulation and PVC jacket.
   (C) max. 100 pr No. 24 awg cable with PVC insulation and jacket.

4. NELSON CMP COMPOUND (part # AA476) - Install CMP to fill the opening around the trays to the full depth of the wall, flush with the floor surface or flush with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.  
C-AJ-4031

Nelson Firestop

DWG NO. FS-0146 R3

DATE: 07/18/06

BY: RL

MEA # 236-87-M Vol. 2

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLE TRAY

F Rating 2 Hr. T Rating 0 Hr.

1. FLOOR or WALL - Min. 4-1/2" (114mm) concrete floor or wall or CMU block wall. The max. area is 320 sq. in. (2065 sq. cm) with max. dimension of 40" (1016mm). The annular space is 0" (point of contact) to 2" (51mm).

2. CABLE TRAY - Max. 36" x 6" (914mm x 152mm) steel, open ladder type cable tray.

3. CABLES - Max. 40% cable fill of opening in any combination of:
   (A) max. 72 fibers 62.5/125 fiber optic cable w/polyvinyl chloride (PVC) insulation and jacket.
   (B) max. 100pr #24 awg cable w/PVC insulation and jacket.

4. NELSON PLW PILLOW (part # AA478 or AA479) - Pillows to be installed horizontally or vertically within the opening in such a manner that the ends project a min. of 2-1/2" (64mm) beyond each surface of floor or wall. Pillows tightly packed into opening to fill the annular space between cables and periphery of opening and between cable tray and periphery of opening.

5. NELSON FSP PUTTY (part # AA445) - Where spacing does not permit installation of pillows between the cable tray and/or cables and the periphery of the opening, a min. 1-1/2" (38mm) thickness of putty applied at cable tray or cable/concrete interface on bottom surface of floor or both surfaces of wall. Putty applied to seal any voids between the cables, and the pillows and between the cable tray and the pillows on both sides of the floor or wall assembly.

6. WIRE LATH - Nominal 2" (51mm), 18g/.090 galv. steel wire lath, cut to fit the contour of the opening with a min. 2" (51mm) lap beyond the periphery of the opening. Wire lath secured to both surfaces of floor or wall assembly with 1/4" (6mm) diameter by 1-3/4" (44mm) long concrete anchors in conjunction with 1/4" (6mm) by 1-1/2" (38mm) diameter steel fender washers, spaced 6" OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-4032

DWG NO. FS-0147 R4

DATE: 07/18/06
BY: RL

MEA # 196-84-M Vol. 3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLE TRAY

F Rating 2 Hr. T Rating 0 Hr.

1. FLOOR or WALL - Min. 4-1/2" (114mm) concrete floor or wall or CMU block wall. The max. size of the opening is 36" x 36" (914mm x 914mm). Annular space between cable tray and perimeter of opening will be min. 8" to max. 24" (152mm to 610mm).

2. CABLE TRAY - Max. 24" x 4" (610mm x 102mm) steel, open ladder type cable tray. Annular space between cable tray sides and CMP opening is nominal 3" (76mm) and from back or front of tray to be 0" (point of contact) to 3" (76mm).

3. CABLES - Max. 30% cable fill of opening in any combination of:
   (A) max. 1/C - 350 kcmil cable w/polyvinyl chloride (PVC) insulation and jacket.
   (B) max. 100pr #24 awg cable w/PVC insulation and jacket.
   (C) max. 7/C #12 awg cable w/PVC nylon insulation and PVC jacket.

4. NELSON CMP COMPOUND (part # AA476) - Apply a min. 4 1/2" (114mm) depth of CMP to reduce the annular space around the cable tray. CMP to be flush with the top surface of the floor or both surfaces of the wall.

5. NELSON PLW PILLOW (part # AA478 or AA479) - Pillows to be installed tightly packed horizontally or vertically within the annular space in such a manner that the ends project a min. of 2-1/2" (64mm) beyond each surface of floor or wall.

6. NELSON FSP PUTTY (part # AA445) - Where spacing does not permit installation of pillows between the cable tray and/or cables and the perimeter of the opening, a min. 1-1/2" (38mm) thickness of putty applied at cable tray or cable/concrete interface on bottom surface of floor or both surfaces of wall. Putty applied to seal any voids between the cables, pillows and between the cable tray/pillows interface on both sides of the floor or wall assembly.

7. WIRE LATH - Nominal 2" (51mm), 19awg galv. steel wire lath, cut to fit the contour of the opening with a min. 2" (51mm) lap beyond the periphery of the opening. Wire lath secured to both surfaces of floor or wall assembly with 1/4" (6mm) diameter by 1-3/4" (44mm) long concrete anchors in conjunction with 1/4" (6mm) by 1-1/2" (38mm) diameter steel fender washers, spaced 6" (152mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0148 R4

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DATE: 07/18/06
BY: RL

MEA # 236-87-M Vol.2

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLE TRAY

F Rating 2 Hr.  T Rating 0 Hr.

(1) Floor or Wall
(2) Pipes
(3) Cable Trays
(4) Cables
(5) Compound

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. size of the opening is 40" X 48" (1016mm x 1219mm). The annular space range is 1" to 12" (25mm to 305mm).

2. METALLIC PIPE or CONDUITS - A max. of (2) penetrants to be installed within opening and annular space between them is 15" (330mm).
   The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) Nom 10" (254mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) Nom 10" (254mm) diameter (or smaller) cast or ductile iron pipe.
   (C) Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   Only one copper pipe or tubing may be larger than nominal 4" (102mm) diameter. Annular space between pipes and the periphery of the opening is 1" to 6-1/2" (25mm to 165mm). The annular space between the pipe and the cable trays is 4" to 12" (102mm to 305mm).

3. CABLE TRAY - Max. 36" (914mm) wide by 4" (102mm) deep open ladder type, steel cable tray. A max. of (3) trays may penetrate the opening with a min. 6" (203mm) separation between trays. Annular space is 1" to 4" (25mm to 102mm).

4. CABLES - Max. 30% cable fill of opening in any combination of:
   (A) max. 1/C - 350 kcmil cable w/polyvinyl chloride (PVC) insulation and jacket.
   (B) max. 7/C - #12 awg cable w/PVC nylon insulation and PVC jacket.
   (C) max. 100pr. #24 awg cable w/PVC insulation and jacket.

5. NELSON CMP COMPOUND (part # AA476) - Installed to fill the opening around the trays to a min. 4-1/2" (114mm) depth, flush with the top surface of the floor or both surfaces of the wall.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

System No.
C-AJ-8049

Nelson Firestop
DWG NO. FS-0149 R3
DATE: 07/18/06
BY: RL
MEA # 236-87--M Vol.2

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.       T Rating 1-1/2 Hr.
Nominal Joint Width - 5/8" (16mm)

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor poured over steel fluted decking.

2. WALL ASSEMBLY - As specified in the U300, U400 series designs per UL fire Resistance Directory. The max. joint width is 5/8" (16mm).

3. STEEL SLIP TRACK

4. FORMING MATERIAL - Tightly pack min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space, and recess 3/4" (19mm) from both sides of the wall.

5. NELSON CLK SEALANT - Apply a min. 3/4" (19mm) bead over the forming material along the interface of the top of the wall and the forming material. Apply a min. 3/4" (19mm) bead of CLK along the interface between the contour of the fluted deck and the forming material.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

---

Nelson Firestop

Warnock Hersey Test Report
WHI-495-PSV-1122

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

**DWG NO.** FS-0166 R5

**DATE:** 11/28/06

**BY:** RL

---

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.  T Rating 2 Hr.
Nominal Joint Width - 1" (25mm)

1. FLOOR ASSEMBLY - Min. 1-1/2" (38mm) thick lightweight or normal weight concrete poured over a steel fluted deck.

2. WALL ASSEMBLY - Min. 8" (203mm) thick concrete wall or CMU block wall. The max. joint width is 1" (25mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening above the wall, to the full depth of the wall.

4. NELSON FSC COATING - Apply by Spray, trowel, or brush over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the wall and the deck a min. of 1/2" (13mm). Apply on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Omega Point Test Report
15670-103058

Nelson Firestop
DWG NO. FS-0168 R6

DATE: 11/28/06
BY: RL

MEA # 16-99-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NO PENETRATION

F Rating 2 Hr. T Rating 3/4 Hr.

(2) Composite Sheet
(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. The max. area of the opening is 128 sq. in. (813 sq. cm) with a max. dimension of 18" (457mm). Max. diameter of opening shall be 7" (178mm) within a HOLLOW-CORE floor.

2. NELSON CPS COMPOSITE SHEET - Apply to the top side of the floor or to both sides of the wall or HOLLOW-CORE floor, with the foil side facing the opening. Overlap the opening by a min. 2" (51mm) on all sides. Mount with 3/8" (10mm) diameter x min. 1-7/8" (48mm) steel masonry anchors spaced a max. of 5" (127mm) on center. When the floor is constructed of HOLLOW-CORE precast concrete units, composite sheet secured to both surfaces of floor with foil side facing the opening.

3. SEALANT (optional, not shown) - Apply CLK sealant around the perimeter of the CPS for added smoke seal protection.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-0049

DWG NO. FS-0169 R5

Project Name: ___________________________  DATE: 07/18/06
Address: ________________________________  BY: RL
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NO PENETRATION

F Rating 2 Hr. T Rating 0 Hr.

(1) Floor or Wall

(2) Composite Sheet

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. area of the opening is 127 sq. inches (819 sq. cm) with a max. dimension of 18" (457mm).

2. NELSON CPS COMPOSITE SHEET - Apply to the under side of the floor or to both sides of the wall with the foil side facing the opening. Overlap the opening by a min. of 3-1/2" (89mm) on all sides. Mount to the floor or wall with 1/4" (6mm) x min. 1-1/4" (32mm) long steel masonry anchors in conjunction with 1/4" (6mm) x 1-1/4" (32mm) diameter steel fender washers spaced a max. of 5" OC.

3. SEALANT (optional, not shown) - Apply Nelson CLK sealant around the perimeter of the composite sheet for added smoke seal protection.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-0050

DWG NO. FS-0176 R4

Project Name: ____________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________

Signature: ______________________________

DATE: 07/18/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NO PENETRATION

F Rating 3 Hr.   T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of the opening is 6-5/8" (168mm).

2. METALLIC SLEEVE - Max. 6" (152mm) nominal diameter, Sch. 10 (or heavier) steel sleeve cast or grouted into the floor or wall. In floors, steel sleeve shall be flush with bottom surface of floor and extend a min. 6" (152mm) above top surface of floor. In walls, steel sleeve shall extend a min. 6" (152mm) beyond each surface of the wall.

3. NELSON PLW PILLOWS (part # AA478 or AA479) - Pillows tightly packed to completely fill the annulus within the steel sleeve. In floors, pillows shall be installed vertically (on edge), flush with both ends of the sleeve. In walls, pillows shall be installed horizontally (on edge) flush with both ends of the steel sleeve.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-0054

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0177 R5

DATE: 07/19/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL SLEEVED CABLES

F Rating 3 Hr.  T Rating 3/4 Hr.

(1) Floor or Wall
(2) Sleeve
(3) Cables
(4) Forming Material
(5) Sealant

1. FLOOR or WALL ASSEMBLY - Min. 8" (203mm) thick lightweight or normal weight concrete floor or min. 8-7/8" (225mm) thick wall, or CMU block wall. Max. diameter of opening is 6" (152mm).

2. METALLIC SLEEVE - Max. nominal 6" (152mm) diameter Sch. 40 (or heavier) steel sleeve, cast or grouted into the floor, and extending 1" above the floor, flush with the bottom of the floor, and 1" (25mm) beyond both surfaces of the wall.

3. CABLES - Max. 15% cable fill of opening in any combination of:
   (A) max. 3/C-18awg
   (B) max. 1/C-3awg, or smaller cables with PVC jacketing.
   Min. 1/4" (6mm) separation between cables.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space to a min. 8" (203mm) depth and recess 7/16" (11mm) from the bottom surface of the floor or both surfaces of the wall.

5. NELSON CLK SEALANT - Apply CLK over the forming material to a min. 7/16" (11mm) depth, flush with the bottom surface of the floor or flush with both surfaces of the sleeve.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-BJ-3014
DWG NO. FS-0192 R5

Project Name: __________________________
Address: ______________________________
Installer: ______________________________
Address: ______________________________
Signature: _____________________________

DATE: 07/19/06
BY: RL

MEA # 135-00-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL SLEEVED CABLES

F Rating 2 Hr.  T Rating 1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor min. 5" (127mm) thick wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick UL Classified HOLLOW-CORE Precast Concrete units. Max. diameter of opening is 4" (102mm).

2. METALLIC SLEEVE (optional) - Fabricated from min. 30 gauge galvanized steel and having a min. 2" (51mm) lap along the longitudinal seam. The sleeve is flush with both surfaces of the floor or wall.

3. CABLES - Max. 70% cable fill of opening in any combination of:
   (A) max. 750 kcmil or smaller cross linked polyethylene (XLPE) insulation and PVC jacketed.
   (B) max. 100pr. 24 awg. or smaller, PVC jacketed.
   (C) max. one length of 1/4" -750 kcmil or smaller along with remainder cables may be max. 100 pr. 24 awg. or smaller, PVC jacketed.

4. NELSON PCS PIPECHOKE - Install the applicable sized pip choke, in accordance with the size of the cable bundle, around the bundle on the underside of the floor or on both sides of the wall. Secure to the concrete surface by means of 1/4" (6mm) diameter by 1-3/4" (44mm) long concrete anchors in conjunction with 1/4" (6mm) by 1-1/4" (32mm) diameter steel fender washers.

5. NELSON FSP PUTTY (part # AA445) - Apply a 3/4" (19mm) depth of FSP in the annular space around the cables, flush with the underside of the floor of with both surfaces of the wall, prior to installing the Pipechoke device. Apply an additional 1/2" (13mm) depth of FSP around the cable bundle where the cables enter the pipechoke device. Fill interstitially within the cable bundle to the max. extent possible.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-3118

DWG NO. FS-0196 R4

DATE: 04/09/07

BY: RL

MEA # 196-84-M Vol. 3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
STEEL OUTLET BOX

F Rating 2 Hr.

(3) Pads
(1) Wall
(2) Steel Outlet Box

FSP Pad removed on this face to show underlying box.

1. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory.

2. STEEL OUTLET BOX - Max. 4" x 4" (102mm x 102mm) steel outlet box installed in accordance with NFPA 70 regulations. The box can be installed within the same stud cavity, provided they are not installed back-to-back.

3. NELSON FSP PUTTY PADS (part # AA452) - Min. 1/4" (6mm) thickness Putty pad. Putty pads are to be installed to completely cover the exterior surfaces of the outlet box (except for the side of the outlet box against the stud) and completely seal against the stud within the stud cavity. An additional 1/4" (6mm) thickness of putty to be formed around the connector securing the end of each electrical metallic tube or conduit to the box. When moldable putty pad outlet box protective material is used on boxes on both sides of wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. (610mm) provided that the boxes are not installed back-to-back.

Tested in accordance with:
ASTM E-119
ANSI/UL 263

Wall Openings Protective Materials (CLIV)
UL File R10764

Nelson Firestop
DWG NO. FS-0210 R4
DATE: 07/19/06
BY: RL

MEA # 196-84-M Vol. III

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
KITCHEN EXHAUST DUCT / AIR DUCT

F Rating 2 Hr.

(3) Duct Insulation
(1) Floor or Wall
(2) Duct
(4) Forming Material
(5) Putty

T Rating 2 Hr.

1. CONCRETE FLOOR or WALL - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5-1/2" (140mm) thick concrete wall or CMU wall. The max. area of the opening is 1792 sq. in. (11561 sq. cm) with a max. dim. of 56" (1422mm). The nominal annular space between insulation and opening is 1" (25mm).

2. THROUGH PENETRANT - One insulated steel air duct or grease duct, rigidly supported on both sides of the floor or wall assy. The following types may be used:
   
   (A) AIR DUCT - max. 24" x 48" (508mm x 1219mm), min. 20 ga. steel using (Thermal Ceramics Inc. Firemaster Duct Wrap or Firemaster Duct Wrap+), (Vesuvius USA Corp Pyroscat FP duct wrap or Pyroscat CSM Duct Wrap) or (ETS Schafer Flameshield or FSB duct insulation). Wrap method to be in accordance with applicable blanket manufacturer instructions.
   
   (B) GREASE DUCT - max. 12" x 36" (305mm x 914mm), min. 20 ga. steel using (Thermal Ceramics Inc. Firemaster Duct Wrap or Firemaster Duct Wrap+) Wrap in accordance with mfg. instructions.
   
   (C) GREASE DUCT - max. 24" x 48" (508mm x 1219mm), min. 20 ga. steel using (Vesuvius USA Corp Pyroscat FP Duct Wrap or Pyroscat CSM Duct Wrap) or (ETS Schafer Flameshield or FSB duct insulation). Wrap method to be in accordance with applicable blanket manufacturer instructions.

3. DUCT INSULATION - Nom 1-1/2" (38mm) tk. blanket, min. 6pcf applied in two layers and installed according with applicable manufactures instructions. (Thermal Ceramics Inc. Firemaster Duct Wrap or Firemaster Duct Wrap+), (Vesuvius USA Corp Pyroscat FP Duct Wrap or Pyroscat CSM Duct Wrap) or (ETS Schafer Flameshield or FSB duct insulation).

4. FORMING MATERIAL - Tightly pack min. 3-1/2" (89mm) depth of loose fill (blanket material) fiber into the annular space. Recess 1" (25mm) from the top surface of the floor or from both surfaces of the wall.

5. NELSON FSP PUTTY (part # AA445) - Pack a min. 1" (25mm) depth over the forming material, flush with the top surface of the floor or with both surfaces of the wall. Additionally, a min. 1/2" (13mm) crown is formed around the wrapped duct and lapping 1/2" (13mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814, E-119
ANSI/UL 1479, UL 1978

System No.'s
C-AJ-7018, C-AJ-7024
C-AJ-7025

Nelson Firestop

DWG NO. FS-0211R7

DATE: 07/19/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL ELECTRICAL OUTLET BOX

F Rating 1 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory.

2. METALLIC OUTLET BOX - Max. 4-11/16" x 4-11/16" (119mm x 119mm) steel outlet box installed in accordance with NFPA 70 regulations. The box can be installed within the same stud cavity, provided they are not installed back-to-back.

3. NELSON FSP PUTTY PADS (part # AA458) - Min. 1/8" (3mm) thickness Putty pad. Putty pads are to be installed to completely cover the exterior surfaces of the outlet box (except for the side of the outlet box against the stud) and completely seal against the stud within the stud cavity. An additional 1/8" (3mm) thickness of putty to be formed around the connector securing the end of each electrical metallic tube or conduit to the box. When moldable putty pad outlet box protective material is used on boxes on both sides of wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. (610mm) provided that the boxes are not installed back-to-back.

Tested in accordance with:
ASTM E-119
ANSI/UL 263

Wall Openings Protective Materials (CLIV)
UL File R10764

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Nelson Firestop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
METALLIC PIPE OR CONDUIT

F Rating 3 Hr.  T Rating 0 Hr.

(4) Putty

(2) Pipe

(3) Forming Material

(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5-1/2" (140mm) thick wall, or CMU block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 6" (152mm).

2. METALLIC PIPE or CONDUIT - The following types of pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   The max. annular space is 3/4" (19mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3-1/2" (89mm) depth, and recess 1" (25mm) from the top surface of the floor or from both wall or HOLLOW-CORE floor surfaces.

4. NELSON FSP PUTTY (part # AA445) - Apply over the forming material to a min. 1" (25mm) depth, flush with the top surface of the floor or with both surfaces of the wall or HOLLOW-CORE floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1197

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 2 Hr.
Nominal Joint Width - 3-1/2" (89mm)
Class II & III Movement - 14% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick, lightweight or normal weight concrete wall or CMU wall. The max. joint width at the time of installation is 3-1/2" (89mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" (102mm) depth. Recess the fiber 1/4" (6mm) from the top surface of the floor. The forming material shall be compressed 25% in the nominal joint width and flush with the top surface of the concrete floor.

4. NELSON CLK SEALANT - Apply CLK over the forming material to a min. 1/4" (6mm) depth, flush with the top surface of the floor.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FW-D-1034

Project Name: ___________________________  Date: 11/28/06
Address: __________________________________
Installer: ____________________________
Address: ________________________________
Signature: ______________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 2 Hr.
Nominal Joint Width - 3-1/2" (89mm)
Class II & III Movement - 14% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 3-1/2" (89mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" (102mm) depth. Recess the fiber 1/4" (6mm) from the top surface of the floor. The forming material shall be compressed 25% in the nominal joint width and flush with the top surface of the floor.

3. NELSON CLK SEALANT - Apply CLK over the forming material to a min. 1/4" (6mm) depth, flush with the top surface of the floor.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-D-1037

Project Name: ____________________________
Address: __________________________________
Installer: ________________________________
Address: __________________________________
Signature: ________________________________

DATE: 11/28/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
CONCRETE PANEL CURTAIN WALL

F Rating 2-1/2 Hr.  T Rating 1 Hr.
L Rating <1 SCFM
Movement - 16.7% Compr & Ext

1. CONCRETE FLOOR ASSEMBLY - Min. 4 1/2" (114mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 8" (203mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10' (3048mm).
   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs. Max spacing to be 60" (1524mm) o.c. and to be installed in accordance with curtain wall manufacturer's instructions.
   (C) Concrete Panels - Concrete panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Panels shall not be less than 2-1/2" (64mm) thick, 12" (305mm) high or 12" (305mm) long.
   (D) Impaling Pins (not shown) - When required by insulation manufacturer, use with insulation. Pins shall be located, sized and installed according to the curtain wall system manufacturer's guidelines.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 235 P

Nelson Firestop

Omega Point

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0310 R2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(E) Curtain Wall Insulation (optional) - Perimeter joint treatment shall be installed before curtain wall insulation. Insulation material designed and installed according to the curtain wall system manufacturer’s guidelines for steel framing. Insulation shall be installed flush against the top and bottom structures of the perimeter joint protection without deforming it.

(F) Concrete Panel Joint - Vertical and horizontal concrete panel joints created between panels can be either flush type or key way type. Concrete panel edges must be in contact with each other.

(G) Framing Covers - Framing covers used over the mullions and transoms are optional. Framing covers shall be located, sized and installed according to the curtain wall system manufacturer’s guidelines. Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment without deforming it.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8” (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4” (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compacted 25% in the nominal joint width and flush with or recessed 1/4” (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8” (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2” (13mm).

(C) Nelson CLK S/L Sealant (not shown) (optional to FSC3) (part # AA552) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4” (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional but recommended for installations subject to vertical shear movement. Z-clips are to be installed on max. 24” (610mm) centers.

(E) Support Angle (not shown) - Horizontally install a min. 1-1/2” x 1-1/2” (38mm x 38mm) 24 GA steel angle mechanically fastened to the stud framing at the mid point location of the forming material.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 235 P

Nelson Firestop
DWG NO. FS-0310 R2

Project Name: ____________________________
Address: __________________________________

Installer: ________________________________
Address: __________________________________

Signature: ________________________________

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
STEEL PANEL CURTAIN WALL

F Rating 2 Hr.       T Rating 1-1/2 Hr.
L Rating <1 SCFM       Movement - 16.7% Compr & Ext

1. CONCRETE FLOOR ASSEMBLY - Min. 4 1/2" (114mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 8" (203mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer’s instructions. Max. distance between mounting attachments shall be 10' (3048mm).
   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs. Max. spacing to be 48" (1219mm) and to be installed in accordance with curtain wall manufacturer’s instructions.
   (C) Steel Panels - Steel panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 20 GA sheet steel panel with max. dimensions of 48 in. (1219mm) by 144 in (3658mm).
   (D) Impaling Pins (not shown) - When insulation is used, use impaling pins when required by manufacturer's instructions. The pins shall be located, sized and installed according to the curtain wall system manufacturer's guidelines.

   Tested in accordance with:
   ASTM E-2307, E-1399

Omega Point Design No.  
CEJ 236 P

Nelson Firestop

Omega Point Firestop

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

Project Name:       Address:  
Installer:       Address:  
Signature:  

DWG NO. FS-0311 R2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II
(E) Curtain Wall Insulation (optional) - When curtain wall insulation is used, the perimeter joint treatment must be installed before the insulation. Insulation may be butted to top and bottom of perimeter joint treatment but not deform the perimeter joint treatment. Either mineral wool or fiberglass batt insulation may be used.

(F) Interior Curtain Wall Surface - Framing covered with one layer of 5/8 in. thick, Type X gypsum wallboard on interior face. The face layer of gypsum wallboard fastened to steel studs with min. #6 x 1-1/8 in. (29mm) long bugle-head phillips drywall screws spaced 12 in. o.c. Joint tape and compound to be applied to be applied to cover joints and screw heads.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (not shown) (optional to FSC3) (part # AA552) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional, but recommended for installations subject to vertical shear movement. Z-clips are to be installed on max 24" (610mm) centers.

(E) Support Angles (not shown) - Horizontally install a min. 1-1/2" x 1-1/2" (38mm x 38mm) 24 GA steel angle mechanically fastened to the stud framing at the mid point location of the forming material.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 236 P

Nelson Firestop
DWG NO. FS-0311 R2
Page 2 of 2

Project Name: ____________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________

Signature: ______________________________

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
STEEL PANEL CURTAIN WALL

F Rating 2 Hr.  T Rating 3/4 Hr.
L Rating <1 SCFM
Movement - 16.7% Compr & Ext

(3B) Coating
(2B) Steel Stud Framing
(2E) Insulation
(2C) Steel Panels
(3A) Forming Material
(2F) Framing Covers
(1) Floor

1. CONCRETE FLOOR ASSEMBLY - Min. 4 1/2" (114mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 8" (203mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:

   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10' (3048mm).

   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs. Max. spacing to be 48" (1219mm) and to be installed in accordance with curtain wall manufacturer's instructions.

   (C) Steel Panels - Steel panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 20 GA sheet steel panel with max. dimensions of 48 in. (1219mm) by 144 in (3658mm).

   (D) Impaling Pins (not shown) - When insulation is used, use impaling pins when required by manufacturer's instructions. The pins shall be located, sized and installed according to the curtain wall system manufacturer's guidelines.

   Tested in accordance with:
   ASTM E-2307, E-1399

Omega Point Design No.
CEJ 237 P

Nelson Firestop

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(E) Curtain Wall Insulation - Use a nom. 4" (102mm) 4pcf (64 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim which is exposed to the room interior. In lieu of filling the full depth of the stud cavity with 4pcf (64 kg /cubic meter) mineral wool, the use of nom. 2" (51mm) 8pcf (96 kg/cubic meter) mineral wool is allowed. Install the batts flush with the interior face of the curtain wall framing. Install the batts flush with the interior face of the curtain wall framing. Install the min. 24" (610mm) wide batts without vertical seams. All meeting edges of insulation are sealed with nom. 4" (102mm) wide pressure sensitive aluminum foil faced tape centered over the junction so that approx. 2" (51mm) of tape covers each edge of the adjacent insulation.

(F) Framing Covers - Strips made of min. 1" (25mm) thick by 4" (102mm) wide, 8pcf, mineral wool batt insulation faced on one side with aluminum foil scrim, which is exposed to the room interior. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced spaced at least 12" (305mm) o.c. and attached in accord with (2D). Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. Joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor, and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (not shown) (optional to FSC3) (part # AA552) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional, but recommended for installations subject to vertical shear movement. Z-clips are to be installed on max 24" (610mm) centers.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 237 P

Nelson Firestop

DWG NO. FS-0312 R2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
STEEL PANEL CURTAIN WALL

F Rating 2 Hr.  
T Rating 1-3/4 Hr.  
L Rating <1 SCFM
Movement - 12.5% Compr & Ext

1. CONCRETE FLOOR ASSEMBLY - Min. 4 1/2" (114mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 8" (203mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:
   
   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10' (3048mm).
   
   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 16 GA steel "C" studs. Max. spacing to be 48" (1219mm) and to be installed in accordance with curtain wall manufacturer's instructions.
   
   (C) Steel Panels - Steel panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 20 GA sheet steel panel with max. dimensions of 48 in. (1219mm) by 144 in. (3658mm).
   
   (D) Impaling Pins (not shown) - When insulation is used, use impaling pins when required by manufacturer's instructions. The pins shall be located, sized and installed according to the curtain wall system manufacturer's guidelines.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No. CEJ 253 P

---

Nelson Firestop

DWG NO. FS-0313 R2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(E) Curtain Wall Insulation (optional) - When curtain wall insulation is used, the perimeter joint treatment must be installed before the insulation. Insulation may be butted to top and bottom of perimeter joint treatment but not deform the perimeter joint treatment. Either mineral wool or fiberglass batt insulation may be used.

(F) Interior Curtain Wall Surface - Framing covered with one layer of 5/8 in. thick, Type X gypsum wallboard on interior face. The face layer of gypsum wallboard fastened to steel studs with min. #6 x 1-1/8 in. (29mm) long bugle-head phillips drywall screws spaced 12 in. (305mm) o.c.. Joint tape and compound to be applied to cover joints and screw heads.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm)."
PERIMETER FIRE BARRIER SYSTEM
TILT UP CONCRETE CURTAIN WALL

F Rating 2 Hr.  T Rating 1-3/4 Hr.
L Rating < 1 SCFM
Movement - 12.5% Compr & Ext

1. CONCRETE FLOOR ASSEMBLY - Min. 4 1/2" (114mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 8" (203mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:

   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10' (3048mm).

   (B) Structural Framing - Structural framing members shall be according to the curtain wall system manufacturer's requirements. Aluminum structural framing must be completely covered by concrete panels.

   (C) Tilt-Up Panels - Tilt-up concrete panels shall be installed to structural framing according to the curtain wall system manufacturer's guidelines. Panels shall not be less than 1-1/2" (38mm) thick.

   (D) Concrete Panel Joint - Vertical and horizontal concrete panel joints created between panels can be either flush type or key way type. Concrete panel edges must be in contact with each other.

   Tested in accordance with:
   ASTM E-2307, E-1399

Omega Point Design No.
CEJ 254 P

Nelson Firestop
DWG NO. FS-0314 R2 Page 1 of 2

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(E) Curtain Wall Insulation (optional) - Perimeter joint treatment must be installed before curtain wall insulation. Insulation may be butted to top and bottom of perimeter joint treatment but not deform the perimeter joint treatment. Either mineral wool or fiberglass batt insulation may be used.

(F) Impaling Pins (not shown) - When insulation is used, use impaling pins when required by manufacturer’s instructions. Pins shall be located, sized and installed according to the curtain wall system manufacturer’s guidelines.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4pcf (64 kg/cubic meter) density mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (not shown) (optional to FSC3) (part # AA552) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional but recommended or installations subject to vertical shear movement. Z-clips are to be installed on max. 24" (610mm) centers.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No. CEJ 254 P

Nelson Firestop

OMEGA POINT LABORATORIES

Project Name: ____________________________
Address: ________________________________
Installer: _________________________________
Address: _________________________________
Signature: _______________________________

Nelson Firestop

DWG NO. FS-0314 R2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
CONCRETE PANEL CURTAIN WALL

F Rating 2 Hr.  T Rating 1-3/4 Hr.
L Rating <1 SCFM
Movement - 12.5% Compr & Ext

1. CONCRETE FLOOR ASSEMBLY - Min. 4 1/2" (114mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 8" (203mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10' (3048mm).
   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 16 GA steel "C" studs. Max spacing to be 60" (1524mm) o.c. and to be installed in accordance with curtain wall manufacturer's instructions.
   (C) Concrete Panels - Concrete panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Panels shall not be less than 1-1/2" (38mm) thick, 12" (305mm) high or 12" (305mm) long.
   (D) Impaling Pins (not shown) - When required by insulation manufacturer, use with insulation. Pins shall be located, sized and installed according to the curtain wall system manufacturer's guidelines.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 255 P

Nelson Firestop

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DWG NO. FS-0315 R2
DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(E) Curtain Wall Insulation (optional) - Perimeter joint treatment shall be installed before curtain wall insulation. Insulation material designed and installed according to the curtain wall system manufacturer's guidelines for steel framing. Insulation shall be installed flush against the top and bottom structures of the perimeter joint protection without deforming it.

(F) Concrete Panel Joint - Vertical and horizontal concrete panel joints created between panels can be either flush type or key way type. Concrete panel edges must be in contact with each other.

(G) Framing Covers - Framing covers used over the mullions and transoms are optional. Framing covers shall be located, sized and installed according to the curtain wall system manufacturer's guidelines. Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment without deforming it.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0888) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (not shown) (optional to FSC3) (part # AA552) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z- shaped clips) are optional but recommended for installations subject to vertical shear movement. Z-clips are to be installed on max. 24" (610mm) centers.

Omega Point Design No. CEJ 255 P

Tested in accordance with:
ASTM E-2307, E-1399

Nelson Firestop

Omega Point Laboratories

Omega Point Design No. CEJ 255 P

Nelson Firestop

Project Name: __________________________
Address: ______________________________

Installer: ______________________________
Address: ______________________________

Signature: ____________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

DWG NO. FS-0315 R2

DATE: 04/19/06

BY: RL

MEA # 127-04-M Vol. II
PERIMETER FIRE BARRIER SYSTEM  
CONCRETE PANEL CURTAIN WALL

F Rating 2 Hr.  
T Rating 1-3/4 Hr.  
L Rating <1 SCFM  
Movement - 12.5% Compr & Ext

(2F) Concrete Panel Joint  
(2B) Aluminum Stud Framing  
(2C) Concrete Panels  
(3B) Coating  
(1) Floor  
(2G) Framing Covers  
(2E) Insulation  
(3A) Forming Material

1. CONCRETE FLOOR ASSEMBLY - Min. 4 1/2" (114mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 8" (203mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:
   
   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10' (3048mm).
   
   (B) Aluminum Stud Framing - Vertical framing members shall be min. 2-1/2" by 4" (64mm x 102mm) deep, 0.100" (3mm) thick rectangular aluminum tubing studs. Max. spacing to be 60" (1524mm) o.c. and to be installed in accordance with curtain wall manufacturer's instructions.
   
   (C) Concrete Panels - Concrete panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Panels shall not be less than 1-1/2" (38mm) thick, 12" (305mm) high or 12" (305mm) long.
   
   (D) Impacting Pins (not shown) - When used with insulation and framing covers, the pins shall be located, sized and installed according to the curtain wall system manufacturer's guidelines. Pins shall be spaced a max. of 12" (305mm) o.c. and installed around the periphery (min.) so that the interior face of the curtain wall insulation is flush with the interior face of the framing.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.  
CEJ 256 P

Nelson Firestop  

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
</tbody>
</table>

| Signature:    |                          |

---

Nelson Firestop  
800 331-7325  Fax: 918 627-2941  
Tulsa, Ok.

MEA # 127-04-M Vol. II  

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0316 R2</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>DATE:</th>
<th>04/19/06</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BY:</th>
<th>RL</th>
</tr>
</thead>
</table>

Page 1 of 2
(E) Curtain Wall Insulation - Nom 4" (102mm) thick 4 pcf (64 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim which is exposed to the room interior, installed the full depth of the stud cavity. Batts are fitted tightly between vertical framing members secured with clips or impaling pins or friction fit with length 1/4" (6mm) longer.

(F) Concrete Panel Joint - Vertical and horizontal concrete panel joints created between panels can be either flush type or key way type. Concrete panel edges must be in contact with each other.

(G) Framing Covers - Strips made of 1" (25mm) thick by 4" (102mm) wide, 8pcf (128 kg/cm) mineral wool batt insulation faced on one side with aluminum foil scrim. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced at least 12" (305mm) o.c.. Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nominal joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (not shown) (optional to FSC3) (part # AA552) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional but recommended for installations subject to vertical shear movement. Z-clips are to be installed on max. 24" (610mm) centers.

(E) Support Angle (not shown) - Horizontally install a min. 1-1/2" x 1-1/2" (38mm x 38mm) 24 GA steel angle mechanically fastened to the stud framing at the mid point location of the forming material. Required when using 2" (51mm) x 8 pcf (128 kg/cm) mineral wool curtain wall insulation.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 256 P

Nelson Firestop

DWG NO. FS-0316 R2

Project Name: ____________________________
Address: ________________________________
Installer: _________________________________
Address: _________________________________
Signature: _______________________________

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
GLASS PANEL CURTAIN WALL

F Rating 2 Hr.  T Rating 1/4 Hr.
L Rating <1 SCFM  Movement - 15% Compr & Ext

1. CONCRETE FLOOR ASSEMBLY - Min. 4 1/2" (114mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 8" (203mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:

   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10' (3048mm).

   (B) Aluminum Framing - Rectangular aluminum tubing mullions and transoms, sized according to the curtain wall system manufacturer's guidelines. Mullions are spaced a min 56-1/2" (1435mm) o.c. and transoms are to be spaced a min 69" (1753mm) o.c. Transoms are to be located at a height of 33" (838mm) above the top surface of the concrete floor assembly.

   (C) Glass Panels - Glass panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick clear, heat-strengthened (HS) glass or tempered glass with a max. width and height less than the aluminum framing o.c. spacing which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar.

   Tested in accordance with: ASTM E-2307, E-1399

---

Nelson Firestop

Omega Point Design No. CEJ 257 P

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
(D) Impaling Pins (not shown) - When used with insulation and framing covers, the aluminum pins shall be located, sized and installed according to the curtain wall system manufacturer’s guidelines. Pins shall be spaced a max. of 12" (305mm) o.c. and installed around the periphery (min.) so that the interior face of the curtain wall insulation is flush with the interior face of the framing.

(E) Curtain Wall Insulation - Nom 4" (102mm) thick 4 pcf (64 kg/cubic meter) mineral wool batt insulation placed on one side with aluminum foil scrim which is exposed to the room interior, installed the full depth of the stud cavity. Batts are fitted tightly between vertical framing members secured with clips or impaling pins.

(F) Framing Covers - Strips made of 1" (25mm) thick by 4" (102mm) wide, 8pcf (96kg/cubic meter) mineral wool batt insulation placed on one side with aluminum foil scrim. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced at least 12" (305mm) o.c.. Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlay the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (not shown) (optional to FSC3) (part # AA552) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional, but recommended for installations subject to vertical shear movement. Z-clips are to be installed on max 24" (610mm) centers. Extended into forming material no more than 4" (102mm) from curtain wall surface.

(E) Support Angle (not shown) - Horizontally install a min 1-1/2" x 1-1/2" (38mm x 38mm) 16 GA steel angle mechanically fastened to each mullion at the mid point location of the forming material. Required when using 2" (51mm) x 8 pcf (96 kg/cubic meter) mineral wool curtain wall insulation.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 257 P

<table>
<thead>
<tr>
<th>DWG NO. FS-0317 R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE: 04/19/06</td>
</tr>
<tr>
<td>BY: RL</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
EIFS CURTAIN WALL

F Rating 1 Hr.  T Rating 1 Hr.
L Rating <1 SCFM
Movement - 15% Compr & Ext

(2F) Exterior Curtain Wall
(2B) Steel Stud Framing
(2D) Insulation
(2C) Sandwich Wall
(3A) Forming Material
(3B) Coating
(1) Floor
(2E) Interior Curtain Wall

1. CONCRETE FLOOR ASSEMBLY - Min. 4" (102mm) thick or normal weight concrete at the joint face. The perimeter joint shall not exceed an 4" (102mm) nominal joint width.

2. CURTAIN WALL ASSEMBLY - The curtain wall shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 10' (3048mm).
   (B) Steel Stud Framing - Vertical framing members shall be min. 3-1/2" (89mm) by 1-1/4" (32mm), 18 GA steel "C" studs. Max spacing to be 16" (406mm) o.c. and to be installed in accordance with curtain wall manufacturer's instructions.
   (C) Sandwich Wall Surface - Min 1/2" (13mm) thick 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard.
   (D) Curtain Wall Insulation - Nom 24" (610mm) wide x 4" (102mm) thick non-faced mineral wool batt insulation is installed 10-1/2" (267mm) above the surface of the perimeter joint protection. Batts are fitted tightly between vertical framing members secured with clips, impaling pins or friction fitted.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 258 P

Nelson Firestop

DWG NO. FS-0318 R2
Page 1 of 2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(E) Interior Curtain Wall Surface - Framing covered with one layer of 5/8" (16mm) thick, Type X gypsum wallboard on interior face. The face layer of gypsum wallboard fastened to steel studs with min. #6 x 1-7/8" (48mm) long Type S drywall screws spaced 8" (203mm) o.c. on the periphery and 12" (305mm) o.c. in the field. Joint tape and compound to be applied to cover joints and screw heads.

(F) Exterior Curtain Wall Surface - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, a base coat, a float coat, a reinforcing mesh, and a finish coat. The EPS foam boards measure 24" x 48" x 4" (610mm x 1219mm x 102mm) thick with a nominal density of 1pcf (16 kg/cubic meter).

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 4" (102mm) nominal joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (not shown) (optional to FSC3) (part # AA552) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional but recommended for installations subject to vertical shear movement. Z-clips are to be installed on max 24" (610mm) centers.

Omega Point Design No.
CEJ 258 P

Tested in accordance with:
ASTM E-2307, E-1399

Nelson Firestop

Omega Point Design No. CEJ 258 P

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr & Ext

1. FLOOR ASSEMBLY - Min. 3-1/2" (89mm) thick light weight or normal weight concrete poured over fluted steel decking.

2. SPRAY-APPLIED FIRE PROOFING (optional) (not shown) - Min. 15 pcf (240 kg/cubic meter) applied to the bottom of the steel floor and form unit, with a thickness equal to obtain a 1 or 2 hour fire resistance.

3. WALL ASSEMBLY - Non-load bearing design rated for a min. of 1 or 2 hr. fire resistance. The max separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression from its installed width. Ceiling furring is attached to bottom of the flutes.

4. STEEL STUDS (not shown) - Min. 2-1/2" (64mm) steel studs with max 24" (610mm) o.c. spacing.

5. FORMING MATERIAL (flutes) - Tightly pack min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation into the flutes. The forming material shall be compressed 33% in the nominal flute width. (Option) - The flutes may be packed full and leveled even with bottom of flutes and finished flush with wall using the spray-applied fire proofing material.

6. FORMING MATERIAL (joint) - Tightly pack min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation into the joint. The forming material shall be compressed 50% in the nominal joint width.

7. NELSON FSC3 COATING (part # AA0868) - Apply by spray, trowel, or brush over the forming material in the joint. Apply a min. 1/8" (3mm) thick wet applied coating and overlap the material a min. 1" (25mm) on the adjacent wall and bottom of the concrete floor or over the spray-applied fire proofing when used.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Omega Point Design No.
CEJ 249 H, CEJ 250 H

Nelson Firestop
DWG NO. FS-0319 R3

Project Name: ____________________
Address: _______________________
Installer: ________________________
Address: _______________________
Signature: ______________________

DATE: 11/30/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr & Ext

1. FLOOR ASSEMBLY - Min. 3-1/2" (89mm) thick light weight or normal weight concrete poured over fluted steel decking.
2. SPRAY-APPLIED FIRE PROOFING (optional) (not shown) - Min. 15 pcf (240kg/cubic meter) applied to the bottom of the steel floor and form unit, with a thickness equal to obtain a 1 or 2 hour fire resistance.
3. WALL ASSEMBLY - Non-load bearing design rated for a min. of 1 or 2 hr. fire resistance. The max separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression from its installed width. Ceiling Runner is attached to bottom of the flutes.
4. STEEL STUDS (not shown) - Min. 2-1/2" (64mm) steel studs with max. 24" (610mm) o.c. spacing.
5. NESTING CHANNEL - Norm 3-3/4" (95mm) x 2" (51mm) deep min. 25 GA. U-shaped steel channel.
6. FORMING MATERIAL (flutes) - Tightly pack min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation into the flute. The forming material shall be compressed 33% in the nominal flute width. (Option) - The flutes may be packed full and leveled even with bottom of flutes and finished flush with wall using the spray-applied fire proofing material.
7. FORMING MATERIAL (joint) - Tightly pack min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation into the joint. The forming material shall be compressed 50% in the nominal joint width.
8. NELSON FSC3 COATING (part # AA0868) - Apply by spray, trowel, or brush over the forming material on both sides of the wall in the joint. Apply a min. 1/8" (3mm) thick wet applied coating and overlap the material a min. 1" (25mm) onto the adjacent wall and bottom of the concrete floor or over the spray-applied fire proofing when used.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Omega Point Design No.
CEJ 251 H, CEJ 252 H

Nelson Firestop

Omega Point Design No.
CEJ 251 H, CEJ 252 H

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0321 R3

DATE: 11/30/06
BY: RL
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The annular space range is 1/8" to 1/4" (3mm to 6mm). Max. diameter of opening is 1-3/8" (35mm).

2. FLEXIBLE METALLIC CONDUIT - Max. 1/2" (13mm) nominal diameter, or smaller, steel or aluminum flexible metal conduit.

3. NELSON ES1399 SEALANT - Apply to fill the annular space around the pipe. In 2 hr fire-rated assemblies, additional fill material to be installed such that a min. 3/8" (10mm) crown is formed around the penetrating item and lapping 1/2" (13mm) beyond the periphery of the opening. In opening. In 1 hr fire-rated assemblies, additional fill material to be installed such that a min 1" (25mm) crown is formed around the penetrating item and lapping a min. 1/2" (13mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-1275

Project Name: ____________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________
Signature: ______________________________
GYPSUM WALL
METALLIC PIPE OR CONDUIT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory.

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

The annular space between penetrant and periphery of opening is 0" (point of contact) to 2" (51mm).

3. FORMING MATERIAL (not shown) - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

4. NELSON ES1399 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth. At areas of point of contact, apply a 3/8" (10mm) bead at the interface between the pipe and both surfaces of the wall.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. W-L-1276

DWG NO. FS-0348 R1

Project Name: ____________________________
Address: _______________________________
Installer: _______________________________
Address: _______________________________
Signature: ______________________________

DATE: 07/19/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
METALLIC PIPES OR CONDUITS

F Rating 1 or 2 Hr.   T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. area of opening is 90-1/2 sq. in. (584 sq. cm) with max. dim. of 22-5/8" (575mm) for steel stud walls or max. area of 58 sq. in. (374 sq. cm) with max. dim. of 14-1/2" (368mm) for wood stud walls, respectively.

2. METALLIC PIPES or CONDUITS - One or more through penetrants to be installed within the opening.
   (A) STEEL PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 3" (76mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 3" (76mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.

Only three penetrants shall have a nom diameter greater than 1" (25mm). Annular space between penetrants shall be a nom 1/2" (13mm). The annular space between penetrants and the periphery of the opening shall be 0" (point of contact) to max. 1/2" (13mm) for penetrants having a nom diameter greater than 1" (25mm). The annular space between penetrants and the periphery of the opening shall be min. 0" (point of contact) to 2-7/8" (73mm) for penetrants having a diameter 1" (25mm) or less.

3. FORMING MATERIAL (optional) (not shown) - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

4. NELSON ES1399 SEALANT - Apply min. 5/8" (16mm) thickness of ES1399 within the annulus, flush with both surfaces of the wall. At point of contact location between penetrants and gypsum wallboard, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the gypsum wallboard/penetrant interface on both surfaces of the wall.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop System No. W-L-1277

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0349 R1

DATE: 07/19/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  T Rating 0 Hr.

(1) Wall
(2) Pipe
(3) Forming Material
(4) Sealant

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall.

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduit or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   The annular space between penetrant and periphery of opening is 0" (point of contact) to 2" (51mm).

3. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

4. NELSON ES1399 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth. At areas of point of contact, apply a 3/8" (10mm) bead at the interface between the pipe and both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0350 R1

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/19/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
METALLIC PIPES OR CONDUITS

F Rating 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick reinforced lightweight or normal weight concrete wall or CMU wall. The max. area of opening is 90-1/2 sq. in. (584 sq. cm) with a max. dimension of 22-5/8" (575mm).

2. METALLIC PIPES or CONDUITS - One or more pipes penetrators to be installed within the opening. The following types of pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 3" (76mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 3" (76mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.

   Only three penetrants shall have a nom diameter greater than 1" (25mm). Annular space between penetrants shall be a nom 1/2" (13mm). The annular space between penetrants and the periphery of the opening shall be 0" (point of contact) to max. 1/2" (13mm) for penetrants having a nom diameter greater than 1" (25mm). The annular space between penetrants and the periphery of the opening shall be min 0" (point of contact) to 2-1/8" (54mm) for penetrants having a diameter 1" (25mm) or less.

3. FORMING MATERIAL (optional) - Used to prevent the leakage of sealant during installation. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

4. NELSON ES1399 SEALANT - Apply min. 5/8" (16mm) thickness of sealant within the annulus, flush with both surfaces of the wall. At point of contact location between penetrant and concrete, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the concrete / penetrant interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
W-J-1119

DWG NO.  FS-0351R1
DATE:  07/19/06
BY:  RL

MEA # 125-04-M

800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any min. 6" (152mm) thick HOLLOW-CORE

2. METALLIC SLEEVE (not shown) (optional) - Max. 8" (203mm) nominal diameter Sch. 10 or heavier, steel sleeve cast or grouted into the floor or wall, flush with floor or wall surfaces.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits and tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe. The annular space between penetrant and periphery of opening is 0" (point of contact) to a max. of 1-7/8" (48mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation or 1" (25mm) diameter backer rod to fill the annular space and recess 1/2" (13mm) from the top surface of the floor or from both surfaces of the wall or HOLLOW-CORE floor.

5. NELSON ES1399 SEALANT - Apply ES1399 sealant over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall or HOLLOW-CORE floor. At areas of point of contact, apply a 3/8" (10mm) bead at the interface between the pipe and the top surface of the floor or both surfaces of the wall or HOLLOW-CORE floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1414

DWG NO. FS-0352 R1

DATE: 07/19/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 3 Hr.          T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 26-1/2" (673mm).

2. METALLIC SLEEVE (optional) - Max. nominal 16" (406mm) diameter, Sch. 10 (or heavier) steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits and tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT- Nom 6" (152mm) diameter (or smaller) rigid steel conduit.
   (D) EMT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing.

The annular space may range from 0" (point of contact) to 2-1/2" (64mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space and recess 1/2" (13mm) from top surface of the floor or both surfaces of wall.

5. NELSON ES1399 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall. Apply a 1/4" (6mm) bead around the entire circumference of the pipe at the pipe at the level of the floor surface or both wall surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
C-AJ-1415

Nelson Firestop

Project Name:  
Address:  
Installer: 
Address:  
Signature:  

DWG NO.  FS-0353 R1

DATE:  07/19/06
BY:  RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 3 Hr.  T Rating 3/4 Hr.

(3) Pipe  (6) Sealant
(2) Sleeve
(1) Floor or Wall
(4) Pipe Insulation  (5) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2” (114mm) thick lightweight or normal weight concrete floor wall, or CMU block wall. The max. diameter of the opening is 18” (457mm).

2. METALLIC SLEEVE (optional) - Nominal 18” (457mm) diameter (or smaller) Sch. 10 (or heavier) steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 10” (254mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 10” (254mm) diameter (or smaller) cast or ductile iron pipe.

4. PIPE INSULATION - Nominal 1” (25mm) thick CELLULAR GLASS pipe insulation. The insulation material may be jacketed within 0.010 in. (25mm) thick aluminum sheet wrapped tightly around with a min. 2” (51mm) overlap. Jacket to be installed with edge abutting surface of sealant on top surface of floor or both surfaces of wall. Jacket to be well secured with metallic bands. The annular space is to 0” (point of contact) to 4-1/4” (108mm).

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2” (51mm) depth, and recess 1” (25mm) from the top surface of the floor or from both surfaces of the wall.

6. NELSON ES1399 SEALANT - Apply over the forming material to a min. 1” (25mm) depth, flush with the top surface of the floor or with both surfaces of the wall. At areas of point of contact, apply a 1/4” (6mm) bead at the interface between the insulated pipe and the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

---

Nelson Firestop

Project Name: ________________
Address: ____________________
Installer: ____________________
Address: ____________________
Signature: __________________

DWG NO. FS-0354 R3
DATE: 08/11/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 4 Hr.
L Rating at Ambient <1 CFM/Lin Ft.
Class II Movement - 12.5% Compr or Ext
Nominal Joint Width - 2" (51mm)

1. FLOOR ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 2" (51mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 6" (152mm) depth. The forming material shall be compressed 50% in the nominal joint width.

3. NELSON FSC3 COATING (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor a min. of 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No. FF-D-0025

Nelson Firestop
DWG NO. FS-0355 R3

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DATE: 11/29/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 4 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 12.5% Compr or Ext

1. FLOOR ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 2" (51mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 5-1/2" (140mm) depth. Recess the fiber 1/4" (6mm) from the top surface of the floor. The forming material shall be compressed 33% in the nominal joint width.

3. NELSON ES1399 SEALANT - Apply ES1399 over the forming material to a min. 1/4" (6mm) depth, flush with the top surface of the floor.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-D-0026

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Date: 11/29/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>RL</td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight
   concrete floor. The max. joint width at the time of installation is 1" (25mm).

2. FORMING MATERIAL - Install backer rod into the opening and recess 1/2"
   (13mm) from both surfaces of the floor.

3. NELSON ES1399 SEALANT - Apply ES1399 over the forming material to a min.
   1/2" (13mm) depth, flush with the both surfaces of the floor.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-D-0027

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE:</th>
<th>DWG NO. FS-0357 R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>11/29/06</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
<td>RL</td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 3 Hr.
L Rating at Ambient < 1 CFM/Lin Ft.
Class II Movement - 15% Comp or Ext
Nominal Joint Width - 3-1/2" (89mm)

(3) Coating

(1) Floor

(2) Forming Material

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 3-1/2" (89mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" (102mm) depth. The forming material shall be compressed 42% in the nominal joint width.

3. NELSON FSC3 COATING (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor a min. of 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-D-1040

DWG NO. FS-0358 R3

DATE: 11/29/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 3 Hr.
Nominal Joint Width - 3-1/2" (89mm)
Class II Movement - 15% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 3-1/2" (89mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" (102mm) depth. Recess the fiber 1/4" (6mm) from the top surface of the floor. The forming material shall be compressed 42% in the nominal joint width.

3. NELSON ES1399 SEALANT - Apply ES1399 over the forming material to a min. 1/4" (6mm) depth, flush with the top surface of the floor.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-D-1041

| Project Name: | __________________________ |
| Address: | __________________________ |
| Installer: | __________________________ |
| Address: | __________________________ |
| Signature: | __________________________ |

DWG NO. FS-0359 R2
DATE: 11/29/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
WALL TO WALL

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 12.5% Compr or Ext

1. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 1" (25mm).

2. FORMING MATERIAL - Install backer rod into the opening and recess 1/2" (13mm) from both surfaces of the wall.

3. NELSON ES1399 SEALANT - Min. 1/2" (13mm) thickness over the forming material applied within the joint, flush with both surfaces of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. WW-D-0030

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

Project Name: ________________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

CLASSIFIED

UL

System No.
WW-D-0030

DWG NO. FS-0360 R2

DATE: 11/28/06
BY: RL

MEA # 125-04-M
JOINT TREATMENT SYSTEM
WALL TO WALL

F Rating 3 Hr.
Nominal Joint Width - 3-1/2" (89mm)
Class II Movement - 15% Compr or Ext

1. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 3-1/2" (89mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" (102mm) depth. The forming material shall be compressed 42% in the nominal joint width.

3. NELSON FSC3 COATING (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto both sides of the wall a min. 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No.
WW-D-1038

DWG NO. FS-0361 R2

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

DATE: 11/28/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
WALL TO WALL

F Rating 3 Hr.
Nominal Joint Width - 3-1/2" (89mm)
Class II Movement - 15% Compr or Ext

(2) Forming Material
(3) Sealant

(1) Wall

1. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation installation is 3-1/2"(89mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" (102mm) depth. Recess the fiber 1/4" (6mm) from both surfaces of the wall. The forming material shall be compressed 42% in the nominal joint width.

3. NELSON ES1399 SEALANT - Apply ES1399 over the forming material, on both sides of the wall, to a min. 1/4" (6mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. WW-D-1039

DWG NO. FS-0362 R2

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/28/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 4 Hr.
L Rating at Ambient <1 CFM/Lin Ft.
Class II Movement - 12.5% Compr or Ext
Nominal Joint Width - 2" (51mm)

1. FLOOR ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 2" (51mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 6" (152mm) depth. The forming material shall be compressed 50% in the nominal joint width.

4. NELSON FSC3 COATING (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and side of wall a min. of 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No. FW-D-0020

Nelson Firestop

DWG NO. FS-0363 R3

Date: 11/29/06

By: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 4 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 12.5% Compr or Ext

1. FLOOR ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 2" (51mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 5-1/2" (140mm) depth. Recess the fiber 1/4" (6mm) from the top surface of the floor. The forming material shall be compressed 33% in the nominal joint width.

4. NELSON ES1399 SEALANT - Apply ES1399 over the forming material, flush with the top surface of the floor, to a min. 1/4" (6mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FW-D-0021
DWG NO. FS-0364 R2

DATE: 11/29/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325     Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 1" (25mm).

3. FORMING MATERIAL - Install backer rod into the opening and recess 1/2" (13mm) from both surfaces of the floor.

4. NELSON ES1399 SEALANT - Apply ES1399 over the forming material, flush with both surfaces of the floor, to a min. 1/2" (13mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FW-D-0022

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 3 Hr.
L Rating at Ambient <1CFM/Lin Ft.
Class II Movement - 15% Compr or Ext
Nominal Joint Width - 3-1/2" (89mm)

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight
cementitious floor.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight
concrete wall or CMU block wall. The max joint width at the time of installation is
3-1/2" (89mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool
batt insulation into the opening to a min. 4" (102mm) depth. The forming material
dshall be compressed 42% in the nominal joint width.

4. NELSON FSC3 COATING (part # AA0868) - Spray, trowel, or brush apply the
coating over the forming material to a nominal 1/8" (3mm) thick wet applied
coating. Single pass application is acceptable. Overlap the coating onto the top
surface of the floor and side of wall a min. of 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No.
FW-D-1038

Nelson Firestop

DWG NO. FS-0366 R3

DATE: 11/29/06
BY: RL

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 3 Hr.
Nominal Joint Width - 3-1/2" (89mm)
Class II Movement - 15% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 3-1/2" (89mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" (102mm) depth. Recess the fiber 1/4" (6mm) from the top surface of the floor. The forming material shall be compressed 42% in the nominal joint width.

4. NELSON ES1399 SEALANT - Apply ES1399 over the forming material, flush with the top surface of the floor, to a min. 1/4" (6mm) thickness, continuous along the entire length of the joint.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FW-D-1039

DWG NO. FS-0367 R2

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/29/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1, 2, 3, or 4 Hr.
L Rating at Ambient <1CFM/Lin Ft
Class II Movement - 25% Compr & Ext
Nominal Joint Width - 2" (51mm)

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick light weight or normal weight concrete floor. Floor may also be constructed of any min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units.

2. WALL ASSEMBLY - As specified in the U400 series designs per UL Fire Resistance Directory. The max separation between bottom of floor and top of wall is 1-1/2" (38mm) for 1 hr fire-rated assemblies and 2" (51mm) for 2, 3, or 4 hr fire-rated assemblies. The joint system is designed to accommodate a max. 25% compression or extension from its installed width.

3. STEEL STUDS - Min 3-5/8" (92mm) steel studs.

4. DEFLECTION CHANNEL (optional) - Nominal 3-3/4" x 3" (95mm x 76mm) deep min. 25 GA. U-shaped steel channel. Secured to the underside of the floor.

5. FORMING MATERIAL - Tightly pack min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space. The forming material shall be compressed 50% in the nominal joint width.

6. NELSON FSC3 COATING (part # AA0868) - Min. 1/8" (3mm) wet thickness of coating spray or brush applied over the forming material on each side of the wall between the top of the wall and the bottom of the concrete floor and overlapping a min. 1/2" (13mm) onto the concrete floor and gypsum board on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No.
HW-D-0305

Nelson Firestop
DWG NO. FS-0368 R3

Project Name: ___________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/29/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 or 3 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 25% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. Floor may also be constructed of any min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units.

2. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The max separation between bottom of floor and top of wall is 2" (51mm). The joint system is designed to accommodate a max. 25% compression or extension from its installed width.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space a min. 6" or 6-5/8" (152mm or 168mm) depth for 2 or 3 hr rated assemblies, respectively, and installed edge-first into joint opening, parallel with joint direction. Recess the fiber 1/8" (3mm) from both sides of the wall. The forming material shall be compressed 50% in the nominal joint width.

4. NELSON FSC3 COATING (part # AA0868) - Min. 1/8" (3mm) wet thickness of coating applied within the joint, flush with each surface of wall and lapping a min. 1/2" (13mm) onto the bottom surface of the floor and each surface of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/29/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 or 3 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 25% Compr or Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated fluted steel deck roof assembly may be used.
3. ROOF INSULATION (not shown) - Min. 2-1/4" (57mm) thick poured insulating concrete, as measured from the top plane of the roof deck.
4. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. separation between bottom of floor and top of wall is 2" (51mm). The joint system is designed to accommodate a max. 25% compression or extension from its installed width.
5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space a min. 6" or 6-5/8" (152mm or 168mm) depth for 2 or 3 hr rated assemblies, respectively. The forming material shall be installed flush with both surfaces of the wall. The forming material shall be compressed 50% in the nominal joint width and 25% into the flutes of the steel floor units or roof deck.
6. SPRAY-APPLIED FIRE PROOFING - As an alternate to the forming material within the flutes, apply min. 15pcf (240 kg/cubic meter) into the flutes of the steel floor or roof deck.
7. FORMING MATERIAL (Plugs)(not shown) - As an alternate to the forming material and spray-applied fire proofing, mineral wool plugs preformed to the shape of the fluted floor units, may be used within the flutes.
8. NELSON FSC3 COATING (part # AA0868) - Min. 1/8" (3mm) wet thickness of fill material spray or brushed on each side of the wall in the flutes of the steel floor units or roof deck and between the top of the wall and the bottom of the steel floor units or roof deck and overlap a min. 1/2" (13mm) onto concrete wall and steel deck on both sides of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
HW-D-0307

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DWG NO. FS-0370 R3

DATE: 11/29/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compression

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.

2. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression from its installed width. Wallboard sheets installed to a min. 5/8" or 1-1/4" (16mm or 32mm) thickness on each side of wall for a 1 hr or 2 hr fire-rated wall. Wallboard is cut to fit the contour of the steel floor with a nom 1" (25mm) gap. Ceiling runner installed within deflection channel when used, else secured to valleys of the steel floor units.

3. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs.

4. DEFLECTION CHANNEL (optional) - Nom 3" (76mm) deep min. 25 GA U-shaped steel channel. Secured to the valleys of the steel floor units.

5. FORMING MATERIAL (not shown) - Install backer rod within the annular space for 2 hr. walls. Recess 5/8" (16mm) from both surfaces of the wall.

6. NELSON ES1399 SEALANT - Apply to fill the cavities to a min. of 5/8" (16mm) depth over the forming material. Apply on both sides of the wall. In 1 hr fire-rated wall assemblies, bond breaker tape shall be applied to ceiling channel or deflection channel prior to installation of fill material on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop

System No. HW-D-0224

DWG NO. FS-0371 R3

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/29/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compression

1. FLOOR ASSEMBLY - Min. 3" (76mm) thick lightweight or normal weight concrete poured over fluted steel decking.

2. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max 25% compression from its installed width. Wallboard sheets installed to a min. 5/8" or 1-1/4" (16mm or 32mm) thickness on each side of wall for a 1 hr or 2 hr fire-rated wall. Ceiling panels installed within deflection channel when used, else secured to valleys of the steel floor units.

3. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs.

4. DEFLECTION CHANNEL (optional) - Nom 3" (76mm) deep min. 25 GA. U-shaped steel channel. Secured to the valleys of the steel floor units.

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a depth of 3-5/8" or 4-7/8" (92mm or 124mm) for 1 hr or 2 hr walls. Cut to the shape of the fluted deck, approx. 20% larger than the area of the flutes. The forming material shall be recessed 5/8" (16mm) from each side of the wall. For 2 hr. assembly, an additional 2" x 1" (51mm x 25mm) section is compressed 50% and installed between the top of gypsum wallboard and bottom of the steel floor units.

6. NELSON ES1399 SEALANT - Apply to fill the cavities to a min. of 5/8" (16mm) depth over the forming material. Apply on both sides of the wall. For 1 hr systems, bond breaker tape to be applied to deflection channel on both sides of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No. HW-D-0229

Nelson Firestop

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0372 R3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>11/30/06</td>
</tr>
<tr>
<td>BY</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compression

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete.

2. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression from its installed width. Wallboard sheets installed to a min. 5/8" or 1-1/4" (16mm or 32mm) thickness on each side of wall for a 1 hr or 2 hr fire-rated wall.

3. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs.

4. DEFLECTION CHANNEL (optional) - Nom 3-3/4" x 3" (95mm x 76mm) deep min. 25 GA. U-shaped steel channel. Secured to the underside of the floor.

5. FORMING MATERIAL (not shown) - Install backer rod within the annular space. Optional for 2 hr. walls. Recess 5/8" (16mm) from both surfaces of the wall.

6. NELSON ES1399 SEALANT - Apply to fill the cavities to a min. of 5/8" (16mm) depth. Apply on both sides of the wall. For 1 hr systems, bond breaker tape to be applied to deflection channel on both sides of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No. HW-D-0226

Nelson Firestop

DWG NO. FS-0373 R3

DATE: 11/30/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compression

(1) Floor
(5) Forming Material
(4) Deflection Channel
(6) Sealant
(2) Wall

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.

2. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression from its installed width. Wallboard sheets installed to a min. 5/8" or 1-1/4" (16mm or 32mm) thickness on each side of wall for a 1 hr or 2 hr fire-rated wall. Ceiling runner (not shown) installed within the deflection channel.

3. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs.

4. DEFLECTION CHANNEL - Nom 3-11/16" x 3" (94mm x 76mm) deep min. 25 GA. U-shaped steel channel. Secured to the valleys of the steel floor units.

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space at 50% compression, and recess 5/8" (16mm) from both sides of the wall.

6. NELSON ES1399 SEALANT - Apply to fill the cavities to a min. of 5/8" (16mm) depth over the forming material. Apply on both sides of the wall. For 1 Hr. Systems, bond breaker tape to be applied to deflection channel on both sides of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No. HW-D-0231

Nelson Firestop

DWG NO. FS-0374 R3

Date: 11/30/06

By: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compression

![Diagram of joint treatment system]

1. FLOOR ASSEMBLY - Min. 3" (76mm) thick lightweight or normal weight concrete poured over fluted steel decking.

2. WALL ASSEMBLY - Min. 8" (203mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression from its installed width.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a depth of 6-7/8" (175mm). Recess the fiber 5/8" (16mm) from both sides of the wall. The forming material shall be compressed 50% in the nominal joint width.

4. NELSON ES1399 SEALANT - Apply to fill the cavities to a min. of 5/8" (16mm) depth over the forming material. Apply on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. HW-D-0230

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0375 R2

DATE: 11/30/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
1. FLOOR or WALL - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or min. 3" (76mm) thick wall, or CMU block wall. The max. diameter of opening is 15-1/4". Annular space shall be 1/2" to 3" (13mm to 76mm) between penetrants and 1/2" to 5" (13mm to 127mm) between periphery of opening and penetrants.

2. METALLIC SLEEVE (optional) (not shown) - Max. 15-1/4" (387mm) diameter, or smaller, Sch. 30 or heavier, steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE - A max. of (8) pipes, conduits or tubing to be installed within opening. The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 2" (51mm) diameter (or smaller) electrical metallic tubing.
   (D) COPPER TUBING or PIPE - Nom 3/4" (19mm) diameter (or smaller) Type L (or heavier) copper tubing or nom 4" (102mm) diameter (or smaller) regular (or heavier) copper pipe.
   Annular space shall be 1/2" to 3" (13mm to 76mm) between penetrants and 1/2" to 5" (13mm to 127mm) between periphery of opening and penetrants.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2" (51mm) depth, and recess 1/2" (13mm) from the top surface of the floor or from both sides of the wall.

5. NELSON ES1399 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479
CONCRETE FLOOR OR WALL
MULT. METALLIC PIPES and CABLES

F Rating 2 Hr.

(2) Pipe
(3) Insulation
(6) Sealant

T Rating 0 Hr.

(4) Cables
(5) Forming Material
(1) Floor or Wall

1. FLOOR or WALL - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or min. 3" (76mm) thick wall, or CMU block wall. The floor assembly may consist of a fluted steel deck/concrete floor assembly (not shown). The max. size of opening is 144 sq. in. (929 sq. cm) with a max. dimension of 24" (610mm). Opening may contain any combination of ten pipes and two cable bundle penetrations.

2. METALLIC PIPES - Max. (10) pipes, conduits or tubing to be installed within opening. The following types and sizes of pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Max (8) nominal 3/4" (19mm) diameter or max. (2) 2" (51mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Max (8) nominal 3/4" (19mm) diameter or max. (2) 2" (51mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Max (8) nominal 3/4" (19mm) diameter or max. (2) 2" (51mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   Annular space shall be 3/8" to 1" (10mm to 25mm) between penetrants and 1/2" to 3" (13mm to 76mm) between periphery of opening and pipes.

3. PIPE INSULATION - Max. 1" (25mm) thick or thinner AB/PVC (ARMAFLEX) foam insulation or FIBERGLASS insulation installed on one 2" (51mm) diameter (or smaller) metallic penetrant. The annular space between the insulated pipe and the periphery of the opening shall be a min. 1/2" to 1-3/4" (13mm to 44mm).

4. CABLES - Max. (2) cable bundles to be installed within opening.
   (A) Max. 3/c #2/0 awg copper conductor, PVC jacketed aluminum clad or steel clad cable.
   (B) Max. 400pr. #24awg telephone cables w/PVC insulation and jacket.
   The annular space between cable bundles and the periphery of the opening shall be a min. 3/8" to 2-5/8" (10mm to 67mm). The bundles shall be 1/2" (13mm) apart.

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2" (51mm) depth, and recess 1/2" (13mm) from the top surface of the floor or both surfaces of the wall.

6. NELSON ES1399 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or both surfaces of the wall. Sealant to be forced into interstices of cable group to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-8118

DWG NO. FS-0377 R1

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 25% Compr or Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight
   concrete poured over fluted steel decking.

2. WALL ASSEMBLY - Constructed in the manner specified in the U400 series
designs as shown in the UL Fire Resistance Directory. The max. separation
between bottom of floor and top of wall is 2" (51mm). The joint system is
designed to accommodate a max. 25% compression or extension from its
installed width. Wallboard sheets installed to a min. 5/8" or 1-1/4" (16mm or
32mm) thickness on each side of wall for a 1 hr or 2 hr fire-rated wall. Ceiling
runner (not shown) installed within the deflection channel.

3. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs.

4. DEFLECTION CHANNEL - Nom 3-11/16" x 3" (94mm x 76mm) deep min. 22 GA.
   U-shaped steel channel. Secured to the valleys of the steel floor units.

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool
   batt insulation into the opening to a min. 1-1/4" (32mm) depth. The forming
   material shall be compressed 50% in the nominal joint width and flush with both
   surfaces of the wall.

6. NELSON FSC3 COATING (part # AA088) - Apply by spray, trowel, or brush
   over the forming material on each side of the wall to a nominal 1/8" (3mm) thick
   wet applied coating. Overlap the coating onto the wall and deck a min. of 1/2"
   (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
HW-D-0227

Project Name: _____________________________
Address: ________________________________
Installer: _________________________________
Address: ________________________________
Signature: _______________________________

System No.

DWG NO. FS-0378 R2

DATE: 11/30/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 12.5% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 12.5% compression or extension from its installed width.

3. FORMING MATERIAL - Install backer rod within the annular space, and recess 1/2" (13mm) from both surfaces of the wall.

4. NELSON ES1399 SEALANT - Apply to fill the cavities to a min. 1/2" (13mm) depth over the forming material. Apply on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. HW-D-0232

DWG NO. FS-0379 R2

DATE: 11/30/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 3 Hr.
Nominal Joint Width - 3-1/2" (89mm)
Class II Movement - 15% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. separation between bottom of floor and top of wall is 3-1/2" (89mm). The joint system is designed to accommodate a max. 15% compression or extension from its installed width.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" (102mm) depth. Recess the fiber 1/8" (3mm) from both sides of the wall. The forming material shall be compressed 42% in the nominal joint width.

4. NELSON FSC3 COATING (part # AA0868) - Apply by spray, trowel, or brush over the forming material on each side of the wall to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating onto the wall and floor a min. of 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
DWG NO. FS-0380 R2

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/30/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 3 Hr.
Nominal Joint Width - 3-1/2" (89mm)
Class II Movement - 15% Compr or Ext

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. separation between bottom of floor and top of wall is 3-1/2" (89mm). The joint system is designed to accommodate a max. 15% compression or extension from its installed width.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 4" depth. Recess the fiber 1/4" (6mm) from both sides of the wall. The forming material shall be compressed 42% in the nominal joint width.

4. NELSON ES1399 SEALANT - Apply to fill the cavities to a min. 1/4" (6mm) depth over the forming material. Apply on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. HW-D-1036

DWG NO. FS-0381 R2

DATE: 11/30/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Construct as specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. diameter of the opening is 4" (102mm). Min. annular space is 1/2" (13mm) to max. 1" (25mm).

2. METALLIC SLEEVE - Max. nominal 4" (102mm) diameter min. 28 GA steel sleeve having a min. 2" (51mm) lap. Sleeve installed by coiling the sheet steel to a diameter smaller than the opening and releasing the coil to let it uncoil against the periphery of the opening. Sleeve will extend a nominal 2" (51mm) beyond each surface of the wall.

3. CABLES - Max. 40% fill of 100pr. #24awg., or smaller PVC jacketed telecommunications cables.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool into the sleeve to the full depth. Recess the fiber 1-1/2" (38mm) from both ends of the sleeve.

5. NELSON FSP PUTTY (part # AA445) - Apply over the forming material to a min. 1-1/2" (38mm) depth, flush with both ends of the sleeve. FSP to be tightly packed within interstices of cable bundle.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-3190

DWG NO. FS-0382 R1

Project Name: ________________________
Address: ____________________________
Installer: ____________________________
Address: ____________________________
Signature: __________________________

DATE: 07/20/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL SLEEVED CABLES

F Rating 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 4" (102mm). Min. annular space is 1/2" (13mm) to max. 1" (25mm).

2. METALLIC SLEEVE - Max. nominal 4" (102mm) diameter min. 28 GA steel sleeve having a min. 2" (51mm) lap. Sleeve installed by coiling the sheet steel to a diameter smaller than the opening and releasing the coil to let it uncoil against the periphery of the opening. Sleeve will extend a nominal 2" (51mm) beyond each surface of the wall.

3. CABLES - Max. 40% fill of 100pr. 24awg, or smaller, PVC jacketed telecommunications cables.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a 7" (178mm) depth, and recess 1-1/2" (38mm) from both ends of the sleeve.

5. NELSON FSP PUTTY (part # AA445) - Apply FSP over the forming material to a min. 1-1/2" depth, flush with both ends of the sleeve. FSP to be tightly packed within interstices of cable bundle.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. W-J-3075

Nelson Firestop

DWG NO. FS-0383 R1

Project Name: ________________________________
Address: ___________________________________
Installer: ________________________________
Address: ___________________________________
Signature: ________________________________

DATE: 07/20/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
ELECTRICAL OUTLET BOX

F Rating 2 Hr.

(2) Metallic Outlet Box
(1) Wall
(3) Box Insert

1. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory.

2. METALLIC OUTLET BOX - Max. 2-1/8" x 4-11/16" (54mm x 119mm) steel outlet box installed in accordance with NFPA 70 regulations. The box can be installed within the same stud cavity, provided they are not installed back-to-back.

3. NELSON BOX INSERT (part # AA0860) - Apply 2" x 4" (51mm x 102mm) box insert inside to back wall of steel outlet box.

Tested in accordance with:
ASTM E-119
ANSI/UL 263

Wall Openings Protective Materials (CLIV)
UL File R10764

Nelson Firestop
DWG NO. FS-0384 R1
DATE: 07/20/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
ELECTRICAL OUTLET BOX

F Rating 2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory.

2. METALLIC OUTLET BOX - Max. 4" x 4" (102mm x 102mm) steel box installed in accordance with NFPA 70 regulations. The box can be installed within the same stud cavity, provided they are not installed back-to-back.

3. NELSON BOX INSERT (part # AA0862) - Apply 4" x 4" (102mm x 102mm) box insert inside to back wall of steel outlet box.

Tested in accordance with:
ASTM E-119
ANSI/UL 263

Nelson Firestop
DWG NO. FS-0385 R1

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/20/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1, 2, 3, or 4 Hr.
L Rating at Ambient <1CFM/Lin Ft
Class II Movement - 25% Compr & Ext
Nominal Joint Width - 2" (51mm)

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick light weight or normal weight concrete floor.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated fluted steel deck roof assembly may be used.
3. ROOF INSULATION (not shown) - Min. 2-1/4" (57mm) thick poured insulating concrete, as measured from the top plane of the roof deck.
4. WALL ASSEMBLY - As specified in the U400 series designs per UL Fire Resistance Directory. The max. separation between bottom of floor and top of wall is 1-1/2" (38mm) for 1 hr fire-rated assemblies and 2" (51mm) for 2, 3, or 4 hr fire-rated assemblies. The joint system is designed to accommodate a max. 25% compression or extension from its installed width.
5. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs.
6. FORMING MATERIAL - Tightly pack min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation flush with both surfaces of the wall to fill the annular space. The forming material shall be compressed 50% in the nominal joint width and 25% into the flutes of the steel floor units between the top of the deflection channel and the steel deck.
7. SPRAY-APPLIED FIRE PROOFING (not shown) - As an alternate to the forming material within the flutes, apply min. 15pcf (240 kg/cubic meter) into the flutes of the steel floor or roof deck between the top of the wall and the bottom of the steel floor units or roof deck.
8. FORMING MATERIAL (Plugs) (not shown) - As an alternate to the forming material and spray-applied fire proofing, mineral wool plugs preformed to the shape of the fluted floor units, may be used within the flutes.
9. NELSON FSC3 COATING (part # AA0888) - Apply by spray or brush over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating onto the wall and deck on both sides a min. of 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No.
HW-D-0304

DWG NO. FS-0386 R3

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/30/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 or 3 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr & Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick light weight or normal weight concrete floor.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated steel deck roof assembly may be used.
3. ROOF INSULATION (not shown) - As specified in the individual P700 series design.
4. SPRAY-APPLIED FIRE PROOFING - The steel roof deck shall be sprayed with the thickness of material specified in the individual P700 series design. As an alternate to the forming material within the flutes, with a thickness equal to obtain a 2 or 3 hour fire resistance, and installed into the flutes of the protected steel floor or roof deck.
5. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression or extension from its installed width.
6. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space to a min. 6" or 6-5/8" (152mm or 168mm) depth for 2 or 3 hr rated assemblies, respectively. The forming material shall be compressed 25% into the fluted area and 50% in the nominal joint and flush with both surfaces of the wall.
7. FORMING MATERIAL (Plugs) (not shown) - As an alternate to the forming material and spray-applied fire proofing, mineral wool plugs preformed to the shape of the fluted floor units, may be used within the flutes.
8. NELSON FSC3 COATING (part # AA0868) - Apply by spray or brush over the fireproofing or forming material in the joint to a horn 1/8" (3mm) thick wet applied coating. Overlap the coating 1/2" (13mm) onto the wall and protected steel floor or roof deck on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop

System No.
HW-D-0308

DWG NO. FS-0387 R3

DATE: 11/30/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1, 2, or 3 Hr.
L Rating at Ambient <1CFM/Lin Ft
Class II Movement - 25% Compr & Ext
Nominal Joint Width - 1" (25mm)

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick light weight or normal weight concrete floor.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated steel deck roof assembly may be used.
3. ROOF INSULATION (not shown) - As specified in the individual P700 series design.
4. SPRAY-APPLIED FIRE PROOFING (not shown) - The steel roof deck shall be sprayed with the thickness of material specified in the individual P700 series design. As an alternate to the forming material within the flutes, with a thickness equal to obtain a 1, 2, or 3 hour fire resistance, and installed into the flutes of the protected steel floor or roof deck between the top of the wall and the bottom of the protected steel floor units or roof deck.
5. WALL ASSEMBLY - Non-load bearing design rated for a min. of 1, 2, or 3 hr. fire resistance. The max separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression from its installed width. Ceiling Runner attached to bottom of the flutes.
6. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs with max. 24" (610mm) o.c. spacing.
7. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space. The forming material shall be compressed 25% into the fluted area and 50% in the nominal joint and flush with both surfaces of the wall.
8. FORMING MATERIAL (Plugs) (not shown) - As an alternate to the forming material and spray-applied fire proofing, mineral wool plugs preformed to the shape of the fluted floor units, may be used within the flutes.
9. NELSON FSC3 COATING (part # AA0868) - Apply by spray or brush over the fireproofing or forming material in the joint to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating 1/2" (13mm) onto the wall and protected steel floor or roof deck on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop

System No.
HW-D-0309

DWG NO. FS-0388 R3

Project Name: ____________________________

Address: ____________________________

Installer: ____________________________

Address: ____________________________

Signature: ____________________________

DATE: 11/30/06

BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr or Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Res. Direct. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly.
3. SPRAY-APPLIED FIRE PROOFING (not shown) - Min. 15 pcf (240 kg/cubic meter) applied to the bottom of the steel floor, with a thickness equal to obtain a 2 hour fire resistance.
4. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression or extension from its installed width. Ceiling runner is attached to bottom of the flutes.
5. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs with max. 24" (610mm) o.c. spacing.
6. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space. The forming material shall be compressed 50% in the nominal joint width and flush with both surfaces of the wall.
7. NELSON FSC3 COATING (part # AA0868) - Apply by spray, trowel, or brush over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating a min. 1/2" (13mm) onto the wall and protected steel floor or roof deck on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No.
HW-D-0239

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0389 R2

DATE: 11/30/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr or Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.

2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the Individual P700 Series Roof-Ceiling Design in the UL Fire Res. Direct. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly.

3. SPRAY-APPLIED FIRE PROOFING (not shown) - Min. 15 pcf (240 kg/cubic meter) applied to the bottom of the steel floor, with a thickness equal to obtain a 2 hr. fire resistance.

4. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The wall may be parallel to and centered under the valleys of the steel floor. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max 25% compression from its installed width.

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space. The forming material shall be compressed 50% in the nominal joint width and flush with both surfaces of the wall.

6. NELSON FSC3 COATING (part # AA0886) - Apply by spray, trowel, or brush over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating a min. 1/2" (13mm) onto the wall and protected steel floor or roof deck on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No. HW-D-0240

Nelson Firestop

DWG NO. FS-0390 R2

DATE: 07/20/06

BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
GLASS PIPE

F Rating 2 Hr.  T Rating 0 Hr.

(1) Wall
(2) Pipe
(3) Sealant

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. The max. annular space is 6" (point of contact) to 1-3/8" (35mm). Max. diameter of opening is 8" (203mm).

2. GLASS PIPE - Max. nominal 6" (152mm) diameter, or smaller glass pipe. For use in closed (process or supply) or vented (drain, waste, or vent) piping systems.

3. NELSON ES1399 SEALANT - Apply ES1399 within the annular space to a min. 5/8" (16mm) depth. Additional sealant to be applied such that a min. 1/4" (6mm) crown is formed around the through penetrant on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-2103

Project Name: ________________________  DWG NO. FS-0391R1
Address: ____________________________
Installer: ____________________________
Address: ____________________________
Signature: ____________________________

DATE: 07/20/06  MEA # 125-04-M
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
NONMETALLIC PIPE

F Rating 2 Hr. T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. The max. diameter of opening is 4" (102mm).

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:

   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.

   (C) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.

   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   The annular space is min. 5/8" to max. 1" (16mm to 25mm).

3. NELSON ES1399 SEALANT - Apply ES1399 within the annular space to a 5/8" (16mm) depth, with an additional 1/4" (6mm) bead around the pipe where it exits the wall on both sides.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

---

Nelson Firestop

System No. W-J-2104

DWG NO. FS-0392 R1

Date: 07/20/06

By: RL

MEA # 125-04-M

Nelson Firestop

800 331-7325 Fax: 918 627-2941

Tulsa, Ok.
CONCRETE WALL
INSULATED METALLIC PIPE

F Rating 2 Hr.  T Rating 1 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 12" (305mm).

2. METALLIC PIPE - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation. The annular space is 0" (point of contact) to 1-3/8" (35mm).

4. FORMING MATERIAL - Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of the wall.

5. NELSON ES1399 SEALANT - Apply ES1399 sealant within the annular space to a min. 5/8" (16mm) depth. At areas of point of contact, apply a min. 3/8" (10mm) bead at the interface between the pipe and both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
W-J-5076

DWG NO.  FS-0393 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
</table>

DATE: 07/20/06

BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
HVAC DUCT

F Rating 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete, or CMU block wall. The max. area of the opening is 498 sq. in. (3213 sq. cm) with a max. dimension of 22-5/8" (575mm). The annular space is 0" (point of contact) to 2" (51mm).

2. STEEL HVAC DUCT - 20" x 20" (508mm), or smaller, No. 24 gauge (or heavier) steel duct installed concentrically or eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall.

3. FORMING MATERIAL - Tightly pack min. 6" (152mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space and flush with both wall surfaces.

4. NELSON FSC3 COATING (part # AA0868) - Apply over the forming material to fill the annular space to a min. 1/8" (3mm) depth on both sides of the wall. Overlap the coating onto the wall and duct a min. 1/2" (13mm).

5. METAL FRAME - Min. No. 22 GA galvanized steel angles sized to lap duct a min. of 2" (51mm) and lap wall surfaces a min. 1-1/2" (38mm). Angles attached to steel duct on both sides of wall with min. No. 10 steel sheet metal screws spaced a max. of 1" (25mm) from each end of steel duct and spaced a max. 6" (152mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
FS-0394 R2

System No.
W-J-7047

Project Name: __________________________  Address: __________________________
Installer: __________________________  Address: __________________________
Signature: __________________________

DATE: 07/20/06  BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
HVAC DUCT

F Rating 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete, or CMU block wall. The max. area of the opening is 1470 sq. in. (9484 sq. cm) with a max. dimension of 70" (1778mm). The annular space is 0" (point contact) to 3-1/2" (89mm).

2. STEEL HVAC DUCT - 67" x 18" (1702mm x 457mm), or smaller, No. 24 gauge, or heavier, steel duct installed concentrically or eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall.

3. FORMING MATERIAL (not shown) - Install backer rod, mineral wool, or fiberglass batt insulation into the opening and recess 5/8" (16mm) from both sides of the wall.

4. NELSON ES1399 SEALANT - Apply within the annular space to a min. 5/8" (16mm) depth, flush with both surfaces of the wall. At areas of point of contact, apply a min. 3/8" (10mm) bead at the interface between the duct and the concrete on both surfaces of the wall.

5. METAL FRAME - Min. No. 22 GA galvanized steel angles sized to lap duct a min. of 2" (51mm) and lap wall surfaces a min. 1-1/2" (38mm). Angles attached to steel duct on both sides of wall with min. No. 10 steel sheet metal screws spaced a max. of 1" (25mm) from each end of steel duct and spaced a max. 6" (152mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-7048

DWG NO. FS-0395 R2

Project Name: ____________________
Address: ________________________

Installer: ________________________
Address: ________________________

Signature: ________________________

DATE: 07/20/06

BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
INSULATED HVAC DUCT

F Rating 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. The max. area of the opening is 1050 sq. in. (6774 sq. cm) with a max. dimension of 35" (889mm).

2. STEEL HVAC DUCT - Max. nom 24" x 30" (610mm x 762mm) (or smaller) 24 GA (or heavier) steel duct installed eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall.

3. DUCT INSULATION - Max. 1-1/2" (38mm) thick (or thinner) FIBERGLASS jacketed on the outside with foil scrim-kraft facing. Longitudinal and transverse joints are to be sealed with aluminum foil tape. Insulation shall be compressed 50% during installation. The annular space is 1" to 2-3/4" (25mm to 70mm).

4. FORMING MATERIAL - Tightly pack min. 4-7/8" (124mm) of min 4pcf (64 kg/ cubic meter) mineral wool batt insulation to fill the annular space and recess 5/8" (16mm) from both surfaces of the wall.

5. NELSON ES1399 SEALANT - Apply over the forming material to fill the annular space to a min. 5/8" (16mm) depth flush with both surfaces of the wall.

6. METAL FRAME (not shown) - Properly install a 2 x 1-1/2" (51mm x 38mm), min. 22 gauge angle around perimeter of duct on each side of wall such that sealant is completely covered and the angle overlaps onto wall min. 1-1/2" (38mm).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Project Name: 
Address: 

Installer: 
Address: 
Signature: 

System No. W-J-7049

DWG NO. FS-0396 R1

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL GLASS PIPE

F Rating 1 or 2 Hr. T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. annular space is 0" (point of contact) to 1-3/8" (35mm).

2. GLASS PIPE - Max. 6" (152mm) nominal diameter glass pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems.

3. NELSON ES1399 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth, with an additional 1/4" (6mm) bead around the pipe, on the surface of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. W-L-2290

Nelson Firestop

DWG NO. FS-0397 R1

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of the opening is 4" (102mm).

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   (C) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   (D) ACRYLONITRILE BUTADIENE STRYENE (ABS) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. The nominal annular space is min. 5/8" (16mm) to max. 1" (16mm to 25mm).

3. NELSON ES1399 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth, flush surface of the wall on both sides. Apply an additional min. 1/4" (6mm) crown around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Project Name: ____________________________
Address: ____________________________________________________________
Installer: ____________________________
Address: ____________________________________________________________
Signature: ____________________________________________________________

DWG NO. FS-0398 R1

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 0, 1 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of the opening is 12" (305mm).

2. METALLIC PIPE - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation. The annular space range is 0" (point of contact) to 1-3/8" (35mm).

4. FORMING MATERIAL (not shown) - Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of the wall.

5. NELSON ES1399 SEALANT - Apply ES1399 to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) bead at the interface between the pipe and both surfaces of the wall. T rating is 0 or 1 hr when installed in 1 or 2 hr rated walls, respectively. Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

System No. W-L-5161

Nelson Firestop

DWG NO. FS-0399 R1

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. area of the opening is 498 sq. in. (3213 sq. cm) with a max. dimension of 22-5/8" (575mm) for steel studs. The max. area of the opening is 328 sq. in. (2116 sq. cm) with a max. dimension of 14-1/2" (368mm) for wood studs. The annular space is 0" (point contact) to 2" (51mm).

2. STEEL HVAC DUCT - 20" x 20" (508mm x 508mm), or smaller, No. 24 gauge, or heavier, steel duct installed concentrically or eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space and flush with both wall surfaces.

4. NELSON FSC3 COATING (part # AA0868) - Apply over the forming material to fill the annular space to a min. 1/8" (3mm) depth on both sides of the wall. Overlap the coating onto the wall and duct a min. 1/2" (152mm).

5. METAL FRAME - Min. No. 22 GA galvanized steel angles sized to lap duct a min. of 2" (51mm) and lap wall surfaces a min. 1-1/2" (38mm). Angles attached to steel duct on both sides of wall with min. No. 10 steel sheet metal screws spaced a max. of 1" (25mm) from each end of steel duct and spaced a max. 6" (152mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-7083

DWG NO. FS-0400 R2

DATE: 07/20/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
HVAC DUCT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of opening is 1470 sq. in. (9484 sq. cm) with a max. dimension of 70" (1778mm). The annular space is 0" (point contact) to 3-1/2" (89mm).

2. STEEL HVAC DUCT - 67" x 18" (1702mm x 457mm), or smaller, No. 24 gauge, or heavier, steel duct installed concentrically or eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall.

3. FORMING MATERIAL (not shown) - Install backer rod, mineral wool, or fiberglass batt insulation into the opening and recess 5/8" (16mm) from both sides of the wall. For 2 hr wall assemblies only.

4. NELSON ES1399 SEALANT - Apply within the annular space to a min. 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) bead at the interface between the duct and both surfaces of the wall.

5. METAL FRAME - Min. No. 22 GA galvanized steel angles sized to lap duct a min. of 2" (51mm) and lap wall surfaces a min. 1-1/2" (38mm). Angles attached to steel duct on both sides of wall with min. No. 10 steel sheet metal screws spaced a max. of 1" (25mm) from each end of steel duct and spaced a max. 6" (152mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
W-L-7084

Nelson Firestop

DWG NO. FS-0401R2

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
INSULATED HVAC DUCT

F Rating 1 or 2 Hr.                      T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. area of the opening is 1050 sq. in. (6774 sq. cm) with a max. dimension of 30" (762mm) for steel studs. The max. area of the opening is 210 sq. in. (1355 sq. cm) with a max. dimension of 14-1/2" (368mm) for wood studs. Opening is to be framed on all sides with stud like material. The annular space is 1" to 2-3/4" (70mm).

2. STEEL HVAC DUCT - Nominal 24" x 30" (610mm x 762mm) (or smaller) 24 gauge (or heavier) steel duct installed eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall.

3. DUCT INSULATION - Max. 1-1/2" (38mm) thick glass fiber batt or blanket (min. 3/4 pcf) jacketed on the outside with foil-scrim-kraft facing. Longitudinal and transverse joints are to be sealed with aluminum foil tape. Insulation shall be compressed 50% during installation.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space and recess 5/8" (16mm) from both wall surfaces.

5. NELSON ES1399 SEALANT - Apply to fill the annular space to a min. 5/8" (16mm) depth on both sides of the wall.

6. METAL FRAME (not shown) - Properly install a 2" x 1-1/2" (51mm x 38mm), min. 22 gauge angle around perimeter of duct on each side of wall such that sealant is completely covered and the angle overlaps onto wall min. 1-1/2" (38mm).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-7085

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0402 R1</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>[Blank]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Installer:</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Address:</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Signature:</td>
<td>[Blank]</td>
</tr>
</tbody>
</table>

DATE: 07/20/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR NONMETALLIC PIPE

F Rating 1 Hr. T Rating 1 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. Max. diameter of opening is 3 -1/8" (79mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses.
   (C) GYPSUM BOARD - Gypsum wallboard secured to wood/steel joists/trusses or furring channels.

2. WALL ASSEMBLY - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

Annular space for all penetrations is min. 1/4" to max. 1/2" (6mm to 13mm).

4. NELSON ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of ES1399 around the pipe where it penetrates the flooring or the sole plate, and a min. 3/4" (19mm) depth where it penetrates the lower top plate with an additional min. 3/8" (10mm) crown at bottom surface of lower top plate of chase wall and top surface of floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-2224

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0406 R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>10/25/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>MEA #</td>
<td>125-04-M</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR
STEEL DUCT

F Rating 1 or 2 Hr.  T Rating 1 or 1-1/2 Hr.

1. WOOD FLOOR ASSEMBLY - Const. in the manner specified in individual L500 series 1 hr floor-ceiling designs in the UL Fire Res. Dir., 2 hr floor-ceiling designs in the UL Fire Res. Dir. shall be constructed in the manner specified in design nos. L505, L511, or L536. Max. diameter of opening is 6-1/2" (165mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.
   (C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) (not shown) - Const. in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. STEEL DUCT - Max. 6" diameter, 30 gauge or heavier, galvanized steel duct, installed concentrically or eccentrically within the openings. Annular space shall be 0" (point of contact) to 1/2" (13mm).

4. NELSON ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of ES1399 flush with annulus on top surface of floor or sole plate. Min. 1/2" (13mm) depth where it penetrates the ceiling or bottom surface of lower top plate of optional chase wall assembly. At areas of point of contact, apply a additional 3/8" (10mm) bead at the interface between the duct and the floor and ceiling or top plate. T rating is 1 or 1-1/2 hr when installed in 1 or 2 hr rated walls, respectively.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DWG NO. FS-0408 R2

DATE: 10/24/06

BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE JOIST FLOOR METALLIC PIPE OR CONDUIT

F Rating 1 Hr.       T Rating 1 Hr.

(1) Floor-Ceiling
(2) Pipe
(3) Sealant
(3) Sealant

1. FLOOR-CEILING ASSEMBLY - Const. in the manner specified in individual G500 series floor-ceiling designs in the UL Fire Res. Div. Max. diameter of opening is 5" (127mm).

2. METALLIC PIPE - The following types and sizes of metallic pipe, conduit or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or rigid galv steel conduit.
   (D) COPPER TUBING or PIPE - Nom 3" (76mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

Annular space range is 0" (point of contact) to 1/2" (13mm) for steel, cast iron, or EMT penetrants, and 0" (point of contact) to 7/8" (22mm) for copper pipe or tubing. Max. diameter of opening is 5" (127mm).

3. NELSON ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of ES1399 around the pipe where it penetrates the flooring and a min. 5/8" (16mm) depth where it penetrates the ceiling. At areas of point of contact, apply an additional min. 1/4" (6mm) diameter bead at the interface between the pipe and the top surface of the concrete (floor) and bottom surface of the gypsum board (ceiling).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
F-E-1007

DWG NO. FS-0409 R1

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325       Fax: 918 627-2941
Tulsa, Ok.
CONCRETE JOIST FLOOR CABLES

F Rating 1 Hr.  T Rating 1 Hr.

1. FLOOR-CEILING ASSEMBLY - Const. in the manner specified in individual G500 series floor-ceiling designs in the UL Fire Res. Dir.. Annular space range for all penetrants is 0" (point of contact) to 1/2" (13mm). Max. diameter of opening is 4" (102mm).

2. CABLES - Max. 3-1/2" (89mm) diameter, or smaller bundle of:
   (A) max. 100pr #24awg or smaller telecommunication cable w/PVC jacketing
   (B) max. 3/C #2/0awg or smaller aluminum conductor SER cable w/PVC jacketing
   (C) max. 3/C w/#12awg or smaller Type NM (ROMEX) w/PVC jacketing
   (D) max. 7/C #12awg, or smaller cables with PVC jacketing
   (E) max. RG/U or smaller copper conductor coaxial cable w/fluorinated ethylene jacketing
   (F) max. (1) 4/C #2awg aluminum or copper conductor aluminum jacketed METAL CLAD cable within the cable bundle. Maintain 3-1/2" (89mm) diameter cable bundle when included with other mentioned cables.

3. NELSON ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of ES1399 around the cables where it penetrates the flooring and a min. 5/8" (16mm) depth where it penetrates the ceiling. At areas of point of contact, apply an additional 1/4" (6mm) bead at the interface between the cables and the top surface of the concrete (floor) and bottom surface of the gypsum board (ceiling).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
F-E-3007

Nelson Firestop

DWG NO.  FS-0410 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE JOIST FLOOR STEEL DUCT

F Rating 1 Hr. T Rating 1 Hr.

1. FLOOR-CEILING ASSEMBLY - Constr. in the manner specified in individual G500 series floor-ceiling designs in the UL Fire Res. Dir.. Annular space range for all penetrations is 0” (point of contact) to 1/2” (13mm). Max. diameter of opening is 6-1/2” (165mm).

2. STEEL DUCT - Max. 6" (152mm) diameter, or smaller, 30 gauge (or heavier), steel duct, installed concentrically or eccentrically within the openings.

3. NELSON ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of ES1399 around the duct where it penetrates the flooring and a min. 5/8" (16mm) depth where it penetrates the ceiling. At areas of point of contact, apply an additional 1/4" (6mm) bead at the interface between the duct and the top surface of the concrete (floor) and bottom surface of the gypsum board (ceiling).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. F-E-7004

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 07/20/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>
PERIMETER FIRE BARRIER SYSTEM
EIFS CURTAIN WALL

F Rating 2 Hr.  T Rating 2 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete a density of 100-150pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:

   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. The mounting attachments to the floor slab shall be connected to the joint face of the floor slab at every floor, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).

   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs secured in an 18 GA steel track top and bottom using #6 x 1.25" (32mm) bugle head SD PT screws. Vertical framing shall not exceed a spacing of 16" (406mm) o.c.

   Tested in accordance with:
   ASTM E-2307, E-1399

Omega Point Design No.
CEJ 278 P

Nelson Firestop
DWG NO. FS-0412 R3
Page 1 of 2

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type S drywall screws 8" (203mm) o.c. As an option, min. 5/8" (16mm) water-resistant Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nom. weight of 2300lb/msf. may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" (102mm) thick min. 4pcf (64 kg/cubic meter) mineral wool batt insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

(E) Exterior Curtain Wall Insulation - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, and an Exterior Curtain Wall Finish. The EIFS system is a monolithic assembly without expansion or control joints. The EPS foam boards measure 24" (610mm) wide by 48" (1219mm) long by 4" (102mm) thick with a nominal density of 1pcf (16 kg/cubic meter). The EPS foam is attached to the scaffolded wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations.

(F) Exterior Curtain Wall Finish - The cementious base coat and reinforcing mesh is applied over the Exterior Curtain Wall Insulation. Apply 1/16" to 1/8" (3mm) thick cementious base coat to the exposed surface of the EPS foam. Apply the mesh in accordance with manufacturer's recommendations.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0688) - Spray, trowel, or brush apply the FSC3 coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1" (25mm) wide x 3" (76mm) high with a 2" (51mm) upper leg and 3" (76mm) lower leg.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 278 P

Nelson Firestop

DWG NO. FS-0412 R3

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE:</th>
<th>04/19/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PERIMETER FIRE BARRIER SYSTEM
EIFS CURTAIN WALL

F Rating 2 Hr.  T Rating 2 Hr.  L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly
   made from either lightweight or normal weight concrete with a density of 100-150
   pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the
   joint face. Overall slab thickness may vary to accommodate various breakout
   depths (longitudinal recesses) formed in the concrete, to house the architectural
   cover plate. The breakout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the
   following construction features:

   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to
       the structural framing shall be according to the curtain wall manufacturer's
       instructions. The mounting attachments to the floorslab shall be connected
       to the joint face of the floorslab at every floor, according to the curtain wall
       manufacturer's instructions. Max. distance between mounting attachments
       shall be 48" (1219mm).

   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm)
       by 1-5/8" (41mm). 18 GA steel "C" studs secured in an 18 GA steel track top
       and bottom using #6 x 1.25" (32mm) bugle head 5D PT screws. Vertical
       framing shall not exceed a spacing of 16" (406mm) o.c.:
   
   Tested in accordance with:
   ASTM E-2307, E-1399

Omega Point Design No.
CEJ 279 P

Nelson Firestop
DWG NO. FS-0413 R3

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type S drywall screws 8" (203mm) o.c. As an option, min. 5/8" (16mm) water-resistant Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nom. weight of 2300lb/mf. may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" (102mm) thick min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

(E) Exterior Curtain Wall Insulation - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, and a Exterior Curtain Wall Finish. The EIFS system is a monolithic assembly without expansion or control joints. The EPS foam boards measure 24" (610mm) wide by 48" (1219mm) long by 4" (102mm) thick with a nominal density of 1 pcf (16 kg/cubic meter). The EPS foam is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations.

(F) Exterior Curtain Wall Finish - The plaster base coat and reinforcing mesh is applied over the Exterior Curtain Wall Insulation. Apply 1/4" (6mm) to 1/8" (3mm) thick plaster base coat to the exposed surface of the EPS foam. Apply the mesh in accordance with manufacturer's recommendations.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nominal joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom. joint width and flush with the top surface of recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1" (25mm) wide x 3" (76mm) high with a 2" (51mm) upper leg and 3" (76mm) lower leg.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 279 P

---

Nelson Firestop

---

DWG NO. FS-0413 R3

---

DATE: 04/19/06

---

BY: RL

---

MEA # 127-04-M Vol. II

---

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
EIFS CURTAIN WALL

F Rating 2 Hr.  
T Rating 2 Hr.  
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

(1B) Steel Stud Framing  
(1E) Exterior Curtain Wall  
(1F) Insulation & Finish

(2B) Coating

(2C) Sandwich Wall

(2D) Insulation

(3A) Forming Material

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various breakout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The breakout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:

(A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. The mounting attachments to the floor slab shall be connected to the joint face of the floor slab at every floor, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).

(B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs secured in an 18 GA steel track top and bottom using #6 x 1.25" (32mm) bugle head SD PT screws. Vertical framing shall not exceed a spacing of 16" (406mm) o.c.

Tested in accordance with:
ASTM E-2307, E-1399

Nelson Firestop
CEJ 280 P

Omega Point Design No.

DWG NO. FS-0414 R3

DATE: 04/19/06

BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type S drywall screws 5/8" (16mm) o.c. As an option, 5/8" (16mm) o.c. As an option, Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nom. weight of 2300lb/msf. may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" (102mm) thick. min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

(E) Exterior Curtain Wall Insulation (optional) - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, and a Exterior Curtain Wall Finish. The EIFS system is a monolithic assembly without expansion or control joints. The EPS foam boards measure 24" (610mm) wide by 48" (1219mm) long by 4" (102mm) thick with a nominal density of 1 pcf (16 kg/cubic meter). The EPS foam material is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations.

(F) Exterior Curtain Wall Finish - Use stone and mortar of any type. Mortar joints not to exceed 7/8" (22mm). Secure stone wall finish to wall assembly using conventional acceptable masonry techniques.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) mineral wool batt insulation installed with the fibers running density, parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or receded 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK SI/Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool batt forming the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1" (25mm) wide x 3" (76mm) high with a 2" (51mm) upper leg and 3" (76mm) lower leg.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No. CEJ 280 P

Nelson Firestop

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 04/19/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td>BY: RL</td>
</tr>
<tr>
<td>Address:</td>
<td>MEA # 127-04-M Vol. II</td>
</tr>
<tr>
<td>Signature:</td>
<td>800 331-7325 Fax: 918 627-2941</td>
</tr>
<tr>
<td></td>
<td>Tulsa, Ok.</td>
</tr>
</tbody>
</table>

Nelson Firestop

Page 2 of 2
PERIMETER FIRE BARRIER SYSTEM
EIFS CURTAIN WALL

F Rating 2 Hr.  T Rating 2 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:

(A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. The mounting attachments to the floor slab shall be connected to the joint face of the floor slab at every floor, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).

(B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs secured in an 18 GA steel track top and bottom using #6 x 1.25" (32mm) bugle head SD PT screws. Vertical framing shall not exceed a spacing of 16" (406mm) o.c.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 281 P

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0415 R3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>04/19/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type SI drywall screws, 8" (203mm) o.c. As an option, min. 5/8" (16mm) water-resistant Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nominal weight of 2300lb/msf, may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" (102mm) thick min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

(E) Exterior Curtain Wall Insulation (optional) - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, and an Exterior Curtain Wall Finish. The EIFS system is a monolithic assembly without expansion or control joints. The EPS foam boards measure 24" (610mm) wide by 48" (1219mm) long by 4" (102mm) thick with a nominal density of 1 pcf (16 kg/cubic meter). The EPS foam is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations.

(F) Exterior Curtain Wall Finish - Use brick and mortar of any type. Mortar joints not to exceed 7/8" (22mm). Secure bricks to wall assembly using conventional acceptable masonry techniques.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0688) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1" (25mm) wide x 3" (76mm) high with a 2" (51mm) upper leg and 3" (76mm) lower leg.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No. CEJ 281 P

Nelson Firestop

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
EIFS CURTAIN WALL

F Rating 2 Hr.  T Rating 2 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various breakout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The breakout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:

   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer’s instructions. The mounting attachments to the floor slab shall be connected to the joint face of the floor slab at every floor, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).

   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs secured in an 18 GA steel track top and bottom using #6 x 1.25" (32mm) bugle head SD PT screws. Vertical framing shall not exceed a spacing of 16" (406mm) o.c.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 282 P

Nelson Firestop

DWG NO. FS-0416 R3

Project Name: __________________________
Address: ______________________________
Installer: ______________________________
Address: ______________________________
Signature: ______________________________

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type S drywall screws 8" (203mm) o.c. As an option, min. 5/8" (16mm) water-resistant Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nom. weight of 2300lb/msf, may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" (102mm) thick min. 4 pcf (64 kg/cubic meter) mineral wool batt (102mm) thick insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1" (25mm) wide x 3" (76mm) high with a 2" (51mm) upper leg and 3" (76mm) lower leg.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 282 P

Nelson Firestop

DWG NO. FS-0416 R3
Page 2 of 2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
EIFS VISION GLASS CURTAIN WALL

F Rating 2 Hr.  T Rating 2 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

(2H) Window Gaskets
(2I) Window Framing
(3B) Coating
(1) Floor
(2G) Glass Vision Panel
(2C) Sandwich Wall
(2E) Exterior Curtain Wall
(2F) Insulation & Finish
(2D) Insulation
(3A) Forming Material

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2” (114mm) at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer’s instructions. The mounting attachments to the floor slab shall be connected to the joint face of the floor slab at every floor, according to the curtain wall manufacturer’s instructions. Max. distance between mounting attachments shall be 48” (1219mm).
   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8” (92mm) by 1-5/8” (41mm), 18 GA steel “C” studs secured in an 18 GA steel track top and bottom using #6 x 1.25” (32mm) bugle head SD PT screws. Vertical framing shall not exceed a spacing of 16” (406mm) o.c.

Tests in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 283 P

Omega Point

Nelson Firestop
DWG NO. FS-0417 R3
Page 1 of 2

Project Name: ___________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79) placed over and fastened to framing with min. 1-1/4" (32mm) long Type X concrete screws 8" (203mm) o.c. As an option, min. 5/8" (16mm) water-resistant Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nom. weight of 2300lb/1000ft^2 may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) by 4" (102mm) thick min. 4pcf (64 kg/cubic meter) mineral wool batt insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

(E) Exterior Curtain Wall Insulation - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, and a Exterior Curtain Wall Finish. The EIFS system is a monolithic assembly without expansion or control joints. The EPS foam boards measure 24" (610mm) wide by 48" (1219mm) long by 4" (102mm) thick with a nominal density of 1 pcf (16 kg/cubic meter). The EPS foam is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations.

(F) Exterior Curtain Wall Finish - The cementitious base coat and reinforcing mesh is applied over the Exterior Curtain Wall Insulation. Apply 1/16" (2mm) to 1/8" (3mm) thick cementitious base coat to the exposed surface of the EPS foam. Apply the mesh in accordance with manufacturer's recommendations.

(G) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(H) Window Gaskets - Secure glass vision panels with a thermal break.

(I) Window Framing - Steel framing members shall be a min. 3-5/8" (92mm) by 1-5/8" (41mm) 18 GA steel "C" channel or similar construction that is compatible with steel stud framing. Locate window framing at least 6" (152mm) above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # A0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 283 P

| Project Name: | | | | |
| Address: | | | | |
| Installer: | | | | |
| Address: | | | | |
| Signature: | | | | |

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0417 R3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>04/19/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM  
EIFS VISION GLASS CURTAIN WALL  

F Rating 2 Hr.    T Rating 2 Hr.    L Rating <1 SCFM  
Movement - 12.5% Horiz./6.25% Vert.

(2H) Window Gaskets
(2I) Window Framing
(3B) Coating
(1) Floor
(2B) Steel Stud Framing
(2G) Glass Vision Panel
(2D) Insulation
(2C) Sandwich Wall
(2E) Exterior Curtain Wall
(2F) Insulation & Finish
(3A) Forming Material

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150pcf (1602 - 2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:

(A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. The mounting attachments to the floor slab shall be connected to the joint face of the floor slab at every floor, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).

(B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 16 GA steel "C" studs secured in an 18 GA steel track top and bottom using #8 x 1-1/2" (32mm) bugle head SD PT screws. Vertical framing shall not exceed a spacing of 16" (406mm) o.c.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 284 P

Nelson Firestop

DWG NO.   FS-0418 R3
Page 1 of 2

DATE:     04/19/06
BY:       RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type S drywall screws 8" (203mm) o.c.. As an option, min. 5/8" (16mm) water-resistant Type X concrete sheathing with embedded glass mat, a non-flammable primer coating, and having a nominal weight of 2300lb/m², may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" (102mm) thick min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 18" (457mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

(E) Exterior Curtain Wall Insulation - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, and a Exterior Curtain Wall Finish. The EIFS system is a monolithic assembly without exterior expansion or control joints. The EPS foam boards measure 24" (610mm) wide by 48" (1219mm) long by 4" (102mm) thick with a nominal density of 1 pcf (16 kg/cubic meter). The EPS foam is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations.

(F) Exterior Curtain Wall Finish - The plaster base coat and reinforcing mesh is applied over the Exterior Curtain Wall Insulation. Apply 7/16" (12mm) to 1/8" (3mm) thick plaster base coat to the exposed surface of the EPS foam. Apply the mesh in accordance with manufacturer's recommendations.

(G) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(H) Window Gaskets - Secure glass vision panels with a thermal break.

(I) Window Framing - Steel framing members shall be a min. 3-5/8" (92mm) by 1-5/8" (41mm) 18 GA steel "U" channel or similar construction that is compatible with steel Stud framing. Locate window framing min. 6" (152mm) above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom. joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # A0866) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # A552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 284 P

Nelson Firestop

Omega Point Design No.
CEJ 284 P

Nelson Firestop

DWG NO. FS-0418 R3

Date: 04/19/06

By: RL

MEAS # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
EIFS VISION GLASS CURTAIN WALL

F Rating 2 Hr.           T Rating 2 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf (1602 - 2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint faces. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:

   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. The mounting attachments to the floor slab shall be connected to the joint face of the floor slab at every floor, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).

   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs secured in an 18 GA steel track top and bottom using #6 x 1.25" (32mm) bugle head SD PT screws. Vertical framing shall not exceed a spacing of 16" (406mm) o.c.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 285 P

Nelson Firestop

Dwg No. FS-0419 R3

Date: 04/19/06
By: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type S drywall screws 8" (203mm) o.c. As an option, min. 5/8" (16mm) water-resistant Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nom. weight of 2500lb/1000sf may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" (102mm) thick min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Bat is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C"-studs.

(E) Exterior Curtain Wall Insulation (optional) - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, and a Exterior Curtain Wall Finish. The EIFS system is a monolithic assembly without expansion or control joints. The EPS foam boards measure 24" (610mm) wide by 48" (1219mm) long by 4" (102mm) thick with a nominal density of 1 pcf (16 kg/cubic meter). The EPS foam is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations.

(F) Exterior Curtain Wall Finish - Use stone and mortar of any type. Mortar joints not to exceed 7/8" (22mm). Secure stone wall finish to wall assembly using conventional acceptable masonry techniques.

(G) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(H) Window Gaskets - Secure glass vision panels with a thermal break.

(I) Window Framing - Steel framing members shall be a min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "U" channel or similar construction that is compatible with steel-stud framing. Locate window framing a min. 6" (152mm) above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thickness 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor. If FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

---

Nelson Firestop

Omega Point Design No.
CEJ 285 P

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop

DWG NO. FS-0419 R3
Page 2 of 2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
EIFS VISION GLASS CURTAIN WALL

F Rating 2 Hr.        T Rating 2 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly
   made from either lightweight or normal weight concrete with a density of 100-150
   pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the
   joint face. Overall slab thickness may vary to accommodate various blockout
   depths (longitudinal recesses) formed in the concrete, to house the architectural
   cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the
   following construction features:
   
   (A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to
       the structural framing shall be according to the curtain wall manufacturer's
       instructions. The mounting attachments to the floor slab shall be connected
       to the joint face of the floor slab at every floor, according to the curtain wall
       manufacturer's instructions. Max. distance between mounting attachments
       shall be 48" (1219mm).

   (B) Steel Stud Framing - Vertical framing members shall be amin. 3-5/8" (92mm)
       by 1-5/8" (41mm), 18 GA steel "C" studs secured in an 18 GA steel track top
       and bottom using #6 x 1.25" (32mm) bugle head SD PT screws. Vertical
       framing shall not exceed a spacing of 18" (406mm) o.c.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 286 P

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0420 R3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>04/19/06</td>
</tr>
<tr>
<td>BY</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwhich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type S drywall screws 8" (203mm) o.c.. As an option, min. 5/8" (16mm) water-resistant Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nom. weight of 2300lb/msf. may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" (102mm) thick min. 4 pcf (64 kg/cubic meter) mineral wool batt insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-3/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

(E) Exterior Curtain Wall Insulation (optional) - An Exterior Insulation Finish System (EIFS) is composed of an expanded polystyrene foam (EPS) insulation, and a Exterior Curtain Wall Finish. The EIFS system is a monolithic assembly without expansion or control joints. The EPS foam boards measure 24" (610mm) wide by 48" (1219mm) long by 4" (102mm) thick with a nominal density of 1 pcf (16 kg/cubic meter). The EPS foam is attached to the sandwiched wall surface using mechanical fasteners or an adhesive in accordance with manufacturer's recommendations.

(F) Exterior Curtain Wall Finish - Use brick and mortar of any type. Mortar joints not to exceed 1/8" (22mm). Secure bricks to wall assembly using conventional acceptable masonry techniques.

(G) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(H) Window Gaskets - Secure glass vision panels with a thermal break.

(I) Window Framing - Steel framing members shall be a min. 3-5/8" (92mm) by 1-5/8" (41mm) 18 GA steel "U" channel or similar construction that is compatible with steel-stud framing. Locate window framing a min. 6" (152mm) above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom. joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK Sealant S/L (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 286 P

Nelson Firestop

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop

800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
EIFS VISION GLASS CURTAIN WALL

F Rating 2 Hr.  T Rating 2 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

(2F) Window Gaskets
(2E) Glass Vision Panel
(2G) Window Framing
(2D) Insulation
(3B) Coating
(2C) Sandwich Wall
(3A) Forming Material
(1) Floor
(2B) Steel Stud Framing

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:

(A) Mounting Attachment (not shown) - Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. The mounting attachments to the floor slab shall be connected to the joint face of the floor slab at every floor, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).

(B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs secured in an 18 GA steel track top and bottom using #6 x 1.25" (32mm) bugle head SD PT screws. Vertical framing shall not exceed a spacing of 16" (406mm) o.c.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 287 P

Nelson Firestop

DWG NO. FS-0421 R3

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: _______________________________

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(C) Sandwich Wall Surface - Use a min. 1/2" (13mm) thick, 48" (1219mm) wide x 96" (2438mm) long, exterior grade gypsum wallboard (ASTM C79), placed over and secured to framing with min. 1-1/4" (32mm) long Type S drywall screws 8" (203mm) o.c.. As an option, min. 5/8" (16mm) water-resistant Type X gypsum wallboard sheathing with embedded glass mat facing and non-flammable primer coating, and having a nom. weight of 2300 lb/1000 sq. ft. may be used in place of the gypsum sheathing.

(D) Curtain Wall Insulation - A nom. 24" (610mm) wide by 34" (864mm) tall by 4" thick min. 4pcf (64 kg/cubic meter) mineral wool batt insulation, faced on one side with aluminum foil scrim (vapor retarder) which faces the room interior, is cut to a width slightly larger than 16" (406mm) and installed in each stud cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining the min. 34" (864mm) vertical length. Batt is fitted tightly between vertical framing members. The curtain wall insulation shall completely fill the recess of the min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs.

(E) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(F) Window Gaskets - Secure glass vision panels with a thermal break.

(G) Window Framing - Steel framing members shall be a min. 3-5/8" (92mm) by 1-5/8" (41mm) 18 GA steel "U" channel or similar construction that is compatible with steel-stud framing. Locate window framing a min. 6" (152mm) above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom., joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom. joint width and flush with or redressed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0668) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips - (Not Shown) Support clips are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips 20 GA galvanized steel with the following dimensions: 1" (25mm) wide x 3" (76mm) high with a 2" (51mm) upper leg and 3" (76mm) lower leg.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 287 P

Nelson Firestop

DWG NO. FS-0421 R3
Fig. 2 of 2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE

F Rating 2 Hr.          T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 9-5/8" (244mm) and 7" (178mm) when precast concrete units are used.

2. METALLIC SLEEVE (optional) - Max. nominal 5" (127mm) diameter, Sch. 10 (or heavier), steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE OR CONDUIT - The following types and sizes of metallic pipe, conduit or tubing may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 8" (203mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) electrical metallic tubing or steel conduit.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe. Annular space range is 0" (point of contact) to 1" (25mm).

4. FORMING MATERIAL - Install backer rod into the opening and recess 1/2" (13mm) from surface of the floor or from both surfaces of wall.

5. NELSON ES1399 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with either the bottom or top surfaces of the floor or one surface of the wall. At areas of point of contact, apply a 3/8" (10mm) diameter bead of sealant at the interface between the pipe and the bottom or top floor surface or at wall surface. In HOLLOW-CORE floors, sealant shall be installed on the bottom side of the floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1439

DWG NO. FS-0456 R0

DATE: 06/11/02
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE

F Rating 2 Hr. T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 24-7/8" (632mm) or 7" (178mm) when HOLLOW-CORE floor is used.

2. METALLIC PIPE OR CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 6" (152mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   Annular space range is 0" (point of contact) to 7/8" (22mm).

3. FORMING MATERIAL - Install backer rod into the opening and recess 1/2" (13mm) from top side of the floor or from both surfaces of wall.

4. NELSON ES1399 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall or HOLLOW-CORE floor. At areas of point of contact, apply a 1/4" (6mm) diameter bead of sealant at the interface between the pipe and the top surface of floor or both surfaces of wall or HOLLOW-CORE floor.
   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop
System No. C-AJ-1440

Project Name: __________________________
Address: ______________________________
Installer: ______________________________
Address: ______________________________
Signature: ____________________________

DWG NO. FS-0457 R0
DATE: 06/11/02
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
MULT. METALLIC PIPES

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. size of opening is 664 sq. in. (5574 sq. cm) with a max. dimension of 48" (1219mm).

2. METALLIC PIPES OR CONDUITS - A max. of (24) pipes, conduits or tubing to be installed within the opening. The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING - Nom 1-1/2" (38mm) diameter (or smaller) Type L (or heavier) copper tubing.
   Annular space shall be 5/16" to 2-1/2" (8mm to 64mm) between penetrants and 0" (point of contact) to 2" (51mm) between periphery of opening and pipes.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth. Forming material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of coating.

4. NELSON FSC3 COATING (part # AA0868) - Apply by spray, trowel, or brush over the forming material to a nominal 1/8" (3mm) thick wet applied coating, flush with top surface of floor or both surfaces of wall. Overlap the edges of the opening and the penetrant surfaces above the floor surface or from both wall surfaces by a min. 1/2" (13mm).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0458 R1

DATE: 07/20/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
HVAC DUCT

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. area of opening is 364 sq. in. (2348 sq. cm) with a max. dimension of 26" (660mm). When HOLLOW-CORE floor is used the max. area of opening is 49 sq. in. (316 sq. cm) with a max. dimension of 7" (178mm). The max. annular space space range is 0" (point of contact) to 2" (51mm).

2. HVAC DUCT - Max. 12" x 24" (305mm x 610mm), 24 gauge (or heavier), galv., sheet steel HVAC duct. Duct to be rigidly supported on both sides of floor or wall assembly.

3. FORMING MATERIAL (not shown) - Min. 1" (25mm) thick polystyrene board, firmly packed into opening. Recess forming material from bottom or top surface of floor or from one surface of wall to accommodate the required thickness of fill material.

4. NELSON ES1399 SEALANT - Apply within the annular space to a min. 1" (25mm) depth, flush with either the top or bottom surface of floor or one surface of wall. When a HOLLOW-CORE floor is used, sealant shall be installed on the bottom surface of the floor. At areas of point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the concrete/duct interface on the bottom or top surface of floor or one surface of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No.
C-AJ-7077

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DWG NO. FS-0459 R1

DATE: 07/20/06
BY: RL

MEA #125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
HVAC DUCT

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall, or CMU block wall. Max. area of opening is 715 sq. in. (4613 sq. cm) with a max. dimension of 37-1/4" (946mm). The max. annular space is 0" (point of contact) to 2" (51mm).

2. HVAC DUCT - Max. 20" x 36" (508mm x 914mm), 24 gauge (or heavier), galv., sheet steel oval HVAC duct. Duct to be rigidly supported along its entire perimeter 8" (203mm) from both surfaces of floor or wall assembly.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from top surface of floor or from both surfaces of wall.

4. NELSON ES1399 SEALANT - Apply within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of floor or both surfaces of wall. At areas of point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the concrete/duct interface on the top surface of floor or both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-7078

Project Name: __________________________
Address: ______________________________
Installer: _______________________________
Address: ______________________________
Signature: _____________________________

DWG NO. FS-0460 R1
DATE: 07/20/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
HVAC DUCT

F Rating 3 Hr.  T Rating 0 Hr.

(2) HVAC Duct  (4) Sealant
(3) Forming Material
(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 8" (203mm) thick HOLLOW-CORE Precast Concrete Units. Max. area of opening is 384 sq. in. (2477 sq. cm) with a max. dimension of 32" (813mm).

When a HOLLOW-CORE floor is used, the max. area of opening is 49 sq. in. (316 sq. cm) with a max. dimension of 7" (178mm). The nominal annular space is 1/2" (13mm) to 1-1/2" (38mm).

2. HVAC DUCT - Max. 10" x 30" (254mm x 762mm), 24 gauge (or heavier), galv., sheet steel HVAC duct. Duct to be rigidly supported along its perimeter 4" (102mm) from both floor or wall surfaces.

3. FORMING MATERIAL - Min. 1" (25mm) diameter backer rod or min. 4pcf (64 kg/cm³) mineral wool batt insulation, firmly packed into opening. Recess forming material from top surface of floor or from both surfaces of wall to accommodate the required thickness of fill material.

4. NELSON ES1399 SEALANT - Apply within the annular space to a min. 1" (25mm) depth, flush with the top surface of floor or both surfaces of wall. When a HOLLOW-CORE floor is used, sealant shall be installed on both surfaces of the floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. C-AJ-7079

Nelson Firestop

DWG NO. FS-0461R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Construct as specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. diameter of the opening is 4-1/2" (114mm). The hourly T rating is 1/2 hr or 1 hr for 1 or 2 hr rated assemblies, respectively.

2. METALLIC SLEEVE - Max. nominal 4" (102mm) diameter (or smaller), steel, iron or EMT sleeve with 0.083 in. wall thickness, tightly fitted into wall opening. Sleeve will extend a nominal 1" (25mm) beyond each surface of the wall.

3. CABLES - Max. 18.6% cable fill of opening in any combination of:
   (A) max. 7/C #16awg or smaller power and control cables w/XLPE or PVC jacket.
   (B) max. 4pr #24awg or smaller data cables w/Hylar jacket.
   (C) max. 2/C #12awg or smaller cables w/PVC jacket.
   (D) max. 62.5/125 micron fibre optic cables w/PVC jacket.
   (E) max. Type RG59/U coaxial cables with polyethylene (PE) insulation and PVC jacket.

   The annular space between cable bundle and edge of metallic sleeve shall be min. 0" (point of contact) to max. 2" (51mm).

4. NELSON ES1399 SEALANT - Apply within the annular space to a min. 5/8" (16mm) depth, flush with both ends of the sleeve. Sealant to be tightly packed within interstices of cable bundle. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at the interfaces of the sleeve and both wall surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-3204

DWG NO. FS-0462 R2

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 3/4 or 1-1/2 Hr.

(1) Wall
(2) Pipe
(3) Pipe Insulation
(4) Forming Material
(5) Sealant

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of the opening is 18-5/16" (465mm) in steel stud walls and 14-1/2" (368mm) in wood stud walls. T rating is 3/4 or 1-1/2 hr for 1 or 2 hr rated assemblies, respectively. The inside diameter of the opening shall be min. 1" (25mm) larger than the outside diameter of pipe covering.

2. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 30 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation.
   The annular space range is 0" (point of contact) to 1-9/16" (40mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

5. NELSON ES1399 SEALANT - Apply sealant to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant shall be applied to the wall/pipe covering interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
W-L-5178

Nelson Firestop

DWG NO. FS-0463 R4

DATE: 07/20/06

By: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 1/2, 1 or 2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of the opening is 18-3/4" (476mm) in steel stud walls and 14-1/2" (368mm) in wood stud walls.

2. METALLIC SLEEVE - Sleeve fabricated from min 28 GA steel having a min. 1" (25mm) lap. Sleeve installed by coiling the sheet steel to a diameter smaller than the opening and releasing the coil to let it uncoil against the periphery of the opening. Sleeve to equal the thickness of wall. The inside diameter of sleeve shall be min. 1" (25mm) larger than the outside diameter of pipe covering.

3. METALLIC PIPE - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 30 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   When copper pipe or tubing is used, the T rating is 1/2 hr or 1 hr for 1 or 2 hr rated assemblies, respectively. When iron or steel pipe is used, the T rating is 1 hr or 2 hr for 1 or 2 hr rated assemblies.

4. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation.

   The annular space range is 0" (point of contact) to 2" (51mm).

5. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 1" (25mm) from both surfaces of the wall.

6. NELSON ES1399 SEALANT - Apply sealant to fill the annular space to a nom 1" (25mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at the wall/sleeve/pipe covering interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.  
W-L-5179

DWG NO. FS-0464 R2

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max diameter of the opening is 15-1/4" (387mm) in steel stud walls and 14-1/2" (368mm) in wood stud walls. The inside diameter of the opening shall be min. 1" (25mm) larger than the outside diameter of the pipe covering.

2. METALLIC PIPE - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 3/4" (19mm) thick (or thinner) AB/PVC (ARMAFLEX) pipe insulation. The annular space range is 0" (point of contact) to 1" (25mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of the wall.

5. NELSON ES1399 SEALANT - Apply sealant to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at the gypsum wallboard/insulated through penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
W-L-5180

DWG NO. FS-0465 R2

Project Name: ___________________________  DATE: 07/20/06
Address: ______________________________  BY: RL
Installer: ______________________________
Address: ______________________________
Signature: ______________________________

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
METALLIC DUCT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory.

2. METALLIC DUCT - Max nominal 6" (152mm) diameter, or smaller, No. 28 MSG (or heavier) steel vent duct. Duct to be rigidly supported on both sides of wall assembly. The annular space between duct and periphery of opening shall be min. 0" (point of contact) to max. 1" (25mm).

3. METALLIC DUCT - Max nominal 20" (508mm) diameter, or smaller, No. 22 MSG (or heavier) steel vent duct. Duct to be rigidly supported on both sides of wall assembly. The annular space between duct and periphery of opening shall be min. 0" (point of contact) to max. 2" (51mm).

4. FORMING MATERIAL (not shown) - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

5. NELSON ES1399 SEALANT - Apply to fill the annular space around the duct to a min 5/8" (16mm) depth. At areas of point of contact, apply a 3/8" (10mm) diameter bead of sealant at the gypsum wallboard/through penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
W-L-7092, W-L-7106

Nelson Firestop
DWG NO. FS-0466 R2

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL SLEEVED CABLES

F Rating 2 Hr.  T Rating 1 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 4-1/2" (114mm).

2. METALLIC SLEEVE - Max. nominal 4" (102mm) diameter or smaller, steel, iron or EMT sleeve with 0.083 in. (2mm) wall thickness, tightly fitted into wall opening. Sleeve will extend a nominal 1" (25mm) beyond each surface of the wall. Sleeve is optional when wall thickness is equal to or greater than 6" (203mm).

3. CABLES - Max. 18.6% cable fill of opening in any combination of:
   (A) max. 7/C #16awg or smaller copper conductor power and control cables w/XLPE or PVC insulation and XLPE or PVC jacket.
   (B) max. 4pr #24awg or smaller copper conductor data cables w/Hylar insulation and jacket.
   (C) max. 2/C #12awg or smaller cables w/PVC insulation and jacket.
   (D) max. 62.5/125 micron fibre optic cables w/PVC insulation and jacket.
   (E) max. Type RG59/U coaxial cables with polyethylene (PE) insulation and PVC jacket.

   The annular space between cable bundle and edge of metallic sleeve shall be min. 0" (point of contact) to 2" (51mm).

4. NELSON ES1399 SEALANT - Apply within the annular space to a min. 5/8" (16mm) depth, flush with both ends of the sleeve. Sealant to be tightly packed within interstices of cable bundle. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at the interfaces of the sleeve and both wall surfaces.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. W-J-3086

DWG NO. FS-0467 R2

DATE: 07/20/06

BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
INSULATED METALLIC PIPE

F Rating 2 Hr.    T Rating 1-1/2 Hr.

1. WALL ASSEMBLY - Min 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 18-5/16" (465mm). The diameter of the opening shall be min. 1" (25mm) larger than the outside diameter of pipe covering.

2. METALLIC PIPE - The following types and sizes of metallic pipes may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 30 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation. The annular space is 0" (point of contact) to 1-9/16" (40mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

5. NELSON ES1399 SEALANT - Apply sealant to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant shall be applied to the wall/pipe covering interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-5085

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
</table>

*System No. W-J-5085*

**Nelson Firestop**

**DWG NO.** FS-0468 R3

**DATE:** 07/20/06

**BY:** RL

**MEA # 125-04-M**

**Nelson Firestop**

800 331-7325 Fax: 918 627-2941

Tulsa, Ok.
CONCRETE WALL INSULATED METALLIC PIPE

F Rating 2 Hr.  T Rating 1 or 2 Hr.

(1) Wall
(2) Sleeve
(3) Pipe
(4) Insulation
(5) Forming Material
(6) Sealant

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 18-3/4" (476mm). The diameter of the opening shall be min. 1" (25mm) larger than the outside diameter of pipe covering.

2. METALLIC SLEEVE (optional) - Sleeve fabricated from min 28 GA steel having a min. 1" (25mm) lap. Sleeve installed by coiling the sheet steel to a diameter smaller than the opening and releasing the coil to let it uncoil against the periphery of the opening. Sleeve to equal the thickness of wall.

3. METALLIC PIPE - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 30 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe. When copper pipe or tubing is used, the T rating is 1 hr. When iron or steel pipe is used, the T rating is 2 hr.

4. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation. The annular space is 0" (point of contact) to 2" (51mm).

5. FORMING MATERIAL - Used to prevent the leakage of sealant during installation. Install backer rod within the annular space, and recess 1" (25mm) from both surfaces of the wall.

6. NELSON ES1399 SEALANT - Apply sealant to fill the annular space to a nom 1" (25mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at the wall/sleeve/pipe covering interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-5086

DWG NO. FS-0469 R2

DATE: 07/20/06

BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL INSULATED METALLIC PIPE

F Rating 2 Hr.        T Rating 1/2 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 15-7/8" (397mm). The inside diameter of the opening shall be min. 1" (25mm) larger than the outside diameter of the pipe covering.

2. METALLIC PIPE - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 3/4" (19mm) thick (or thinner) AB/PVC (ARMAFLEX) pipe insulation. The annular space is 0" (point of contact) to 1" (25mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation. Install backer rod within the annular space, and recess 3/8" from both surfaces of the wall.

5. NELSON ES1399 SEALANT - Apply sealant to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at the wall/insulated through penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-5087

DWG NO. FS-0470 R2

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941 Tulsa, Ok.
CONCRETE WALL
METALLIC DUCT

F Rating 2 Hr.  T Rating 0 Hr.

(1) Wall

(2) Duct

(3) Forming Material

(4) Sealant

1. WALL ASSEMBLY - Min 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. The annular space range is 0" (point of contact) to 1" (25mm).

2. METALLIC DUCT - Max nominal 6" (152mm) diameter, or smaller, No. 28 MSG (or heavier) steel vent duct. Duct to be rigidly supported on both sides of wall assembly.

3. FORMING MATERIAL - Used to prevent the leakage of sealant during installation. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

4. NELSON ES1399 SEALANT - Apply to fill the annular space around the duct to a the duct to a min 5/8" (16mm) depth. At areas of point of contact, apply a 3/8" (10mm) diameter bead of sealant at the wall/through penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR NONMETALLIC TUBING

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, or L536 in the UL Fire Resistance Directory. Max. diameter of opening is 3" (76mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.
   (C) GYPSUM BOARD - First layer of wallboard nailed to wood/steel joists/trusses. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) (not shown) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. NONMETALLIC TUBING - The following types of through penetrants shall be used:
   (A) CROSS-LINKED POLYETHYLENE TUBING - Max. of (3) nom 3/4" (19mm) diameter SDR9 (or heavier) cross-linked (PEX) tubing for use in closed (process or supply) piping systems. Max. (1) PEX tube shall have a nom diameter greater than 3/4" (19mm). Max F rating is 1 hr. Annular space between tubing and periphery of opening shall be min. 3/16" (5mm) to 1" (25mm). The space between tubing shall be a min. 0" (point of contact) to a max. 1/4" (6mm).
   (B) ALUMINUM CROSS-LINKED POLYETHYLENE TUBING - Max. of (3) nom 3/4" (19mm) diameter SDR9 (or heavier) aluminum cross-linked polyethylene (AL PEX) tubing for use in closed (process or supply) piping systems. Max. (3) nominal 3/4" (19mm) diameter (AL PEX) tubing. Max. F rating is 1 or 2 hrs. Annular space between tubing and periphery of opening shall be a min. 1/8" (3mm) to 1" (25mm). The space between the tubing shall be min. 0" (point of contact) to a max. 1/4" (6mm).

4. NELSON ES1399 SEALANT - Apply a min 3/4" (19mm) depth of sealant within the annulus, flush with the top surface of floor or sole plate. Min 1/2" (13mm) thickness of sealant within the annulus, flush with bottom surface of ceiling or on bottom surface of lower top plate of chase wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. F-C-2249
DWG NO. FS-0475 R4

| Project Name: | DATE: 10/25/06 |
| Address: | BY: RL |
| Installer: | MEA # 125-04-M |
| Address: | |
| Signature: | |

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR NONMETALLIC PIPE

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. Diameter of opening through flooring system and through top plate of chase wall assembly to be max. 1/2” (13mm) larger than outside diameter of through penetrant. Max. diameter of opening is 5” (127mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses.
   (C) GYPSUM BOARD - Gypsum wallboard secured to wood/steel joists/trusses or furring channels.

2. WALL ASSEMBLY - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. NONMETALLIC PIPE - The following types and sizes of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4” (102mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) RIGID NONMETALLIC CONDUIT - Nom 4” (102mm) diameter (or smaller) Sch. 40 PVC conduit.
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4” (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   (D) ACRYLONITRILE BUTADIENE SYTRENE (ABS) PIPE - Nom 4” (102mm) diameter (or smaller) SDR 9 cross linked polyethylene (PEX) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (E) CROSS LINKED POLYETHYLENE (PEX) TUBING - Nom 1-1/2" (38mm) diameter (or smaller) SDR 9 cross linked polyethylene (PEX) tubing for use in closed (process or supply) piping systems. The annular space for all penetrations is 0” (point of contact) to 1/2” (13mm).

4. NELSON ES1399 SEALANT - Apply a min. 3/4” (19mm) depth of sealant within the annulus, flush with the top surface of the subfloor and a min. 5/8” (16mm) thickness of sealant within annulus on lower top plate of chase wall assembly. Additional sealant to be installed such that a min. 1/4” (6mm) bead is formed around the penetrant on the top surface of the floor and bottom surface of the lower plate of chase wall assembly. At areas of point of contact, apply a min. 1/2” (13mm) diameter bead of sealant shall be applied to the penetrant/plywood interface on top surface of floor assembly and penetrant/top plate interface.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-2251

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 1 or 1 1/2 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, or L536 in the UL Fire Resistance Directory. Max. diameter of opening is 6" (152mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.
   (C) GYPSUM BOARD - First layer of wallboard nailed to wood/steel joists/trusses Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 3" (76mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 3" (76mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

4. PIPE INSULATION - Nominal 1" (25mm) thick FIBERGLASS pipe insulation. Annular space shall be min. 3/8" (10mm) to max. 5/8" (16mm).

5. NELSON ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annular space, flush with top surface of floor. Min. 5/8" (16mm) thickness of sealant applied within the annular space, flush with bottom surface of gypsum board ceiling or lower top plate of chase wall assembly.
   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. F-C-5061

DWG NO. FS-0478 R3

DATE: 10/25/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 1 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 12.5% Compr & Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 2" (51mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 2-1/2" (64mm) depth. The forming material shall be compressed 50% in the nominal joint width.

4. NELSON FSC3 COATING (part # AA0868) - Spray, trowel, or brush apply the FSC3 coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and side of wall a min. of 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FW-D-0029

DWG NO. FS-0479 R2

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 12/04/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
FLOOR TO FLOOR

F Rating 1 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 12.5% Compr & Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 2" (51mm).

2. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the opening to a min. 2-1/2" (64mm) depth. The forming material shall be compressed 50% in the nominal joint width.

3. NELSON FSC3 COATING (part # AA0868) - Spray, trowel, or brush apply the FSC3 coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor a min. of 1/2" (13mm).

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-D-0034

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 12/04/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr & Ext

1. FLOOR ASSEMBLY - Min 3" (76mm) thick lightweight or normal weight concrete poured over fluted steel decking.

2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Res. Direct. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. Roof assembly shall include min. 2-1/4" (57mm) thick poured insulating concrete, and roof covering hot mopped or cold application materials compatible with concrete.

3. WALL ASSEMBLY - Min 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The wall may be parallel to and centered under the valleys of the steel floor. The max separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max 25% compression or extension from its installed width.

4. FORMING MATERIAL - Tightly pack min 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space. The forming material shall be compressed 50% in the nominal joint width and recessed from both surfaces of the wall to accommodate the required thickness of sealant.

5. NELSON ES1399 SEALANT - Min. 5/8" (16mm) thickness of sealant installed flush with both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. HW-D-0287

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0482 R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>11/30/06</td>
</tr>
<tr>
<td>BY</td>
<td>RL</td>
</tr>
<tr>
<td>MEA #</td>
<td>125-04-M</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 3/4" (19mm)
Class II Movement - 33% Compr & Ext

1. FLOOR ASSEMBLY (not shown) - As an alternate to the roof assembly, min. 2-1/2" (64mm) thick light weight or normal weight concrete poured over steel fluted deck.

2. ROOF ASSEMBLY - A fire-rated steel deck roof assembly. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Res. Direct. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly.

3. SPRAY-APPLIED FIRE PROOFING - Min 15 pcf (240 kg/cubic meter) applied to the bottom of the steel floor, with a thickness of min. 3/4" (19mm).

4. WALL ASSEMBLY - Non-load bearing design rated for a min of 2 hr. fire resistance. The max separation between bottom of floor and top of wall is 3/4" (19mm). The joint system is designed to accommodate a max. 33% compression or extension from its installed width. Ceiling Runner is attached to bottom of the flutes.

5. STEEL STUDS (not shown) - Min 3-5/8" (92mm) steel studs with max 24" (610mm) o.c. spacing.

6. NELSON FSC3 COATING (part # AA0868) - Apply by spray, trowel, or brush over the fireproofing in the joint to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating 1/2" (13mm) onto the wall and protected steel floor or roof deck on both sides of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No. HW-D-0288

Nelson Firestop

Project Name: ____________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________

Signature: ______________________________

DATE: 12/04/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 25% Compr & Ext

(1) Floor
(4) Forming Material
(5) Coating
(3) Wall

1. FLOOR ASSEMBLY - Min 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.

2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Res. Direct. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly.

3. WALL ASSEMBLY - Min 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. The wall may be parallel to and centered under the valleys of the steel floor. The max separation between bottom of floor and top of wall is 2" (51mm). The joint system is designed to accommodate a max 25% compression or extension from its installed width.

4. FORMING MATERIAL - Tightly pack min 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space. The forming material shall be compressed 50% in the nominal joint width and flush with both surfaces of the wall.

5. NELSON FSC3 COATING (part # AA0888) - Apply by spray, trowel, or brush over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating a min 1/2" (13mm) onto the wall and protected steel floor or roof deck on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. HW-D-0289

DWG NO. FS-0484 R2

DATE: 12/04/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1, 2 or 3 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 19% Compr & Ext

1. FLOOR ASSEMBLY - Constructed in the manner specified in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated steel deck roof assembly may be used.
3. ROOF INSULATION (not shown) - As specified in the individual P700 series design.
4. STRUCTURAL BEAM - Steel Beam as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units.
5. SPRAY-APPLIED FIRE PROOFING - Steel floor and beam to be sprayed with min. thickness as specified in the individual D700/P700 Series Design. Additional material shall be applied to the web of the steel beam on each side of the wall. The thickness of material applied to each side of the steel beam web shall be 13/16" (21mm), 1-3/8" (35mm) and 1-9/16" (40mm) for 1, 2 and 3 hr assembly rating, respectively.
6. WALL ASSEMBLY - Non-load bearing design rated for a min of 1, 2 or 3 hr. fire resistance. The max separation between bottom of protected steel beam and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 19% compression or extension from its installed width. Ceiling Runner is attached to bottom of the steel beam.
7. STEEL STUDS (not shown) - Min 3-1/2" (89mm) steel studs with max 24" (610mm) o.c. spacing.
8. FORMING MATERIAL - Tightly pack min 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space. The forming material shall be compressed 50% in the nominal joint and flush with both surfaces of the wall.
9. NELSON FSC3 COATING (part # AA0868) - Apply by spray, trowel, or brush over the fireproofing or forming material in the joint to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating 1/2" (13mm) onto the wall and 2" (51mm) onto the fireproofing material on the steel beam on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
DWG NO. FS-0485 R4

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 03/05/07
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR METALLIC PIPE OR CONDUIT

F Rating 1 or 2 Hr.  T Rating 1/2 or 1 Hr.

(4) Sealant  (3) Pipe

(1) Wood Floor

(4) Sealant

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, L536 in the UL Fire Resistance Directory.

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) (not shown) - Constructed in the manner specified in individual U300 series designs as shown in the UL Fire Resistance Directory.

3. METALLIC PIPE - The following types and sizes of metallic pipes, conduits or tubing may be used.

(A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.

(B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.

(C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or rigid galv steel conduit.

(D) COPPER TUBING or PIPE - Nom 3" (76mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

T rating is 1 Hr. if steel, cast iron pipe, RMC, or EMT is used and T rating is 1/2 Hr. if copper tubing or pipe is used.

Annular space is min. 0" (point of contact) to max. 1/2" (13mm) for steel, cast iron, RMC or EMT, or 0" (point of contact) to 7/8" (22mm) for copper pipe or tubing.

4. NELSON ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus, flush with top surface of floor or sole plate. Min. 5/8" (16mm) thickness of sealant within the annulus, flush with bottom surface of ceiling or bottom top plate. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant applied at penetrant/floor or sole plate interface and at penetrant/ceiling or top plate interface. Additional sealant shall be applied in such manner that the sealant overlaps a min. 1/2" (13mm) beyond the periphery of the opening on the top surface of the floor or sole plate and bottom surface of ceiling or bottom top plate.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0486 R3

DATE: 10/27/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR NONMETALLIC PIPE

F Rating 1 Hr. T Rating 1 Hr.
(4) Sealant
(3) Pipe
(4) Sealant
(1) Wood Floor
(2) Wall

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. Max area of opening is 30-1/4 sq. in. (195 sq. cm) with a max. dimension of 5-1/2" (140mm).
(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses.
(C) GYPSUM BOARD - Gypsum wallboard secured to wood/steel joists/trusses or furring channels.

2. WALL ASSEMBLY - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
(A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, vent, or vent) piping systems.
(B) RIGID NONMETALLIC CONDUIT - Nom 4" (102mm) diameter (or smaller) Sch. 40 PVC conduit.
(C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
(D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (drain, vent, or vent) piping systems. Annular space within the top plate of chase wall is 0" (point of contact) to 1/2" (13mm). Dimensions of opening through flooring system to be max. 1" (25mm) larger than outside diameter of through penetrant. On top surface of the floor, the annular space for within the firestop system shall be 0" (point of contact) to 1" (25mm).

4. NELSON ES1399 SEALANT - Apply a min 3/4" (19mm) depth of ES1399 within annulus, flush with top surface of floor. Min 5/8" (16mm) thickness of sealant. Applied within annulus on lower top plate of chase wall assembly. At areas of point of contact, apply a min. 1/4" (6mm) diameter bead of sealant at the through penetration on the top surface of the floor and bottom surface of the lower top plate of chase wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Classification
System No. F-C-2254

DWG NO. FS-0487 R3

DATE: 10/30/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L506, L511, L536 in the UL Fire Resistance Directory. Max. diameter of opening is 4" (102mm). The annular space between cable bundle and periphery of opening shall be 0" (point of contact) to 1/2" (13mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. CABLES - Max. nominal 3-1/2" (99mm) diameter cable bundle w/ PVC insulation and jacketing or other as noted of:

(A) max. 100pr. #24awg or smaller telecommunication cables.
(B) max. 3/C #2/0 awg or smaller aluminum SER cables.
(C) max. 3/C #12awg or smaller Type NM ROMEX cables.
(D) max. 7/C #12awg or smaller power/control cables.
(E) max. RG/U or smaller coaxial cable w/fluorinated ethylene jacketing.
(F) max. 4/C #2awg or smaller aluminum or copper conductor aluminum jacketed Metal Clad cable. Max. one cable to be installed within the cable bundle.

4. NELSON ES1399 SEALANT - Apply a min 3/4" (19mm) depth of sealant within the annulus, flush with top surface of the floor or sole plate. Min. 5/8" (16mm) thick sealant applied within the annulus, flush with bottom surface of ceiling or top plate. Sealant forced within interstices of cable bundle to max. extent possible. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at cable bundle/floor or sole plate interface and at cable bundle/ceiling or top plate interface. Additional sealant shall be applied in such a manner that the sealant overlaps a min. 1/2" (13mm) surface of ceiling or bottom top plate.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0488 R2
DATE: 10/30/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
GLASS SPANDREL CURTAIN WALL

F Rating 2 Hr.  T Rating 1-1/4 Hr.
L Rating <1 SCFM
Movement - 12.5% Horizontal/6.25% Vertical

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150pcf (1602 - 2404 kg/cubic meter), with a min. thickness of 4" (102mm) at the joint face.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be min 60" (1524mm) O.C.
   (B) Aluminum Framing - Rectangular aluminum tubing mullions and transoms, sized according to the curtain wall system manufacturer's guidelines. Mullions are spaced a min 60" (1524mm) o.c. and transoms are to be spaced a min 34" (864mm) o.c. For the spandrel region, the lower transom must be placed a min. of 13-3/4" (349mm) below the concrete floor (from the underside of the floor to the top side of the transom) and the upper transom must be placed a min. of 4-1/2" (114mm) above the floor (from the top surface of the floor to the underside of the transom) while maintaining the min. 34" (864mm) spandrel height.
   (C) Glass Panels - Glass panels shall be installed according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear heat-strengthened (HS) glass or tempered glass with a max. width and height less than the aluminum framing o.c. spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8" (16mm) long screws, and a snap face (aluminum extrusion).

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 298 P

Nelson Firestop

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0489 R2
Page 1 of 2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(D) Perimeter Spandrel Angles - Min. 20 GA 1-1/2" x 1-1/2" (38mm x 38mm) galvanized steel angle is placed around the entire inside perimeter of the spandrel framing and is secured to the wall framing (2B) with No. 10 sheet metal screws spaced max. 8" (203mm) o.c.

(E) Reinforcing Angle - At the horizontal butt joints of the insulation in the field of the glass panels (2C), place two 1-1/2" x 1-1/2" (38mm x 38mm) by 20 GA steel angles back to back to form a "T". Locate the 4" reinforcing angle at the horizontal centerline of the perimeter joint protection and secure the "T" angle to the perimeter spandrel angles (2D).

(F) Curtain Wall Insulation - All spandrel panels shall be installed with a min. 2 in. (51mm) thick, 8pcf (128 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim (vapor retarder) which is exposed to the room interior. The batt is to be fitted tightly to the framing, and is secured to the framing with the perimeter spandrel angle (2D) and impaling pins (2G). All meeting edges of insulation are sealed with nom. 4" (102mm) wide pressure sensitive aluminum foil faced tape centered over the junction so that approx. 2" (51mm) of tape covers each edge of the adjacent insulation. Place a horizontal seam at the centerline of the perimeter joint protection and reinforce with angle (2E). The 24" (610mm) wide batts shall be installed without vertical seams, spanning the full length between the vertical curtain wall-framing members.

(G) Impaling Pins - (Not Shown) Attach curtain wall insulation to the perimeter spandrel angle (2D) with min. 12 GA steel cup-head pins with a spacing of max. 8" (203mm) o.c. at the centerline of the flange. Pins should be sized in accordance with the curtain wall insulation thickness, to maintain a firm attachment to the perimeter spandrel angle. Pins shall be installed so that the interior face of the curtain wall insulation is flush with the interior face of the framing.

(H) Framing Covers - Strips made of 2" (51mm) thick by 8" (203mm) wide, 8pcf (128 kg/cm) mineral wool batt insulation faced on one side with aluminum foil scrim. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced at least 12" (305mm) o.c. Framing covers do not pass through the perimeter joint protection.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 20% in the interior joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CKL is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply coating over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 298 P

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0489 R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>04/19/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>MEA # 127-04-M Vol. II</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
ALUMINUM SPANDREL CURTAIN WALL

F Rating 2 Hr.  
T Rating 1-1/4 Hr.  
L Rating <1 SCFM
Movement - 12.5% Horizontal/6.25% Vertical

(1) Floor
(2I) Framing Covers
(2B) Aluminum Framing
(3B) Coating
(2C) Vision Glass Panels
(2G) Insulation
(2F) Reinforcing Angle
(3A) Forming Material
(2D) Aluminum Spandrel Panels

(2E) Spandrel Angles

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf (1602-2404 kg/cubic meter), with a min. thickness of 4" (102mm) at the joint face.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
(A) Mounting Attachment (not shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be min. 60" (1524mm) O.C.
(B) Aluminum Framing - Rectangular aluminum tubing mullions and transoms, sized according to the curtain wall system manufacturer's guidelines. Mullions are spaced a min 60" (1524mm) O.C. and transoms are to be spaced a min 34" (864mm) O.C. For the spandrel region, the lower transom must be placed a min. of 13-3/4" (349mm) below the concrete floor (from the underside of the floor to the top side of the transom) and the upper transom must be placed a min. of 4-1/2" (114mm) above the floor (from the top surface of the floor to the underside of the transom) while maintaining the min. 34" (864mm) spandrel height.
(C) Vision Glass Panels - Glass panels shall be installed according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear heat-strengthened (HS) glass or tempered glass with a max. width and height less than the aluminum framing O.C. spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8" (16mm) long screws, and a snap face (aluminum extrusion).

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No. CEJ 299 P

Nelson Firestop

DWG NO. FS-0490 R2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(D) Aluminum Spandrel Panels - Aluminum panels used in the spandrel shall be sized and attached to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/8" (3mm) sheet aluminum panel with max. dimensions 34" x 60" (864mm x 1524mm).

(E) Perimeter Spandrel Angles - Min. 20 GA 1-1/2" x 1-1/2" (38mm x 38mm) galv. steel angle is placed around the entire inside perimeter of the spandrel framing and is secured to the wall framing (2B) with No. 10 sheet metal screws spaced max. 8° (203mm) o.c..

(F) Reinforcing Angle - At the horizontal butt joints of the insulation in the field of the glass panels (2D), place two 1-1/2" x 1-1/2" (38mm x 38mm) by 20 GA steel angles back to back to form a "T". Locate the "T" reinforcing angle at the horizontal centerline of the perimeter joint protection and secure the "T" angle to the perimeter spandrel angles (2E).

(G) Curtain Wall Insulation - All spandrel panels shall be installed with thick, 8pcf (128 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim a min. 2 in. (51mm) (vapor retarder) which is exposed to the room interior. The batt is to be fitted tightly to the framing, and is secured to the framing with the perimeter spandrel angle (2E) and impaling pins (2H). All meeting edges of insulation are sealed with nom. 4" (102mm) wide pressure sensitive aluminum foil faced tape centered over the junction so that approx. 2" (51mm) of tape covers each edge of the adjacent insulation. Place a horizontal seam at the centerline of the perimeter joint protection and reinforce with angle (2F). The 24" (610mm) wide batts shall be installed without vertical seams, spanning the full length between the vertical curtain wall-framing members.

(H) Impaling Pins - (Not Shown) Attach curtain wall insulation to the perimeter spandrel angle (2E) with min. 12 GA steel cup-head pins with a spacing of max. 8° (203mm) o.c. at the centerline of the flange. Pins should be sized in accordance with the curtain wall insulation thickness, to maintain a firm attachment to the perimeter spandrel angle. Pins shall be installed so that the interior face of the curtain wall insulation is flush with the interior face of the framing.

(I) Framing Covers - Strips made of 2" (51mm) thick by 8° (203mm) wide, 8pcf (128 kg/cbm) mineral wool batt insulation faced on one side with aluminum foil scrim. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced at least 12" (305mm) o.c.. Framing covers do not pass through the perimeter joint protection.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8° (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom joint width and flush with or resected 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 299 P

Nelson Firestop

| Project Name: | | | |
| Address: | | | |
| Installer: | | | |
| Address: | | | |
| Signature: | | | |

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL CABLES

F Rating 2 Hr. T Rating 1 Hr.

(1) Wall (3) Metallic Sleeve
(2) Cables (4 & 5) Pillows & Putty
(3) Metallic Sleeve

1. WALL ASSEMBLY - Min. 6" (152mm) thick reinforced lightweight or normal weight (100-150 pcf) (1602-2404 kg/cm) concrete. Wall may also be constructed of any UL Classified Concrete Blocks. Max. area of opening is 83-1/4 sq. in. (537 sq. cm) with max. dimensions of 18-1/2" (470mm).

2. CABLE - Max. 25% cable fill of opening in any combination of:
   (A) max. 350 kcmil power cable w/PVC insulation
   (B) max. 7C #12 awg control cable w/PVC insulation jacket
   (C) max. 100pr. #24 awg communications cable w/PVC insulation and jacket.

3. METALLIC SLEEVE - Metallic sleeve consists of a rectangular shaped sleeve and a cover plate fabricated from 14MSG (0.072 in.) thick galv. steel. The rectangular shaped sleeve consists of a cover 18" (457mm) wide by 4" (102mm) high by 20" (508mm) long sleeve with a 2-3/4" (70mm) wide mounting plate. The cover plate consists of a 2-3/4" (70mm) wide leg and 1-1/2" (38mm) high flange. The rectangular shaped sleeve is to be inserted into the opening from either side of wall. Cover plate to be surface mounted on opposite side of wall. Both rectangular shaped sleeve and cover plate secured to wall by means of 1/4" (6mm) diameter 1-1/4" (32mm) long steel screws in conjunction with 1/4" (6mm) by 1-1/4" (32mm) long steel fender washers installed in pre-drilled holes spaced 7-1/2" (191mm) OC along the mounting plate and cover plate.

   P-W SOUTHERN INC. - Type P-W
   COOPER B-LINE INC - Wall Penetration Sleeve

4. NELSON PLW PILLOWS (part # AA478 or AA479) - Tightly pack pillows into opening to fill annular space between cables and periphery of opening. Install pillows flat and centered within the wall.

5. NELSON FSP PUTTY (part # AA445) - (not shown) After installation of the pillows, putty shall be applied to seal any voids between the cables and the pillows and the metallic sleeve on both sides of wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-3100

DWG NO. FS-0491R2

DATE: 07/20/06
BY: RL

Installer:
Address:
Signature:

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor, wall or CMU block wall. Max. diameter of opening is 15-1/2" (394mm).

2. METALLIC SLEEVE (optional) - Max. nominal 16" (406mm) diameter, Sch. 10 (or heavier), steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE OR CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 30 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

The annular space may range from 0" (point contact) to a max. of 2-3/8" (60mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth. Forming material to be installed flush with top surface of floor or both surfaces of wall assembly. At the point contact location between through penetrant and concrete, forming material forced into interstices between through penetrant and concrete to max. extent possible.

5. NELSON FSC3 COATING (part # AA0868) - Min. 1/8" (3mm) wet thickness of coating brush or spray applied over the annulus on top surface of floor or both surfaces of wall assembly. Additional min. 1/8" (3mm) wet thickness of coating applied on the through penetrant to a min. height of 1/2" (13mm) above the top surface of the floor and both surfaces of the wall assembly and a min. 1/2" (13mm) beyond the periphery of the opening on top surface of the floor and on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1458

DWG NO. FS-0492 R1

DATE: 07/20/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 2 Hr.  T Rating 1/2 Hr.

(1) Floor or Wall  (3) Pipe  (6) Sealant
(4) Pipe Insulation  (5) Forming Material  (2) Sleeve

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 17-1/2" (445mm).

2. METALLIC SLEEVE (optional) - Nominal 18" (457mm) diameter, (or smaller), Sch. 10 or heavier steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter (or smaller) Sch. 30 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 8" (203mm) diameter (or smaller) cast or ductile iron pipe.

4. PIPE INSULATION - Nominal 1" (25mm) to 3" (76mm) thick, CELLULAR GLASS insulation. The insulation material may be jacketed within 0.010 in. (25mm) thick aluminum sheet wrapped tightly around with a min. 2" (51mm) overlap. Jacket to be installed with edge abutting surface of sealant on top surface of floor or both surfaces of wall. Jacket to be well secured with metallic bands.

   The annular space between insulated pipe and periphery of opening is 0" (point of contact) to 2-1/8" (54mm).

5. FORMING MATERIAL - Min. 1" (25mm) diameter foam backer rod firmly packed into opening as a permanent form. As an alternate, foaming material may consist of FIBERGLASS or MINERAL WOOL batt insulation. Forming Material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the thickness of fill material.

6. NELSON ES1399 SEALANT - Apply over the forming material a min. 1" (25mm) depth, flush with the top surface of the floor or with both surfaces of the wall. Additional material to be installed to form a min. 3/8" (10mm) bead at the concrete/insulation material interface on the top surface of the floor and both surfaces of the wall.

Tested in accordance with:
ASTM E–814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-5234

DWG NO. FS-0493 R3

DATE: 10/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
BUS DUCT

F Rating 3 Hr.       T Rating 0 Hr.

(2) Bus Duct
(4) Sealant
(3) Forming Material
(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick concrete wall, or CMU block wall. The max area of opening is 345 sq. in. and a max. dimension of 28-1/2" (724mm).

2. BUS DUCT ASSEMBLY - Nom 19" x 6" (483mm x 152mm), "I" shaped aluminum and steel enclosure containing factory mounted aluminum bars rated for 600V, 4000A. The annular space between the flange tip of the busway and the periphery of the opening shall be min. 0" (point of contact) to 5-1/8" (130mm). The annular space between the web section of the busway and the periphery of the opening shall be a nominal 8" (203mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from top of floor surface or from both surfaces of wall.

4. NELSON ES1399 SEALANT - Apply over forming material, within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-6030

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/20/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr & Ext

1. FLOOR ASSEMBLY - Min 2-1/2" (64mm) thick lightweight or normal weight
   concrete poured over fluted steel decking.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a steel
   fluted deck roof assembly may be used. The roof assembly shall be constructed
   of the materials and in the manner described in the individual P700 Series
   Roof-Ceiling Design in the UL Fire Res. Direct. The hourly rating of the roof
   assembly shall be equal to or greater than the hourly rating of the wall assembly.
3. STRUCTURAL BEAM (optional) - Steel Beam or open web steel joint as specified
   in the individual D700 Series Floor-Ceiling Design, used to support steel floor
   units with framing.
4. SPRAY-APPLIED FIRE PROOFING - Steel floor or roof and beam to be sprayed
   with min. thickness as specified in the individual D700 Series Design.
5. WALL ASSEMBLY - Non-load bearing design rated for a 1 or 2 hr. fire resistance.
   The max separation between bottom of protected steel floor or roof deck and top
   of wall is 1" (25mm) with the joint system designed to accommodate a max. 25% 
   compression or extension from its installed width. A min. clearance of 1" (25mm)
   to a max. 3" (76mm) shall be maintained between the framing and the fire-proofed
   beam on two sides of the beam with a 1" (25mm) max. being on the bottom.
6. FORMING MATERIAL - Tightly pack min 4pcf (64 kg/cubic meter) mineral wool
   batt insulation into the annular space. The forming material shall be compressed
   50% in the nominal joint and flush with both surfaces of the wall.
7. NELSON FSC3 COATING (part # AA0868) - Apply by spray or brush over the
   fireproofing or forming material in the joint to a nominal 1/8" (3mm) thick wet
   applied coating. Overlap the coating 1" (25mm) onto the wall and 2" (51mm) onto
   the fireproofing material on the steel floor or roof deck and steel beam on both
   sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No.
HW-D-0310

Nelson Firestop

SYSTEM NO. FS-0495 R3

DATE: 12/04/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr & Ext

1. FLOOR ASSEMBLY - Min 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a steel fluted deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Res. Direct. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly.
3. ROOF INSULATION (not shown) - As specified in the individual P700 series design.
4. STRUCTURAL BEAM (optional) - Steel Beam or open web steel joist as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units.
5. SPRAY-APPLIED FIRE PROOFING - Steel floor or roof and beam to be sprayed with min. thickness as specified in the individual D700 Series Design.
6. WALL ASSEMBLY - Min. 6" (152mm) thick reinforced lightweight or normal weight concrete wall or CMU block wall. The max separation between bottom of protected steel floor or roof deck and top of wall is 1" (25mm) with the joint system designed to accommodate a max. 25% compression or extension from its installed width. A min. clearance of 1" (25mm) to a max. 3" (76mm) shall be maintained between the opening and the fire-proofed beam or joist on two sides of the beam or joist with a 1" (25mm) max. being on the bottom.
7. FORMING MATERIAL - Tightly pack min 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space. The forming material shall be compressed 50% in the nominal joint and flush with both surfaces of the wall.
8. NELSON FSC3 COATING (part # AA0868) - Apply by spray or brush over the fireproofing or forming material in the joint to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating 1" (25mm) onto the wall and 2" (51mm) onto the fireproofing material on the steel floor or roof deck and steel beam on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
HW-D-0311

System No.

DWG NO. FS-0496 R4

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
STEEL PANEL CURTAIN WALL

F Rating 2 Hr.  T Rating 1-3/4 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

(2H) Window Gaskets
(2I) Window Framing
(3B) Coating
(2F) Interior Curtain Wall
(1) Floor
(2B) Structural Framing
(2G) Glass Vision Panel
(2E) Insulation
(2C) Steel Panels
(3A) Forming Material

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. When required, the mounting attachments to the floor slab shall be connected to the joint face of the floor slab, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).
   (B) Steel Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) by 1-5/8" (41mm), 18 GA steel "C" studs. Attachment shall be according to the curtain wall system manufacturer's guidelines. Vertical framing shall not exceed a spacing of 48" (1219mm) o.c. If required, horizontal framing members shall be installed according to the curtain wall system manufacturer's guidelines.

   Tested in accordance with:
   ASTM E-2307, E-1399

Omega Point Design No.
CEJ 291 P

Nelson Firestop

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Date:</th>
<th>04/19/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td>By:</td>
<td>RL</td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(C) Steel Panels - Steel panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 20 GA sheet steel panel with max dimensions of 48 in. (1219mm) by 144 in. (3659mm).

(D) Impaling Pins - (Not Shown) When insulation is used, use impaling pins when required by manufacturer's instructions. The pins shall be located, sized and installed according to the curtain wall system manufacturer's guidelines.

(E) Curtain Wall Insulation (Optional) - When curtain wall insulation is used, the curtain wall insulation must be installed before the joint treatment. Insulation may be friction fitted or mechanically fastened to the wall framing. Either mineral wool or fiberglass batt insulation may be used.

(F) Interior Curtain Wall Surface - Framing covered with one layer of 5/8" (16mm) thick, Type X gypsum wallboard on interior face. The face layer of gypsum wallboard fastened to steel studs with min. #6 1-1/8" (29mm) long bugle-head Phillips drywall screws spaced 12 in. (305mm) o.c. Joint tape and compound to be applied to cover joints and screw heads.

The following vision glass panel detail is included as an optional installation detail outside the spandrel area:

(G) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(H) Window Gaskets - Secure glass vision panels with a thermal break.

(I) Window Framing - Steel framing members shall be a min. 3-5/8" (92mm) by 1-5/8" (41mm) 18 GA steel "U" channel or similar construction that is compatible with steel-stud framing. Locate window framing a min. 8" (152mm) above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating onto the top surface of the floor and curtain wall a min of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1" (25mm) wide x 3" (76mm) high with a 2" (51mm) upper leg and 3" lower leg.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 291 P

Nelson Firestop

DWG NO. FS-0497 R3

DATE: 04/19/06

BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
CONCRETE PANEL CURTAIN WALL
F Rating 2 Hr. T Rating 1-3/4 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf (1602-2404 Kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various backout depths (longitudinal recesses) formed in the concrete to house the architectural cover plate. The backout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. When required, the mounting attachments to the floor slab shall be connected to the joint face of the floor slab, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).
   (B) Steel-Stud Framing - Vertical framing members shall be min. 3-5/8" (92mm) x 1-5/8" (41mm) 18GA steel "C" studs. Attachment shall be according to the curtain wall system manufacturer's guidelines. Vertical framing shall not exceed a spacing of 48" (1219mm) o.c. If required, horizontal framing members shall be installed to the curtain wall system manufacturer's guidelines.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 292 P

Nelson Firestop

| Project Name: | | | |
| Address: | | | |
| Installer: | | | |
| Address: | | | |
| Signature: | | | |

DWG NO. FS-0498 R3
Page 1 of 2

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(C) Concrete Panels - Concrete panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Panels shall not be less than 1-1/2" (38mm) thick, 12" (305mm) high or 12" (305mm) long.

(D) Impaling Pins - (Not Shown) When insulation is used, use impaling pins when required by manufacturer's instructions. Pins shall be located, sized and installed according to the curtain wall system manufacturer's guidelines.

(E) Curtain Wall Insulation (Optional) - Perimeter joint treatment shall be installed before curtain wall insulation. Insulation shall be installed flush against the top and bottom surfaces of the perimeter joint protection without deforming it. Insulation material designed and installed according to the curtain wall system manufacturer's guidelines for steel framing.

(F) Concrete Panel Joint - Vertical and horizontal concrete panel joints created between panels can be either flush type or key way type. Concrete panel edges must be in contact with each other.

(G) Framing Covers - Framing covers used over the mullions and transoms are optional. When used, the framing covers shall be located, and installed according to covers do not pass through the perimeter joint treatment. They are butt to the top and bottom surfaces of the perimeter joint treatment without deforming it.

The following vision glass panel detail is included as an optional installation detail outside the spandrel area:

(H) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(I) Window Gaskets - Secure glass vision panels with a thermal break.

(J) Window Framing - Steel framing members shall be a min. 3-5/8" (92mm) by 1-5/8" (41mm) 18 GA steel "U" channel or similar construction that is compatible with steel-stud framing. Locate window framing a min. 6" (152mm) above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom. joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # A0868) - Spray apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # A6552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 292 P

Nelson Firestop

DWG NO. FS-0498 R3
Page 2 of 2

Project Name: ____________________________
Address: ____________________________
Installer: ____________________________
Address: ____________________________
Signature: ____________________________

DATE: 04/19/06
BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
CONCRETE PANEL CURTAIN WALL
F Rating 2 Hr. T Rating 1-3/4 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

(2I) Window Gaskets
(2J) Window Framing
(3B) Coating
(1) Floor
(2B) Aluminum Framing
(2G) Framing Covers
(2H) Glass Vision Panel
(2E) Insulation
(2D) Concrete Panel Joint
(2C) Concrete Panels
(3A) Forming Material

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. When required, the mounting attachments to the floor slab shall be connected to the joint face of the floor slab, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).
   (B) Aluminum Framing - Vertical framing members shall be min. 2-1/2" (64mm) wide by 4" (102mm) deep, 0.100" (2.5mm) thick rectangular aluminum tubing members and not exceed a spacing of 60" (1524mm) o.c. and shall exist on the internal side of the wall panels only. Attachment shall be according to the curtain wall system manufacturer's guidelines.
   (C) Concrete Panels - Any non-combustible exterior concrete based panel. Panels shall not be less than 1-1/2" (38mm) thick, 12" (305mm) high or 12" (305mm) long. Attachment to the framing shall be according to the curtain wall system manufacturer's guidelines.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 293 P

Nelson Firestop
DWG NO. FS-0499 R3
Page 1 of 2

DATE: 04/19/06
BY: RL
MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(D) Impaling Pins - (Not Shown) When used with insulation and framing covers, the pins shall be located, sized and installed according to curtain wall system manufacturer's guidelines.

(E) Curtain Wall Insulation - A nom 4" (102mm) 4pcf (64 kg/cubic meter) mineral wool batt insulation faced on one side with aluminium foil scrim which is exposed to the room interior and installed the full depth of the spandrel cavity. Install insulation in each spandrel cavity so that a min. of 4-1/2" (114mm) of insulation extends above the surface of the perimeter joint protection and a min. of 13-3/4" (349mm) extends below the floor while maintaining a min. 34" (864mm) vertical length. Batts are fitted tightly between vertical framing members, secured with clips, impaling pins, or friction fit using a batt insulation length at least 1/4" (6mm) longer than the distance between vertical framing members. All meeting edges of insulation are sealed with nom 4" (102mm) wide pressure sensitive aluminum foil faced tape. In lieu of 4" (102mm) 4pcf (64 kg/cubic meter) mineral wool, the use of 2" (51mm) 8pcf (128 kg/cubic meter) batt insulation is permitted and must be at least 1-1/2" x 1-1/2" x 38mn x 38mm 20GA horizontal support angle installed at the mid point of the perimeter joint protection and mechanically attached to all vertical framing. Horizontal seams in the insulation are to be located at least 6" (152mm) from the top surface of the perimeter joint treatment, or 13-3/4" (349mm) below the bottom surface of the perimeter joint treatment.

(F) Concrete Panel Joint - Vertical and horizontal concrete panel joints created between panels can be either flush type or key way type.

(G) Framing Covers - Strips made of 1" (25mm) thick by 4" (102mm) wide, 8pcf (128 kg/cm), mineral wool batt insulation faced on one side with aluminium foil scrim which is exposed to the room interior. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced at least 12" (305mm) o.c. and attached with (2d). Framing covers do not pass through the perimeter joint treatment. They are butted to the top and bottom surfaces of the perimeter joint treatment without deforming it. The following vision glass panel detail is included as an optional installation detail outside the spandrel area.

(H) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(I) Window Gaskets - Secure glass vision panels with a thermal break.

(J) Window Framing - Aluminum framing members shall be a min. 0.100" thick with min. 4" depth and min. 2-1/2" width of the extrusion and must be compatible with aluminum framing (2d). Locate window framing a min. 6" above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0888) - Spray apply the coating over the forming material to a nominal 1/8" (3mm) thick applied coating. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # A552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 293 P

---

**Nelson Firestop**

**DWG NO.** FS-0499 R3

**DATE:** 04/19/06

**BY:** RL

---

**Nelson Firestop**

800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
TILT-UP PANEL CURTAIN WALL

F Rating 2 Hr. T Rating 1-3/4 Hr.
L Rating <1 SCFM
Movement - 12.5% Horiz./6.25% Vert.

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150 pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face. Overall slab thickness may vary to accommodate various blockout depths (longitudinal recesses) formed in the concrete, to house the architectural cover plate. The blockout width may also vary without restriction.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (not shown) Attachment of the curtain wall framing to the structural framing shall be according to the curtain wall manufacturer's instructions. When required, the mounting attachments to the floor slab shall be connected to the joint face of the floor slab, according to the curtain wall manufacturer's instructions. Max. distance between mounting attachments shall be 48" (1219mm).
   (B) Structural Framing - Structural framing members shall be according to the curtain wall system manufacturer's requirements. Aluminum structural framing must be completely covered by concrete panels.

Tested in accordance with:
ASTM E–2307, E–1399

Omega Point Design No. CEJ 294 P

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0500 R3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>04/19/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(C) Tilt-up Panels - Tilt-up concrete panels shall be installed to structural framing according to the curtain wall system manufacturer’s requirements. Panels shall not be less than 1-1/2" (13mm) thick, reinforced lightweight or normal weight.

(D) Concrete Panel Joint - Vertical and horizontal concrete panel joints created between panels can be either flush type or key way type. Concrete panel edges must be in contact with each other.

(E) Curtain Wall Insulation (Optional) - When curtain wall insulation is used, the perimeter joint treatment must be installed before the insulation. Insulation may be butted to top and bottom of perimeter joint treatment but not deform the perimeter joint treatment. Either mineral wool or fiberglass batt insulation may be used.

(F) Impaling Pins - (Not Shown) When curtain wall insulation is used, use impaling pins when required by manufacturer’s instructions. The pins shall be located, sized and installed according to the curtain wall system manufacturer’s guidelines.

The following vision glass panel detail is included as an optional installation detail outside the spandrel area:

(G) Glass Vision Panels - Glass vision panels shall be a min. 6" (152mm) above the top surface of the floor assembly. Glass vision panels shall be installed to curtain wall framing according to the curtain wall system manufacturer’s guidelines. Use a min. 1/4" (6mm) thick, clear tempered glass with a max. width of 56-1/2" (1435mm) and max. height of 69" (1753mm).

(H) Window Gaskets - Secure glass vision panels with a thermal break.

(I) Window Framing - Steel framing members shall be a min. 3-5/8" (92mm) by 1-5/8" (41mm) 18 GA steel "U" channel or similar construction that is compatible with steel-stud framing. Locate window framing a min. 6" (152mm) above the top surface of the floor assembly.

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating onto the top surface of the floor and curtain wall a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

(D) Support Clips (not shown) - Support clips (Z-shaped clips) are optional but recommended for installations subject to vertical shear movement. Standard Z-shaped clips are 20 GA galvanized steel with the following dimensions: 1" (25mm) wide x 3" (76mm) high with a 2" (51mm) upper leg and a 3" (76mm) lower leg.

Tested in accordance with:
ASTM E–2307, E–1399

Omega Point Design No.
CEJ 294 P

Nelson Firestop

DWG NO. FS-0500 R3
Page 2 of 2

DATE: 04/19/06

BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
ARMORED or METAL CLAD CABLE

F Rating 2 Hr.          T Rating 0 Hr.

(1) Floor or Wall

(4) Putty

(2) Cable

(3) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal
weight concrete floor or min. 6" (152mm) thick concrete wall or CMU block wall.
The max. diameter of the opening is 3" (76mm).

2. CABLE - Max. four copper conductor No. 5 AWG (or smaller) aluminum or steel
ARMORED CABLE or METAL CLAD CABLE. Max. one ARMORED cable or
METAL CLAD cable centered within the firestop system. The annular space
between the through penetrating product and the periphery of the opening shall
be a nom 7/8" (22mm).

3. FORMING MATERIAL - Min. 3" (76mm) thickness of min. 4pcf (64 kg/cubic meter)
mineral wool batt insulation tightly packed into opening. Putty to be recessed
from top surface of floor or from both surfaces of wall as required to accomodate
the required thickness of putty.

4. NELSON FSP PUTTY (part # AA445) - Min. 1-1/2" (38mm) thickness of putty
applied within the annulus, flush with top top surface of floor or both surfaces of
wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-3149

DWG NO. FS-0501R1

Date: 07/21/06

By: RL

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 or 3 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 19% Compr & Ext

1. FLOOR ASSEMBLY - Constructed in the manner specified in the individual D700 Series Floor-Ceiling Design in the UL Fire Resistance.

2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated steel deck roof assembly may be used.

3. ROOF INSULATION (not shown) - As specified in the individual P700 Series design.

4. STRUCTURAL BEAM - Steel Beam as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units.

5. SPRAY-APPLIED FIRE PROOFING - Steel floor and beam to be sprayed with min. thickness as specified in the individual D700/P700 Series Design. Additional material shall be applied to the web of the steel beam on each side of the wall. The thickness of material applied to each side of the steel beam web shall be 1-3/8" (35mm) and 1-9/16" (40mm) for 2 and 3 hr assembly rating, respectively.

6. WALL ASSEMBLY - Min. 6" (152mm) thick reinforced lightweight or normal weight structural concrete. Wall may also be constructed of any UL Classified Concrete Blocks. The max. separation between bottom of protected steel beam and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 19% compression or expansion from its installed width.

7. FORMING MATERIAL - Tightly pack min. 6" (152mm) or 6-5/8" (168mm) of nom 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space. The forming material shall be compressed 50% in the nominal joint and flush with both surfaces of the wall.

8. NELSON FSC3 COATING (part # AA0868) - Apply by spray, trowel, or brush over the fireproofing or forming material in the joint to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating 1/2" (13mm) onto the wall and 2" (51mm) onto the fireproofing material on the steel beam on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop

System No.
HW-D-0326

DWG NO. FS-0503 R3

Project Name: ____________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________

Signature: ______________________________

DATE: 03/05/07
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NO PENETRATION

F Rating 3 Hr. T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of the opening is 6-5/8" (168mm).

2. METALLIC SLEEVE - Max. 6" (152mm) nominal diameter, Sch. 10 (or heavier), steel sleeve cast or grouted into the floor or wall. The sleeve shall extend 2" (51mm) above both surfaces of the floor or wall.

3. NELSON PLW PILLOWS (part # AA478 or AA479) - Pillows tightly packed to completely fill the annulus within the steel sleeve. Pillows to be installed with the 9-1/2" (241mm) dimension projecting through the floor or wall and centered within the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-0099

DWG NO. FS-0505 R2
DATE: 07/21/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
GLASS PANEL CURTAIN WALL

F Rating 2 Hr.  T Rating 1-1/4 Hr.
L Rating <1 SCFM
Movement - 12.5% Horizontal/6.25% Vertical

(2B) Aluminum Framing
(2C) Glass Panels
(3B) Coating
(3A) Forming Material
(2G) Curtain Wall Insulation
(2H) Framing Covers
(2E) Insulation Reinforcement
(2D) Steel Hat Channels

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150pcf (1602-2404 kg/cm³), with a min. thickness of 4-1/2" (114mm) at the joint face.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (Not Shown) Attachment of the min. 1/4" (6mm) plate steel curtain framing to the structural framing shall be according to the curtain wall manufacturer's instructions to allow vertical shear movement only. Max. distance between mounting attachments shall be min. 60" (1524mm) O.C.
   (B) Aluminum Framing - Install I shaped mullions and transoms, sized according to the curtain wall system manufacturer's guidelines. Mullions are spaced a max. 60" (1524mm) o.c. and transoms are to be spaced a min. 34" (864mm) o.c. For the spandrel region, the lower transom must be placed a min. of 13-3/4" (349mm) below the concrete floor (from the underside of the floor to the top side of the transom) and the upper transom must be placed a min. of 4-1/2" (114mm) above the floor (from the top surface of the floor to the underside of the transom) while maintaining the min. 34" (864mm) spandrel height.
   (C) Glass Panels - Glass panels shall be installed according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear heat-strengthened (HS) glass or tempered glass with a min. width, height, and thickness less than the aluminum framing o.c. spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4 x 5/8" (18cm) long screws, and a snap face (aluminum extrusion).

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 304 P

Nelson Firestop

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0506 R2

DATE: 04/20/06

BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325     Fax: 918 627-2941
Tulsa, Ok.
(D) Steel Hat Channels - Apply nom. 2-1/2" (64mm) wide x 7/8" (22mm) deep, min. 24 GA steel hat channels so that they span the space between mullions for the purpose of providing a retention system for the curtain wall insulation. The hat channels are to be applied, horizontally, at a max. 3" (76mm) above the lower transom and 3" (76mm) below the upper transom of the spandrel area, and at max. 24" (610mm) centers within the spandrel area.

(E) Insulation Reinforcement - At the horizontal centerline of the perimeter joint protection, apply a hat channel (2D) that is secured to the vertical framing as described in (2D).

(F) Impaling Pins - (Not Shown) Attach curtain wall insulation to the steel hat channel (2D) with min. 12 GA steel cup-head pins with a spacing of max. 8" (203mm) O.C. at the centerline of the flange. Pins shall be installed so that the interior face of the curtain wall insulation is flush with the interior face of the framing.

(G) Curtain Wall Insulation - All spandrel panels shall be installed with a min. 2 in. (51mm) thick, 8pcf (128 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim (vapor retarder) which is exposed to the room interior. The batt is to be fitted tightly to the framing, and is secured to the framing with the steel hat channel (2D) and impaling pins (2F). All meeting edges of insulation are sealed with nom. 4" (102mm) wide pressure sensitive aluminum foil faced tape centered over the joint so that approx. 2" (51mm) of tape covers each edge of the adjacent insulation. 24" (610mm) wide batt insulation installed without vertical seams and horizontal seams are to be placed min. 2-1/2" (114mm) above the floor. The batt in the perimeter joint region is to be supported by at least one hat channel support (2D) above the floor in addition to the centerline perimeter joint insulation reinforcement channel (2E).

(H) Framing Covers - Strips made of 2" (51mm) thick by 8" (203mm) wide, 8pcf (128 kg/cm) mineral wool batt insulation faced on one side with aluminum foil scrim. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced at least 12" (305mm) O.C.. Framing covers do not pass through the perimeter joint protection.

(I) Thermal Break (not shown) - Secure panels with a thermal break, pressure bar, 1/4-20 x 5/8" (16mm) long screws, and a snap face. The spandrel panels shall be insulated according to (2G).

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nominal joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(B) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nominal joint width and flush with or recessed 1/4" from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/I Sealant (part # AA552) (not shown) (optional for FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

 Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 304 P

Nelson Firestop

DWG NO. FS-0506 R2

Project Name: ____________________________
Address: ____________________________
Installer: ____________________________
Address: ____________________________
Signature: ____________________________

DATE: 04/20/06

BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
GLASS PANEL CURTAIN WALL

F Rating 2 Hr.  
T Rating 1-1/4 Hr.  
L Rating <1 SCFM
Movement - 12.5% Horizontal/6.25% Vertical

(2B) Aluminum Framing
(2C) Glass Panels
(3B) Coating
(3A) Forming Material
(2E) Insulation Reinforcement
(2G) Curtain Wall Insulation
(2D) Steel Hat Channels
(1) Floor
(2H) Framing Covers

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (Not Shown) - Attachment of the min. 1/4" (6mm) plate steel curtain framing to the structural framing shall be according to the curtain wall manufacturer’s instructions to allow vertical shear movement only. Max. distance between mounting attachments shall be min. 60" (1524mm) O.C.
   (B) Aluminum Framing - Rectangular aluminum tubing mullions and transoms, sized according to the curtain wall system manufacturer’s guidelines. Mullions are spaced a min. 60" (1524mm) O.C. and transoms are to be spaced a min. 34" (864mm) O.C.. For the spandrel region, the lower transom must be placed a min. of 13-3/4" (349mm) below the concrete floor (from the underside of the floor to the top side of the transom) and the upper transom must be placed a min. of 4-1/2" (114mm) above the floor (from the top surface of the floor to the underside of the transom) while maintaining the min. 34" (864mm) spandrel height.
   (C) Glass Panels - Glass panels shall be installed according to the curtain wall system manufacturer’s guidelines. Use a min. 1/4" (6mm) thick, clear heat-strengthened (HS) glass or tempered glass with a max. width and height less than the aluminum framing O.C. spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8" (16mm) long screws, and a snap face (aluminum extrusion).

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No. 
CEJ 305 P

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0507 R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>04/19/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
(D) Steel Hat Channels - Apply nom 2-1/2" (64mm) wide x 7/8" (22mm) deep, min. 24 GA steel hat channels so that they span the space between mullions for the purpose of providing a retention system for the curtain wall insulation. The hat channels are to be applied, horizontally, at a max. 3" (76mm) above the lower transom and 3" (76mm) below the upper transom of the spandrel area, and at max. 24" (610mm) centers within the spandrel area.

(E) Insulation Reinforcement - At the horizontal centerline of the perimeter joint protection, apply a hat channel (2D) that is secured to the vertical framing as described in (2D).

(F) Impaling Pins - (Not Shown) Attach curtain wall insulation to the steel hat channel (2D) with min. 12 GA steel cup-head pins with a spacing of max. 8" o.c. at the centerline of the flange. Pins shall be installed so that the interior face of the curtain wall insulation is flush with the interior face of the framing.

(G) Curtain Wall Insulation - All spandrel panels shall be installed with a min. 2 in. (51mm) thick, 8pcf (126 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim (vapor retarder) which is exposed to the room interior. The batt is to be fitted tightly to the framing, and is secured to the framing with the steel hat channel (2D) and impaling pins (2F). All meeting edges of insulation are sealed with nom. 4" (102mm) wide pressure sensitive aluminum foil faced tape centered over the junction so that approx. 2" (51mm) of tape covers each edge of the adjacent insulation. 24" (610mm) wide batt insulation installed without vertical seams and horizontal seams are to be a placed min. 4-1/2" (114mm) above the floor. The batt in the perimeter joint region is to be supported by at least one hat channel support (2D) above the floor, in addition to the centerline perimeter joint insulation reinforcement channel (2E).

(H) Framing Covers - Strips made of 2" (51mm) thick by 8" (203mm) wide, 8pcf (128 kg/cm) mineral wool batt insulation faced on one side with aluminum foil scrim. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced at least 12" (305mm) o.c.. Framing covers do not pass through the perimeter joint protection.

(I) Thermal Break (not shown) - Secure panels with a thermal break, pressure bar, 1/4/20 x 5/8" (16mm) long screws, and a snap face. The spandrel panels shall be insulated according to (2G).

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation installed with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom joint width and flush with or recessed 1/4" (6mm) from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # AA0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick well applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # AA552) (not shown) (optional to FSC3) - Applied to cover the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 305 P

Nelson Firestop

DWG NO. FS-0507 R2

DATE: 04/19/06

BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
PERIMETER FIRE BARRIER SYSTEM
ALUMINUM SPANDREL CURTAIN WALL

F Rating 2 Hr.  T Rating 1-1/4 Hr.
L Rating <1 SCFM
Movement - 12.5% Horizontal/6.25% Vertical

(2B) Aluminum Framing
(2C) Vision Glass Panels
(3A) Forming Material
(2E) Steel Hat Channels
(3B) Coating
(2F) Insulation Reinforcement
(2H) Curtain Wall Insulation
(2D) Aluminum Spandrel Panels

1. CONCRETE FLOOR ASSEMBLY - Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100-150pcf (1602-2404 kg/cubic meter), with a min. thickness of 4-1/2" (114mm) at the joint face.

2. CURTAIN WALL ASSEMBLY - The curtain wall assembly shall incorporate the following construction features:
   (A) Mounting Attachment (Not Shown) Attachment of the min. 1/4" (6mm) plate steel curtain framing to the structural framing shall be according to the curtain wall manufacturer's instructions to allow vertical shear movement only. Max. distance between mounting attachments shall be min 60" (1524mm) O.C.
   (B) Aluminum Framing - Rectangular aluminum tubing mullions and transoms sized according to the curtain wall system manufacturer's guidelines. Mullions are spaced a min 60" (1524mm) o.c. and transoms are to be spaced a min 34" (864mm) o.c. For the spandrel region, the lower transom must be placed a min. of 13-3/4" (349mm) below the concrete floor (from the underside of the floor to the top side of the transom) and the upper transom must be placed a min. of 4-1/2" (114mm) above the floor (from the top surface of the floor to the underside of the transom) while maintaining the min. 34" (864mm) spandrel height.
   (C) Vision Glass Panels - Glass panels shall be installed according to the curtain wall system manufacturer's guidelines. Use a min. 1/4" (6mm) thick, clear, heat-strengthened (HS) glass or tempered glass with a max. width and height less than the aluminum framing o.c. spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing and pressure bar. Panels are secured with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), min. 1/4-20 x 5/8" (16mm) long screws, and a snap face (aluminum extrusion).

OMEGA POINT DESIGN NO.
CEJ 306 P

Omega Point

Nelson Firestop

DWG NO. FS-0508 R2

DATE: 04/20/06
BY: RL
MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
(D) Aluminum Spandrel Panels - Aluminum panels used in the spandrel shall be sized and attached to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a min. 1/8" (3mm) sheet aluminum panel with max. dimensions 4' x 6' (1220mm x 1829mm).

(E) Steel Hat Channels - Apply nom. 2-1/2" (64mm) wide x 7/8" (22mm) deep, min. 24GA steel hat channels so that they span the space between mullions for the purpose of providing a retention system for the curtain wall insulation. The hat channels are to be applied, horizontally, at a max. 3" (76mm) above the lower transom and 3" (76mm) below the upper transom of the spandrel area, and at 24" (610mm) centers within the spandrel area.

(F) Insulation Reinforcement - At the horizontal centerline of the perimeter joint protection, apply a hat channel (2D) that is secured to the vertical framing as described in (2D).

(G) Impaling Pins - (Not Shown) Attach curtain wall insulation to the steel hat channel (2E) with min. 12 GA steel cup-head pins with a spacing of max. 8" (203mm) o.c. at the centerline of the flange. Pins shall be installed so that the interior face of the curtain wall insulation is flush with the interior face of the framing.

(H) Curtain Wall Insulation - All spandrel panels shall be installed with a min. 2 in. (51mm) thick, 8pcf (128 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim (vapor retarder) which is exposed to the room interior. The batt is to be fitted tightly to the framing, and is secured to the framing with the steel hat channel (2C) and impaling pins (2G). All meeting edges of insulation are sealed with nom. 4" (102mm) wide pressure sensitive aluminum foil faced tape centered over the junction so that approx. 2" (51mm) of tape covers each edge of the adjacent insulation. 24" (610mm) without vertical seams and horizontal seams are to be placed a min. 4-1/2" (114mm) above the floor. The batt in the perimeter joint region is to be supported by at least one hat channel the floor in addition to the centerline perimeter joint insulation reinforcement channel (2E).

(I) Framing Covers - Strips made of 2" (51mm) thick by 8" (203mm) wide, 8pcf (128 kg/cubic meter) mineral wool batt insulation faced on one side with aluminum foil scrim. Framing covers are centered over each vertical framing member and secured to the member with impaling pins and clips spaced at least 12" (305mm) o.c.. Framing covers do not pass through the perimeter joint protection.

(J) Thermal Break (not shown) - Secure panels with a thermal break, pressure bar, 1/4-20 x 5/8" (16mm) long screws, and a snap face. The spandrel panels shall be insulated according to (2H).

3. PERIMETER JOINT PROTECTION - The perimeter joint (linear opening) shall not exceed an 8" (203mm) nom. joint width (joint width at installation) and the perimeter joint treatment shall incorporate the following construction features:

(A) Forming Material - Min. 4" (102mm) thick 4 pcf (64 kg/cubic meter) density, mineral wool batt insulation faced with the fibers running parallel to the slab edge and curtain wall. The forming material shall be compressed 25% in the nom joint width and flush with or recessed 1/4" from the top surface of the concrete floor, if FSC3 or CLK is used respectively.

(B) Nelson FSC3 Coating (part # A0868) - Spray, trowel, or brush apply the coating over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Single pass application is acceptable. Overlap the coating onto the top surface of the floor and curtain wall insulation a min. of 1/2" (13mm).

(C) Nelson CLK S/L Sealant (part # A552) (not shown) (optional to the FSC3) - Applied sealant over the exposed surface of the mineral wool installed in the perimeter joint. Apply sealant over the forming material to a min. 1/4" (6mm) thickness and finish flush with the top surface of the concrete floor.

Tested in accordance with:
ASTM E-2307, E-1399

Omega Point Design No.
CEJ 306 P

Table:

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop

DWG NO. FS-0508 R2

DATE: 04/20/06

BY: RL

MEA # 127-04-M Vol. II

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL SLEEVED CABLES

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 Series Wall and Partitions Designs in the UL Fire Resistance Directory. Max. diameter of opening is 4" (102mm).

2. METALLIC SLEEVE (optional) - Cylindrical sleeve fabricated from 0.015" (.381mm) (30 MSG) thick galv sheet steel and having a min. 2" (51mm) lap along the longitudinal seam. Sleeve installed flush with both wall surfaces.

3. CABLES - Max. 70% cable fill of opening of any combination of:
   (A) max. 750 kcmil single conductor cable with cross linked polyethylene insulation and polyvinyl chloride (PVC) jacket.
   (B) max. 100pr. No. 24awg, or smaller, with PVC insulation and jacket.
   Max. one length of 1/C -750 kcmil cable along with max. 100pr No. 24awg can be installed within the opening.

4. NELSON PCS PIPECHOKE - Install the applicable sized pipechoke, in accordance with the size of the cable bundle, around the bundle on both sides of the wall. Secure to the wall with 1/8" x 1-3/4" (3mm x 44mm) long steel toggle bolts in conjunction with 1/4" x 3/4" (6mm x 19mm) and 1/4" x 1-1/4" (6mm x 32mm) diameter steel fender washers.

5. NELSON FSP PUTTY (part # AA445) - Apply a 5/8" (16mm) depth of FSP in the annular space around the cables, flush with both surfaces of the wall. Additional 1/2" (13mm) thickness of putty shall be applied within interstices of cable bundle at its egress from the device to seal any voids on both sides of wall. Min. 3/4" (19mm) thick crown of putty shall be applied around outer circumference of cable bundle, at the interface of the cable bundle and the retainer tabs on both sides of wall.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop
System No.
W-L-3227

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
<th></th>
</tr>
</thead>
</table>

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.

DWG NO. FS-0509 R2

DATE: 07/21/06

BY: RL
CONCRETE FLOOR OR WALL
NO PENETRATING ITEM

F Rating 3 Hr.  T Rating 1/2 Hr.

(4) Sealant

(2) Sleeve

(1) Floor or Wall

(3) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 15" (381mm).

2. METALLIC SLEEVE (optional) - Nom 14" (356mm) diameter (or smaller) Sch. 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. FORMING MATERIAL - Min. 2" (51mm) thickness of min. 4pcf (64kg/cubic meter) mineral wool batt insulation firmly packed into opening. Recess 1" (25mm) from top surface of floor or from both surfaces of wall.

4. NELSON ES1399 SEALANT - Min. 1" (25mm) thickness of sealant applied within annulus, flush with top surface of floor or both surfaces of wall. If cracking occurs after sealant cures, the cracks shall be sealed with sealant.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-0104

DWG NO. FS-0510 R1

DATE: 07/21/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR
NONMETALLIC PIPE

F Rating 2 Hr.  T Rating 2 Hr.

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. The max. diameter of opening is 6" (152mm).

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in vented (drain, waste or vent) piping systems.
   (B) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in vented (drain, waste or vent) piping systems.

   The nominal annular space between drain pipe and periphery of opening is 0" (point of contact) to 1-1/2" (38mm).

3. NELSON ES1399/LBS3 SEALANT - Apply to fill the annular space to a min. 1" (25mm) depth flush with bottom surface of the floor. At point contact location between concrete and pipe, a min. 1/2" (13mm) diameter bead of sealant shall be applied to the pipe/concrete interface on bottom surface of floor assembly. A min. 1/2" (13mm) diameter bead of sealant shall also be applied around top edge of toilet flange. Prior to placement of water closet, a min. 1/2" (13mm) diameter bead of material shall be applied to the bottom surface of the outer rim of the water closet.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

---

Nelson Firestop

System No. F-A-2122

DWG NO. FS-0511 R2

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 02/14/07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td>BY: RL</td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop

800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)
Class II Movement - 25% Compr or Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.
2. STEEL STRAPS - Min. 2" (51mm) wide 16 MSG galv steel straps cut to a length to span the flute and overlap the adjacent valleys of fluted floor units by 1-1/2" (38mm). Straps spaced max. 24" (610mm) OC and fastened to floor assembly with 1/4" (6mm) diameter by 1-1/2" (38mm) long steel concrete anchors.
3. FORMING MATERIAL PLUGS - Preformed mineral wool plugs, formed to the shape of the fluted floor units, friction fit to completely fill the flutes above the steel straps. Adjacent lengths of plugs to be tightly butted with butted seams spaced min. 24" apart along the length of the plugs.
4. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. The max. separation between bottom of floor and top of wall is 1" (25mm). The joint system is designed to accommodate a max. 25% compression or extension from its installed width. Ceiling runner is secured to straps with two #8 self-drilling, self-tapping steel screws per strap.
5. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs with max. 24" (610mm) o.c. spacing.
6. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space above the wall. The forming material shall be compressed 50% in the non joint width and flush with both surfaces of wall.
7. NELSON FSC3 COATING (part # AA0868) - Spray or trowel over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating a min. 1/2" (13mm) onto the wall, steel floor and steel straps on both sides of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop

DWG NO. FS-0512 R2

DATE: 12/04/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
STEEL DUCT

F Rating 3 Hr.  T Rating 0 Hr.

(2) Duct

(4) Sealant

(3) Forming Material

(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall or CMU wall. Max. diameter of opening is 28" (711mm).

2. METALLIC DUCT - Max. nominal 24" (610mm) diameter, (or smaller), No. 22 GA (or heavier) steel HVAC duct to be installed concentrically or eccentrically within the firestop system. The annular space between duct and periphery of opening shall be min. 0" (point of contact) to max. 4" (102mm). Duct to be rigidly supported on both sides of floor or wall assembly.

3. FORMING MATERIAL - Min. 4" (102mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation firmly packed into opening as a permanent form. Forming material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of sealant.

4. NELSON ES1399 SEALANT - Apply to fill the annular space around the duct to a min. 1/2" (13mm) depth, flush with top surface of floor or both surfaces of wall. Additional sealant installed to form a min. 1/4" (6mm) bead at the point of contact of the duct and periphery of the opening on the top floor surface of both wall surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-7093

DWG NO. FS-0513 R1

Project Name: 
Address: 

Installer: 
Address: 

Signature: 

DATE: 07/21/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 3 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 12.5% Compr & Ext

1. FLOOR ASSEMBLY - Min 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.

2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Res. Direct. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly.

3. SPRAY-APPLIED FIRE PROOFING (not shown, optional) - The roof assembly shall be sprayed with the type and thickness of fire resistive material indicated in the individual P700 Series design.

4. WALL ASSEMBLY - Min 8" (203mm) thick lightweight or normal weight concrete wall or CMU block wall. The wall shall be installed parallel with the flutes of the steel floor and roof deck units. The max. separation between bottom of floor and top of wall is 2" (51mm). The joint system is designed to accommodate a max. 12.5% compression or extension from its installed width.

5. FORMING MATERIAL - Min. 4pcf (64 kg/cubic meter) mineral wool batt insulation cut into strips min. 2" (51mm) wide compressed 50% in thickness and inserted into gap between the top of the wall and the bottom of the steel floor units, roof deck or sprayed-applied fire resistive material flush with one surface of the wall.

6. NELSON FSC3 COATING - Min. 1/8" (3mm) wet thickness of coating sprayed or trowelled into the joint to completely cover forming material and to overlap a min. of 1/2" (13mm) onto wall and steel deck, roof deck or spray-applied fire resistive material within joint cavity.

7. FORMING MATERIAL - Min. 4pcf (64 kg/cubic meter) mineral wool batt insulation cut into strips min. 6" (152mm) wide compressed 50% in thickness and inserted into gap between the top of the wall and the bottom of the steel floor units, roof deck or sprayed-applied fire resistive material buttting edge of the forming material.

8. NELSON FSC3 COATING (part # AA0868) - Min. 1/8" (3mm) wet thickness of coating sprayed or trowelled to completely cover forming material and to overlap a min. of 1/2" (13mm) onto wall and steel deck, roof deck or spray-applied fire resistive material on accessible side of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Based on System No.
HW-D-0362

Nelson Firestop

DWG NO. FS-0514 R2

DATE: 12/04/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 3 Hr.
Nominal Joint Width - 2" (51mm)
Class II Movement - 12.5% Compr or Ext

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete poured over fluted steel decking.
2. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a fire-rated fluted steel deck roof assembly may be used.
3. ROOF INSULATION (not shown) - Min. 2-1/4" (57mm) thick poured insulating concrete, as measured from the top plane of the roof deck.
4. WALL ASSEMBLY - Min. 8" (203mm) thick lightweight or normal weight concrete wall or CMU block wall. The max separation between bottom of floor and top of wall is 2" (51mm). The joint system is designed to accommodate a max 12.5% compression or extension from its installed width.
5. FORMING MATERIAL - Tightly pack 2" (51mm) wide min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space between the top of the wall and bottom of the floor or roof on one side of the wall and installed flush with one surface of the wall. The forming material shall be compressed 50% in the nominal joint width and 33% into the flutes of the steel floor units or roof deck.
Tightly pack 6" (152mm) wide min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space between the top of the wall and bottom of the floor or roof and installed flush with surface of the wall. The forming material shall be compressed 50% in the nominal joint width and 33% into the flutes of the steel floor units or roof deck.
6. NELSON FSC3 COATING - Min. 1/8" (3mm) wet thickness of coating sprayed or trowelled into the joint to completely cover forming material and to overlap a min. of 1/2" (13mm) onto wall and steel deck, within joint cavity.
7. NELSON FSC3 COATING (part # AA0888) - Min. 1/8" (3mm) wet thickness of coating sprayed or trowelled on one side of the wall to completely cover forming material and to overlap a min. of 1/2" (13mm) onto wall and steel deck on accessible side of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop

Project Name:
Address:
Installer:
Address:
Signature:

System No.
HW-D-0361

DWG NO. FS-0515 R2
DATE: 12/04/06
BY: RL

MEA # 127-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 0 or 1 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 13-7/8" (352mm) and 10-3/8" (264mm) for steel or wood stud walls, respectively.

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING - Nom 6" (152mm) diameter (or smaller) Type L or heavier) copper tubing.

3. PIPE INSULATION - Nominal 3" (76mm) thick CELLULAR GLASS pipe insulation. The annular space between insulated through penetrant and periphery of opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

5. NELSON ES1399 SEALANT - Apply sealant to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, min. 3/8" (10mm) diameter bead of sealant shall be applied to the insulation/wall interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-5212

DWG NO. FS-0516 R1

DATE: 07/13/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
FLEXIBLE METALLIC CONDUITS

F Rating 2 or 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall or CMU block wall. Floor may also be constructed of any min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 4" (102mm) if flexible ALUMINUM conduit is used and max. diameter opening is 6" (152mm) if flexible STEEL conduit is used.

2. METALLIC SLEEVE (optional) - Nom 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces. If flexible STEEL conduit is used, the max. diameter of the steel sleeve is 6" (152mm). If flexible ALUMINUM conduit is used, the max. diameter of the steel sleeve is 4" (102mm).

3. FLEXIBLE METALLIC CONDUITS - One or more 1-1/2" (38mm) diameter, (or smaller) flexible STEEL metallic conduits or 1" (25mm) diameter (or smaller) flexible ALUMINUM conduit bundled together and installed within the opening. Max. diameter of through penetrant bundle shall not exceed 4" (102mm) and 2-1/2" (64mm) for flexible STEEL conduit and flexible ALUMINUM conduit, respectively. Annular space between penetrants is 0" (point of contact) to 1/4" (6mm). The annular space between the through penetrants and periphery of opening shall be min. 0" (point of contact) to 2" (51mm) for flexible STEEL conduit and 0" (point of contact) to 1-1/2" (38mm) for flexible ALUMINUM conduit. If flexible ALUMINUM conduit is used, the F rating of the firestop system is 2 Hr. and if flexible STEEL conduit is used, the F rating is 3 Hr.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a 4" (102mm) depth, and recess 1/2" (13mm) from the top surface of the floor or from both surfaces of wall or HOLLOW-CORE floor.

5. NELSON ES1399 SEALANT - Apply sealant over the forming material to fill the annular space to a min. 1/2" (13mm) depth, flush with top surface of the floor or with both surfaces of wall. At point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the concrete/penetrating item interface on top surface of floor or on both surfaces of wall or HOLLOW-CORE precast concrete units. Additional sealant shall be forced into interstices of through penetrants to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

---

Nelson Firestop
System No. C-AJ-1512

DWG NO. FS-0517 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 07/21/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td>BY: RL</td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 2 Hr.  T Rating 0 Hr.

(1) Floor or Wall  (2) Cables  (3) Forming Material  (4) Sealant

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall, or CMU block wall. Floor may be constructed of any min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening to be 6" (152mm).

2. CABLES - Max. 25% fill of aggregate cross-section area of opening. Cables installed individually or in bundles having a max. bundle diameter of 3" (76mm). The annular space between cable bundle and the periphery of the opening shall be min. 3/8" (10mm) to max. 2-5/8" (67mm).

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Cable Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Max. 100 pr. No. 24 awg copper conductor with PVC jacketing and insulation.</td>
</tr>
<tr>
<td>b</td>
<td>Max. 3/C No. 2/0 awg aluminum conductor SER with PVC insulation and jacket.</td>
</tr>
<tr>
<td>c</td>
<td>Max. 3/C No. 12 awg nonmetallic sheathed (ROMEX) with copper conductors, PVC insulation and jacket.</td>
</tr>
<tr>
<td>d</td>
<td>Max. 350kcmil, 1/C, copper conductor with XLPE or PVC Insul and XLPE or PVC jacket.</td>
</tr>
<tr>
<td>e</td>
<td>Max. RG59/U copper conductor coaxial cable with ethylene insulation and jacketing.</td>
</tr>
<tr>
<td>f</td>
<td>Max. 62.5/125 fiber optic with PVC insulation and jacketing.</td>
</tr>
<tr>
<td>g</td>
<td>Max. RG6 No. 18 awg copper conductor CATV coaxial cable with PVC Insul and jacket.</td>
</tr>
<tr>
<td>h</td>
<td>Max. 7/C No. 12 awg copper conductor with XLPE or PVC Insulation and jacket.</td>
</tr>
</tbody>
</table>

2. CABLES - As an alternate to the cables listed above, max. 3/C No. 2/0 awg copper conductors aluminum or steel METAL CLAD cable.

3. FORMING MATERIAL - Tightly pack, min. 4" (102mm) tk, min. 4pcf (64 kg/cubic meter) mineral wool insulation into the opening. Recess from top or both surfaces of wall or floor as required for sealant.

4. NELSON ES1399 SEALANT - Apply sealant over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor, or both ends of the wall or HOLLOW-CORE floor. Sealant to be forced into interstices of cable group to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-3235

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
</table>

Nelson Firestop
DWG NO. FS-0518 R1
DATE: 07/21/06
BY: RL
MEA # 125-04-M

800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
MULTIPLE FLEXIBLE METALLIC CONDUITS

1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 or V400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 6" (152mm).

2. FLEXIBLE METALLIC CONDUITS - One or more 1-1/2" (38mm) diameter, (or smaller) steel flexible metallic conduits. Max. diameter of through penetrant bundle shall be 4" (102mm). Annular space between penetrants is 0" (point of contact) to 1/4" (6mm). The annular space between the through penetrants and periphery of opening shall be min. 0" (point of contact) to 2" (51mm).

3. NELSON ES1399 SEALANT - Apply sealant within the annular space to a min. 5/8" (16mm) depth. Apply flush with both surfaces of the wall. At point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the gypsum board/through penetrant interface on both surfaces of the wall. Additional sealant shall be forced into interstices of through penetrants to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-1352

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DATE: 07/21/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
MULTIPLE FLEXIBLE METALLIC CONDUITS

F Rating 2 Hr.       T Rating 0 Hr.

(1) Wall
(3) Sealant
(2) Conduits

1. WALL ASSEMBLY - Min. 6" (152mm) thick reinforced lightweight or normal weight concrete wall or CMU block wall. Max. diameter of opening is 6" (152mm).

2. FLEXIBLE METALLIC CONDUITS - One or more 1-1/2" (38mm) diameter, (or smaller) steel flexible metallic conduits. Max. diameter of through penetrant bundle shall be 4" (102mm). Annular space between penetrants is 0" (point of contact) to 1/4" (6mm). The annular space between the through penetrants and periphery of opening shall be min. 0" (point of contact) to 2" (51mm).

3. NELSON ES1399 SEALANT - Apply sealant within the annular space to a min. 5/8" (16mm) depth. Apply flush with both surfaces of the wall. At point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the concrete/through penetrant interface on both surfaces of the wall. Additional sealant shall be forced into interstices of through penetrants to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-1162

Project Name: 
Address: 

Installer: 
Address: 

Signature: 

DWG NO. FS-0520 R1
DATE: 07/21/06
BY: RL

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR
MULTIPLE FLEXIBLE METALLIC PIPES

F Rating 1 or 2 Hr.    T Rating 0 Hr.

(4) Sealant
(3) Conduits
(1) Wood Floor
(2) Wall
(4) Sealant

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. For 1 Hr. floor-ceiling assemblies nom 10" (254mm) deep lumber, steel or combination lumber and steel joists or trusses may be used. The 2 Hr. fire-rated wood floor ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, or L536 in the UL Fire Resistance Directory.

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsun board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsun board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. FLEXIBLE METALLIC CONDUITS - One or more 1-1/2" (38mm) diameter, (or smaller) steel flexible metallic conduits. Max. diameter of through penetrant bundle shall be 3" (76mm). Annular space between penetrants is 0" (point of contact) to 1/4" (6mm). The annular space between the through penetrants and periphery of opening shall be min. 0" (point of contact) to 1" (25mm).

4. NELSON ES1399 SEALANT - Min. 3/4" (19mm) thickness of sealant applied within annulus, on top surface of the floor or sole plate. Min. 5/8" (16mm) thickness of sealant applied within the annulus, flush with bottom surface of ceiling or bottom top plate. Additional min. 1/8" (3mm) thickness of sealant shall extend a min. 1/2" (13mm) beyond the periphery of the opening on top surface of the floor or sole plate and bottom surface of the ceiling or at point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied opening on top surface of the floor or sole plate and bottom surface of the ceiling or at point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the gypsum board through penetrant interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-1129

DWG NO. FS-0521 R2

MEA # 125-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 2 or 3 Hr.  
T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 26" (660mm).

2. METALLIC SLEEVE (optional) (not shown) - Nom. 8" (203mm) diameter (or smaller), Sch 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces. Max. 6" (152mm) diameter (or smaller) steel sleeve for 4" (102mm) diameter or smaller metallic pipe.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   The annular space is 0" (point of contact) to 1-7/8" (48mm).

4. FORMING MATERIAL - Min. 4pcf (64 kg/cubic meter) mineral wool batt insulation tightly packed into opening or min. 1" (25mm) diameter backer rod into the opening and recess to accommodate the required thickness of sealant from top surface of the floor or both surfaces of the wall or HOLLOW-CORE floor.

5. NELSON LB3/ES1399 SEALANT - Sealant to be applied within the annulus, flush with top surface of floor or with both surfaces of wall. At areas of point of contact, apply a min. 3/8" (10mm) bead of sealant at the concrete/through penetrant interface on the top surface of floor and on both surfaces of wall. When the floor is constructed of HOLLOW-CORE precast concrete units, sealant shall be installed on BOTH sides of floor, flush with BOTH floor surfaces. Apply 1" (25mm) depth of LBS3 sealant for a F Rating of 3 Hr. for the metallic pipe described above. Apply 1/2" (13mm) depth of LB3 sealant for a F Rating of 2 Hr. for the metallic pipe described above. Apply 1/2" (13mm) depth of ES1399 sealant for a max. F Rating of 3 Hr. for the metallic pipe described above.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
C-011483

Nelson Firestop

DWG NO. FS-0522 R3

DATE: 02/14/07
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 14" (356mm).

2. METALLIC SLEEVE (optional) - Max. nominal 14" (356mm) diameter, Sch. 10 (or heavier), steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 10" (254mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 10" (254mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   The annular space is 0" (point of contact) to 2-1/2" (64mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation within the annular space to a min. 2" (51mm) depth, and recess 1/2" (13mm) from the top surface of the floor or both surfaces of wall.

5. NELSON LBS3 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall. At areas of point of contact, apply a min. 1/4" (6mm) bead of sealant at the interface between the pipe and the top floor surface or both wall surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Project Name:
Address:
Installer:
Address:
Signature:

System No.
C-AJ-1484

DWG NO.  FS-0523 R1

DATE:  07/21/06
BY:    RL

MEA # 126-04-M

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  

T Rating 0 Hr.

(1) Floor or Wall
(2) Sleeve
(3) Pipe
(4) Forming Material
(5) Sealant

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 10-3/4" (273mm).

2. METALLIC SLEEVE (optional) - Max. nominal 10" (254mm) diameter, Sch. 10 (or heavier), steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits and tubing may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 8" (203mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   The annular space is 0" (point of contact) to 2-1/8" (54mm).

4. FORMING MATERIAL - Install backer rod into the opening and recess 1/2" (13mm) from top surface of the floor or both surfaces of the wall or HOLLOW-CORE floor.

5. NELSON LBS3 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall. At areas of point of contact, apply a min. 1/4" (6mm) bead of sealant at the interface between the pipe and the top floor surface or both wall surfaces. When the floor is constructed of HOLLOW-CORE Precast Concrete Units, sealant shall be installed on BOTH sides of the floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1485

DWG NO. FS-0524 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  
(1) Floor or Wall  
(3) Pipe

T Rating 0 Hr.  
(2) Sleeve  
(4) Forming Material  
(5) Sealant

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 9-5/8" (244mm). When precast concrete units are used the max. diameter of opening is 7" (178mm).

2. METALLIC SLEEVE (optional) - Max. nominal 5" (127mm) diameter, Sch. 10 (or heavier), steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter or 4" (102mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe with ES1399 sealant or LBS3 sealant respectively.
   (B) IRON PIPE - Nom 8" (203mm) diameter or 4" (102mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe with ES1399 sealant or LBS3 sealant respectively.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit with either sealant.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe with ES1399 sealant ONLY.

   The annular space is 0" (point of contact) to 1/2" (13mm) for LBS3 and 0" (point of contact) to 1" for ES1399.

4. FORMING MATERIAL - Install backer rod into the opening and recess 1/2" (13mm) for ES1399 or 3/4" (19mm) for LBS3 from floor or wall surfaces.

5. NELSON LBS3/ES1399 SEALANT - Apply over the forming material to a min. 3/4" (19mm) or 1/2" (13mm) depth of LBS3 or ES1399 sealant respectively, flush with the BOTTOM or TOP surface of the floor or with ONE surface of the wall. At areas of point of contact, apply a min. 3/8" (10mm) bead of sealant at the interface between the pipe and the BOTTOM or TOP floor surface or ONE wall surface. When the floor is constructed of HOLLOW-CORE Precast Concrete Units, sealant shall be installed on BOTTOM side of the floor.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No.  
C-AJ-1486

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop

800 331-7325  Fax: 918 627-2941  
Tulsa, Ok.

DWG NO.  FS-0525 R3

DATE:  1/11/07

BY:  RL

MEA # 126-04-M
CONCRETE FLOOR OR WALL
METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  T Rating 0 Hr.

(2) Pipe
(4) Sealant
(1) Floor or Wall
(3) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 24-7/8" (632mm) or 7" (178mm) when precast concrete units are used.

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 6" (152mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   The annular space is 0" (point of contact) to 7/8" (22mm).

3. FORMING MATERIAL - Install backer rod into the opening and recess 1/2" (13mm) from top surface of the floor or both surfaces of the wall or HOLLOW-CORE floor.

4. NELSON LBS3/ES1399 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or both surfaces of the wall. At areas of point of contact, apply a min. 1/4" bead of sealant at the interface between the pipe and the top floor surface or both wall surfaces. When the floor is constructed of HOLLOW-CORE Precast Concrete Units, sealant shall be installed on BOTH sides of the floor.
   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1487

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0526 R2

DATE: 12/11/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL FLEXIBLE METALLIC CONDUITS

F Rating 3 Hr.                  T Rating 1/2 Hr.

(3) Conduit

(1) Floor or Wall

(5) Sealant

(2) Sleeve

(4) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any min. 6" (152mm) thick UL Classified HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 6-5/16" (160mm).

2. METALLIC SLEEVE - Nom 6" (152mm) diameter or smaller, Sch 10 (or heavier) steel pipe sleeve, cast into floor or wall flush with floor or wall surfaces.

3. METALLIC CONDUIT - Max. (7) 1-1/2" (38mm) nominal diameter, (or smaller), steel flexible metal conduit. The annular space between pipes and periphery of opening shall be min. 0" (point of contact) to max. 1-1/2" (38mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a 4" (102mm) depth, and recess 1/2" (13mm) from the top surface of the floor or from both surfaces of wall. When the floor is constructed of HOLLOW-CORE precast concrete units, forming material shall be recessed from BOTH surfaces of floor.

5. NELSON LBS3 SEALANT - Apply sealant over the forming material to fill the annular space to a min. 1/2" (13mm) depth flush with the top surface of the floor or with both surfaces of wall. When the floor is constructed of HOLLOW-CORE precast concrete units, sealant shall be installed symmetrically on BOTH sides of floor, flush with BOTH floor surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1488

DWG NO. FS-0527 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL METALLIC PIPE OR CONDUIT

F Rating 2-1/2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 9-1/8" (232mm) and 7" (178mm) when precast concrete units are used.

2. METALLIC SLEEVE (optional) - Max. nominal 5" (127mm) diameter, Sch. 10 (or heavier), steel sleeve cast or grouted into the floor or wall, flush with both surfaces.

3. METALLIC PIPE OR CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 8" (203mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING OR PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   The annular space between pipe, conduit or tubing and periphery of opening shall be min. 0" (point of contact) to max. 1/2" (13mm).

4. FORMING MATERIAL - Min. 4pcf (64 kg/cubic meter) mineral wool batt insulation compressed and tightly packed to a min. 2" (51mm) thickness. Forming material recessed from bottom surface of floor or both surfaces of wall as required to accommodate sealant.

5. NELSON LBS3 SEALANT - Apply over the forming material to a min. 3/4" (19mm) depth, flush with the bottom floor surface or ONE or both surfaces of wall.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. C-AJ-1489

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0528 R0

DATE: 07/21/03

BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NONMETALLIC PIPE

F Rating 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 3" (76mm).

2. NONMETALLIC PIPE - A max. of two nom 1" (25mm) diameter (or smaller) SDR9 cross linked polyethylene (PEX) tubing for use in closed (process or supply) or vented (drain, waste, or vent) piping systems. The space between the through penetrants shall be a nom 3/8" (10mm). The annular space between the through penetrants and the periphery of opening shall be min. 1/2" (13mm) to max. 3/4" (19mm). Only one penetrant shall have a nom diameter greater than 1/2" (13mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool insulation to fill the annular space to a min. 2" (51mm) depth, and recess 1" (25mm) from the top surface of the floor or both surfaces of wall.

4. NELSON LBS3 SEALANT - Apply to fill the annular space around the pipe to a min. 1" (25mm) depth, flush with top surface of floor or with both surfaces of wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the through penetrants.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-2461

Project Name: __________________________
Address: ______________________________
Installer: ______________________________
Address: ______________________________
Signature: _____________________________

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 2 Hr.  
T Rating 1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Max. diameter of opening is 4-1/4" (108mm).

2. METALLIC SLEEVE (optional) - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) piping systems.
   (B) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   The annular space is min. 9/16" (14mm) to max. 1-3/8" (35mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2" (51mm) depth, and recess from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of sealant.

5. NELSON LBS3 SEALANT - Apply to fill the annular space to a min. 1" (25mm) depth over the forming material. Sealant is to be installed flush to top surface of the floor or with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-2462

Project Name: ____________________________  Date: 07/21/06
Address: ________________________________  By: RL
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 2 or 3 Hr.  T Rating 1/2 or 1-1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 3-7/32" (82mm).

2. METALLIC SLEEVE (optional) - Nom 3" (76mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (CPVC) PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 1-1/2" (38mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   (C) RIGID NONMETALLIC CONDUIT - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 40 PVC conduit.

4. FORMING MATERIAL - Install backer rod into the opening and recess from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material surfaces.

5. NELSON LBS3 SEALANT - Sealant applied within the annulus, flush with top surface of floor or with both surfaces of wall as shown in the table below. When floor is constructed of HOLLOW-CORE precast concrete units, sealant shall be installed symmetrically on BOTH sides of floor, flush with BOTH floor surfaces.

<table>
<thead>
<tr>
<th>Nom Steel Sleeve In. (mm)</th>
<th>Max. Diameter of Opening In. (mm)</th>
<th>Max. Diameter of Pipe In. (mm)</th>
<th>Annular Space In. (mm)</th>
<th>Min. Thickness of Sealant In. (mm)</th>
<th>F Rating Hr.</th>
<th>T Rating Hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (51)</td>
<td>2-3/16 (56)</td>
<td>1 (25)</td>
<td>0 to 7/8 (22)</td>
<td>1/2 (13)</td>
<td>3</td>
<td>1-1/2</td>
</tr>
<tr>
<td>3 (76)</td>
<td>3-7/32 (82)</td>
<td>1-1/2 (38)</td>
<td>0 to 1-9/32 (33)</td>
<td>1 (25)</td>
<td>2</td>
<td>1/2</td>
</tr>
</tbody>
</table>

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0531 R1

DATE: 07/21/06
BY: RL

System No.
C-AJ-2463

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any min. 6" (152mm) thick UL classified HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 6" (152mm).

2. METALLIC SLEEVE (optional) - Nom 8" (152mm) diameter (or smaller), Sch. 40 (or heavier) steel pipe sleeve, cast or grouted into floor or wall assembly, flush with top surface of floor or both surfaces of wall assembly.

3. CABLES - Max. 33% cable fill of opening in any combination of:
   (A) max. 1/C-350 kcmil cable w/PVC insulation and jacket.
   (B) max. 16/C #16awg cable w/PVC insulation and jacket.
   (C) max. 100 pair #24awg cable w/PVC insulation and jacket.
   (D) max. 4/C #12awg cable with rubber insulation and neoprene jacket.
   The annular space between the cable bundle and the periphery of the opening shall be a min. 1/2" (13mm) to a max. 2" (51mm).

4. NELSON LBS3 SEALANT - Min. 3/4" (19mm) thickness of sealant applied within the annulus and interstices between cables, flush with top surface of floor or both surfaces of wall. A min. 1/4" (6mm) crown of the caulking material shall be applied around the entire circumference of the cable bundle at the level of the floor surface or both wall surfaces. When the floor is constructed of HOLLOW-CORE precast concrete units, sealant shall be installed symmetrically on BOTH sides of floor, flush with BOTH floor surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-3225

DWG NO. FS-0532 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________
CONCRETE FLOOR OR WALL CABLES

F Rating 2 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 5" (127mm).

2. METALLIC SLEEVE (optional) - Nom 5" (127mm) diameter (or smaller), Sch. 10 (or heavier) steel pipe sleeve, cast or grouted into floor or wall assembly, flush with top surface of floor or both surfaces of wall assembly.

3. CABLES - Max. 38% cable fill of opening in any combination of:
   (A) max. 1/C 750 MCM THHN power cable w/PVC insulation and jacket.
   (B) max. 72 conductors 62.5/125 fibre optic cable w/ PVC insulation and jacket.
   (C) max. 400 pairs #24awg telephone communication cable w/PVC insulation and jacket.
   (D) max. 7/C #16awg power and control cables with rubber insulation and neoprene jacket.

   The annular space between the cable bundle and the periphery of the opening shall be a min. 1/4" (6mm) to a max. 3/4" (19mm).

4. NELSON LBS3 SEALANT - Min. 3/4" (19mm) thickness of sealant applied within the annulus and interstices between cables, flush with top surface of floor or both surfaces of wall. A min. 1/4" (6mm) crown of the caulking material shall be applied around the entire circumference of the cable bundle at the level of the floor surface or both wall surfaces.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. C-AJ-3224

DWG NO. FS-0533 R1

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: _______________________________

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 2 Hr.       T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any min. 6" (152mm) thick UL classified HOLLOW-CORE Precast Concrete Units. When individual cable is installed, diameter of opening to be 3/4" (19mm) to 1-3/4" (44mm) larger than diameter of cable. Max. diameter of opening is 4" (102mm).

2. METALLIC SLEEVE (optional) - Nom 4" (102mm) diameter (or smaller), Sch. 10 (or heavier) steel pipe sleeve, cast or grouted into floor or wall assembly, flush with top surface of floor or both surfaces of wall assembly.

3. CABLES - Max. six copper 3/C #2/0awg aluminum or steel jacketed METAL-CLAD or ARMORED cables. The annular space between the cable bundle and the periphery of the opening shall be a min. 0" (point of contact) to a max. 1-3/4" (44mm).

4. NELSON LBS3 SEALANT - Min. 1" (25mm) thickness of sealant applied within the annulus and interstices between cables, flush with either BOTTOM or TOP surface of floor or ONE surface of wall. A min. 3/8" (10mm) thick bead of sealant shall be applied at point of contact of cable bundle with the opening. When the floor is constructed of HOLLOW-CORE precast concrete units, sealant shall be installed on BOTTOM side of floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DWG NO. FS-0534 R1
DATE: 07/21/06
BY: RL
MEA # 126-04-M

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of any min. 8" (203mm) thick UL classified HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 4-3/8" (111mm).

2. METALLIC SLEEVE (optional) - Nom 4" (102mm) diameter or smaller, Sch. 10 (or heavier) steel pipe sleeve, cast or grouted into floor or wall assembly, flush with top surface of floor or both surfaces of wall assembly.

3. CABLES - Max. 40% cable fill of opening in any combination of:
   (A) max. 1/C 750 MCM THHN power cable w/insulation and jacket.
   (B) max. 72 conductors 62.5/125 fibre optic cable w/PVC insulation and jacket.
   (C) max. 400 pairs, #24awg telephone communication cable, w/PVC insulation and jacket.
   (D) max. 7/C, #16awg power and control cables with rubber insulation and neoprene jacket.

   The annular space between the cable bundle and the periphery of the opening shall be a min. 3/8" (10mm) to a max. 1-3/16" (30mm).

4. FORMING MATERIAL - Install backer rod into the opening and recess 1" (25mm) from the top surface of the floor or both surfaces of wall.

5. NELSON LBS3 SEALANT - Min. 1" (25mm) thickness of sealant applied within the annulus and interstices between cables, flush with top surface of floor or both surfaces of wall. When the floor is constructed of HOLLOW-CORE precast concrete units, sealant shall be installed on BOTH sides of floor, flush with BOTH floor surfaces.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DWG NO. FS-0535 R1
DATE: 07/21/06
BY: RL
MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 1-1/2 Hr.  T Rating 1/2 Hr.

(2) Pipe  (5) Sealant
(3) Insulation  (1) Floor or Wall
(4) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of opening is 15" (381mm).

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 10" (254mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 10" (254mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 10" (254mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 1" (25mm) thick, or thinner, acrylonitrile butadiene/ polyvinyl chloride (AB/PVC) (ARMAFLEX) flexible foam pipe insulation. The annular space is 1-1/2" (38mm).

4. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter) mineral wool batt insulation into the annular space to a min. 2" (51mm) depth, and recess the fiber 1" (25mm) from the top surface of the floor or from both surfaces of the wall.

5. NELSON LBS3 SEALANT - Apply over the forming material to a min. 1" (25mm) depth, flush with the top surface of the floor or with both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-5255

DWG NO. FS-0536 R1

Project Name: ______________________
Address: ______________________
Installer: ______________________
Address: ______________________
Signature: ______________________

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 2 Hr.  T Rating 3/4 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of opening is 18" (457mm).

2. METALLIC SLEEVE (optional) - Max. nominal 18" (457mm) diameter, (or smaller) Sch. 10 or heavier steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. METALLIC PIPE - The following types of metallic pipes may be used:
   - (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   - (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.

4. PIPE INSULATION - Nominal 1" (25mm) thick, or thinner, FIBERGLASS or MINERAL FIBER pipe insulation. The annular space is 0" (point of contact) to 2-3/4" (70mm).

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2" (51mm) depth, and recess 1/2" (13mm) from the top surface of the floor or from both sides of the wall. At the point contact location between through penetrant and concrete, forming material forced into interstices of through penetrant and concrete to max. extent possible.

6. NELSON LBS3 SEALANT - Apply sealant over the forming material to a min. 1/2" (13mm) depth, flush with the topside of the floor or with both sides of the wall. At areas of point of contact: apply a min. 1/4" (6mm) crown at the interface between the pipe and the top surface of the floor or both surfaces of the wall. Additional sealant to be installed such that a min. 1/8" (6mm) crown is formed around the thru penetrants.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

DWG NO.  FS-0537 R1
DATE: 07/21/06
BY:  RL

MEA #126-04-M
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 2 Hr.       T Rating 1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or min 3-1/2" (89mm) thick concrete wall, or CMU block wall. The max. diameter of opening is 8-1/4" (210mm).

2. METALLIC SLEEVE (optional, not shown) - Nom. 8" (203mm) diameter (or smaller) Sch. 10 steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

4. PIPE INSULATION - Nominal 1" (25mm) thick, or thinner, acrylonitrile butadiene/polyvinyl chloride (AB/PVC) (ARMAFLEX) flexible foam pipe insulation. The annular space shall be 1/2" (13mm) to 1-3/8" (35mm).

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation into the annular space to a min. 1-1/2" (38mm) depth, and recess the fiber 1" (25mm) from the top surface of the floor or from both surfaces of the wall.

6. NELSON LBS3 SEALANT - Apply over the forming material to a min. 1" (25mm) depth, flush with the top surface of the floor or with both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-5257

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.

CLASSIFIED
UL

DWG NO. FS-0538 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M
CONCRETE FLOOR OR WALL
MULTIPLE INSULATED METALLIC PIPES

F Rating 3 Hr.  T Rating 2-1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5-1/2" (140mm) thick wall, or CMU block wall. The max. area of the opening is 144 sq. inches (929 sq. cm) with a max. dimension of 24" (610mm).

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 3" (76mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 3" (76mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   Of the six penetrants, only two shall have a nominal diameter greater than 1" (25mm).

3. PIPE INSULATION - Max 3/4" (19mm) thick AB/PVC (ARMAFLEX) flexible foam insulation. The annular space range is 1/2" (13mm) to 2-5/8" (67mm). Annular space between pipes is 2" (51mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min 3-1/2" (89mm) depth, and recess 1" (25mm) from the top surface of the floor or both surfaces of the wall.

5. NELSON LBS3 SEALANT - Apply sealant over the forming material a min. 1" (25mm) depth, flush with the top surface of the floor or both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No.
C-AJ-5259

DWG NO. FS-0540 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
BUS DUCT

F Rating 2 Hr.  T Rating 0 Hr.

(1) Floor or Wall  (2) Bus Duct
(3) Insulation
(4) Forming Material
(5) Sealant

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall, or CMU block wall. The max. area of opening is 360 sq. in. (2323 sq. cm) and a max. dimension of 30" (762mm).

2. BUS DUCT ASSEMBLY - Nominal 27" x 6" (686mm x 152mm), "I" shaped aluminum and steel enclosure containing factory mounted aluminum bars rated for 600V/4000A. Annular space between the flange tip of the busway the periphery of the opening shall be a nom 2" (51mm). The annular space between the web section of the busway the periphery of the opening shall be a nom 5-1/4" (133mm).

3. COVER PLATE ASSEMBLY (not shown) - A min. 1/8" (3mm) thick steel cover plate provided by busway manufacturer shall be installed on top surface of floor and both surfaces of wall. Steel cover plate secured in accordance with busway manufacturer's installation instructions.

4. FORMING MATERIAL - Tightly pack min. 6pcf (95 kg/cubic meter) mineral wool batt insulation into the annular space to a min. 4" (102mm) depth, and recess 1/2" (13mm) from top surface of the floor or from both surfaces of wall.

5. NELSON LBS3 SEALANT - Apply over forming material, within the annular space to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-6035

Project Name: __________________________
Address: _______________________________
Installer: ______________________________
Address: ______________________________
Signature: _____________________________

DATE: 02/06/07
BY: RL
MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
HVAC DUCT

F Rating 1-1/2 Hr.  T Rating 1/2 Hr.

(2) HVAC Duct  (4) Sealant

(1) Floor or Wall  (3) Forming Material

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. area of opening is 364 sq. in. (2348 sq. cm) with a max. dimension of 26" (660mm).

2. HVAC DUCT - Max. 24" x 12" (610mm x 305mm), 24 gauge (or heavier), steel HVAC duct. Duct to be rigidly supported on both sides of floor or wall assembly. Annular space is a nom 1" (25mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2" (51mm) depth, and recess 1" (25mm) from top surface of floor or from both surfaces of wall.

4. NELSON LBS3 SEALANT - Apply within the annular space to a min. 1" (25mm) depth, flush with the top surface of floor or both surfaces of wall.

5. STEEL ANGLE (not shown) - Min. 2" (51mm) wide x 3" (76mm) high x 0.108" (3mm) thick steel angle cut to fit contour of the duct with a 1" (25mm) lap on the top surface of floor or both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-7091

DWG NO. FS-0542 R1

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________

Signature: ______________________________

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL STEEL DUCT

F Rating 2 Hr.  T Rating 0 Hr.

(2) Duct  
(4) Sealant  
(3) Forming Material  
(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of opening is 14" (356mm).

2. STEEL DUCT - Max. 10" (254mm) nominal diameter or smaller, 28GA (or heavier) steel duct. Duct to be installed either concentrically or eccentricity within the firestop system. The annular space between steel duct and periphery of opening shall be min. 3/4" (19mm) to max. 3-1/4" (83mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2" (51mm) depth, and recess 3/4" (19mm) from the top surface of the floor or from both surfaces of the wall.

4. NELSON LBS3 SEALANT - Apply sealant over the forming material to a min. 3/4" (19mm) depth, flush with the top surface of the floor or with both surfaces of the wall. Apply an additional 1/4" (6mm) crown around the duct on top surface of floor or on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. C-AJ-7092

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0543 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
MULTIPLE METALLIC PIPES

F Rating 2 Hr.

(2) Pipe

(3) Pipe

(7) Sealant

T Rating 0 Hr.

(5) Cables

(1) Floor or Wall

(4) Pipe Insulation

1. FLOOR or WALL ASSEMBLY: Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall, or CMU block wall. The max. area of the opening is 144 sq. in. (929 sq. cm) with a max. dimension of 24" (610mm). Of the four penetrants, only one pipe shall have a nom diameter greater than 2" (51mm).

2. METALLIC PIPE - The following types of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   Space between pipes is nom 1" (25mm). Space between pipes and periphery of opening is 1" (25mm) to 2" (51mm).

3. NONMETALLIC PIPE - One or more nominal 2" (51mm) diameter, or smaller, Sch. 40 or heavier PVC pipe for use in closed (process or supply) piping systems.

4. PIPE INSULATION - Max. 1" (25mm) thick AB/PVC (ARMAFLEX) foam insulation. The insulation may be installed on any of the metallic pipes or tubing having a diameter of 2" (51mm) or less. The insulated pipe or tubing shall be spaced 1" (25mm) from the other through penetrants. The annular space between the insulated pipe or tubing and periphery of the opening shall be a nom 1" (25mm).

5. CABLES - Max. 12 lengths of cables to be installed within the opening. The space between the cables and the periphery of opening shall range from a min. 1-7/16" (37mm) to a max. 2-5/8" (67mm). Cables to be bundled together or spaced a nom 1/8" (3mm) apart. Max. 25pr #24awg cables or 62.5/125 UM fiber optic cables, both jacketed.

6. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2 1/2" (64mm) depth, and recess 1-1/4" (32mm) from the top surface of the floor or both sides of the wall.

7. NELSON LBS3 SEALANT - Apply over the forming material to a min. 1-1/4" (32mm) depth, flush with the top surface of the floor or both surfaces of wall.

Tested in accordance with:

ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0544 R1

DATE: 07/21/06

BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

System No.
C-AJ-8141

Project Name:
Address:
Installer:
Address:
Signature:
CONCRETE FLOOR OR WALL
METALLIC PIPE or CONDUIT

F Rating 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 26" (660mm).

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nominal 24" (610mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nominal 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nominal 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.

   The annular space is min. 3/4" (19mm) to max. 2-1/2" (64mm).

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation within the annular space to a min. 2-1/2" (64mm) depth, and recess 1/4" (6mm) from the top surface of the floor or both surfaces of wall.

4. NELSON LBS3 SEALANT - Apply over the forming material to a min. 1/4" (6mm) depth, flush with the top surface of the floor or with both surfaces of the wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-BJ-1051

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0545 R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>07/21/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 2 or 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 6” (152mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Max. diameter of opening is 5” (127mm).

2. NONMETALLIC PIPE - The following types and sizes of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2” (51mm) diameter (or smaller) Sch. 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) CHLORINATED POLYVINYL (CPVC) PIPE - Nom 2” (51mm) diameter (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (C) RIGID NONMETALLIC CONDUIT - Nom 2” (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   (D) ELECTRICAL NONMETALLIC TUBING (ENT) - Nom 1” (25mm) diameter (or smaller) PVC tubing.

The nominal annular space is 1-5/16” (33mm). If a PVC, CPVC or RNC is used, the F rating is 3 hr. and if a ENT is used, the F rating is 2 hr.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2-1/2” (64mm) depth, and recess from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of sealant.

4. NELSON LBS3 SEALANT - Apply to fill the annular space to a min. 1” (25mm) depth over the forming material. Sealant is to be installed flush to top surface of the floor or with both surfaces of the wall. Additional sealant to be installed such that a min. 1/4” (6mm) crown is formed around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-BJ-2022

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DWG NO. FS-0546 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 3 Hr.  
T Rating 3 Hr.

(2) Pipe  
(3) Insulation  
(4) Forming Material  
(5) Sealant  
(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Max. diameter of opening is 16" (406mm).

2. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 8" (203mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick, or thinner, FIBERGLASS or MINERAL FIBER pipe insulation. The annular space is to be 1/2" (13mm) to 2" (51mm).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2-1/2" (64mm) depth. Forming material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of coating.

5. NELSON LBS3 SEALANT - Apply sealant within the annulus and over the forming material to a min. 1" (25mm) depth, flush with the top surface of the floor or with both sides of the wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-BJ-5014

Project Name:  
Address:  
Installer:  
Address:  
Signature:  

DWG NO. FS-0547 R1

DATE: 07/21/06  
BY: RL

MEA # 126-04-M

Nelson Firestop  
800 331-7325  Fax: 918 627-2941  
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR METALLIC PIPE OR CONDUIT

F Rating 1 or 2 Hr. 

(4) Sealant

(3) Pipe

(1) Wood Floor

(4) Sealant

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L506, L511, L536 in the UL Fire Resistance Directory. Max. diameter of opening is 5-1/2" (140mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard nailed to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) (not shown) - Constructed in the manner specified in individual U300 series designs as shown in the UL Fire Resistance Directory.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:

(A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.

(B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.

(C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.

(D) COPPER TUBING or PIPE - Nom 3" (76mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

The annular space is dependent upon the nom diameter of the penetrant. If the nom diameter of the penetrant is 3" (76mm) or less, the annular space shall be min. 0" (point of contact) to max. 5/8" (16mm). If the nom diameter of the penetrant is greater than 3" (76mm), the annular space shall be a nom 1/2" (13mm).

4. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus, flush with top surface of floor. Min. 5/8" (16mm) thickness of sealant within the annulus, flush with bottom surface of ceiling or bottom top plate.

Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrant on top surface of floor and bottom surface of ceiling or bottom top plate.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-1116

DWG NO. FS-0548 R2

DATE: 10/31/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR
MULTIPLE FLEXIBLE METALLIC CONDUITS

F Rating 1 or 2 Hr.  T Rating 1 or 2 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L506, L511, L536 in the UL Fire Resistance Directory. Max. diameter of opening is 2" (51mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.
   (C) GYPSUM BOARD - First layer of wallboard nailed to wood/steel joists/trusses. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. METALLIC CONDUITS - Max. (3) nominal 1-1/4" (32mm) diameter, (or smaller), steel flexible metal conduits. Of the three conduits, only one conduit shall have a nom diameter greater than 1/2" (13mm). Annular space between conduits shall be 0" (point of contact) to 1/4" (6mm). The annular space between conduits and the periphery of opening shall be 1/8" (3mm) to 1/4" (6mm).

4. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annular space at the subfloor level and a min. 5/8" (16mm) depth where it penetrates the bottom surface of ceiling or lower top plate. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the through penetrants on top surface of floor and bottom surface of ceiling or lower top plate of chase wall assembly. Sealant to be forced into interstices of conduit bundle to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR
NONMETALLIC PIPE

F Rating 1 or 2 Hr. T Rating 0 or 1 Hr.

(3) Sealant
(2) Pipe
(1) Wood Floor

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, L536 in the UL Fire Resistance Directory. Max. diameter of opening is 4" (102mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard nailed to wood/steel joists/trusses. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:

(A) POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

(B) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.

(C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.

<table>
<thead>
<tr>
<th>Rating of Assembly Hr.</th>
<th>Type of Sealant</th>
<th>Annular Space In. (mm)</th>
<th>Min. Thickness of Sealant in Ceiling In. (mm)</th>
<th>F Rating Hr.</th>
<th>T Rating Hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>LBS3</td>
<td>1/2 (13) to 1-1/8 (29)</td>
<td>1-1/4 (32)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>ES1399</td>
<td>1/2 (13) to 5/8 (16)</td>
<td>5/8 (16)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>ES1399</td>
<td>1/2 (13) to 5/8 (16)</td>
<td>5/8 (16)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

3. NELSON LBS3/ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus, flush with top surface of subfloor and min. 1-1/4" (32mm) or 5/8" (16mm) thickness of sealant within the annulus, flush with bottom surface of ceiling. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrating item on both sides of floor-ceiling assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

**Nelson Firestop**

**DWG NO.** FS-0551 R2

**DATE:** 11/1/06

**BY:** RL

**MEA #** 126-04-M

**Nelson Firestop**

800 331-7325 Fax: 918 627-2941

Tulsa, Ok.

---

**System No.**
F-C-2276

**Project Name:**

**Address:**

**Installer:**

**Address:**

**Signature:**
WOOD/STEEL JOIST FLOOR  
NONMETALLIC PIPE

F Rating 1 Hr.  
T Rating 1 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. Max. diameter of opening is 5' (127mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses.
   (C) GYPSUM BOARD - Gypsum wallboard secured to wood/steel joists/trusses.

2. NONMETALLIC PIPE (closet flange) - PVC or ABS flange installed in hole-sawed opening in flooring system with flange secured to top of flooring with steel screws. Diameter of opening through flooring to be 1/2" (13mm) larger than outside diameter of closet flange.

3. NONMETALLIC PIPE (drain pipe) - Max. nominal 4" (102mm) diameter Sch. 40 PVC or ABS pipe.

4. NELSON LBS3/ES1399 SEALANT - Apply sealant into the annulus between pipe and periphery in flooring to max extent possible, flush with bottom surface of floor. An additional 3/8" (10mm) crown is formed around the closet stub on the bottom surface of floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-2278

Project Name:  
Address:  
Installer:  
Address:  
Signature:  

Date:  11/01/06  
By:  RL  

MEA # 126-04-M

Nelson Firestop  
800 331-7325  
Fax: 918 627-2941  
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR NONMETALLIC PIPE

F Rating 1 Hr. T Rating 1 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory.
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture. Max. rectangular cutout in flooring to be 8" x 12" (203mm x 305mm).
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses.
   (C) GYPSUM BOARD - Gypsum wallboard secured to wood/steel joists/trusses. One piece of gypsum board, min. 4" (102mm) longer and wider than the cutout in the flooring, screw-attached to bottom of flooring concentric with cutout by means of 1" (25mm) long Type S steel screws spaced max. 5" (127mm) OC. Diameter of opening hole-sawed through the gypsum board patch to be 1" (25mm) larger than outside diameter of bathtub drain piping.

2. NONMETALLIC PIPE - Max. nominal 1-1/2" (38mm) diameter solid or cellular core Sch. 40 PVC or ABS pipe for use in vented (drain, waste, or vent) piping systems. Annular space within the firestop system shall be a min. 3/8" (10mm) to a max. 5/8" (16mm).

3. NELSON LBS3/ES1399 SEALANT - Apply to fill the annular space to a min. 5/8" (16mm) depth flush with the top surface of the gypsum patch. An additional 1/4" (6mm) crown is formed around the pipe at the topside of the patch.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-2279

DWG NO. FS-0554 R2

DATE: 11/01/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR
NONMETALLIC TUBING

F Rating 1 or 2 Hr. T Rating 1 or 2 Hr.

(4) Sealant
(4) Sealant

(3) Tubing
(1) Wood Floor

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in Individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, or L536 in the UL Fire Resistance Directory. Max. diameter of opening is 3" (76mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) (not shown) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. NONMETALLIC TUBING - The following types of through penetrants shall be used:

   (A) CROSS LINKED POLYETHYLENE TUBING - Max. of (3) SDR9 (or heavier) cross linked (PEX) tubing for use in closed (process or supply) piping systems. Of the (3) tubes, a max. of (1) shall have a nom diameter greater than 3/4" (19mm).

   Annular space between tubing and periphery of opening shall be 3/16" (5mm) to 1" (25mm). The space between all tubing shall be a min. 0" (point of contact) to a max. 1/4" (6mm).

   (B) ALUMINUM CROSS LINKED POLYETHYLENE TUBING - Max. of (3) nom 3/4" (19mm) diameter (or smaller) SDR 9 aluminum cross linked (AL PEX) tubing for use in closed (process or supply) piping systems.

   Annular space between tubing and periphery of opening shall be 1/8" (3mm) to 1" (25mm). The space between tubing shall be a min. 0" (point of contact) to a max. 1/4" (6mm).

4. NELSON LBS3/ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus, flush with the top surface of floor or sole plate. Min. 1/2" (13mm) thickness of sealant within the annulus, flush with bottom surface of ceiling or on bottom surface of lower top plate of chase wall assembly. Additional sealant forced within the group of tubing to max. extent possible on the top surface of floor or sole plate and bottom surface of ceiling or on bottom surface of lower plate of chase wall assembly. LBS3 to be used with (PEX) tubing only. ES1399 to be used on 1 or 2 hr. (AL PEX) or 1 hr. (PEX) tubing.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

---

Nelson Firestop

System No. F-C-2282

DWG NO. FS-0557 R2

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: _______________________________

DATE: 11/02/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR CABLES

F Rating 1 or 2 Hr.  T Rating 3/4 or 1-1/2 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, or L536 in the UL Fire Resistance Directory. Max. diameter of opening is 2" (51mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR Topping mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard nailed to wood/steel joists/trusses. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) (not shown) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. CABLES - One or more of the following cables.

(A) max. 100pr. #24awg copper conductor telephone cable.

(B) max. 2/C #12awg copper conductor nonmetallic sheathed cable.

(C) max. RG/U #22awg copper conductor coaxial cable.

(D) max. 3/C #2/0awg aluminum conductor service entrance cable (SER).

(E) max. 2/C #24awg copper conductor cable.

All with PVC insulation and jacket materials. The annular space shall be 1/8" (3mm) to 1/4" (6mm).

4. NELSON LB53/ES1399 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within annulus on top surface of floor. Min. 5/8" (16mm) thickness of sealant applied within annulus on bottom surface of ceiling or lower top plate of chase wall assembly. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the through penetrant on top surface of floor and bottom surface of ceiling or lower top plate of chase wall assembly. Sealant to be forced into interstices of cable bundle to max. extent possible.

Tested in accordance with:

ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0558 R2

Project Name: ___________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________

Signature: _______________________________

DATE: 11/02/06

BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
WOOD JOIST FLOOR
INSULATED METALLIC PIPE

F Rating 2 Hr. T Rating 2 Hr.

(1) Wood Floor
(3) Pipe
(4) Insulation
(5) Sealant
(5) Sealant

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified Design No. L505, L511, L536 in the UL Fire Resistance Directory. Max. diameter of opening is 4-3/4" (121mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood joists between first and second layers of wallboard and spaced 24" O.C.
   (C) GYPSUM BOARD - First layer of wallboard nailed to wood joists. Second layer of wallboard screw-attached to furring channels.

2. WALL ASSEMBLY (optional) (not shown) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 1-1/2" (38mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

4. PIPE INSULATION - Nominal 1" (25mm) thick FIBERGLASS pipe insulation. The annular space between the insulated penetrating item and the periphery of the opening shall be a min. of 1/2" (13mm) to a max. of 5/8" (16mm).

5. NELSON LBS3 SEALANT - Apply a min 3/4" (19mm) depth of sealant within the annular space, flush with top surface of floor. Min. 1/4" (3mm) thickness of sealant applied within the annular space, flush with bottom surface of gypsum board ceiling or lower top plate of chase wall assembly. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrant on top surface of floor and bottom surface of ceiling or lower top plate of chase wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. F-C-5069

DWG NO. FS-0559 R2

PROJECT NAME:
Address:
Installer:
Address:
Signature:

DATE: 11/02/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR STEEL DUCT

F Rating 1 or 2 Hr.  T Rating 3/4 or 1-1/2 Hr.

1. WOOD FLOOR ASSEMBLY - Const. in the manner specified in individual L500 series 1 hr floor-ceiling designs in the UL Fire Res. Dir. The 2 hr floor-ceiling designs in the UL Fire Res. Dir. shall be constructed in the manner specified in design nos. L505, L511, or L536. Max. diameter of opening is 4-1/2" (114mm).

   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C..

   (C) GYPSUM BOARD - First layer of wallboard nailed to wood/steel joists/trusses. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional) (not shown) - Const. in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. STEEL DUCT - Max. 4" (102mm) diameter, 28 gauge or heavier, steel duct, installed concentrically or eccentrically within the openings. A nom 1/4" (6mm) annular space is required.

4. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant around the duct where it penetrates the flooring and a min. 5/8" (16mm) depth where it penetrates the ceiling or bottom surface of lower top plate of optional chase wall assembly. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the through penetrant on top surface of floor, and bottom surface of ceiling or lower top plate of chase wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
F-C-7027

DWG NO. FS-0561 R2

DATE: 11/6/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR
STEEL DUCT

F Rating 1 Hr.  T Rating 0 Hr.

(4) Angles

(1) Wood Floor
(3) Sealant
(2) HVAC Duct

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual
L500 series 1 hr floor-ceiling designs in the UL Fire Res. Dir.. Max. area of
opening is 96 sq. in. (619 sq. cm) with a max. dimensions of 12" (305mm).
(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber,
plywood or FLOOR TOPPING mixture.
(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed
perpendicular to wood/steel joists/trusses between gypsum board and
wood/steel joists/trusses or furring channels.
(C) GYPSUM BOARD - Gypsum wallboard secured to wood/steel joists/trusses
or furring channels.

2. STEEL DUCT - Max. 6" x 10" (152mm x 254mm) or smaller 24 gauge (or heavier),
steel duct, installed installed concentrically or eccentrically within the opening. An
annular space range is min. 3/8" (10mm) to a max. 1-5/8" (41mm).

3. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant around
the duct where it penetrates the flooring and a min. 5/8" (16mm) depth where it
penetrates the ceiling. Additional sealant to be installed such that a min. 1/4"
(6mm) crown is formed around the through penetrant on bottom surface of ceiling.

4. STEEL RETAINING ANGLES - Min. #16 GA galv steel angles sized to lap steel
duct a min. 2" (51mm) and lap floor surfaces a min. 1" (25mm). Angles attached
to steel duct on top surface of floor with min. #6 x 1/2" (13mm) long steel sheet
metal screws spaced a max. of 1" (25mm) from each end of steel duct and
spaced a max. 6" (152mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-7028

| Project Name: | DATE: 11/06/06 |
| Address: | |

| Installer: | BY: RL |
| Address: | |

| Signature: | MEA # 126-04-M |

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR CABLES, METALLIC PIPES

F Rating 1 or 2 Hr.

(1) Wood Floor

(7) Sealant

(3) Pipe

(5) Cables

(4) Insulation

(6) Forming Material

(2) Sleeve

T Rating 1 or 2 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, L536 in the UL Fire Resistance Directory. Max. diameter of opening is 6" (152mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) Furring CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard nailed to wood/steel joists/trusses. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. METALLIC SLEEVE - Sleeve fabricated from 0.015" (.38mm) 28MSG thick galv sheet steel having a min. 1" (25mm) lap and flush with wall surfaces. Diameter of sleeve is 6" (152mm).

3. METALLIC PIPE or CONDUIT - Max. (2) pipes, conduits or tubing may be installed. The following types/sizes of pipes, conduits and tubing may be used:

   (A) STEEL PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.

   (B) IRON PIPE - Nom 2" (51mm) diameter (or smaller) cast or ductile iron pipe.

   (C) CONDUIT - Nom 2" (51mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.

   (D) COPPER TUBING or PIPE - Nom 1/2" (13mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

Pipes to be spaced 1/2" (13mm) apart. The annular space between pipes and the periphery of the opening is 1/2" (13mm).

4. PIPE INSULATION - Nom 1/2" (13mm) thick FIBERGLASS pipe insulation to be applied to one penetrant having a max. diameter of 1/2" (13mm). Insulated penetrant to be spaced from other penetrants and spaced between periphery of opening a nom 1/2" (13mm).

5. CABLES - One 100pr. #24awg PVC insulated and jacketed telephone cable. Cable to be spaced from other penetrants and spaced between periphery of opening 1/2" (13mm).

6. FORMING MATERIAL - Min. 2" (51mm) thickness of min. 4 pcf (64 kg/cubic meter) mineral wool insulation and recessed 3/4" (19mm) from both surfaces of assembly.

7. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus, flush with top surface of the floor. At bottom of the assembly, min. 3/4" (19mm) thickness of sealant applied within annulus, flush with bottom surface of ceiling. Additional sealant shall be applied such that a min. 1/4" (6mm) crown is formed around the penetrating items on bottom surface of ceiling.

Tested in accordance with:

ASTM E-814
ANSI/UL 1479

---

Nelson Firestop

DWG NO. FS-0563 R2

DATE: 11/06/06

BY: RL

MEA # 126-04-M

Nelson Firestop

800 331-7325 Fax: 918 627-2941

Tulsa, Ok.
1. FLOOR-CEILING ASSEMBLY - Constructed in the manner specified in individual G500 series floor-ceiling designs in the UL Fire Res. Dir. Max. diameter of opening is 2" (51mm).

2. METALLIC CONDUITS - A max. of three flexible steel conduits to be installed either concentrically or eccentrically within the firestop system. Of the three conduits, only one shall have a nonm diameter greater than 1/2" (13mm). The annular space between the conduit shall be a min. 0" (point of contact) to 1/4" (6mm). The annular space between the conduit and the periphery of the opening shall min. 1/8" (3mm) to a max. 1/4" (6mm). Conduits to be located approx. midway between joists and rigidly supported on both sides of floor-ceiling assembly.

3. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus, flush with top surface of floor. Min. 5/8" (16mm) thickness of sealant applied within the annulus, flush with bottom surface of ceiling. On both the top and bottom of the assembly, sealant forced into interstices within group of penetrating items to max. extent possible. Additional sealant shall be installed such that a min. 1/4" (6mm) thick crown of sealant applied around the group of penetrants on both the top and bottom of the assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
F-E-1013

Nelson Firestop

Project Name: ___________________________  DATE: 07/21/06
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE JOIST FLOOR
NONMETALLIC TUBING

F Rating 1 Hr.          T Rating 1 Hr.

(1) Floor-Ceiling

(2) Tubing

(3) Sealant

1. FLOOR-CEILING ASSEMBLY - Constructed in the manner specified in individual G500 series floor-ceiling designs in the UL Fire Res. Dir.. Max. diameter of opening is 3" (76mm).

2. NONMETALLIC TUBING - A max. of three SDR 9 or heavier cross-linked polyethylene (PEX) tubing for use in closed (process or supply) piping systems. Of the three tubes, a max. of one shall have a nom diameter greater than 3/4" (19mm). The annular space between the tubing and the periphery of the opening shall be a min. 3/16" (5mm) and a max. of 1" (25mm). The space between the tubing shall be a min. 0" (point of contact) to a max. 1/4" (6mm). Tubing to be rigidly supported on both sides of the floor-ceiling assembly.

3. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus, flush with top surface of floor. Min. 5/8" (16mm) thickness of sealant applied within the annulus, flush with bottom surface of ceiling. On both the top and bottom of the assembly, sealant forced into interstices within group of penetrating items to max. extent possible. Additional sealant shall be installed such that a min. 1/4" (6mm) thick crown of sealant applied around the group of penetrants on both the top and bottom of the assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. F-E-2020

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0565 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE JOIST FLOOR INSULATED METALLIC PIPE

F Rating 1 Hr.   T Rating 1 Hr.

1. FLOOR-CEILING ASSEMBLY - Constructed in the manner specified in individual G500 series floor-ceiling designs in the UL Fire Res. Dir.. Max. diameter of opening is 4-3/4" (121mm).

2. METALLIC PIPE - The following types of metallic pipes and tubing may be used:
   (A) STEEL PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 1-1/2" (38mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 1-1/2" (38mm) diameter (or smaller)
      Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

If AB/PVC (ARMAFLEX) pipe insulation is used for any of the above pipes, the max. diameter of pipe is 1" (25mm) or smaller.

3. PIPE INSULATION - Max. nominal 1" (25mm) thick or thinner FIBERGLASS or MINERAL FIBER pipe insulation. Max. nominal 3/4" (19mm) thick or thinner AB/PVC (ARMAFLEX) flexible foam pipe insulation.

The annular space between the insulated through penetrant and the periphery of the opening shall be 1/2" (13mm) to 5/8" (16mm) for FIBERGLASS or MINERAL FIBER insulation or 1/4" (6mm) to 5/8" (16mm) for (ARMAFLEX) insulation.

4. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant around the pipe where it penetrates the flooring and a min. 5/8" (16mm) depth where it penetrates the ceiling. On both the top and bottom surfaces of the assembly, a min. 1/4" (6mm) thick crown of sealant is applied around the insulated through penetrant on both the top and bottom of the assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
F-E-5007

DWG NO.    FS-0566 R1

DATE:  07/21/06

BY:  RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
METALLIC PIPE OR CONDUIT

F Rating 2 Hr.       T Rating 0 Hr.

(1) Wall
(3) Forming Material
(2) Pipe
(4) Sealant

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 24-5/8" (625mm).

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

The annular space between the pipe, conduit or tubing and the periphery of opening shall be min. 1/8" (3mm) to max. 1/2" (13mm).

3. FORMING MATERIAL - Min. 2" (51mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation firmly packed into opening as a permanent form. Recess from both surfaces of wall as required to accommodate the required thickness of sealant.

4. NELSON LBS3 SEALANT - Apply sealant over the forming material to a min. 1/4" (6mm) depth flush with both surfaces of the wall. Additional sealant to be installed such that a min. 1/4" (6mm) thick crown is formed around the penetrating item and lapping a min. 1/4" (6mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
W-J-1149

Project Name:
Address:
Installer:
Address:
Signature:

DWG NO. FS-0567 R0

DATE: 06/24/03
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
MULTIPLE METALLIC PIPES

F Rating 2 Hr.        T Rating 1 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick reinforced lightweight or normal weight concrete, wall or CMU wall. The max. area of opening is 33 sq. in. (213 sq. cm) with a max. dimension of 11" (279).

2. METALLIC PIPES or CONDUITS - One or more pipes, conduits or tubing to be installed within the opening. The following types of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 2" (51mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 2" (51mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.

   Only two penetrants shall have a nom diameter greater than 1" (25mm). Annular space between penetrants shall be a nom 1/2" (13mm). The annular space between penetrants and the periphery of the opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm).

3. FORMING MATERIAL - Used to prevent the leakage of sealant during installation. Install backer rod within the annular space, and recessed 5/8" (16mm) from both surfaces of wall.

4. NELSON LBS3 SEALANT - Apply min. 5/8" (16mm) thickness of sealant within the annulus, flush with both surfaces of the wall. At point of contact location between penetrants and concrete, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the concrete/penetrant interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0568 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
METALLIC PIPE OR CONDUIT

F Rating 2 Hr.  
T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. The max. diameter of opening is 5-1/8" (166mm).

2. METALLIC PIPE or CONDUIT - The following types of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   The annular space range is 0" (point of contact) to 2" (51mm).

3. FORMING MATERIAL - Used to prevent leakage of sealant during installation. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

4. NELSON LBS3 SEALANT - Apply sealant over the forming material to a min. 5/8" (16mm) depth flush with both surfaces of the wall. At areas of point of contact, apply a min. 3/8" (10mm) bead at the interface between the pipe and the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0569 R0

Project Name: ________________________________  DATE: 07/21/03
Address: __________________________________________________________________________
Installer: ________________________________  BY: RL
Address: __________________________________________________________________________
Signature: ________________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
FLEXIBLE METALLIC TUBING

F Rating 2 Hr.  T Rating 0 Hr.

(1) Wall

(2) Tubing

(3) Sealant

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 4" (102mm).

2. FLEXIBLE METALLIC TUBING - Max. (4) nominal 1" (25mm) diameter, (or smaller), aluminum flexible metal tubing. Annular space between tubing is 0" (point of contact) to 1/4" (6mm). Annular space between the through penetrants and periphery of opening shall be min. 0" (point of contact) to max. 1-1/2" (38mm).

3. NELSON LBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant applied within the annulus, flush with both surfaces of wall. At areas of point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the concrete/through interface on both surfaces of wall. Additional sealant shall be forced into interstices of through penetrants to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-1152

| Project Name: | __________________________ |
| Address: | __________________________ |
| Installer: | __________________________ |
| Address: | __________________________ |
| Signature: | __________________________ |

DWG NO. FS-0570 R1
DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL 
NONMETALLIC PIPE

F Rating 2 Hr.  T Rating 0 or 1 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete, or CMU block wall. Max. diameter of opening is 4" (102mm).
2. NONMETALLIC PIPE - The following types and sizes of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom. 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) piping systems.
   (C) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (E) ELECTRICAL NONMETALLIC TUBING (ENT) - Nom 1-1/2" (38mm) diameter (or smaller) PVC tubing.
   (F) CROSS LINKED POLYETHYLENE (PEX) TUBING - Nom 1-1/2" (38mm) diameter (or smaller) SDR 9 cross linked polyethylene (PEX) tubing for use in closed (process or supply) piping systems.

<table>
<thead>
<tr>
<th>Type of Through Penetrant</th>
<th>T Rating Hr.</th>
<th>Annular Space (Min., Max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC, CPVC Pipe, or PVC Conduit</td>
<td>1</td>
<td>5/8&quot;, 1&quot; (16, 25)</td>
</tr>
<tr>
<td>PVC ENT</td>
<td>1</td>
<td>3/8&quot;, 1-1/8&quot; (10, 29)</td>
</tr>
<tr>
<td>ABS Pipe, or PEX Tubing</td>
<td>0</td>
<td>3/8&quot;, 1-1/8&quot; (10, 29)</td>
</tr>
</tbody>
</table>

3. NELSON LBS3 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth, flush with both surfaces of wall. Additional sealant to be installed such that a min. 1/4" (6mm) thick crown is formed around the penetrating item.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-2146

Project Name: __________________________
Address: ________________________________
Installer: _______________________________
Address: ________________________________
Signature: ______________________________

DWG NO. FS-0571 R1

DATE: 07/21/06
BY: RL
MEA # 126-04-M

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
GLASS PIPE

F Rating 2 Hr.  T Rating 0 Hr.

(1) Wall
(2) Pipe
(3) Sealant

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 6" (152mm).

2. GLASS PIPE - Max. nominal 4" (102mm) diameter, or smaller glass pipe. For use in closed (process or supply) or vented (drain, waste, or vent) piping systems. The annular space between pipe and periphery of opening shall be min. 0" (point of contact) to max. 1-3/8" (35mm).

3. NELSON LBS3 SEALANT - Apply sealant within the annular space to a min. 5/8" (16mm) depth, flush with both surfaces of wall assembly. Additional sealant to be applied such that a min. 1/4" (6mm) crown is formed around the through penetrant on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-2147

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0572 R1
DATE: 07/21/06
BY: RL

MEA # 126-04-M
Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
NONMETALLIC PIPE

F Rating 2 Hr.       T Rating 1-1/2 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 4" (102mm).

2. NONMETALLIC PIPE - Max. 1" (25mm) nominal diameter, or smaller, SDR 9 Cross-linked Polyethylene (PEX) tubing for use in closed (process or supply) systems. A max. of three tubes to be bundled together and installed eccentrically or concentrically within the firestop system. Of the three tubes, a max. of one shall have a nom diameter greater than 3/4" (19mm). The annular space between the tubing and the periphery of the opening shall be min. 5/8" (16mm) to max. 1-1/4" (32mm). Separation between the tubing shall be a min. 0" (point of contact) to max. 3/8" (10mm).

3. FORMING MATERIAL (not shown) (optional) - Install backer rod into the opening and recess from both surfaces of wall as required to accomodate the required thickness of sealant.

4. NELSON LBS3 SEALANT - Apply to fill the annular space to a min. 5/8" (16mm) depth, flush with both surfaces of wall. Additional sealant to be forced within tubing bundle to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Classified
UL

System No.
W-J-2148

Nelson Firestop

DWG NO. FS-0573 R1

Date: 07/21/06

By: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL SLEEVED CABLES

F Rating 2 Hr.  T Rating 1/2 Hr.

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 4-1/2" (114mm).

2. METALLIC SLEEVE - Max. nominal 4" (102mm) diameter Sch 40 steel sleeve having cast into wall assembly with cement. Length of sleeve to be equal to thickness of wall plus 4" such that, when installed, the ends of the sleeve project 2" (51mm) beyond each side of the wall.

3. CABLES - Max. 25% fill of 25 pr. 24 awg, or smaller, PVC jacketed telephone cable.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 2" (51mm) depth, and recess 1" (25mm) from both ends of the sleeve. Forming material to be forced into interstices of cable group to max. extent possible.

5. NELSON LBS3 SEALANT - Apply sealant over the forming material to a min. 1" (25mm) depth, flush with both ends of the sleeve. Sealant to be tightly packed within interstices of cable bundle. A min. 1/2" (13mm) thick bead shall be applied at the steel sleeve/concrete interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0574 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 5" (127mm).

2. CABLES - Max. 40% cable fill of opening in any combination of:
   (A) max. 3/C #12awg copper conductor nonmetallic sheathed (ROMEX) cable.
   (B) max. 3/C #2/0 awg aluminum conductor service entrance cable (SER).
   (C) max. 24 fiber 62.5/125 uM fiber optic cable
   All above with PVC insulation and jacket materials.
   (D) max. 1C-350 kcmil or smaller copper conductor cable with a cross-linked polyethylene (XLPE) jacket.
   The annular space between the cable bundle and the periphery of the opening shall be a min. 0" (point of contact) to a max. 1" (25mm).

3. NELSON LBS3 SEALANT - Apply sealant fill the annular space to a min. 5/8" (16mm) depth. Apply flush with both surfaces of the wall. Sealant to be forced into interstices of cable group to max. extent possible. Additional sealant to be installed such that a min. 3/8" (10mm) thick crown is formed around the cable bundle on both sides of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0575 R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>07/21/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>MEA #:</td>
<td>126-04-M</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL CABLES

F Rating 2 Hr.  T Rating 1/2 Hr.

(1) Wall

(2,3) Cables

(4) Sealant

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 4" (102mm).

2. CABLE - Max. (1) 3/C #2/0 awg aluminum conductor service entrance cable, with PVC insulation and jacket. Annular space between the cable and periphery of the opening shall be a min. 0" (point of contact) to a max. 1-1/2" (38mm).

3. ARMORED or METAL CLAD CABLES - Max. (2) 3/C #2awg or smaller aluminum ARMORED cable or METAL CLAD cable with copper conductors. The annular space between the through penetrating item and the periphery of the opening shall be a min. 1/8" (3mm) to a max. 1-1/2" (38mm). The annular space between the cable and the ARMORED or METAL CLAD cables shall be a min. 1/8" (3mm) to a max. 1/2" (13mm).

4. NELSON LBS3 SEALANT - Apply sealant fill the annular space to a min. 5/8" (16mm) depth. Apply flush with both surfaces of the wall. Sealant to be forced into interstices of cable group to max. extent possible. Additional sealant to be installed such that a min. 1/4" (6mm) thick crown is formed around the cable bundle on both sides of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-3117

DWG NO. FS-0576 R1

DATE: 07/21/06

BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 4" (102mm).

2. CABLES - Max. 41% cable fill of opening in any combination of:
   (A) max. 2/C with ground #12 awg copper conductor cable (12-2 ROMEX) w/polyvinyl chloride (PVC) insulation and jacket.
   (B) max. RG/6 #18 awg Type CATV copper conductor coaxial cable w/polyvinyl chloride (PVC) insulation and jacket.
   (C) max. 1/C - 350 kcmil cable w/polyvinyl chloride (PVC) insulation and jacket.
   (D) max. 400pr #24 awg copper telephone cables, w/polyvinyl chloride (PVC) insulation and jacket.
   (E) max. 1/C - 350 kcmil cable w/cross linked polyethylene (XLPE) insulation and jacket.
   (F) max. 4/C, #2/0 aluminum or copper conductor, aluminum or steel jacketed METAL-CLAD or ARMORED-CLAD cable.

The annular space between the cable bundle (max. 2-3/4" (70mm)) and the periphery of the opening shall be a min. 0" (point of contact) to a max. 1-1/4" (32mm).

3. NELSON LBS3 SEALANT - Apply sealant to fill the annular space to a min. 5/8" (16mm) depth. Apply flush with both surfaces of the wall. Sealant to be forced into interstices of cable group to max. extent possible. Additional sealant to be installed such that a min. 3/8" (10mm) thick crown is formed, at the point of contact of cable bundle and wall, on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-3118

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL SLEEVED CABLES

F Rating 1 or 2 Hr.  T Rating 1/4 or 1/2 Hr.

1. WALL ASSEMBLY - Min. 4-7/8" (124mm) or 6-1/8" (156mm) thick lightweight or normal weight concrete wall, or CMU block wall for 1 or 2 Hr. rated assemblies, respectively. Max. diameter of opening is 5" (127mm).

2. METALLIC SLEEVE - Max. nominal 4" (102mm) diameter steel, iron or EMT sleeve with 0.083" (2mm) wall thickness, fitted into wall opening with a max. annular space of 1/2" (13mm) between the edge of the wall opening. Length of sleeve to be equal to thickness of wall plus 2" (51mm), such that when installed, the ends of the sleeve project 1" (25mm) beyond each side of the wall.

3. CABLES - Max 55.6% cable fill of opening in any combination of:
   (A) max. 4/C #12awg or smaller cable.
   (B) max. #18awg RG6/U coaxial cable.
   (C) max. 62.5/125 micron, Type OFN, fibre optic cables.
   All with PVC insulation and jacket.
   (D) max. 1/C #350MCM cable with XLPE insulation and jacket.
   (E) max. Type RG59/U coaxial cables with polyethylene insulation and PVC jacket.

   The annular space between cable bundle and edge of sleeve shall be a min. 0" (point of contact) to max. 1/8" (3mm).

4. NELSON LBS3 SEALANT - Apply sealant to fill the annular space between sleeve and wall opening to a min. 5/8" (16mm) thickness, flush with wall surfaces. Min. 1/2" (13mm) thickness of sealant applied within the annulus between cable bundle and sleeve, flush with ends of sleeve. Sealant to be forced into interstices of cable group to max. extent possible. A min. 3/8" (10mm) bead of the sealant shall be applied at the point contact locations of the sleeve with wall and cable bundle with sleeve on both sides of the wall assembly.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No.
W-J-3119

DWG NO.  FS-0578 R1

DATE:  07/21/06
BY:  RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL CABLE TRAY

F Rating 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Min. 5" (127mm) reinforced lightweight or normal weight concrete or CMU block wall. The max. area of opening is 136.5 sq. in. (881 sq. cm) with a max. dimension of 22-3/4" (578mm).

2. CABLE TRAY - Max. 18" (457mm) wide x 5" (127mm) deep open ladder type cable tray with channel-shaped side rails formed of min. 0.069 in. (2mm) thick aluminum and with 1" (25mm) wide by 7/8" (22mm) deep rungs spaced (229mm) OC. The annular space between the cable tray and periphery of the opening shall be min. 3/8" (10mm) to max. 1-9/16" (40mm).

3. CABLES - Max. 20% cable fill of opening in any combination of:
   (A) max. 1/C - 350 kcmil cable w/cross linked polyethylene (XLPE) jacket.
   (B) max. 3/C #2awg cable w/XLPE insulation and polyvinyl chloride (PVC) jacket.
   (C) max. 7/C #12awg cable w/PVC insulation and jacket.
   (D) max. 2/C #16awg cable w/PVC insulation and jacket.

4. FORMING MATERIAL - Min. 4" (102mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation firmly packed into opening. Forming material to be forced into interstices of cable group to max. extent possible and recessed 1/2" (13mm) from both surfaces of wall.

5. NELSON LBS3 SEALANT - Min. 1/2" (13mm) thickness of sealant applied within the annulus on both surfaces of wall. Sealant to be forced into interstices of cable group to max. extent possible. Additional sealant to be installed such that a min. 1/2" (13mm) thick crown is formed around the penetrating item and lapping a min. 1/2" (13mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0579 R1
DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL INSULATED METALLIC PIPE

F Rating 2 Hr.  T Rating 1-1/2 Hr.

(1) Wall  (5) Sealant
(2) Pipe
(3) Insulation  (4) Forming Material  (6) Jacket

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 13" (330mm).

2. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 8" (203mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 1-1/2" (38mm) thick, or thinner, CALCIUM SILICATE insulation. The insulation material may be jacketed with 0.010 in. (.254mm) thick aluminum sheet wrapped tightly around with a min. 2" (51mm) overlap. Jacket to be secured with stainless steel hose clamps. The annular space between insulated through penetrant and periphery of opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr. fire-rated assemblies. Install foam backer rod firmly packed into opening as a permanent form. Forming Material to be recessed from both surfaces of wall as required to accommodate the thickness of sealant.

5. NELSON LBS3 SEALANT - Apply over the forming material to a min. 5/8" (16mm) depth, flush with both surfaces of the wall. At areas of point of contact, apply a 3/8" (10mm) bead at the concrete/insulated through penetrant interface on both surfaces of wall.

6. METAL JACKET - Min. 12" (305mm) long jacket formed of min. 0.010 in (.254mm) thick aluminum sheet cut to wrap tightly around the pipe insulation with a min. 2" (51mm) lap and secured using 1/2" (13mm) wide by 0.028 in. (.711mm) thick stainless steel hose clamps. Clamps to be located within 2" (51mm) of each end of the jacket and spaced max. 10" (254mm) OC.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. W-J-5106

DWG NO. FS-0580 R1

Project Name: ____________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________

Signature: ________________________________

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL INSULATED METALLIC PIPE

F Rating 2 Hr.  T Rating 1-1/2 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of opening is 18" (457mm).

2. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 10" (254mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 10" (254mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 3" (76mm) thick, CELLULAR GLASS pipe insulation. The annular space between insulated through penetrant and periphery of opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr. fire-rated assemblies. Install foam backer rod firmly packed into opening as a permanent form. Forming material to be recessed from both surfaces of wall as required to accommodate the thickness of sealant.

5. NELSON LBS3 SEALANT - Apply over the forming material to a min. 5/8" (16mm) depth, flush with both surfaces of the wall. At areas of point of contact, apply a 3/8" (10mm) bead at the concrete/insulated through penetrant interface on both surfaces of wall after installation of the metal jacket.

6. METAL JACKET - Min. 12" (305mm) long jacket formed of min. 0.010 in. (.25mm) thick aluminum sheet cut to wrap tightly around the pipe insulation with a min. 2" (51mm) lap and secured using 1/2" (13mm) wide by 0.028 in. (.71mm) thick stainless steel hose clamps. Clamps to be located within 2" (51mm) of each end of the jacket and spaced max. 10" (254mm) OC. Jacket to be installed with edge abutting surface of sealant on each side of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-5107

DWG NO. FS-0581 R1

DATE: 07/13/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
INSULATED METALLIC PIPE

F Rating 2 Hr. T Rating 1 or 1-1/2 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 12" (305mm).

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) or 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) or 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 4" (102mm) or 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation. The annular space is min. 0" (point of contact) to max. 1-3/8" (35mm).

4. FORMING MATERIAL - Used to prevent leakage of sealant during installation. Install backer rod within the annular space, and recess 3/8" (16mm) from both surfaces of the wall.

5. NELSON LBS3/ES1399 SEALANT - Apply sealant within the annular space to a min. 5/8" (16mm) depth. At areas of point of contact, apply a min. 3/8" (10mm) bead at the interface between the concrete/insulated through penetrant insulated through penetrant on both surfaces of the wall. Max. pipe diameter to be used with LBS3 is 4" (102mm) and the T rating is 1-1/2 Hr. Max. pipe diameter to be used with ES1399 is 6" (152mm) and T rating is 1 Hr.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-5108

DWG NO. FS-0582 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL INSULATED METALLIC PIPE

F Rating 2 Hr. T Rating 1/2 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 7" (178mm).

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 3/4" (19mm) thick (or thinner) AB/PVC (ARMAFLEX) foam insulation. The annular space between the insulated through penetrant and the periphery of the opening shall be a min. 0" (point of contact) to max. 1-1/4" (32mm).

4. FORMING MATERIAL - Used to prevent leakage of sealant during installation. Install backer rod within the annular space and recess 5/8" (16mm) from both surfaces of wall.

5. NELSON LBS3 SEALANT - Apply sealant over the forming material to a min. 5/8" (16mm) depth, flush with both surfaces of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at the concrete/insulation interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-5109

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0583 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 3/4 or 1-1/2 Hr.

1. WALL ASSEMBLY - Min. 4-7/8" (124mm) or 6-1/8" (156mm) thick lightweight or normal weight concrete for 1 or 2 hr. fire-rated wall or CMU wall assemblies. Max. diameter of opening is 14" (356mm).

2. METALLIC SLEEVE - Sleeve fabricated from min. 0.018 (.46mm) thick (No. 28 GA) galvanized sheet steel and having a min. 1" (25mm) lap along the longitudinal seam. The inside diameter of sleeve shall be min. 1" (25mm) larger than the outside diameter of pipe covering. Sleeve installed by coiling the sheet steel to a diameter smaller than the through opening in the concrete or block wall, inserting the coil through the opening and releasing the coil to let it uncoil against the circular wall opening.

3. METALLIC PIPE - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

4. PIPE INSULATION - Nominal 3" (76mm) thick or thinner FIBERGLASS or MINERAL FIBER pipe insulation. The annular space range is 0" (point of contact) to 1-7/8" (48mm).

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cm) mineral wool batt insulation to fill the annular space to a 3" (76mm) or 4" (102mm) depth for 1 or 2 hr rated wall, and recess 1" (25mm) from both surfaces of the wall.

6. NELSON LBS3 SEALANT - Apply sealant over the forming material to a min. 1" (25mm) depth, flush with both surfaces of the wall. At areas of point of contact, apply a 3/8" (10mm) bead at the interface between the wall/sleeve/insulation interface on both sides of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO.  FS-0584 R1

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
HVAC DUCT

F Rating 2 Hr.          T Rating 1 Hr.

(2) HVAC Duct          (3) Forming Material

(1) Wall              (4) Sealant

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete, or CMU block wall. Max. area of opening is 196 sq. in. (1265 sq. cm), with a max. dimension of 14" (356mm).

2. STEEL HVAC DUCT - 12" x 12" (305mm) x 305mm), or smaller, No. 24 gauge, or heavier, steel duct installed concentrically within the opening. The duct is to be rigidly supported on both sides of the wall. A nom 1" (25mm) annular space is required within the firestop system.

3. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3-1/2" (89mm) depth, and recess 3/4" (19mm) from both surfaces of the wall.

4. NELSON LBS3 SEALANT - Apply over the forming material to fill the annular space to a min. 3/4" (19mm) depth on both sides of the wall. Additional sealant to be installed such that a min. 1/4" (6mm) thick crown is formed around the penetrating item and lapping a min. 1/4" (6mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
W-J-7061

Nelson Firestop

Project Name:  
Address:  
Installer:
Address:  
Signature:  

DWG NO.  FS-0585 R1

DATE:  07/21/06
BY:  RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
HVAC DUCT

F Rating 2 Hr.        T Rating 0 Hr.

(3) Forming Material  (4) Sealant

(2) HVAC Duct

(1) Wall

(5) Frame

1. WALL ASSEMBLY - Min 6" (152mm) thick lightweight or normal weight concrete, or CMU block wall. The max. area of opening is 989 sq. in. (6381 sq. cm) with max. dimensions of 43" (1092mm).

2. RECTANGULAR STEEL HVAC DUCT - 40 x 20" (1016mm x 508mm), (or smaller), No. 24 gauge, or heavier, steel duct installed concentrically or eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall. The space between the steel duct and periphery of opening shall be min. 3/4" (19mm) to max. 2-1/4" (57mm). During the installation of the steel duct, internal support members consisting of nom 1/2" (13mm) diameter threaded steel shall be installed within the center of the steel duct on both sides of wall assembly. In addition to the threaded steel rod, external supports consisting of min. 1-1/2" (38mm) x 1-1/2" (38mm) x 3/16" (5mm) thick steel angles to be installed around the outer perimeter of the steel duct and secured to the steel duct by means of No. 10 x 3/4" (19mm) long steel sheet metal screws spaced a max. 8" (203mm) OC.

3. FORMING MATERIAL - Install backer rod, mineral wool, or fiberglass batt insulation into the opening and recess 5/8" (16mm) from both surfaces of the wall.

4. NELSON LBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant applied within the annulus, flush with both surfaces of wall.

5. METAL FRAME - Min. 16 GA galv steel angles sized to lap steel duct a min. of 2" (51mm) and lap wall surfaces a min. 1" (25mm). Angles attached to steel duct on both sides of wall with min. #10 x 1/2" (13mm) long steel sheet metal screws spaced a max. of 1" (25mm) from each end of steel duct and spaced a max. 6" (152mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

SYSTEM NO. W-J-7062

DWG NO. FS-0586 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
METALLIC DUCT

F Rating 2 Hr.  T Rating 0 Hr.

(1) Wall
(2) Duct
(3) Forming Material
(4) Sealant

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU wall. Max. diameter of opening is 5" (127mm).

2. METALLIC DUCT - Max. nominal 4" (102mm) diameter, or smaller, No. 30 MSG (or heavier) steel vent duct. Duct to be rigidly supported on both sides of wall assembly. The annular space between duct and periphery of opening shall be min. 0" (point of contact) to max. 7/8" (22mm).

3. FORMING MATERIAL - Used to prevent the leakage of sealant during installation. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

4. NELSON LBS3 SEALANT - Apply to fill the annular space around the duct to a min. 5/8" (16mm) depth. At areas of point of contact, apply a 3/8" (10mm) diameter bead of sealant at the concrete/through penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-J-7063

DWG NO. FS-0587 R1
DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
FLEXIBLE METALLIC CONDUIT

F Rating 1 or 2 Hr.  T Rating 1/2 Hr.

(1) Wall
(2) Conduit
(3) Sealant

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 1-3/8" (35mm).

2. FLEXIBLE METALLIC CONDUIT - Max. 1/2" (13mm) nominal diameter, (or smaller), steel or aluminum flexible metal conduit. The annular space shall be min. 1/8" (3mm) to a max. 1/4" (6mm).

3. NELSON LBS3 SEALANT - Sealant applied to completely fill the annular space between the through penetrant and the periphery of the opening to max. extent possible. In 1 Hr. or 2 Hr. fire rated assemblies, additional sealant to be installed such that a min. 1" (25mm) or 3/8" (10mm) crown is formed around the penetrating item, respectively and lapping 1/2" (13mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0588 R1

System No. W-L-1332

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
METALLIC PIPE OR CONDUIT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 24-5/8" (625mm) for steel stud walls and 14-1/2" (368mm) for wood stud walls.

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   The annular space between pipes, tubing or conduits and periphery of opening shall be min. 1/8" (3mm) to max. 1/2" (13mm).

3. FORMING MATERIAL - In 2 Hr. wall assemblies, min. 2" (51mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation firmly packed into opening. In 1 Hr. wall assemblies, min. 3-3/4" (95mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation firmly packed into opening. Forming material to be recessed from both surfaces of wall as required to accommodate the required thickness of sealant.

4. NELSON LBS3 SEALANT - In 2 Hr wall assemblies, apply sealant within the annular space around the through penetrant to a min. 1/4" (6mm) depth, flush with both surfaces of the wall. Additional sealant to be installed such that a min. 1-1/4" (32mm) thick crown is formed around the penetrating item and lapping a min. 1/4" (6mm) beyond the periphery of the opening. In 1 Hr. wall assemblies, a min. 1/2" (13mm) thick crown is formed around the penetrating item and lapping a min. 1/2" (13mm) beyond the periphery of the opening on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0589 R0

Project Name: ____________________________  DATE: 07/08/03
Address: ________________________________  BY: RL
Installer: ________________________________
Address: ________________________________
Signature: ________________________________

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
METALLIC PIPE OR CONDUIT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 26-3/8" (670mm) for steel stud walls and 14-1/2" (368mm) for wood stud walls.

2. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   The annular space between pipes, tubing or conduits and periphery of opening shall be min. 0" (point of contact) to max. 2" (51mm).

3. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr. fire-rated assemblies. Install backer rod into the opening and recess 5/8" (16mm) from the both surfaces of the wall.

4. NELSON LBS3 SEALANT - Apply sealant within the annular space around the through penetrant to a min. 5/8" (16mm) depth, flush with both surfaces of the wall. At areas of point of contact, apply a 3/8" (10mm) bead at the interface between the through penetrant and both surfaces of the wall. An additional 1/4" (6mm) crown of sealant shall be applied around the entire circumference of the penetrant at both wall surfaces.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

System No. W-L-1334

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0590 R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>07/21/06</td>
</tr>
<tr>
<td>BY</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. area of opening is 33 sq. in. (213 sq. cm) with max. dimensions of 11" (279mm).

2. METALLIC PIPES or CONDUITS - One or more pipes, conduits or tubing to be installed within the opening. The following types of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 2" (51mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 2" (51mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.

The annular space between pipes, conduits or tubing and periphery of opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm). Of the through penetrants, only two through penetrants shall have a nom diameter greater than 1" (25mm).

3. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr. fire-rated assemblies. Install backer rod within the annular space, and recess from both surfaces of wall as required to accommodate the required thickness of sealant.

4. NELSON LBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant applied within annulus, flush with both surfaces of wall. At areas of point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the gypsum wallboard/through penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-1335

**Classification**

DWG NO. FS-0591 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
<th>DATE:</th>
<th>07/21/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
<td>MEA #</td>
<td>126-04-M</td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
METALLIC PIPE OR CONDUIT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 8-1/8" (156mm).

2. METALLIC PIPE or CONDUIT - The following types of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   The annular space between pipes, tubing or conduits and periphery of opening shall be a min. 0" (point of contact) to max. 2" (51mm).

3. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr. fire-rated assemblies. Install backer rod into the opening and recess 5/8" (16mm) from the both surfaces of the wall.

4. NELSON LBS3 SEALANT - Apply sealant within the annular space around the through penetrant to a min. 5/8" (16mm) depth, flush with both surfaces of the wall. At areas of point of contact, apply a 3/8" (10mm) bead at the interface between the through penetrant and both surfaces of the wall.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No.
W-L-1336

DWG NO. FS-0592 R0

DATE: 07/08/03
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 4" (102mm).

2. FLEXIBLE METALLIC TUBING - Max. (4) nominal 1" (25mm) diameter, (or smaller), aluminum flexible metal tubing. Annular space between tubing is 0" (point of contact) to 1/4" (6mm). Annular space between the through penetrants and periphery of opening shall be min. 0" (point of contact) to max. 1-1/2" (38mm).

3. NELSON LBS3 SEALANT - Apply min. 5/8" (16mm) thickness of sealant within the annulus, flush with both surfaces of wall. At areas of point of contact, a min. 3/8" (10mm) the diameter bead of sealant shall be applied at the gypsum wallboard/through penetrant interface on both surfaces of wall. Additional sealant shall be forced into interstices of through penetrants to max. extent possible.

Tested in accordance with:
ASTM E–814
ANSI/UL 1479

Nelson Firestop

System No. W-L-1337

DWG NO. FS-0593 R1

Project Name: ____________________________
Address: ________________________________

Installer: _________________________________
Address: ________________________________

Signature: ________________________________

DATE: 07/21/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
NONMETALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 0 or 1 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 4" (102mm).

2. NONMETALLIC PIPE or TUBING - The following types and sizes of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (waste, drain or vent) piping systems.
   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) or vented (waste, drain or vent) piping systems.
   (C) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 1-1/2" (38mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (E) ELECTRICAL NONMETALLIC TUBING (ENT) - Nom 1-1/2" (38mm) diameter (or smaller) PVC tubing.
   (F) CROSS LINKED POLYETHYLENE (PEX) TUBING - Nom 1-1/2" (38mm) diameter (or smaller) SDR 9 cross linked polyethylene (PEX) tubing for use in closed (process or supply) piping systems.

<table>
<thead>
<tr>
<th>Type of Through Penetrant</th>
<th>F Rating (Hr.)</th>
<th>T Rating (Hr.)</th>
<th>Annular Space (Min. Max.) In. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC Pipe, CPVC Pipe or PVC Conduit</td>
<td>2</td>
<td>1</td>
<td>5/8&quot;, 1&quot; (16, 25)</td>
</tr>
<tr>
<td>PVC ENT</td>
<td>2</td>
<td>1</td>
<td>3/8&quot;, 1-1/8&quot; (10, 29)</td>
</tr>
<tr>
<td>ABS Pipe or PEX Tubing</td>
<td>2</td>
<td>0</td>
<td>3/8&quot;, 1-1/8&quot; (10, 29)</td>
</tr>
<tr>
<td>PVC Pipe, CPVC Pipe or PVC Conduit</td>
<td>1</td>
<td>0</td>
<td>5/8&quot;, 1&quot; (16, 25)</td>
</tr>
<tr>
<td>PVC ENT, ABS Pipe or PEX Tubing</td>
<td>1</td>
<td>0</td>
<td>3/8&quot;, 1-1/8&quot; (10, 29)</td>
</tr>
</tbody>
</table>

3. NELSON LBS3 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth, flush with both surfaces of wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrating item. Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

---

Nelson Firestop

**DWG NO. FS-0594 R1**

**DATE:** 07/21/06

**BY:** RL

**MEA # 126-04-M**

Nelson Firestop

800 331-7325  Fax: 918 627-2941

Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of opening is 6" (152mm).

2. GLASS PIPE - Max. 4" (102mm) nominal diameter glass pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems. The annular space between pipe and periphery of opening shall be min. 0" (point of contact) to max. 1-3/8" (35mm).

3. NELSON LBS3 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth, with an additional 1/4" (6mm) bead around the pipe, on the surface of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-2382

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

DWG NO. FS-0595 R1

DATE: 07/21/06
BY: RL

MEA # 126-04-M
GYPSUM WALL
NONMETALLIC TUBING

F Rating 1 or 2 Hr.  T Rating 1 or 1-1/2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 4" (102mm).

2. NONMETALLIC TUBING - Nominal 1" (25mm) diameter, or smaller, Cross-linked Polyethylene SDR9 (PEX) tubing. For use in closed (process or supply) systems. A max. of three tubes to be bundled together and installed eccentrically or concentrically within the firestop system. Of the three tubes, a max. of one shall have a nom diameter greater than 3/4" (19mm). The annular space between the tubing and the periphery of the opening shall be min. 5/8" (16mm) to max. 1-1/4" (32mm). Separation between the tubing shall be a min. 0" (point of contact) to max. 3/8" (10mm).

3. FORMING MATERIAL (not shown) (optional) - Install backer rod into the annular space to control the sealant depth in 2 Hr. fire-rated wall assemblies. Recess the backer rod 5/8" (16mm) from both surfaces of the wall.

4. NELSON LBS3 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) depth, flush with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-2383

Project Name: ____________________________  DATE: 07/21/06
Address: ____________________________
Installer: ____________________________
Address: ____________________________
Signature: ____________________________

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Construct as specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. diameter of the opening is 4-1/2" (114mm).

2. METALLIC SLEEVE - Max. nominal 4" (102mm) diameter or smaller, Sch. 40 steel sleeve friction fitted into wall opening. Sleeve will extend a nominal 2" (51mm) beyond each surface of the wall.

3. CABLES - Max. 25% fill of 25pr #24awg or smaller polyvinyl chloride (PVC) insulated and jacketed telephone cable.

4. FORMING MATERIAL - Min. 2" (51mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation tightly packed into opening. Forming material to be forced into interstices of cable group to max. extent possible. Forming material to be recessed 1" (25mm) from both wall surfaces.

5. NELSON LBS3 SEALANT - Min. 1" (25mm) thickness of sealant applied within the annulus, flush with ends of sleeve. Sealant to be forced into interstices of cable group to max. extent possible. A min. 1/2" (13mm) thick bead shall be applied at the steel sleeve/gypsum wallboard interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-3239

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 07/21/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td>BY: RL</td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

MEA # 126-04-M

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL CABLES

F Rating 1 or 2 Hr.  T Rating 0 or 1/2 Hr.

1. WALL ASSEMBLY- Construct as specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. diameter of the opening is 4" (102mm).

2. CABLE - Max. 3/C #2/0awg aluminum conductor service entrance cable with PVC insulation and jacket materials. The annular space between the cable and the periphery of the opening shall be a min. 0" (point of contact) to a max. 1-1/2" (38mm). Max. one cable to be installed concentrically or eccentrically within the opening.

3. ARMOURED or METAL CLAD CABLES - Max. 3/C #2awg aluminum ARMOURED cable or METAL CLAD cable with copper conductors. Max. two lengths to be installed concentrically or eccentrically within the opening in addition to the service entrance cable. The annular space between the cable and the ARMOURED or METAL CLAD cables shall be a min. 1/8" (3mm) to a max. 1/2" (13mm). The annular space between the ARMOURED or METAL CLAD cables and the periphery of the opening shall be a min. 1/8" (3mm) to a max. 1-1/2" (38mm).

4. NELSON LBS3 SEALANT - Min. 5/8" (16mm) depth of sealant applied within annulus, flush with both surfaces of wall. Sealant to be forced into interstices of cable group to max. extent possible. Additional sealant to be installed such that a min. 1/4" (6mm) thick crown is formed around the cable bundle on both sides of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-3240

DWG NO. FS-0598 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
GYPSUM WALL CABLES

F Rating 1 or 2 Hr.  T Rating 0 or 1/2 Hr.

1. WALL ASSEMBLY- Construct as specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. diameter of the opening is 5" (127mm).

2. CABLES - Max. 40% cable fill of opening in any combination of:
   (A) max. 1/C-350 kcmil copper conductor cable with a cross-linked polyethylene (XLPE) jacket.
   (B) max. 3/C #2/0awg aluminum conductor service entrance cable (SER) with polyvinyl chloride (PVC) insulation and jacket.
   (C) max. 3/C #12awg copper conductor nonmetallic sheathed (ROMEX) cable with PVC insulation and jacket.
   (D) max. 24 fiber 62.5/125 uM fiber optic cable with PVC insulation and jacket.

   The annular space between the cable bundle and the periphery of the opening shall be a min. 0" (point of contact) to a max. 1" (25mm).

3. NELSON LBS3 SEALANT - Apply within the annulus to a min. 5/8" (16mm) depth, flush with both surfaces of wall. Sealant to be forced into interstices of cable group to max. extent possible. Additional sealant to be installed such that a min. 3/8" (10mm) thick crown is formed around the cable bundle on both sides of wall.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

---

System No.
W-L-3241

Nelson Firestop
DWG NO.  FS-0599 R1

DATE: 07/20/06
BY: RL

MEA # 126-04-M

800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL CABLES

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY: Construct as specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. diameter of the opening is 4" (102mm).

2. CABLES - Max. 41% cable fill of opening in any combination of:
   (A) max. 2/C #12awg copper conductor cable (12-2 ROMEX)
   (B) max. RG-6 #18awg Type CATV copper conductor coaxial cable
   (C) max. 1/C-350 kcmil cable
   (D) max. 400pr #24awg copper telephone cables
   All with polyvinyl chloride (PVC) insulation and jacket
   (E) max. 1/C 350 kcmil cable with cross-linked polyethylene (XLPE) insulation and jacket
   (F) max. 4/C #2/0 aluminum or copper conductor, aluminum or steel jacketed METAL CLAD or ARMORED CLAD cable.

   The annular space between the cable bundle and the periphery of opening shall be a min. 0" (point of contact) to max. 1-1/4" (32mm).

3. NELSON LBS3 SEALANT - Apply within the annulus to a min. 5/8" (16mm) depth, flush with both surfaces of wall. Sealant to be forced into interstices between the cables, prior to securing the bundle together, at both surfaces of wall. Additional sealant to be installed such that a min. 3/8" (10mm) thick crown is formed, at the point of contact of cable bundle and wall, on both surfaces of wall.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. W-L-3242

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
GYPSUM WALL CABLES

F Rating 1 or 2 Hr.  T Rating 1/4 or 1/2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as showing the UL Fire Resistance Directory. Max. diameter of opening is 5" (127mm).

2. METALLIC SLEEVE - Nom 4" (102mm) diameter or smaller steel, iron, or EMT sleeve with 0.083 in. (2mm) wall thickness, fitted into wall opening with a max. annular space of 1/2" (13mm) between the edge of the wall opening. Sleeve to project 1" (25mm) beyond each surface of the wall.

3. CABLES - Nominal 55.6% of cable fill of opening in any combination of:
   (A) max. 4/C #12awg cable.
   (B) max. #18awg RG6/U coaxial cable.
   (C) max. 62.5/125 micron, Type OFNR, fibre optic cables.
   All with PVC insulation and jacket.
   (D) max. Type RG59/U coaxial cables with polyethylene (PE) insulation and PVC jacket.
   (E) max. 1/C #350 MCM cable with (XLPE) insulation and jacket.

   The annular space between cable bundle and edge of metallic sleeve shall be a min. 0" (point of contact) to max. 1/8" (3mm).

4. NELSON LBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant applied within the annulus, between sleeve and wall opening, flush with wall surfaces. Min. 1/2" (13mm) thickness of sealant applied within the annulus between cable bundle and sleeve, flush with ends of sleeve. Sealant to be forced into interstices of cable group to seal any voids on both surfaces of wall. A min. 3/8" (10mm) bead of sealant shall be applied at the point contact locations of the sleeve with wall and cable bundle with sleeve on both sides of the wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-3243

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0601 R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>07/20/06</td>
</tr>
<tr>
<td>BY</td>
<td>RL</td>
</tr>
<tr>
<td>MEA #</td>
<td>126-04-M</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL CABLE TRAY

F Rating 1 or 2 Hr.  T Rating 1/2 Hr.

(1) Wall
(2) Cable Tray
(3) Cables
(4) Forming Material
(5) Sealant

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as showing the UL Fire Resistance Directory. The max. area of opening is 87 or 136.5 sq. in. (561 sq. cm or 881 sq. cm) with a max. dimension of 14-1/2" (366mm) or 22-3/4" (578mm), if the cable tray is installed in a wood or steel stud/gypsum wallboard assembly, respectively.

2. CABLE TRAY - Max. 18" (457mm) wide x 5" (127mm) deep aluminum open ladder type cable tray. The annular space between the cable tray and periphery of the opening shall be min. 3/8" (10mm) to max. 1-9/16" (40mm). The max. width of the cable tray is 12" (305mm) or 18" (457mm), if the cable tray is installed in a wood or steel stud/gypsum wallboard assembly, respectively.

3. CABLES - Max. 20% cable fill of opening in any combination of:
   (A) max. 1/C - 350 kcmil cable w/cross linked polyethylene (XLPE) jacket.
   (B) max. 3/C #2awg cable w/XLPE insulation and polyvinyl chloride (PVC) jacket.
   (C) max. 7/C #12awg cable w/PVC insulation and jacket.
   (D) max. 2/C #16awg cable w/PVC insulation and jacket.

4. FORMING MATERIAL - Min. 3-7/8" (98mm) or 4" (102mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation, if installed in a 1 Hr. or 2 Hr. fire rated wall assemblies, respectively. Forming material to be forced into interstices of cable group to max. extent possible. Forming material to be recessed 1/2" (13mm) from both surfaces of wall.

5. NELSON LBS3 SEALANT - Min. 1/2" (13mm) thickness of sealant applied within the annulus on both surfaces of wall. Sealant to be forced into interstices of cable group to max. extent possible. Additional sealant to be installed such that a min. 1/2" (13mm) thick crown is formed around the penetrating item and lapping a min. 1/2" (13mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-4045

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer:</td>
<td>Address:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DWG NO. FS-0602 R1
DATE: 07/20/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of the opening is 13" (330mm).

2. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 8" (203mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 1-1/2" (38mm) thick (or thinner) CALCIUM SILICATE pipe insulation. The annular space between insulated through penetrant and periphery of opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm).

4. INSULATION JACKET (not shown) - Min. 12" (305mm) long jacket formed of min. 0.010" (.25) thick aluminum sheet cut to wrap tightly around the pipe insulation with a min. 2" (51mm) lap and secured using 1/2" (13mm) wide x 0.028" (.71mm) thick stainless steel hose clamps.

5. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

6. NELSON LBS3 SEALANT - Apply sealant to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant shall be applied to the wall/pipe covering interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
W-L-5211

DWG NO. FS-0603 R1

DATE: 07/20/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
INSULATED METALLIC PIPE

F Rating 1 or 2 Hr. T Rating 3/4 or 1-1/2 Hr.

(1) Wall
(2) Pipe
(3) Pipe Insulation
(4) Metal Jacket
(5) Forming Material
(6) Sealant

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 18" (457mm) and 14-1/2" (368mm) for steel or wood stud walls, respectively.

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 10" (254mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 10" (254mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 3" (76mm) thick CELLULAR GLASS pipe insulation. The annular space between insulated through penetrant and periphery of opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm).

4. INSULATION JACKET - Min. 12" (305mm) long jacket formed of min. 0.010" (.25mm) thick aluminum sheet cut to wrap tightly around the pipe insulation with a min. 2" (51mm) lap and secured using 1/2" (13mm) wide x (.71mm) thick stainless steel hose clamps. Jacket to be installed with edge abutting surface of sealant on each side of wall.

5. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

6. NELSON LBS3 SEALANT - Apply sealant to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. After installation of the metal jacket, min. 3/8" (10mm) diameter bead of sealant shall be applied to the metal jacketing/sealant interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0604 R1
DATE: 07/13/06
BY: RL

System No. W-L-5212

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 1 or 1-1/2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of the opening is 12" (305mm).

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) or 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) or 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 4" (102mm) or 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation. The annular space between the insulated through penetrant and the periphery of the opening shall be a min. 0" (point of contact) to a max. 1-3/8" (35mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of the wall.

5. NELSON LBS3/ES1399 SEALANT - Apply sealant within the annular space to a min. 5/8" (16mm) depth. At areas of point of contact, apply a min. 3/8" (10mm) bead at the interface between the gyspsum/insulated through penetrant on both surfaces of the wall. Max. pipe diameter to be used with LBS3 is 4" (102mm) and the T rating is 1-1/2 Hr. Max. pipe diameter to be used with ES1399 is 6" (152mm) and T rating is 1 Hr.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO.  FS-0605 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DATE: 07/14/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of the opening is 7" (178mm).

2. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nom 3/4" (19mm) thick (or thinner) AB/PVC (ARMAFLEX) pipe insulation. Annular space between the insulated through penetrant and the periphery of the opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of the wall.

5. NELSON LBS3 SEALANT - Apply sealant to fill the annular space to a nom 5/8" (16mm) depth on both sides of the wall. At areas of point of contact, apply a min. 3/8" (10mm) diameter bead of sealant at the gypsum wallboard/insulated through gypsum penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-5214

DWG NO. FS-0606 R1

DATE: 07/20/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 3/4 or 1-1/2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of the opening is 14-1/2" (368mm) or 18-5/16" (465mm) in wood or steel stud walls. The inside diameter of the opening shall be min. 1" (25mm) larger than the outside diameter of insulation.

2. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 30 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation. The annular space between the insulated through penetrant and the periphery of the opening shall be a min. 0" (point of contact) to a max. 1-9/16" (40mm).

4. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 Hr. fire-rated assemblies. Install backer rod into the opening and recess 5/8" (16mm) from both surfaces of wall.

5. NELSON LBS3 SEALANT - Apply sealant over the forming material to fill the annular space to a min. 5/8" (16mm) depth. At areas of point of contact, a min. (10mm) diameter bead of sealant shall be applied at the gypsum board/insulated through penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
W-L-5215

DWG NO. FS-0607 R1

DATE: 07/20/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 3/4 or 1-1/2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. diameter of opening is 14" (356mm).

2. METALLIC SLEEVE - Cylindrical sleeve fabricated from min. 0.018" (46mm) thick 28 GA galv. sheet steel and having a min 1" (25mm) lap along the longitudinal seam. The inside diameter of sleeve shall be a min. 1" (25mm) larger than the outside diameter of pipe covering.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   (D) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit.

4. PIPE INSULATION - Nominal 3" (76mm) thick (or thinner) FIBERGLASS or MINERAL FIBER pipe insulation. The annular space between the insulated through penetrant and the metallic sleeve shall be a min. 1/8" (4mm) in thickness.

5. FORMING MATERIAL - Tightly pack 3" (76mm) or 4" (102mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space and recess 1" (25mm) from both surfaces of the 1 Hr or 2 Hr. wall, respectively.

6. NELSON LBS3 SEALANT - Apply sealant over the forming material to a min. 1" (25mm) depth, flush with both surfaces of the wall. At areas of point of contact, apply a 3/8" (10mm) bead of sealant shall be applied to the wall/sleeve/insulation interface on both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
W-L-5216

DWG NO.  FS-0608 R1

DATE:  07/20/06
BY:  RL

MEA #: 126-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
HVAC DUCT

F Rating 1 or 2 Hr.        T Rating 1 Hr.

(1) Wall
(2) HVAC Duct
(3) Forming Material
(4) Sealant

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. area of opening is 196 sq. in. (1265 sq. cm), with a max. dimension of 14" (356mm).

2. STEEL HVAC DUCT - 12" x 12" (305mm x 305mm), or smaller, No. 24 gauge, (or heavier), steel duct installed concentrically within the opening. The duct is to be rigidly supported on both sides of the wall. A nom 1" (25mm) annular space is required within the firestop system.

3. FORMING MATERIAL - In 1 or 2 Hr. fire rated assemblies, min. 3-7/8" (98mm) or 3-1/2" (89mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation firmly packed into opening, respectively. Forming material to be recessed from both surfaces of wall as required to accommodate the required thickness of sealant.

4. NELSON LBS3 SEALANT - In 1 or 2 Hr. fire rated assemblies, min. 1/2" (13mm) or 3/4" (19mm) thickness of sealant applied within the annulus, on both surfaces of wall, respectively. Additional sealant to be installed such that a min. 1/2" (13mm) or 1/4" (6mm) thick crown is formed around the penetrating item and lapping a min. 1/4" (6mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-7104

DWG NO. FS-0609 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

DATE: 07/20/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
HVAC DUCT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

(1) Wall  (1) Sealant
(2) HVAC Duct
(3) Forming Material

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. area of opening is 989 sq. in. (6381 sq. cm) with max. dimensions of 43" (1092mm).

2. RECTANGULAR STEEL HVAC DUCT - 40 x 20" (1016mm x 508mm) (or smaller), No. 24 gauge (or heavier) steel duct installed concentrically or eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall. The space between the steel duct and periphery of opening shall be min. 3/4" (19mm) to max. 2-1/4" (57mm). During the installation of the steel duct, internal support members consisting of nom 1/2" (13mm) diameter threaded steel shall be installed within the center of the steel duct on both sides of wall assembly. In addition to the threaded steel rod, external supports consisting of min. 1-1/2" x 1-1/2" x 3/16" (38mm x 38mm x 5mm) thick steel angles to be installed around the outer perimeter of the steel duct and secured to the steel duct by means of No. 10 x 3/4" (19mm) long steel sheet metal screws spaced a max. 8" (203mm) OC. Steel angles to be installed on both sides of wall.

3. FORMING MATERIAL (2 Hr. walls) - Install backer rod, mineral wool, or fiberglass batt insulation into the opening and recess 5/8" (16mm) from both surfaces of the wall.

4. NELSON LBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant applied within the annulus, flush with both surfaces of wall.

5. METAL FRAME (not shown) - Min. 16 GA galv steel angles sized to lap steel duct a min. of 2" and lap wall surfaces a min. 1" (25mm). Angles attached to steel duct on both sides of wall with min. #10 x 1-1/2" (13mm) long steel sheet metal screws spaced a max. of 1" (25mm) from each end of steel duct and spaced a max. 6" (152mm) OC.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
W-L-7105

Nelson Firestop

DWG NO. FS-0610R1

DATE: 07/20/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL METALLIC DUCT

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 5" (127mm).

2. METALLIC DUCT - Max. nominal 4" (102mm) diameter, or smaller, No. 30 MSG (or heavier) steel vent duct. Duct to be rigidly supported on both sides of wall assembly. The annular space between duct and periphery of opening shall be min. 0" (point of contact) to max. 7/8" (22mm).

3. FORMING MATERIAL - Used to prevent the leakage of sealant during installation in 2 hr. fire-rated assemblies. Install backer rod within the annular space, and recess 5/8" (16mm) from both surfaces of wall.

4. NELSON LBS3 SEALANT - Apply to fill the annular space around the duct to a min. 5/8" depth. At areas of point of contact, apply a 3/8" (10mm) diameter bead of sealant at the gypsum wallboard/through penetrant interface on both surfaces of wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Classified
UL
System No. W-L-7106

Nelson Firestop

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DWG NO. FS-0611 R1
DATE: 07/20/06
BY: RL

MEA # 126-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL INSULATED METALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. The max. area of the opening is 67 (561 sq. cm) or 136.5 sq. in. (881 sq. cm) (with max. dimension of 14-1/2" (368mm) or 22-3/4" (578mm), if the through penetrants are installed in a wood or steel stud/gypsum board assembly, respectively.

2. PIPES - Max. 4 pipes, conduits or tubing to be installed within the opening. The following types and sizes of pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 2" (51mm) diameter (or smaller) steel electrical metallic tubing or steel conduit.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) cooper tubing or regular (or heavier) cooper pipe.
   (E) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC pipe for use in closed (process or supply) piping systems.

3. CABLES - Six (6) 25gf #24awg telephone cables with PVC insulation and jacket. Cables to be spaced 1-7/16" (37mm) from penetrants and 1-7/16" (37mm) to 2-5/8" (67mm) from periphery of opening.

4. PIPE INSULATION - Nominal 1" (25mm) thick (or thinner) AB/PVC (ARMAFLEX) flexible foam pipe insulation, or max. 3/4" (19mm) thick or thinner MINERAL FIBER pipe insulation. The insulation may be installed on one metallic penetrant having a diameter of 2" (51mm) or less. Spacing between penetrants and insulated penetrant is 1-7/16" (37mm) and space between insulated penetrant and periphery of opening is 7/8" (22mm).

5. FORMING MATERIAL - In 1 Hr. or 2 Hr. wall assemblies, min. 2-3/8" (60mm) or 2-1/2" (64mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation, respectively. Forming material to be tightly packed and recessed from both wall surfaces 1-1/4" (32mm).

6. NELSON LBS3 SEALANT - Apply sealant over the forming material to fill the annular space to a min. 1-1/4" (32mm) depth, flush with both surfaces of wall. Sealant to be forced into interstices of cable group to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0612 R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>07/20/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>MEA #</td>
<td>126-04-M</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 3 Hr. T Rating 0 or 1 Hr.

(1) Floor or Wall (3) Pipe (4) Wrapstrip (6) Sealant

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Floor may also be constructed of min. 6" thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 6" (152mm) and 5" (127mm).

2. METALLIC SLEEVE (not shown) - Nom. 5" (127mm) diameter or smaller Sch. 10 or heavier steel pipe cast or groused into floor or wall assembly, flush with floor or wall surfaces. Steel sleeve may be used only when FRPP is used.

3. NONMETALLIC PIPE - The following types and sizes of nonmetallic pipes and conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 40 solid core PVC pipe.
   (B) RIGID NONMETALLIC CONDUIT - Nom 3" (76mm) diameter (or smaller) Sch. 40 solid core PVC conduit (RNC)
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 3" (76mm) diameter (or smaller) SDR 17 CPVC pipe.
   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 40 solid core ABS pipe.
   (E) FIRE RETARDANT POLYPROPYLENE (FRPP) PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 40 FRPP pipe.

PVC, RNC and ABS pipes are for use in closed (process or supply) or vented (waste, drain or vent) piping systems. CPVC and FRPP pipes are for use in closed systems only.

The annular space is 1/2" (13mm) to 2" (51mm) and 1/2" (13mm) to 1-1/8" (28mm) for PVC, CPVC, ABS, or RNC pipes and FRPP pipe respectively. When PVC, RNC, CPVC and ABS pipes are used, the T rating is 0 Hr. When FRPP pipe is used, the T rating is 1 Hr.

4. NELSON WRS3 WRAPSTRIP (part # AA0897) - Apply 2 continuous layers of 1/4" (6mm) thick by 1-1/2" (38mm) wide Nelson wrapstrip around the pipe. Wrapstrip recessed 2-3/4" (70mm) from bottom surface of the floor. When floor is constructed of HOLLOW-CORE precast concrete unit, wrapstrip shall be installed on both surfaces of floor or wall, such that the exposed edges of the wrapstrip are recessed a max. 1/4" (6mm) from each side of the floor or wall.

5. FORMING MATERIAL (not shown) - Min. 1" (25mm) diameter backer rod installed may be the opening and recessed from top surface of the floor or both surfaces of wall as required to accommodate the required thickness of sealant.

6. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth within the annular space, flush with the top surface of the floor or with both surfaces of the wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the pipe on top surface of floor or on both surfaces of wall. In floors, bottom edge of sealant shall be recessed a nom 1/2" (13mm) below the top edge of wrapstrip. When floor is constructed of HOLLOW-CORE precast concrete unit, sealant to be installed symmetrically on both sides of floor, flush with floor surfaces. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the pipe on both surfaces of precast concrete unit.

Tested in accordance with:
ASTM E–814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0613 R1

DATE: 07/20/06

BY:  RL

MEA # 128-04-M

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NONMETALLIC PIPE

F Rating 2 or 3 Hr.  T Rating 3/4, 1, 1-1/2, or 2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) or 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 5-1/4" (133mm).

2. METALLIC SLEEVE (optional) - Nom 5" (127mm) diameter, or smaller, Sch. 10 (or heavier) steel sleeve, cast or grouted into floor or wall assembly, flush with top surface of floor or both surfaces of wall.

3. NONMETALLIC PIPE - Max. 4" (102mm) diameter, or smaller, Sch. 40 PVC, ABS, RNC, or FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Max. 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed piping systems.

4. NELSON LBS3 SEALANT - Min. 1/4" (6mm) thickness of sealant applied within annulus, flush with top surface of floor or with both surfaces of wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the through penetrant on top surface of floor or on both surfaces of wall.

5. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 1/4" (6mm) thick by 1" (25mm) wide Nelson wrapstrip around the through penetrant. The wrapstrip is installed on the bottom side of the floor or on each side of the wall.

<table>
<thead>
<tr>
<th>Min. Concrete Floor or Wall Thickness, in. (mm)</th>
<th>Nom Pipe Diam, in. (mm)</th>
<th>Pipe Type</th>
<th>Annular Space in. (mm)</th>
<th>Min. No. of Wrapstrip Layers</th>
<th>F Rating</th>
<th>T Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1/2 (64)</td>
<td>3 &amp; 4 (76 &amp; 102)</td>
<td>ABS</td>
<td>0 to 9/16 (16)</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2-1/2 (64)</td>
<td>1-1/2 &amp; 2 (38 &amp; 51)</td>
<td>ABS</td>
<td>0 to 9/16 (16)</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2-1/2 (64)</td>
<td>3 &amp; 4 (76 &amp; 102)</td>
<td>FRPP</td>
<td>0 to 9/16 (16)</td>
<td>2</td>
<td>2</td>
<td>3/4</td>
</tr>
<tr>
<td>2-1/2 (64)</td>
<td>1-1/2 &amp; 2 (38 &amp; 51)</td>
<td>FRPP</td>
<td>0 to 9/16 (16)</td>
<td>1</td>
<td>2</td>
<td>3/4</td>
</tr>
<tr>
<td>4-1/2 (114)</td>
<td>4 (102)</td>
<td>ABS</td>
<td>0 to 3/4 (19)</td>
<td>3</td>
<td>2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>4-1/2 (114)</td>
<td>3 (76mm)</td>
<td>ABS</td>
<td>0 to 3/4 (19)</td>
<td>2</td>
<td>2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>4-1/2 (114)</td>
<td>1-1/2 &amp; 2 (38 &amp; 51)</td>
<td>ABS</td>
<td>0 to 3/4 (19)</td>
<td>1</td>
<td>2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>4-1/2 (114)</td>
<td>4 (102)</td>
<td>PVC, CPVC, RNC</td>
<td>0 to 3/4 (19)</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4-1/2 (114)</td>
<td>3 (76mm)</td>
<td>PVC, CPVC, RNC</td>
<td>0 to 3/4 (19)</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4-1/2 (114)</td>
<td>1-1/2 &amp; 2 (38 &amp; 51)</td>
<td>PVC, CPVC, RNC</td>
<td>0 to 3/4 (19)</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

6. RESTRAINING COLLAR (part # AA0659D) - Apply min. 28 GA, glv. steel restraining collar around the wrapstrip. Attach the collar to the floor or wall with (6mm) diameter x 2-1/4" (57mm) long steel concrete anchors in conjunction with min. 1/4" x 1-1/4" (6mm x 32mm) diameter fender washers.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Classified
System No.
C-AJ-2473

Nelson Firestop
DWG NO. FS-0614 R2
DATE: 07/20/06
BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 2 Hr.  
T Rating 0 or 1 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units.

2. METALLIC SLEEVE (optional) - Nom 5" (127mm) diameter, or smaller, Sch. 10 (or heavier) steel pipe sleeve, cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. NONMETALLIC PIPE - Max. 3" (76mm) diameter, (or smaller). Sch. 40 PVC, ABS or RNC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Max. 3" (76mm) diameter, (or smaller). SDR13.5 CPVC pipe for use in closed piping systems. T rating is 1 hr for 2" (51mm) diameter pipe.

4. NELSON LBS3 SEALANT - Sealant to be applied within the annulus, flush with top or bottom surface of floor, bottom surface of a HOLLOW-CORE floor or one surface of wall, as shown in table below.

5. NELSON WR33 WRAPSTRIP (part # AA0897) - Apply 1/4" (6mm) by 1-1/2" (38mm) wide Nelson wrapstrip around the pipe. Wrapstrip recessed from top or bottom surface of the floor or one surface of the wall by an amount equivalent to the thickness of seal/ant required. Second piece is wrapped over the first piece (layered) or wrapped around the penetrant, stacked above the first piece.

<table>
<thead>
<tr>
<th>Max Opening/Sleeve Diam. (mm)</th>
<th>Pipe Type</th>
<th>Max Pipe Diam. (mm)</th>
<th>Annular Space in (mm)</th>
<th>Min. No. of Wrapstrip Layers</th>
<th>Min. Sealant Thkns, in (mm)</th>
<th>Stacked/Layered</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>ABS</td>
<td>3 (76)</td>
<td>1/4 to 5/16</td>
<td>2</td>
<td>1/4 (6)</td>
<td>Stacked</td>
</tr>
<tr>
<td>5 (127)</td>
<td>ABS</td>
<td>3 (76)</td>
<td>1/2 to 1-3/16</td>
<td>2</td>
<td>1/2 (13)</td>
<td>Layered</td>
</tr>
<tr>
<td>4 (102)</td>
<td>PVC, RNC, CPVC</td>
<td>2 (51)</td>
<td>1/4 to 1-5/8</td>
<td>1</td>
<td>1/2 (13)</td>
<td>-</td>
</tr>
<tr>
<td>4 (102)</td>
<td>PVC, RNC, CPVC</td>
<td>3 (76)</td>
<td>1/4 to 5/16</td>
<td>2</td>
<td>1/2 (13)</td>
<td>Stacked</td>
</tr>
<tr>
<td>3 (76)</td>
<td>PVC, RNC, CPVC</td>
<td>2 (51)</td>
<td>1/4 to 3/8</td>
<td>1</td>
<td>1/2 (13)</td>
<td>-</td>
</tr>
</tbody>
</table>

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0615 R1

DATE: 03/07/05
BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 1 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 7" (178mm).

2. METALLIC SLEEVE (optional) - Nom 5" (127mm) diameter, or smaller, Sch. 10 or heavier steel sleeve, cast or grouted into floor or wall assembly, flush with top surface of floor or both surfaces of wall.

3. NONMETALLIC PIPE - Max. 6" (152mm) diameter, or smaller, Sch. 40 PVC or RNC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Max. 6" (152mm) diameter or smaller SDR 13.5 CPVC pipe for use in closed piping systems.

4. NELSON LBS3 SEALANT - Min. 1/4" (6mm) thickness of sealant applied within the annulus, flush with top surface of floor or with both surfaces of wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the through penetrant on top surface of floor or on both surfaces of wall.

5. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 1/4" (6mm) thick by 1" (25mm) wide Nelson wrapstrip around the through penetrant. The wrapstrip is installed on the bottom side of the floor or on each side of the wall.

<table>
<thead>
<tr>
<th>Nom. Pipe Diam. in. (mm)</th>
<th>Min. No. of Wrapstrip Layers</th>
<th>Annular Space in. (mm)</th>
<th>Use of Sleeve</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 (152)</td>
<td>4</td>
<td>0 to 3/8 (10)</td>
<td>Not Permitted</td>
</tr>
<tr>
<td>5 (127)</td>
<td>4</td>
<td>0 to 3/8 (10)</td>
<td>Not Permitted</td>
</tr>
<tr>
<td>4 (102)</td>
<td>2</td>
<td>0 to 3/4 (19)</td>
<td>Permitted</td>
</tr>
<tr>
<td>3 (76)</td>
<td>2</td>
<td>0 to 3/4 (19)</td>
<td>Permitted</td>
</tr>
<tr>
<td>2 (51)</td>
<td>1</td>
<td>0 to 3/4 (19)</td>
<td>Permitted</td>
</tr>
<tr>
<td>1-1/2 (38)</td>
<td>1</td>
<td>0 to 3/4 (19)</td>
<td>Permitted</td>
</tr>
</tbody>
</table>

6. RESTRAINING COLLAR (part # AA0659D) - Apply min. 28 GA, glv. steel restraining collar around the wrapstrip. Attach the collar to the floor or wall with min. 1/4" (6mm) diameter x 2-1/4" (57mm) long steel concrete anchors in conjunction with 1/4" (6mm) x 1-1/4" (32mm) diameter fender washers.

Tested in accordance with: 
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0616 R2

DATE: 07/20/06
BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NONMETALLIC PIPE

F Rating 2 Hr.  T Rating 3/4 or 2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 7" (178mm).

2. NONMETALLIC PIPE - The following types of nonmetallic pipes may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (waste, drain or vent) piping systems.
   
   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   
   (C) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (waste, drain or vent) piping systems.

   When PVC and CPVC pipes are used, the T rating is 3/4 Hr. When ABS pipe is used, the T rating is 2 Hr. The annular space between pipe and periphery of opening shall be min. 5/8" (16mm) to max. 1-3/4" (44mm).

3. NELSON WRS3 WRAPSTRIP (part # A00897) - Apply 3 continuous layers of 1-1/2" (38mm) wide Nelson wrapstrip around the pipe. Wrapstrip recessed 1/4" (6mm) from top surface of the floor or both surfaces of wall.
   
   When floor is constructed of HOLLOW-CORE precast concrete unit, wrapstrip shall be installed on both surfaces of floor, such that the exposed edges of the wrapstrip are recessed a max. 1/4" (6mm) from each surface of the floor.

4. NELSON LBS3 SEALANT - Apply a min. 1/2" (13mm) depth within the annular space, flush with the top surface of the floor or with both surfaces of the wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the through penetrant on top surface of floor or on both surfaces of wall.
   
   When floor is constructed of HOLLOW-CORE precast concrete unit, sealant to be installed symmetrically on both sides of floor, flush with floor surfaces. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the through penetrant on both surfaces of precast concrete unit.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

NELSON FIRESTOP

System No.
C-AJ-2476

DWG NO. FS-0617 R1

DATE: 07/20/06

BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

Project Name: ________________________________
Address: ____________________________________
Installer: ____________________________________
Address: ____________________________________
Signature: ___________________________________
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 1-1/2 Hr.  T Rating 3/4 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 10-5/8" (270mm) and 7" (178mm), when HOLLOW-CORE precast concrete units are used.

2. METALLIC SLEEVE (optional) - Nom 10" (254mm) diameter (or smaller) Sch. 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. METALLIC PIPE - The following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 4" (102mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

4. PIPE INSULATION - Nominal 2" (51mm) thick (or thinner) FIBERGLASS pipe insulation. The annular space between the insulated penetrant and the periphery of opening shall be a min. 1/4" (6mm) to a max. 2" (51mm).

5. NELSON WRS3 WRAPSTRIP (part # AA0897) - Apply 1 continuous layer of 1/4" (6mm) thick by 1-1/2" (38mm) wide Nelson wrapstrip around the pipe. Wrapstrip recessed 1/4" (6mm) from the top surface of the floor or both surfaces of wall. When floor is constructed of HOLLOW-CORE precast concrete unit, wrapstrip shall be installed on both surfaces of floor, such that the exposed edges of the wrapstrip are recessed a max. 1/4" (6mm) from each side of the floor.

6. NELSON LBS3 SEALANT - Apply a min. 1/2" (13mm) depth within the annular space, flush with the top surface of the floor or with both surfaces of the wall. In floors constructed of HOLLOW-CORE precast concrete units, sealant shall be installed symmetrically on both surfaces of floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0618 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 07/20/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td>BY: RL</td>
</tr>
<tr>
<td>Address:</td>
<td>MEA # 128-04-M</td>
</tr>
<tr>
<td>Signature:</td>
<td>Nelson Firestop</td>
</tr>
<tr>
<td></td>
<td>800 331-7325</td>
</tr>
<tr>
<td></td>
<td>Fax: 918 627-2941</td>
</tr>
<tr>
<td></td>
<td>Tulsa, Ok.</td>
</tr>
</tbody>
</table>
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 3 Hr.  T Rating 1 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Max. diameter of opening is 10". (254mm).

2. METALLIC PIPE - The following types of pipes or tubing may be used:
   (A) STEEL PIPE - Nom 6" (152mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 6" (152mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nominal 1" (25mm) thick or thinner AB/PVC (ARMAFLEX) pipe insulation. The annular space between the insulated penetrant and the periphery of opening shall be a min. 1/2" (13mm) to a max. 1-3/8" (35mm).

4. NELSON WRS3 WRAPSTRIP (part # AA0897) - Apply 2 continuous layers of 1/4" (6mm) thick by 1-1/2" (38mm) wide Nelson wrapstrip around the pipe. Wrapstrip recessed 2-3/4" (70mm) from the bottom surface of the floor. In walls, the wrapstrip shall be installed on both surfaces of the wall such that the exposed edge of the wrapstrip is recessed a nom 1/4" (6mm) from each side of the wall.

5. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth within the annular space, flush with the top surface of the floor or with both surfaces of the wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrant on top surface of floor or both surfaces of wall. In floors, bottom edge of sealant shall be recessed a nom 1/2" (13mm) below the top edge of wrapstrip.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

System No.
C-AJ-5269

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0619 R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>07/20/06</td>
</tr>
<tr>
<td>BY</td>
<td>RL</td>
</tr>
</tbody>
</table>

MEA # 128-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 3 Hr.  T Rating 2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Max. diameter of opening is 14" (356mm).

2. METALLIC PIPE - The following types of pipes may be used:
   (A) STEEL PIPE - Nom 8" (203mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 8" (203mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nominal 2" (51mm) thick or thinner FIBERGLASS or MINERAL FIBER pipe insulation. The annular space between the insulated penetrant and the periphery of opening shall be a min. 1/2" (13mm) to a max. 7/8" (22mm).

4. NELSON WRS3 WRAPSTRIP (part # AA0897) - Apply 2 continuous layers of 1/4" (6mm) thick by 1-1/2" (38mm) wide Nelson wrapstrip around the pipe. Wrapstrip recessed 2-3/4" (70mm) from the bottom surface of the floor. In walls, the wrapstrip shall be installed on both surfaces of the wall such that the exposed edge of the wrapstrip is recessed a nom 1/4" (6mm) from each side of the wall.

5. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth within the annular space, flush with the top surface of the floor or with both surfaces of the wall. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrant on top surface of floor or both surfaces of wall. In floors, bottom edge of sealant shall be recessed a nom 1/2" (13mm) below the top edge of wrapstrip.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-5270

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0620 R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>07/19/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>MEA #:</td>
<td>128-04-M</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR
NONMETALLIC PIPE

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. Nom 10" (254mm) deep lumber, steel or combination lumber and steel joists, trusses may be used in 1 Hr. fire-rated floor-ceiling assemblies. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, or L536 in the UL Fire Resistance Directory. Max. diameter of opening is 3" (76mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 Hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. NONMETALLIC PIPE or CONDUIT - The following types of nonmetallic pipes or conduits may be used:

(A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 solid core PVC pipe for use in closed (process or supply) or vented (waste, drain or vent) piping systems.

(B) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.

(C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) or vented (waste, drain or vent) piping systems.

(D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 2"(51mm) diameter (or smaller) Sch. 40 solid core ABS pipe for use in closed (process or supply) or vented (waste, drain or vent) piping systems.

Diameter of opening through flooring system and through gypsum wallboard ceiling to be nom 5/8" (16mm) larger than the outside diameter of pipe.

3. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 1 continuous layer of 1/4" (6mm) thick by 1" (25mm) wide Nelson wrapstrip around the pipe as its egress from bottom surface of the ceiling. The bottom edge of the wrapstrip shall extend 1/4" (6mm) below the ceiling.

4. NELSON LBS3 SEALANT - Min. 3/4" (19mm) thickness of sealant applied within annulus on top surface of floor. Min. 5/8" (16mm) thickness of sealant applied within annulus on bottom surface of ceiling. Additional sealant to be installed such that a min. 3/8" (10mm) crown is formed around the penetrating item on top surface of floor and bottom surface of ceiling.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0621 R2

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 11/06/06
BY: ____________

MEA # 128-04-M

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
WOOD/ STEEL JOIST FLOOR
NONMETALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 0, 1 or 2 Hr.

(5) Sealant
(4) Wrapstrip
(3) Pipe
(1) Wood Floor

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. Nom 10" (254mm) deep lumber, steel or combination lumber and steel joists, trusses may be used in 1 Hr. fire-rated floor-ceiling assemblies. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511, or L536 in the UL Fire.

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.

(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.

(C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. CHASE WALL (not shown, optional) - Constructed in the manner specified in individual U300 series designs as shown in the UL Fire Resistance Directory.

3. NONMETALLIC PIPE or CONDUIT - The following types of pipes or conduits may be used:

(A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

(B) RIGID NONMETALLIC CONDUIT - Nom 4" (102mm) diameter (or smaller) Sch. 40 PVC conduit.

(C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) piping systems.

(D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space between pipe or conduit and periphery of opening shall be min. 0" (point of contact) to max. 1/2" (13mm). T rating is 0 Hr. for PVC, RNC and CPVC pipe. T rating is 1 or 2 Hr. for ABS pipe.

4. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 2 continuous layers of 1/4" (6mm) thick by 1" (25mm) wide Nelson wrapstrip around the pipe. Secure to the underside of the ceiling with min. 28 GA galvanized steel restraining collars. Collar secured to ceiling at each anchor tab with 3/16" (5mm) diameter by 3" (76mm) long toggle bolts in conjunction with min. 1/4" (6mm) by 1-1/4" (32mm) diameter steel fender washers. Collar (part # AA0659D) not shown.

5. NELSON LBS3 SEALANT - Min. 1/4" (6mm) thickness of sealant applied within annulus, flush with top surface of floor or sole plate. At point of contact, min. 3/8" (10mm) diameter bead of sealant applied at penetrant/floor or sole plate interface.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-C-2293

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

DWG NO. FS-0623 R2

DATE: 11/06/06
BY: RL

MEA # 128-04-M
WOOD/STEEL JOIST FLOOR INSULATED PIPE

F Rating 1 or 2 Hr. T Rating 3/4 or 1-1/2 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. Nom 10" (254mm) deep lumber, steel or combination lumber and steel joists, trusses may be used in 1 Hr. fire-rated floor-ceiling assemblies. The 2 Hr. fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. Max. diameter of opening is 3-3/4" (95mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
(B) Furring CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and in 2 Hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.
(C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2hr.) screw-attached to furring channels.

2. WALL ASSEMBLY (optional, not shown) - Constructed in the manner specified in individual U300 series wall and partition designs in the UL Fire Resistance Directory.

3. METALLIC PIPE - The following types of pipes or tubing may be used:
   (A) STEEL PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 2" (51mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 2" (51mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

4. PIPE INSULATION - Nom 1/2" (13mm) thick, or thinner AB/PVC (ARMAFLEX) pipe insulation. Annular space is 5/16" (8mm).

5. NELSON WR53 WRAPSTRIP (part # AA0896) - Apply 1 continuous layer of 1/4" (6mm) thick by 1" (25mm) wide Nelson wrapstrip around the pipe as its egress from bottom surface of the ceiling or lower top plate of chase wall assembly. The bottom edge of the wrapstrip shall extend 1/4" (6mm) below the bottom surface of the ceiling or lower top plate of chase wall assembly.

6. NELSON LB3 SEALANT - Min. 3/4" (19mm) thickness of sealant applied within annulus on top surface of floor. Min. 5/8" (16mm) thickness of sealant applied within annulus on bottom surface of ceiling or lower top plate of chase wall assembly. Additional sealant to be installed such that a min. 1/4" (6mm) crown is formed around the penetrating item on top surface of floor and bottom surface of ceiling or lower top plate of chase wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. F-C-5071
DWG NO. FS-0625 R2

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DATE: 11/07/06
BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR CABLES, METALLIC PIPES

F Rating 1 Hr.  T Rating 3/4 Hr.

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series floor-ceiling designs in the UL Fire Resistance Directory. As an alternate to lumber joists, nom 10" (254mm) deep lumber, steel or combination lumber and steel joists or trusses. Max. diameter of opening is 4-1/2" (114mm).
   (A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
   (B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses or furring channels.
   (C) GYPSUM BOARD - Gypsum wallboard secured to wood/steel joists/trusses or furring channels.

2. WALL ASSEMBLY (optional, not shown) - Constructed in the manner specified in the U300 series designs as shown in the UL Fire Resistance Directory.

3. METALLIC PIPE or CONDUIT - One or more metallic pipes, conduits or tubing to be installed within the firestop system.
   (A) STEEL PIPE - Nom 3/4" (19mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 3/4" (19mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 3/4" (19mm) diameter (or smaller) steel electrical metallic tubing or galv steel conduit.
   (D) COPPER TUBING or PIPE - Nom 3/4" (19mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   Pipes to be spaced 1/8" (3mm) to 1/2" (13mm) apart. The space between pipes and the periphery of the opening is 1/4" (6mm) to 1/2" (13mm).

4. PIPE INSULATION - Nom 3/4" (19mm) thick AB/PVC (ARMAFLEX) pipe insulation to be applied to one or more of the metallic pipes or tubing. Insulated pipes or tubing shall be spaced a min. 1/4" (6mm) to a max. 1/2" (13mm) from the other pipes. The space between insulated pipes and periphery of opening shall be a min. 1/4" (6mm) to a max. 1/2" (13mm).

5. NONMETALLIC PIPE - Max. 1-1/4" (32mm) diameter or smaller, Sch. 40 PVC, RNC or SDR13.5 CPVC pipe. PVC pipe to be used in closed or vented piping systems. CPVC pipe to be used in closed piping system. Pipe to be spaced 1/8" (3mm) to 1/2" (13mm) from other penetrants. The annular space between pipe and periphery of opening shall be 1/4" (6mm) to 1/2" (13mm).

6. CABLES - Two 7/C No. 12 AWG with PVC - nylon insulation and PVC jacketed material. Cable to be spaced 1/8" (3mm) to 1/2" (13mm) from the other penetrants and spaced between the cable and periphery of opening shall be a min. 1/4" (6mm) to a max. 1/2" (13mm).

7. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 1 continuous layer of 1/4" (6mm) thick by 1" (25mm) wide Nelson wrapstrip around outer group of penetrants and at its egress from the bottom surface of ceiling or lower top plate of chase wall assembly. The bottom edge of wrapstrip shall be recessed a nom 3/8" (10mm) from the bottom surface of ceiling or lower top plate of chase wall assembly.

8. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus, flush with top surface of the floor. At bottom of the assembly, min. 3/8" (10mm) thickness of sealant applied within annulus, flush with bottom surface of ceiling or lower top plate of chase wall assembly. Additional sealant shall be applied such that a min. 1/4" (6mm) crown is formed around the penetrating items on bottom and top surface of assembly.

Tested in accordance with:
- ASTM E-814
- ANSI/UL 1479

Nelson Firestop

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0626 R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
<td>11/07/06</td>
</tr>
<tr>
<td>BY</td>
<td>RL</td>
</tr>
<tr>
<td>MEA #</td>
<td>128-04-M</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE JOIST FLOOR
NONMETALLIC PIPE

F Rating 1 Hr.  T Rating 0 Hr.

(2) Pipe
(4) Sealant
(1) Floor-Ceiling
(3) Wrapstrip
(4) Sealant

1. FLOOR-CEILING ASSEMBLY - Const. in the manner specified in individual G500 series floor-ceiling designs in the UL Fire Res. Dir.. Max. diameter of opening is 3" (76mm).

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   
   (B) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   
   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   The annular space between pipe or conduit and periphery of opening to be a nom 5/16" (8mm).

3. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 1 continuous layer of 1/4" (6mm) thick by 1" (25mm) wide wrapstrip around the pipe at its egress from bottom surface of the ceiling. The bottom edge of the wrapstrip shall extend 1/4" (6mm) below the ceiling.

4. NELSON LBS3 SEALANT - Apply a min. 3/4" (19mm) depth of sealant within the annulus on top surface of floor. Min. 5/8" (16mm) thickness of sealant applied within annulus on bottom surface of ceiling. Additional sealant to be installed such that a min. 3/8" (10mm) crown is formed around the pipe on top surface of floor and bottom surface of ceiling.

   Tested in accordance with:
   
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. F-E-2024

DWG NO. FS-0627 R1

DATE: 07/19/06

BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE JOIST FLOOR NONMETALLIC PIPE

F Rating 1 Hr.  T Rating 0 or 1 Hr.

1. FLOOR-CEILING ASSEMBLY - Const. in the manner specified in individual G500 series floor-ceiling designs in the UL Fire Res. Dir.. Max. diameter of opening is 5" (127mm).

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:

(A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

(B) RIGID NONMETALLIC CONDUIT - Nom 4" (102mm) diameter (or smaller) Sch. 40 PVC conduit.

(C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.

(D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

The annular space between pipe or conduit and periphery of opening to be a nom 1/4" (6mm). If a PVC, RNC, or CPVC pipe is used, the T rating is 0 Hr. If ABS pipe is used, the T rating is 1 Hr.

3. NELSON LBS3 SEALANT - Apply a min. 1/4" (6mm) depth of sealant within the annulus, flush with the top surface of the floor or sole plate. Min. 5/8" (16mm) thickness of sealant applied within annulus, flush with bottom surface of ceiling. At point contact, min. 3/8" (10mm) diameter bead of sealant applied at penetrant/floor and at penetrant/ceiling interface.

4. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 2 continuous layers of 1/4" (6mm) thick by 1" (25mm) wide wrapstrip around the pipe on underside of gypsum board ceiling and held in place with masking tape.

5. RESTRAINING COLLAR (not shown) (part # AA0659D) - Apply a min. 28 GA galv. steel restraining collar around the wrapstrip. Attach the collar to the ceiling at each anchor tab with 3/16" (5mm) diameter by min. 3" (76mm) long toggle bolts in conjunction with min. 1/4" (6mm) by 1-1/4" (32mm) diameter steel fender washers.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-E-2025

DWG NO. FS-0628 R1

DATE: 07/19/06

BY: RL

MEA # 128-04-M

Nelson Firestop

800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
NONMETALLIC PIPE

F Rating 2 Hr.  T Rating 0, 1 or 1-1/2, 2 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. The max. diameter of the opening is 5" (127mm).
2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   (C) RIGID NONMETALLIC CONDUIT - Nom 4" (102mm) diameter (or smaller) Sch. 40 PVC conduit.
   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   The annular space between pipe, conduit or tubing and periphery of opening shall be 0" (point of contact) to 1/2" (13mm).
3. NELSON LBS3 SEALANT - Apply LBS3 within the annular space to a min. 5/8" (16mm) depth, flush with both wall surfaces. At point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the concrete/pipe interface on both surfaces of wall.
4. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 1" (25mm) wide WRSS3 around the pipe on both sides of the wall in accordance with the schedule shown in the table below.

<table>
<thead>
<tr>
<th>Pipe Type</th>
<th>Max. Pipe Size</th>
<th>Number of Layers</th>
<th>T Rating (Hr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC, CPVC or RNC</td>
<td>4&quot; (102mm)</td>
<td>2x3</td>
<td>0 or 1</td>
</tr>
<tr>
<td>ABS</td>
<td>4&quot; (102mm) or 3&quot; (76mm)</td>
<td>3x2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>PVC, CPVC or RNC</td>
<td>3&quot; (76mm) or 2&quot; (51mm)</td>
<td>2x1</td>
<td>1</td>
</tr>
</tbody>
</table>

5. STEEL RESTRAINING COLLAR (part # AA0659D) - Apply nominal 28 gauge prefabricated galvanized steel collar around the wrapstrip. Overlap the collar and secure with 1/2" (13mm) wide by 0.028" (.71mm) thick stainless steel hose clamp. Collar secured to the wall with 1/4" (6mm) diameter by min. 1-3/4" (44mm) long steel concrete anchors in conjunction with 1/4" (6mm) by 1-1/4" (32mm) diameter steel tendon washers. Tested in accordance with:
   - ASTM E-814
   - ANSI/UL 1479

---

**Nelson Firestop**

**DWG NO.** FS-0629 R1

**DATE:** 07/19/06

**BY:** RL

**MEA # 128-04-M**

**Nelson Firestop**

800 331-7325  Fax: 918 627-2941

Tulsa, Ok.
CONCRETE WALL
NONMETALLIC PIPE

F Rating 2 Hr.          T Rating 0 Hr.

(4) Sealant
(1) Wall

(3) Wrapstrip
(2) Pipe

1. WALL ASSEMBLY- Min. 6" (152mm) thick lightweight or normal weight concrete wall, or CMU block wall. Max. diameter of the opening is 5" (127mm).

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   (B) RIGID NONMETALLIC CONDUIT - Nom 3" (76mm) diameter (or smaller) Sch. 40 PVC conduit.

   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 3" (76mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.

   The annular space between the pipe or conduit and the periphery of opening shall be 1/4" (6mm) to 1-1/4" (32mm).

3. NELSON WRS3 WRAPSTRIP (part # AA0897) - Apply a continuous layer of 1-1/2" (38mm) wide WRS3 around the pipe on both sides of the wall and slide into the annular space, such that the ends are recessed 1/4" (6mm) from the surface of the wall.

4. NELSON LBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant applied within the annulus flush with both surfaces of wall. Additional sealant to be installed such that a min. 3/8" (10mm) thick crown is formed around the pipe.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Project Name: ____________________________
Address: __________________________________
Installer: _________________________________
Address: __________________________________
Signature: ________________________________

DWG NO.  FS-0630 R1

DATE:  07/19/06
BY:  RL

MEA # 128-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL
INSULATED METALLIC PIPE

F Rating 2 Hr.  T Rating 2 Hr.

1. WALL ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete wall or CMU block wall. Max. diameter of opening is 21" (533mm).

2. METALLIC PIPE - The following types of pipes or tubing may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 12" (305mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Nom 3" (76mm) thick FIBERGLASS or MINERAL FIBER pipe insulation. The annular space between insulated pipe and periphery of opening shall be 1/2" (13mm) to 1-3/4" (44mm).

4. NELSON WRS3 WRAPSTRIP (part# AA0897) - Apply 2 layers of 1-1/2" (38mm) wide WRS3 around the insulated pipe and secure with tape. Wrapstrips are slid along the insulated pipe into annulus such that visible ends of the wrapstrip are recessed 3/8" (10mm) into the wall.

5. NELSON LBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant applied within annulus, flush with both surfaces of wall. Additional sealant to be installed such that a min. 3/8" (10mm) crown is formed around the insulated penetrant.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

Project Name: ____________________________
Address: _______________________________
Installer: _______________________________
Address: _______________________________
Signature: _____________________________

System No. W-J-5111

DWG NO. FS-0631 R1

DATE: 07/19/06
BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
NONMETALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 0, 1 or 1-1/2 Hr.

(5) Restraining Collar (3) Sealant (5) Restraining Collar
(2) Pipe (4) Wrapstrip

(1) Wall

1. WALL ASSEMBLY - Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory.

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) Rigid NONMETALLIC CONDUIT - Nom 4" (102mm) diameter (or smaller) Sch. 40 PVC conduit
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   The annular space between pipe or conduit and periphery of opening shall be 0" (point of contact) to 1/2" (13mm).

3. NELSON LBS3 SEALANT - Apply LBS3 within the annular space to a min. 5/8" (16mm) depth, flush with both wall surfaces. At point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the gypsum/pipe interface on both surfaces of wall.

4. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 1" (25mm) wide WRS3 around the pipe on both sides of the wall in accordance with the schedule shown in the table below.

<table>
<thead>
<tr>
<th>Pipe Type</th>
<th>Max. Pipe Size</th>
<th>Nos. of Layers</th>
<th>F Rating (Hr.)</th>
<th>T Rating (Hr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC, CPVC or RNC</td>
<td>4 (102mm)</td>
<td>2 or 3</td>
<td>2</td>
<td>0 or 1</td>
</tr>
<tr>
<td>ABS</td>
<td>2 (51mm) or 3 (76mm)</td>
<td>1, 2 or 3</td>
<td>2</td>
<td>1-12</td>
</tr>
<tr>
<td>PVC, CPVC or RNC</td>
<td>2 (51mm)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ABS</td>
<td>4 (102mm)</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>PVC, CPVC, ABS or RNC</td>
<td>4 (102mm)</td>
<td>2 or 3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>PVC, CPVC, ABS or RNC</td>
<td>2 (51mm) or 3 (76mm)</td>
<td>1 or 2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

5. STEEL RESTRAINING COLLAR (part # AA0659D) - Apply nominal 28 gauge prefabricated galvanized steel collar around the wrapstrip. Overlap the collar and secure with 1/2" (13mm) wide by 0.028" (7.11mm) thick stainless steel hose clamp. Collar secured to the wall with 1/8" (3mm) diameter by min. 2-3/4" molly bolts in conjunction with 1/4" (6mm) by 1-1/4" (32mm) diameter steel fender (70mm) long steel washers.

   Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. W-L-2388

Project Name: 
Address: 
Installer: 
Address: 
Signature:

DATE: 07/19/06
BY: RL
MEA # 128-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

DWG NO. FS-0632 R1
1. WALL ASSEMBLY: Constructed in the manner specified in the U300 or U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 5” (127mm).

2. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 3” (76mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) RIGID NONMETALLIC CONDUIT - Nom 3” (76mm) diameter (or smaller) Sch. 40 PVC conduit.
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 3” (76mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.

   The annular space between the pipe or conduit and the periphery of opening shall be min. 1/4” (6mm) to max. 1-1/4” (32mm).

3. NELSON WR3S WRAPSTRIP (part # AA0897) - Apply 1 continuous layer of 1-1/2” (38mm) wide wrapstrip around the pipe on both sides of the wall and slide into the annular space, such that the ends are recessed 1/4” (6mm) from the surface of the wall.

4. NELSON LBS3 SEALANT - Min. 5/8” (16mm) thickness of sealant applied within the annulus flush with both surfaces of wall. Additional sealant to be installed such that a min. 3/8” (10mm) thick crown is formed around the pipe.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

Nelson Firestop

System No. W-L-2389

**DWG NO. FS-0633 R1**

**DATE: 07/19/06**

**BY: RL**

**MEA # 128-04-M**

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 21" (533mm).

2. METALLIC PIPE - The following types of metallic pipes may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.

3. PIPE INSULATION - Nom 3" (76mm) thick FIBERGLASS or MINERAL FIBER pipe insulation. The annular space between insulated pipe and periphery of opening shall be 1/2" (13mm) to 1-3/4" (44mm).

4. NELSON WRS3 WRAPSTRIP (part # AA0897) - Apply 2 layers of 1-1/2" (38mm) wide wrapstrip around the insulated pipe on both sides of the wall. Wrapstrips are slid along the insulated pipe into annulus such that visible ends of the wrapstrip are recessed 3/8" (10mm) into the wall.

5. NELSON LBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant applied within annulus, flush with both surfaces of wall. Additional sealant to be installed such that a min. 3/8" (10mm) crown is formed around the insulated penetrant.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0634 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DATE: 07/19/06
BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
WALL TO WALL

F Rating 2 Hr.
Nominal Joint Width - 3/4" (19mm)

1. WALL ASSEMBLY - Nonbearing 2 Hr. fire rated gypsum board/stud assembly constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory. Max. width of joint is 3/4" (19mm).

2. STEEL STUDS - Min 3-5/8" (92mm) steel studs.

3. NELSON ES1399 SEALANT - Min, 1-1/4" (32mm) thickness of sealant applied within the joint, flush with each surface of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. WW-S-0044

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
<th>DATE:</th>
<th>11/28/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL CABLE TRAY

F Rating 1 or 2 Hr.  T Rating 0 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 or V400 Series Wall and Partition Designs as shown in the UL Fire Resistance Directory. The max. area of opening is 102 sq. in. (658 sq. cm) with max. dimension of 14-1/2" (368mm) if cable tray is installed in a wood stud/gypsum wallboard assembly. The max. area of opening is 159 sq. in. (1026 sq. cm) with max. dimension of 22-3/4" (578mm) if cable tray is installed in a steel stud/gypsum wallboard assembly.

2. CABLE TRAY - Max. 18" x 4" (457mm x 102mm) open ladder type, steel, cable tray. Center tray in the opening. The annular space between cable tray and edge of the opening is 1-1/2" (38mm). If the cable tray is installed in a wood stud/gypsum board assembly, the max. width of the cable tray is 12" (305mm). If the cable tray is installed in a steel stud/gypsum board assembly, the max. width of the cable tray is 18" (457mm).

3. CABLES - Max. 36% aggregate cross-sectional fill of #2awg or #12awg multi-#12awg multi-conductor power and control cables and max. 36% aggregate cross-sectional fill of 300kcmil single conductor power cables.

4. FORMING MATERIAL - Tightly pack min. 6pcf (96 kg/cubic meter) mineral wool or ceramic fiber insulation in and around cables for separation of cables to a 3-3/8" (86mm) depth or 4-5/8" (117mm) depth for 1 or 2 hr wall assemblies respectively. Recess 3/4" (19mm) from each wall surface.

5. NELSON FSP PUTTY (part # AA445) - Min. 3/4" (19mm) thickness of putty applied within the annulus on both surfaces of wall. Additional 1" (25mm) crown around the penetrating item. Putty to be forced into interstices of cable group to max. extent possible.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
W-L-4051

DWG NO. FS-0636 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE: 07/19/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>BY: RL</td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
F Rating 1 or 2 Hr.
Nominal Joint Width - 1" (25mm)

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick light weight or normal weight concrete floor. Floor may also be constructed of any 6" (152mm) thick UL Classified HOLLOW-CORE Precast Concrete Units.

2. WALL ASSEMBLY - As specified in the U400 or V400 series designs per UL Fire Resistance Directory. In addition, the wall may incorporate a head-of-wall joint system constructed as specified in the HW Series Joint Systems in the UL Fire Resistance Directory. The max separation between top of floor and bottom of wall is 1" (25mm).

3. STEEL STUDS (not shown) - Min. 3-5/8" (92mm) steel studs.

4. STEEL FLOOR RUNNER - Floor runners of wall assembly shall consist of min. 25 ga galv steel channels sized to accomodate steel studs. Floor runners to be provided with min. 1-1/4" (32mm) flanges.

5. FORMING MATERIAL (optional)(not shown) - Install backer rod within the annular space, and recess 5/8" (16mm) from each surface of the wall.

6. NELSON ES1399 or LBS3 SEALANT - Apply to fill the cavities to a min. of 5/8" (16mm) depth on each side of the wall between the bottom of the gypsum board and the top of the concrete floor, flush with each surface of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
BW-S-0012

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>DATE:</th>
<th>11/30/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>BY:</td>
<td>RL</td>
</tr>
<tr>
<td>Installer:</td>
<td>MEA # 126-04-M</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 2 or 3 Hr. T Rating 1-1/2 or 2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall or CMU block wall. Floor may also be constructed of min. 6" thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 6" (152mm).

2. METALLIC SLEEVE (optional) - Nominal 5" (127mm) diameter (or smaller) Sch. 10 or heavier steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. NONMETALLIC PIPE - Max. 5" (127mm) diameter (or smaller) Sch. 40 PVC, RNC or nominal 4" (102mm) diameter (or smaller) Sch 40 ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Max. 5" (127mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed piping systems.

4. NELSON LBS3 SEALANT - Apply a min. 1/4" (6mm) depth within the annular space, flush with top surface of floor or both surfaces of wall. Additional min. 1/4" (6mm) crown is formed around the penetrant on top surface of floor or both surfaces of wall.

5. NELSON WRS3 WRAPSTRIP (part # AA0897) - Apply 1/4" (6mm) thick by 1-1/2" (38mm) wide wrapstrip around the pipe to the underside of the floor or sides of the wall in accordance with the table below.

<table>
<thead>
<tr>
<th>Pipe Type</th>
<th>Max. Pipe Size</th>
<th>Annular Space</th>
<th>Nos. of Layers</th>
<th>Use of Sleeve</th>
<th>F Rating (Hr.)</th>
<th>T Rating (Hr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC, CPVC, RNC</td>
<td>4&quot; to 5&quot; (100mm to 125mm)</td>
<td>3/32&quot; (1mm)</td>
<td>3</td>
<td>Not Permitted</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>PVC, CPVC, RNC</td>
<td>3&quot; (75mm)</td>
<td>3/32&quot; (1mm)</td>
<td>2</td>
<td>Permitted</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>PVC, CPVC, RNC</td>
<td>1-1/2&quot; to 2&quot; (38mm to 51mm)</td>
<td>3/32&quot; (1mm)</td>
<td>1</td>
<td>Not Permitted</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>PVC, CPVC, RNC</td>
<td>4&quot; (100mm)</td>
<td>3/32&quot; (1mm)</td>
<td>3</td>
<td>Permitted</td>
<td>3</td>
<td>1-1/2</td>
</tr>
<tr>
<td>PVC, CPVC, RNC</td>
<td>3&quot; (75mm)</td>
<td>3/32&quot; (1mm)</td>
<td>2</td>
<td>Permitted</td>
<td>3</td>
<td>1-1/2</td>
</tr>
<tr>
<td>PVC, CPVC, RNC</td>
<td>1-1/2&quot; to 2&quot; (38mm to 51mm)</td>
<td>3/32&quot; (1mm)</td>
<td>1</td>
<td>Permitted</td>
<td>3</td>
<td>1-1/2</td>
</tr>
<tr>
<td>ABS</td>
<td>4&quot; (100mm)</td>
<td>3/32&quot; (1mm)</td>
<td>3</td>
<td>Permitted</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>ABS</td>
<td>3&quot; (75mm)</td>
<td>3/32&quot; (1mm)</td>
<td>3</td>
<td>Permitted</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>ABS</td>
<td>1-1/2&quot; to 2&quot; (38mm to 51mm)</td>
<td>3/32&quot; (1mm)</td>
<td>1</td>
<td>Permitted</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

6. RESTRAINING COLLAR (part # AA0659D) - Apply min. 28 GA, galv. steel restraining collar around the wrapstrip. Attach the collar to the floor with min. 1/4" (6mm) diameter x 2-1/4" (57mm) long steel masonry anchors in conjunction with 1/4" (6mm) x 1-1/4" (32mm) diameter steel fender washers. In wall assemblies, a collar is used on each side of the concrete wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

---

Nelson Firestop

DWG NO. FS-0638 R2

DATE: 07/19/06

BY: RL

MEA # 128-04-M

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
MULT. METALLIC PIPES and CABLES

F Rating 2 Hr. T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The floor assembly may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 4" (102mm).

2. METALLIC PIPES - Max. (2) pipes of the following types of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 1" (25mm) diameter (or smaller) Sch. 10 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 1" (25mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 1" (25mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

3. PIPE INSULATION - Max. 3/4" (19mm) thick or thinner AB/PVC (ARMAFLEX) foam insulation. The annular space between the insulated penetrating item and uninsulated metallic pipes, conduit or tubing shall be 0" (point of contact) to 1-1/4" (32mm). The annular space between the insulated penetrating item and the periphery of the opening shall be 0" (point of contact) to 2-1/4" (57mm).

4. CABLES - Max. (2) cables of the following; Max. 7/c #24awg control cable with polyvinyl chloride insulation and jacket or 2/C #10awg thermostat wire. Cables spaced 0" (point of contact) from insulation or min. 1/2" (13mm) from other penetrants. The annular space between cable and periphery of opening is 0" (point of contact) to 2-1/4" (57mm).

5. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 3" (76mm) depth, and recess 1/2" (13mm) from the top surface of the floor or both surfaces of the wall. When the floor is constructed of HOLLOW-CORE precast concrete units, forming material shall be recessed 1/2" (13mm) from both surfaces of floor.

6. NELSON ES1399/LBS3 SEALANT - Apply over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or both surfaces of the wall. Min. 1/2" (13mm) diameter bead of sealant applied to the penetrant/concrete interface at the point of contact location on the top surface of floor or both surfaces of wall. ES1399 to be forced into interstices between penetrants to max. extent possible when used. When the floor is constructed of HOLLOW-CORE precast concrete units, sealant shall be installed flush with both surfaces of floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-8162

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
<th>DATE: 07/14/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
<td>BY: RL</td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 or V400 series designs as showing the UL Fire Resistance Directory. The max. area of opening is 168 sq. in. (1084 sq. cm) with a max. dimension of 28” (711mm).

2. CABLE TRAY - Max. 24" (610mm) wide x 4" (102mm) deep open ladder cable tray. The annular space between the cable tray and periphery of opening shall be min. 0" (point of contact) to 2" (51mm).

3. CABLES - Max. 40% cable fill of opening in any combination of:
   A). 1/C-350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene jacket.
   B). 200 pair - No. 24awg (or smaller) copper conductor cable with polyvinyl insulation and jacket.
   C). 62.5/125 fiber optic cable with PVC insulation and jacket.
   D). Max. 3/C No.12awg (or smaller) METAL-CLAD cable.

4. NELSON FSP PUTTY (part # AA445) - Prior to installation of the fire bricks, min. 3/8" (10mm) thickness of putty forced into interstices of cables and between cables and cable tray within the full depth of the stud cavity. After installation of the fire bricks, min. 3/8" (10mm) additional putty applied between the interstices of cables, between cables and cable tray, between the fire bricks and cables and between cable tray and fire brick on both surfaces of the wall assembly. At point of contact location between cable tray and gypsum board, min. 3/8" (10mm) thickness of putty applied at the cable tray/gypsum board interface on both surfaces of the wall.

5. NELSON FIRE BRICKS (part # AA0834) - For walls incorporating max. 3-1/2" (89mm) steel studs, fire bricks installed with 5" (127mm) dimension projecting through and centered in opening. For walls constructed of larger than 3-1/2" (89mm) steel studs, fire brick installed with long dimension passing through and centered in opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-4061

DWG NO. FS-0642 R1

DATE: 07/19/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE WALL CABLE TRAY

F Rating 2 Hr.  T Rating 3/4 Hr.

(1) Wall
(4) Putty
(3) Cables
(5) Fire Brick
(2) Cable Tray

1. WALL ASSEMBLY - Min. 6" (152mm) thick reinforced lightweight or normal weight concrete. Wall may also be constructed of any UL Classified Concrete Blocks. The max. area of opening is 168 sq. in. (1084 sq. cm) with a max. dimension of 28" (711mm).

2. CABLE TRAY - Max. 24" wide x 4" deep open ladder cable tray. The annular space between the cable tray and periphery of opening shall be min. 0" (point of contact) to 2".

3. CABLES - Max. 40% cable fill of opening in any combination of:
   A). 1/C-350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene jacket.
   B). 200 pair - No. 24awg (or smaller) copper conductor cable with polyvinyl insulation and jacket.
   C). 62.5/125 fiber optic cable with PVC insulation and jacket.
   D). Max. 3/C No.12awg (or smaller) METAL-CLAD cable.

4. NELSON FSP PUTTY (part # AA445) - Prior to installation of the fire bricks, min. 3/8" (10mm) thickness of putty forced into interstices of cables and between cables and cable tray within the full depth of the stud cavity. After installation of the fire bricks, min. 3/8" (10mm) additional putty applied between the interstices of cables, between cables and cable tray, between the fire bricks and cables and between cable tray and fire brick on both surfaces of the wall assembly. At point of contact location between cable tray and wall, a min. 3/8" (10mm) thickness of putty applied at the cable tray/concrete interface on both surfaces of the wall.

5. NELSON FIRE BRICKS (part # AA0834) - For reinforced concrete and solid filled concrete block wall assemblies, fire bricks installed centered within depth of opening with the long dimension placed horizontally. For hollow core block walls, fire bricks installed with long dimension passing through the opening from surface to surface. Fire bricks to completely fill the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-J-4058

DWG NO. FS-0643 R1

Project Name: ____________________________
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: ______________________________

DATE: 07/19/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 1 or 2 Hr.
Nominal Joint Width - 1” to 6” (25mm to 152mm)
Class II Movement - 12.5% Compr or Ext

(1) Floor
(2) Structural Beam
(3) Fire Proofing
(4) Roof Assembly (not shown)
(5) Wall
(6) Forming Material
(7) Coating
(8) Forming Material

1. FLOOR ASSEMBLY - Constructed in the manner specified in the individual D700 or D900 Series Floor-Ceiling Design in the UL Fire Res.
2. STRUCTURAL SUPPORT - Steel beam or joist as specified in the individual D700 or D900 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to and 1” (25mm) to 6” (152mm) from wall assembly.
3. SPRAY-APPLIED FIRE PROOFING - Steel floor beam or joist to be sprayed with min. thickness as specified in the individual D700 or D900 Series Design.
4. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly a steel fluted deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 or P900 Series Roof-Ceiling Design in the UL Fire Res. Direct.
5. WALL ASSEMBLY - Constructed in the manner specified in the U400 or V400 series designs as shown in the UL Fire Resistance Directory. The max. separation between bottom of floor/fireproofed floor and top of wall is 1” (25mm). Separation between fire proofing on beam/joist and wall is 1” (25mm) to 4” (102mm). The joint system is designed to accommodate a max. 12.5% compression of extension from its installed width.
6. STEEL STUDS (not shown) - Min. 3-1/2” (89mm) steel studs with max. 24” (610mm) o.c. spacing.
7. FORMING MATERIAL - Nom 4pcf (64 kg/cubic meter) mineral wool batt insulation cut to a width of 4” (102mm) and stacked to a thickness which is 50% greater than the width of the linear gap between the spray applied fire resistive material on the structural steel member and the surface of the wall assembly and installed between fireproofed support and wall and compressed 50%. The forming material shall be compressed 50% in the nom joint width above the wall and flush with surface of the wall opposite structural support.
8. NELSON FSC3 COATING (part # AA0868) - Min. 1/8” (3mm) wet thickness over the forming material on each side of the wall. Overlap the coating a min. 1/2” (13mm) onto the wall and 2” (51mm) onto steel floor/fireproofed floor and fire proofed steel support member on each side of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No.
HW-D-0393

Project Name: ___________________________ Date: 12/04/06
Address: ________________________________
Installer: ________________________________
Address: ________________________________
Signature: _______________________________

DWG NO. FS-0644 R2

BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

Nelson Firestop
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 1" to 6" (25mm to 152mm)
Class II Movement - 12.5% Compr or Ext

1. FLOOR ASSEMBLY - Constructed in the manner specified in the individual D700 or D900 Series Floor-Ceiling Design in the UL Fire
2. STRUCTURAL SUPPORT - Steel beam or joist as specified in the individual D700 or D900 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to and 1" (25mm) to 6" (152mm) from wall assembly.
3. SPRAY-APPLIED FIRE PROOFING - Steel floor, beam or joist to be sprayed with minimum thickness as specified in the individual D700 or D900 Series Design.
4. ROOF ASSEMBLY (not shown) - As an alternate to the floor assembly, a steel fluted deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 or P900 Series Roof-Ceiling Design in the UL Fire Res. Direct.
5. WALL ASSEMBLY - Min. 6" (152mm) thick steel-reinforced lightweight or nominal weight structural concrete wall or CMU block wall. The max separation between bottom of floor/fireproofed floor and top of wall is 1" (25mm). Separation between fire proofing on beam/ joist and wall is 1" (25mm) to 4" (102mm). The joint system is designed to accommodate a max. 12.5% compression or extension from its installed width.
6. FORMING MATERIAL - Nom 4pcf (64 kg/cubic meter) mineral wool batt insulation cut to a width of 4" (102mm) and stacked to a thickness which is 50% greater than the width of the linear gap between the spray applied fire resistive material on the structural steel member and the surface of the wall assembly and installed between fireproofed support and wall and compressed 50%. The forming material shall be compressed 50% in the nominal joint width above the wall and flush with surface of the wall opposite structural support.
7. NELSON FSC3 COATING (part # AA0888) - Spray or trowel over the forming material to a nominal 1/8" (3mm) thick wet applied coating. Overlap the coating a min. 1/2" (13mm) onto the wall and 2" (51mm) onto steel floor/fireproofed floor onto steel floor/fireproofed floor and fire proofed steel support member on each side of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No.
HW-D-0394

Nelson Firestop

DWG NO. FS-0645 R2

DATE: 12/04/06

BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 3 Hr.  T Rating 1-3/4, 2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. Floor may also be constructed of min. 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 14" (356mm) and 7" (178mm) when a HOLLOW-CORE floor are used.

2. METALLIC PIPE - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 12" (305mm) diameter (or smaller) Sch. 40 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 12" (305mm) diameter (or smaller) cast or ductile iron pipe.
   (C) STEEL PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (D) COPPER TUBING or PIPE - Nom 4" (102mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.
   Annular space between penetrant and periphery of opening shall be min. 0" (point of contact) to max. 1-1/4" (32mm) for steel/iron penetrants and 2" (51mm) for copper penetrants. T rating is 2 hr. when penetrant is 4" (102mm) diameter or less and 1-3/4" hr. when diameter of penetrant is greater than 4" (102mm).

3. PIPE INSULATION - Nominal 2" (51mm) thick, or thinner, MINERAL FIBER pipe insulation. Insulation shall extend 12" (305mm) below floor and 36" (914mm) above floor or 36" (914mm) beyond both surfaces of wall.

4. FORMING MATERIAL - Tightly pack min. 4" (102mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space and recessed 1/2" (13mm) from the top surface of the floor or from both sides of the wall or HOLLOW-CORE floor.

5. NELSON ES1399 SEALANT - Apply sealant over the forming material to a min. 1/2" (13mm) depth, flush with the top surface of the floor or with BOTH surfaces of the wall or HOLLOW-CORE floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. C-AJ-1532

DSG NO. FS-0646 RO

DATE: 01/20/05
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL NONMETALLIC PIPE

F Rating 3 Hr.  T Rating 2-1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or 6" (152mm) thick wall or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 4" (102mm).

2. METALLIC SLEEVE (optional) - Nom 4" (102mm) diameter (or smaller) Sch. 10 or heavier steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. NONMETALLIC PIPE - The following types of nonmetallic pipes, conduits or tubing may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) piping systems.
   (B) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) piping systems.
   (D) ELECTRICAL NONMETALLIC TUBING - Nom 2" (51mm) diameter (or smaller) PVC tubing.

   The annular space between the pipe, conduit or tube and the periphery of the opening shall be min. 0" (point of contact) to max. 1-3/4" (44mm) pipe.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess from top surface of floor or from both surfaces of wall or HOLLOW-CORE floor floor to accommodate the required thickness of sealant.

5. NELSON ES1399 SEALANT - Min. 1/2" (13mm) thickness of sealant installed within annulus, flush with top surface of floor or both surfaces of wall. In HOLLOW-CORE floor sealant installed to min. 1/2" (13mm) depth flush with each surface of the floor. At the point of contact of pipe and concrete a min. 1/2" (13mm) diameter bead of sealant shall be applied at top surface of floor or both surfaces of wall or precast concrete units.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No.
C-AJ-2525

DWG NO.  FS-0647 R0

Project Name: ___________________________  DATE: 01/20/05
Address: ____________________________________________________________
Installer: ___________________________  BY: RL
Address: ____________________________________________________________
Signature: __________________________________________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.

MEA # 126-04-M
CONCRETE FLOOR OR WALL INSULATED METALLIC PIPE

F Rating 3 Hr.  T Rating 1, 1-1/2, 1-3/4 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or min. 5" (127mm) thick wall, or CMU block wall. Floor may also be constructed of any 6" (152mm) thick HOLLOW-CORE Precast Concrete Units. Max. diameter of opening is 30" (762mm). Max. diameter of opening is 7" (178mm) when HOLLOW-CORE Precast Concrete Units are used.

2. METALLIC SLEEVE (optional) - Max. nominal 30" (762mm) diameter, or smaller, Sch. 10 or heavier steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. METALLIC PIPE - The following types and sizes of metallic pipes or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 20 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

4. FORMING INSULATION - Nominal 2" (51mm) thick, or thinner, FIBERGLASS pipe insulation. The annular space is 5/16" to 1-1/4" (8mm to 32mm).

5. FORMING MATERIAL - Tightly pack min. 4" (102mm) thickness of min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space and recessed 1/2" (13mm) from the top surface of the floor or from both sides of the wall. When the floor is constructed of HOLLOW-CORE precast concrete units, forming material shall be recessed 1/2" from BOTH surfaces of floor.

6. NELSON ES1399/LBS3 SEALANT - Apply sealant over the forming material to a min. 1/2" (13mm) depth, flush with the topside of the floor or with both sides of the wall. When the floor is constructed of HOLLOW-CORE precast concrete units, sealant shall be installed symmetrically on both sides of floor, flush with BOTH floor surfaces. T rating is 1 or 1-1/2 hr. when LBS3 or ES1399 is used respectively, with copper penetrants. T rating is 1 or 1-3/4 hr. when LBS3 or ES1399 is used respectively, with steel/iron penetrants.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0648 R1

Project Name:  
Address:  
Installer:  
Address:  
Signature:  

DATE: 07/14/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY: Construct as specified in the U300 or U400 series designs per UL Fire Resistance Directory. The max. diameter of the opening is 5\" (127mm).

2. CABLES - Max. 64% cable fill of opening in any combination of:
   (A) max. 3/C #12awg nonmetallic sheathed (ROMEX) cable w/copper conductors.
   (B) max. 400pr #24awg copper telephone cables.
   (C) max. RG/6 #18awg Type CATV copper conductor coaxial cable.
   (D) max. 3/C #2/0awg copper or aluminum conductor SER cables.
   (E) max. 62.5/125 micron fibre optic cables.
   All with PVC insulation and jacket.
   (F) max. 1/C 350 kcmil copper conductor cable w/cross-linked polyethylene (XLPE) jacket.
   (G) max. 7/C #12awg copper conductor power and control cables w/XLPE or PVC insulation w/XLPE or PVC jacket.
   (H) max. 4/C #2/0 aluminum or copper conductor, aluminum or steel jacketed METAL CLAD or ARMORED CLAD cable.
   (I) max. RG59/U television coaxial cable with fluorinated ethylene insulation and jacketing.
   The annular space between the cable bundle and the periphery of opening shall be a min. 0\" (point of contact) to max. 1-1/4\" (32mm).

3. FORMING MATERIAL (optional) - Mineral wool or fiberglass insulation or foam backer rod compressed and firmly packed into annular space from each end of opening and recessed 5/8\" (16mm) from each wall surface.

4. NELSON ES1399 SEALANT - Min. 5/8\" (16mm) thickness of sealant applied within annulus, flush with both surfaces of wall. At point of contact, 1/2\" (13mm) diameter bead of sealant applied at interface of cables and periphery of opening on both surfaces of wall.

Tested in accordance with:
   ASTM E-814
   ANSI/UL 1479

---

Nelson Firestop

System No.
W-L-3270

**DWG NO.** FS-0649 R0

**DATE:** 01/20/05

**BY:** RL

---

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 23" (584mm).

2. METALLIC DUCT - Max nominal 20" (508mm) diameter, or smaller, No. 28 MSG (or heavier) steel vent duct. Duct to be rigidly supported on both sides of wall assembly.

3. DUCT INSULATION - Nom 1-1/2" (38mm) thick FIBERGLASS insulation jacket on the outside with foil-scrim-kraft facing. The annular space between the wrapstrip and the periphery of the opening shall be min. 0" (point of contact) to max. 1-1/8" (29mm).

4. NELSON WRS3 WRAPSTRIP (part # AA0897) - One layer of nom 1/4" (6mm) thick by 1-1/2" (38mm) wide wrapstrip tightly wrapped around duct insulation, with a max. insulation compression ratio of 50% and held in place with masking tape. Wrapstrip slid into annulus on both sides of wall such that wrapstrip is recessed 5/8" (16mm) from both surfaces of wall.

5. FORMING MATERIAL (optional) - Mineral wool or fiberglass insulation or foam backer rod compressed and firmly packed into annular space from each end of opening and recessed 5/8" (16mm) from each wall surface.

6. NELSON ES1399 SEALANT - Apply to fill the annular space around the duct to a min 5/8" (16mm) depth; flush with both surfaces of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 2 Hr.
Nominal Joint Width - 4\" (102mm)

1. FLOOR ASSEMBLY - Min. 4-1/2\" (114mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 4\" (102mm).

2. FORMING MATERIAL - Min. 11\" (279mm) width of forming material folded in half, compressed min. 40 percent in thickness and friction fitted into opening as a permanent form. Forming material to be recessed from top surface of floor to accommodate the required thickness of sealant.

BACKER ROD MFG INC - ULTRA BLOCK

3. NELSON CLK SEALANT - Min. 1/2\" (13mm) thickness of sealant applied within the joint, flush with top surface of floor.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No.
FF-S-1032

Nelson Firestop
DWG NO. FS-0651 R1

DATE: 11/29/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO WALL

F Rating 2 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 4" (102mm).

2. WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete wall. The wall may be constructed of any UL Classified Concrete Blocks.

3. FORMING MATERIAL - Min. 11" (279mm) width of forming material folded in half, compressed min. 40 percent in thickness and friction fitted into opening as a permanent form. Forming material to be recessed from top surface of floor to accommodate the required thickness of sealant.

   BACKER ROD MFG INC - ULTRA BLOCK

4. NELSON CLK SEALANT - Min. 1/2" (13mm) thickness of sealant applied within the joint, flush with top surface of floor.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

System No.
FW-S-1017

Nelson Firestop

Project Name: __________________________
Address: ______________________________
Installer: ______________________________
Address: ______________________________
Signature: _____________________________

DATE: 11/29/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
HEAD OF WALL

F Rating 2 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor.

2. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall or CMU block wall. The max. joint width at the time of installation is 4" (102mm).

3. FORMING MATERIAL - Nom 11" (279mm) wide by 3-3/8" (86mm) thick forming material folded in half and compressed min. 40 percent in thickness. Forming material installed into opening as a permanent form and to be recessed from each surface of walls to accommodate the required thickness of sealant.

4. NELSON CLK SEALANT - Apply CLK over the forming material on both sides of the wall to a min. 1/2" (13mm) thickness, flush with each surface of the wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. HW-S-1013

| Project Name: | __________________________ |
| Address:      | __________________________ |
| Installer:    | __________________________ |
| Address:      | __________________________ |
| Signature:    | __________________________ |

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

DWG NO. FS-0653 R1
DATE: 11/29/06
BY: RL
JOINT TREATMENT SYSTEM
WALL TO WALL

F Rating 2 Hr.
Nominal Joint Width - 4" (102mm)

1. WALL ASSEMBLY - Min. 5" (127mm) thick lightweight or normal weight concrete wall. The max. joint width at the time of installation is 4" (102mm).

2. FORMING MATERIAL - Nom 11" (279mm) wide by 3-3/8" (86mm) thick forming material folded in half and compressed 40 percent in thickness. Forming material installed into opening as a permanent form and to be recessed from each surface of wall to accommodate the required thickness of sealant.

3. NELSON CLK SEALANT - Apply CLK over the forming material on both sides of the wall to a min. 1/2" (13mm) thickness, flush with each surface of wall.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop

System No. WW-S-1034

Project Name: ____________________________  DATE: 11/28/06
Address: ___________________________________
Installer: ____________________________  BY: RL
Address: ____________________________
Signature: ____________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
WOOD/STEEL JOIST FLOOR
INSULATED HVAC/GREASE DUCT

F Rating 1 or 2 Hr.  T Rating 1 or 2 Hr.

(2) HVAC Duct
(6) Sealant
(5) Forming Material
(4) Insulation
(1) Wood Floor

1. WOOD FLOOR ASSEMBLY - Constructed in the manner specified in individual L500 series 1 hr. floor-ceiling designs in the UL Fire Res. Dir. For 1 hr. fire rated floor-ceiling assemblies nom 10" (254mm) deep (or deeper) lumber, steel or combination lumber and steel joists and trusses. The 2 Hr. fire rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design No. L505, L511 or L536 in the UL Fire Resistance Directory. Max. area of opening is 435 sq. in. (2806 sq. cm) with a max. dimensions of 30" (762mm).

(A) FLOORING SYSTEM - Lumber or plywood subfloor with finish lumber, plywood or FLOOR TOPPING mixture.
(B) FURRING CHANNELS (not shown) - Resilient galv. steel furring installed perpendicular to wood/steel joists/trusses between gypsum board and wood/steel joists/trusses and to 2 hr. assemblies, installed perpendicular to wood joists between first and second layers of gypsum board. All spaced max. 24" O.C.
(C) GYPSUM BOARD - First layer of wallboard secured to wood/steel joists/trusses or furring channels. Second layer of wallboard (2 hr.) screw-attached to furring channels.

2. HVAC DUCT - Max. 7-1/2" x 24" (191mm x 610mm) or smaller 26 ga (or heavier) steel duct, installed concentrically or eccentrically within the opening.

3. GREASE DUCT (not shown) - Max. 7-1/2" x 24" (191mm x 610mm) or smaller 16 ga (or heavier) steel duct, installed concentrically or eccentrically within the opening.

4. DUCT INSULATION - Nom 1-1/2" (38mm) thick blanket totally encapsulated within foil scrim facers. The steel grease duct shall be wrapped with one layer of duct wrap installed in accordance with Grease Duct Assembly No. G-14. The steel air duct shall be wrapped with one layer of duct wrap installed in accordance with Ventilation Assembly No. V-19. The annular space between the insulated steel duct and the periphery of the opening shall be nom 1-1/2" (38mm).

THERMAL CERAMICS INC - FireMaster Fast Wrap+

5. FORMING MATERIAL - Min. 10-3/8" (264mm) and 11-5/8" (295mm) thickness of unfaced scrap duct ap material compressed 50 % into opening as a permanent form between the insulated steel duct and the periphery of the opening for 1 and 2 Hr. fire rated floor-ceiling assemblies, respectively. At point of contact location between overlap of duct wrap material and floor-ceiling assembly, forming material shall be firmly packed to max. extent possible on both sides of the floor-ceiling assembly. Forming material to be installed flush with bottom surface of ceiling and recessed from top surface of floor to accommodate the required thickness of sealant.

6. NELSON ES1399/LBS3 SEALANT - Min. 1/4" (3mm) thickness of sealant applied within annulus on top surface of floor. A min. 1/4" (3mm) diameter bead of sealant shall be applied at the plywood floor/insulated steel duct interface on both surfaces of floor-ceiling assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO.  FS-0655 R2

| Project Name: |  |
| Address: |  |
| Installer: |  |
| Address: |  |
| Signature: |  |

DATE: 11/06/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
INSULATED HVAC/GREASE DUCT

F Rating 1 or 2 Hr.  T Rating 1 or 2 Hr.

(4) Duct Insulation

(6) Sealant

(2) HVAC Duct

(1) Wall

(5) Forming Material

1. WALL ASSEMBLY - Constructed in the manner specified in the U400 or V400 series designs as shown in the UL Fire Resistance Directory. The max. area of the opening is 1007.5 sq. in. (6500 sq. cm) with a max. dimension of 36" (899mm).

2. HVAC DUCT - Nominal 24" x 30" (610mm x 762mm), or smaller, 26 gauge (or heavier) steel duct installed eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall.

3. GREASE DUCT (not shown) - Nominal 24" x 30" (610mm x 762mm) (or smaller), 16 GA (or heavier) steel duct installed eccentrically within the opening. The duct is to be rigidly supported on both sides of the wall. Grease duct assemblies are for use only in 2 Hr. rated walls.

4. DUCT INSULATION - Nom 1-1/2" (38mm) thick blanket totally encapsulated within foil-scrim facers. The steel grease duct shall be wrapped with one layer of duct wrap installed in accordance with Grease Duct Assembly No. G-14. The steel air duct shall be wrapped with one layer of duct wrap installed in accordance with Ventilation Assembly No. V-19. The annular space between the insulated duct and the periphery of the opening shall be min. 0" (point of contact) to max. 2" (51mm).

THERMAL CERAMICS INC - Firemaster Fast Wrap+

5. FORMING MATERIAL - Min. 3-1/2" (89mm) thickness of unfaced scrap duct wrap material compressed 50 percent into opening as a permanent form between the insulated steel duct and the periphery of opening. Forming material shall be firmly packed to max. extent possible at gypsum board/insulated steel duct interface on both sides of the wall. Forming material to be recessed from both surfaces of wall to accommodate the required thickness of sealant.

6. NELSON ES1399/LBS3 SEALANT - Min. 1/4" (6mm) thickness of sealant applied within annulus, flush with both surfaces of wall assembly. A min. 1/4" (6mm) diameter bead of sealant shall be applied at the gypsum board/insulated duct interface on both surfaces of wall assembly.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-7121

DWG NO. FS-0656 R1

DATE: 07/14/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
METALLIC PIPE OR CONDUIT

F Rating 1 or 2 Hr.       T Rating 0 Hr.

(4) Forming Material
(5) Sealant
(1) Wall
(2) Sleeve
(3) Pipe

1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 or V400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 26-3/8" (670mm) for steel stud walls and 14-1/2" (368mm) for wood stud walls.

2. METALLIC SLEEVE - Sleeve fabricated from 0.018" (0.46mm) thick (28 GA) galv sheet steel and having a min. 1" (25mm) lap along the longitudinal seam. Sheet steel coiled to a diameter less than circular cutouts in wall assembly, inserted through both sides of wall and allowed to uncoil against the circular cutouts in the wall assembly. Sleeve may consist of Sch. 5 (or heavier) steel pipe, rigid steel conduit or EMT friction fitted into wall assembly, flush with or extending max. 4" (102mm) beyond each surface of the wall surface.

3. METALLIC PIPE or CONDUIT - The following types and sizes of metallic pipes, conduits or tubing may be used:
   (A) STEEL PIPE - Nom 24" (610mm) diameter (or smaller) Sch. 5 (or heavier) steel pipe.
   (B) IRON PIPE - Nom 24" (610mm) diameter (or smaller) cast or ductile iron pipe.
   (C) CONDUIT - Nom 4" (102mm) diameter (or smaller) steel electrical metallic tubing or nom 6" (152mm) diameter (or smaller) steel conduit or nom 1" (25mm) diameter (or smaller) flexible steel conduit.
   (D) COPPER TUBING or PIPE - Nom 6" (152mm) diameter (or smaller) Type L (or heavier) copper tubing or regular (or heavier) copper pipe.

   The annular space between pipes, tubing or conduits and periphery of opening shall be min. 0" (point of contact) to max. 2" (51mm).

4. FORMING MATERIAL - Min. 2" (51mm) thickness of nom 4pcf (64 kg/cubic meter) mineral wool batt insulation firmly packed into ends of steel sleeve and recessed as required to accomodate required thickness of sealant.

5. NELSON ES1399/LSBS3 SEALANT - Min. 5/8" (16mm) thickness of sealant within the annular space flush with edges of steel sleeve on both sides of the wall. Nom 3/8" (10mm) diameter bead of sealant to be applied at the point of contact location between the metallic penetrant and the steel sleeve. Additional nom 3/8" (10mm) diameter bead of sealant applied at the steel sleeve/gypsum board interface when sleeve projects beyond the surface of the wall.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-1405

<table>
<thead>
<tr>
<th>DWG NO.</th>
<th>FS-0657 R1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>07/14/06</td>
</tr>
<tr>
<td>BY:</td>
<td>RL</td>
</tr>
</tbody>
</table>

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.

Project Name: ____________________________
Address: ________________________________
Installer: _______________________________
Address: ________________________________
Signature: _____________________________
CONCRETE FLOOR NONMETALLIC PIPE

F Rating 2 Hr.

(1) Floor
(2) Pipe
(3) Steel Cover Plate
(4) Forming Material
(5) Sealant
(6) Wrapstrip
(7) Restraining Collar

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete topping poured over a steel fluted deck. Diameter of opening to be 1/2" - 5/8" (13 - 16mm) larger than penetrant. Max. diameter of opening is 5" (127mm).

2. NONMETALLIC PIPE - Max. 4" (102mm) diameter, (or smaller), Sch. 40 PVC or RNC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Max. 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed piping systems. Max. 4" (102mm) diameter (or smaller) Sch. 40 ABS pipe for use in closed or vented piping systems. Max. 4" (102mm) diameter (or smaller) Sch. 40 FRPP pipe for use in closed or vented piping systems.

3. STEEL COVER PLATE - Min. 16 GA galv steel. Width of plate to extend a min. of 3" (76mm) beyond both sides of opening. Length of plate to extend to steel floor unit valley beyond each side of core-drilled hole with a min. lap of 1-1/2" (38mm) on the floor unit valley at each end. Circular cutout in plate to be 1/4" (6mm) larger than the outside diameter of penetrant. Max. diameter of opening is 4-3/4" (121mm). Plate to be cut in half along the length of plate to permit installation around the penetrant. Plate secured to valleys of floor unit using 1/4" (6mm) diameter by min. 1-1/4" (32mm) long steel concrete anchors in conjunction with min. 1" (25mm) diameter steel fender washers. Fasteners to be located approx. 1" (25mm) from edges of plate at each corner and at both sides of cut made to permit installation around penetrant.

4. FORMING MATERIAL - Min. 4pcf (64 kg/cubic meter) mineral wool batt insulation tightly packed into flutes of steel floor units above steel cover plate and annular space between penetrant and floor. Forming material within flutes to be recessed 1/2" (13mm) from both side edges of steel cover plate to accommodate the required depth of sealant. Additional forming material firmly packed into annular space between pipe and concrete. Forming material in annular space to be recessed 1/4" (6mm) from top surface of floor to accommodate the sealant.

5. NELSON LBS3 SEALANT - Min. 1/4" (6mm) thickness of sealant applied within annular space, flush with the top of the concrete floor. Min. 1/2" (13mm) thickness of sealant applied into flutes of steel floor units above steel cover plate to completely cover forming material.

6. NELSON WRS3 WRAPSTRIP (part # AA0896) - Apply 1/4" (6mm) thick by 1" (25mm) wide wrapstrip around the through penetrant. The wrapstrips are installed on the bottom side of the steel cover plate.

<table>
<thead>
<tr>
<th>Pipe Diam. in. (mm)</th>
<th>Min. No. of Wrapstrip Layers</th>
<th>Annular Space in. (mm)</th>
<th>Through Penetrant</th>
<th>T Rating Hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 &amp; 4 (76 &amp; 102)</td>
<td>2</td>
<td>0 to 5/8 (16)</td>
<td>PVC, CPVC, ABS, RNC</td>
<td>1</td>
</tr>
<tr>
<td>1-1/2 &amp; 2 (38 &amp; 51)</td>
<td>1</td>
<td>0 to 5/8 (16)</td>
<td>PVC, CPVC, ABS, RNC</td>
<td>1</td>
</tr>
<tr>
<td>3 &amp; 4 (76 &amp; 102)</td>
<td>2</td>
<td>0 to 5/8 (16)</td>
<td>FRPP</td>
<td>3/4</td>
</tr>
<tr>
<td>1-1/2 &amp; 2 (38 &amp; 51)</td>
<td>1</td>
<td>0 to 5/8 (16)</td>
<td>FRPP</td>
<td>3/4</td>
</tr>
</tbody>
</table>

7. RESTRAINING COLLAR (part # AA0659D) - Apply min. 28 GA, glv. steel restraining collar around the wrapstrip. Attach the collar to the steel cover plate with No. 8 by 3/4" (19mm) long steel sheet metal screws in conjunction with 1" (24mm) diameter steel fender washers. Use 1/4" (6mm) by 1-1/4" (32mm) concrete screws when mounting beneath valley of steel floor unit.

8. NELSON PCS PIPECHECK (not shown) - As an option to the WRS3 and restraining collar, the appropriate sized pipecheck may be used around the penetrant on the underside of the steel cover plate. Secure using 1/4" (6mm) diameter by 1-3/4" (44mm) long steel concrete anchors in conjunction with 1/4" (6mm) diameter by 1-3/4" (44mm) long steel concrete anchors in conjunction with 1/4" (6mm) diameter by 1-1/4" (32mm) diameter steel washers. When used with ABS or FRPP pipe, the max. size of pipe is 2" (51mm).

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. F-A-2159

DWG NO. FS-0658 R1

DATE: 10/25/06

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

Nelson Firestop

800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL
NONMETALLIC PIPE

F Rating 1 or 2 Hr.  T Rating 1 or 2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 or V400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 4-3/8" (111mm).

2. METALLIC SLEEVE - Nom 4" (102mm) diameter (or smaller) cylindrical sleeve fabricated from 0.018" (0.46mm) thick (26 GA) galv sheet steel and having a min. 1" (25mm) lap along the longitudinal seam. Circular cutouts in wall assembly, inserted through both sides of wall and allowed to uncoil against the Length of sleeve to be installed flush with wall surfaces or extending a max. 1" (25mm) from wall surfaces. Sleeve may consist of Sch. 5 (or heavier) steel pipe, rigid steel conduit or EMT friction fitted into wall assembly flush with or extending a max. 4" (102mm) beyond each surface of the wall.

3. NONMETALLIC PIPE or TUBING - The following types and sizes of nonmetallic pipes, conduits or tubing may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 2" (51mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) piping systems.
   (B) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 2" (51mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   (C) RIGID NONMETALLIC CONDUIT - Nom 2" (51mm) diameter (or smaller) Sch. 40 PVC conduit.
   (D) ELECTRICAL NONMETALLIC TUBING (ENT) - Nom 1" (25mm) diameter (or smaller) PVC tubing. Max. annular space is 1" (25mm).

4. NELSON LBS3 SEALANT - Apply to fill the annular space around the pipe to a min. 5/8" (16mm) or 1-1/4" (32mm) depth for 1 or 2 Hr. assemblies respectively, flush with both surfaces of sleeve. Additional sealant to be installed such that a min. 5/8" (16mm) crown is formed around the penetrating item and lapping a min. 1" (25mm) beyond the periphery of the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
System No. W-L-2470

Project Name: ____________________________
Address: ________________________________

Installer: ________________________________
Address: ________________________________

Signature: ______________________________

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR
MULTIPLE PENETRANTS

F Rating 1 Hr.  T Rating 0 Hr.

(2 C) Cables  (4) Sealant
(3) Pipe Insulation  (5) Wrapstrip
(2 B) Pipe  (2 A) Pipe

1. FLOOR ASSEMBLY - Min. 2-1/2" (64mm) thick lightweight or normal weight concrete floor. The max. diameter of opening is 5" (127mm).

2. PENETRANTS - Pipes, tubes and cables to be bundled together and centered in opening. The annular space shall be min. 0" (point of contact) to 1/2" (13mm).
   (A) COPPER TUBING - Nom 1" (25mm) diameter (or smaller) Type L (or heavier) copper tubing. A max. of (TWO) 1" (25mm) diameter (or smaller) copper tubes without insulation may be used. A max. of (TWO) 3/4" (19mm) diameter (or smaller) copper tubes with insulation may be used.
   (B) NONMETALLIC PIPE - Nom 1-1/2" (13mm) diameter (or smaller) Sch. 40 (or heavier) solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system. A max. of (ONE) pipe may be used.
   (C) CABLES - Four pair No. 18awg (or smaller) cable with PVC insulation and jacket materials. A max. of (TWO) cables may be used.

3. PIPE INSULATION - Nom 1/2" (13mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing. Tube insulation to be installed on a max. of (TWO) 3/4" (19mm) diameter (or smaller) copper tubes.

4. NELSON LSB3 SEALANT - Min. 1/2" (13mm) thickness of sealant applied within annulus, flush with top and bottom surfaces of floor. At point contact location, apply a min. 1/4" (6mm) thick bead of sealant at the penetrant/concrete interface on both surfaces of the floor.

5. NELSON WRS3 WRAPSTRIP (part # AA0897) - Nom 1/4" (6mm) thick by 1-1/2" (38mm) wide strips. ONE layer of wrapstrip is applied around the group of penetrants at its egress from the sealant with its top edge abutting the bottom surface of the floor.

6. RESTRAINING COLLAR (not shown) (part # AA0859D) - Apply min. 30 GA. galv. steel restraining collar around the wrapstrip. Attach the collar to the floor with min. 1/4" (6mm) diameter x 1-3/4" (45mm) long steel concrete anchors in conjunction with 1/4" x 1-1/4" (6mm x 32mm) diameter fender washers. Four concrete anchors are required.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0660 R0
DATE: 03/30/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
GYPSUM WALL NONMETALLIC PIPE

F Rating 1 or 2 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 or V400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 5" (127mm).

2. METALLIC SLEEVE (optional) - Sleeve fabricated from 0.018" (0.46mm) thick (28 GA) galv sheet steel and having a min. 1" (25mm) lip along the longitudinal seam. Sheet steel coiled to a diameter less than circular cutouts in wall assembly. Inserted to both sides of wall and allowed to uncoil against the circular cutouts in the wall assembly. Sleeve to be installed flush with each surface of wall. Sleeve may consist of Sch. 5 (or heavier) steel pipe, rigid steel conduit or EMT friction fitted into wall assembly.

3. NONMETALLIC PIPE - The following types of nonmetallic pipes or conduits may be used:
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   (B) RIGID NONMETALLIC CONDUIT - Nom 4" (102mm) diameter (or smaller) Sch. 40 PVC conduit.
   (C) CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - Nom 4" (102mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 4" (102mm) diameter (or smaller) Sch. 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   The annular space between pipe or conduit and periphery of opening shall be 0" (point of contact) to 1/2" (13mm).

4. NELSON LBS3 SEALANT - Apply LBS3 within the annular space to a min. 5/8" (16mm) depth, flush with both wall surfaces. At point of contact, a min. 3/8" (10mm) diameter bead of sealant shall be applied at the gypsum/penetrant interface on both surfaces of wall.

5. NELSON WRS3 WRAPSTRIP (part # AA0886) - Apply 1/4" (6mm) thick by 1" (25mm) wide WRS3 around the pipe on both sides of the wall in accordance with the schedule shown in the table below.

<table>
<thead>
<tr>
<th>Pipe Type</th>
<th>Max. Pipe Size</th>
<th>Nos. of Layers</th>
<th>F Rating (Hr.)</th>
<th>T Rating (Hr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC, CPVC or RNC</td>
<td>4 (102mm)</td>
<td>2 or 3</td>
<td>2</td>
<td>0 or 1</td>
</tr>
<tr>
<td>ABS</td>
<td>2 (51mm), 3 (76mm) or 4 (102mm)</td>
<td>1, 2 or 3</td>
<td>2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>PVC, CPVC or RNC</td>
<td>2 (51mm)</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ABS</td>
<td>4 (102mm)</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>PVC, CPVC, ABS or RNC</td>
<td>4 (102mm)</td>
<td>2 or 3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>PVC, CPVC or RNC, ABS or RNC</td>
<td>2 (51mm) or 3 (76mm)</td>
<td>1 or 2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

6. STEEL RESTRAINING COLLAR (part # AA0659D) - Apply nominal 28 gauge prefabricated galvanized steel collar around the wrapstrip. Overlap the collar and secure with 1/2" (13mm) wide by 0.028" (.711mm) thick stainless steel hose clamp. Collar secured to the wall with 1/8" (3mm) diameter by min. 2-3/4" (70mm) long steel molly bolts in conjunction with 1/4" (6mm) by 1-1/4" (32mm) diameter steel fender washers.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

DWG NO. FS-0661 R0

DATE: 03/28/06

BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
**GYPSUM WALL**

**NONMETALLIC PIPE**

**F Rating 1 or 2 Hr.**

**T Rating 0 Hr.**

![Diagram of Gypsum Wall Nonmetallic Pipe]

1. **WALL ASSEMBLY** - Constructed in the manner specified in the U300, U400 or V400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 5" (127mm).

2. **METALLIC SLEEVE (optional)** - Sleeve fabricated from 0.018" (0.46mm) thick (28 GA) galv sheet steel and having a min. 1" (25mm) lap along the longitudinal seam. Sheet steel collared to a diameter less than circular cutouts in wall assembly, inserted through both sides of wall and allowed to uncoil against the circular cutouts in the wall assembly. Sleeve to be installed, flush with each surface of wall. Sleeve may consist of Sch. 5 (or heavier) steel pipe, rigid steel conduit or EMT friction fitted into wall assembly.

3. **NONMETALLIC PIPE** - The following types of nonmetallic pipes or conduits may be used:
   - (A) **POLYVINYL CHLORIDE (PVC) PIPE** - Nom 3" (76mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   - (B) **RIGID NONMETALLIC CONDUIT** - Nom 3" (76mm) diameter (or smaller) Sch. 40 PVC conduit.
   - (C) **CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE** - Nom 3" (76mm) diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   
   The annular space between the pipe or conduit and the periphery of opening shall be min. 1/4" (6mm) to max. 1-1/4" (32mm).

4. **NELSON WRS3 WRAPSTRIP** (part # AA0897) - Apply 1 continuous layer of 1/4" (6mm) thick by 1-1/2" (38mm) wide wrapstrip around the pipe on both sides of the wall and slide into the annular space, such that the ends are recessed 1/4" (6mm) from the surface of the wall.

5. **NELSON LBS3 SEALANT** - Min. 5/8" (16mm) thickness of sealant applied within the annulus flush with both surfaces of wall. Additional sealant to be installed such that a min. 3/8" (10mm) thick crown is formed around the pipe.

Tested in accordance with:
- ASTM E-814
- ANSI/UL 1479

---

**Nelson Firestop**

**System No.**

**W-L-2469**

**DWG NO.**

**FS-0662 R0**

**DATE:** 03/28/06

**BY:** RL

---

**Nelson Firestop**

800 331-7325  Fax: 918 627-2941

Tulsa, Ok.
GYPSUM WALL CABLES

F Rating 1 or 2 Hr.  
T Rating 3/4 Hr.

1. WALL ASSEMBLY - Constructed in the manner specified in the U400 or V400 series designs as showing the UL Fire Resistance Directory. The max. area of opening is 168 sq. in. (1084 sq. cm) with a max. dimension of 28" (711mm). Additional framing members shall be installed in stud cavity to form a rectangular box around cables.

2. CABLES - Aggregate cross-sectional area of cables within opening is to be max. 29 sq. in. (187 sq. cm). The annular space between the cables and the periphery of opening shall be min. 0" (point of contact) to max. 2" (51mm). Any combination of the following types and sizes of cables may be used:
   A). 1/C-350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene jacket.
   B). 200 pair - No. 24awg (or smaller) copper conductor cable with polyvinyl insulation and jacket.
   C). 62.5/125 fiber optic cable with PVC insulation and jacket.
   D). Max. 3/C No.12awg (or smaller) METAL-CLAD cable.

3. NELSON FSP PUTTY (part # AA445) - Prior to installation of the fire bricks, min. 3/8" (10mm) thickness of putty forced into interstices of cables within the full depth of the stud cavity. After installation of the fire bricks, min. 3/8" (10mm) additional putty applied between the interstices of cables and between the fire bricks and cables on both surfaces of the wall assembly. At point of contact location between cables and gypsum board, min. 3/8" (10mm) thickness of putty applied at the cables/gypsum board interface on both surfaces of the wall.

4. NELSON FIRE BRICKS (part # AA0834) - For walls incorporating max. 3-1/2" (89mm) steel studs, fire bricks installed with 5" (127mm) dimension projecting through and centered in opening. For walls constructed of larger than 3-1/2" (89mm) steel studs, fire brick installed with long dimension passing through and centered in opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. W-L-3311

DWG NO. FS-0663 R0

Project Name: 
Address: 
Installer: 
Address: 
Signature: 

DATE: 07/14/06
BY: RL

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Min. 6" (152mm) thick reinforced lightweight or normal weight concrete. Wall may also be constructed of any UL Classified Concrete Blocks. Max. area of opening is 168 sq. in. (1084 sq. cm) with a max. dimension of 28" (711mm).

2. CABLES - Aggregate cross-sectional area of cables within opening is to be max. 29 sq. in. (187 sq. cm). The annular space between the cables and the periphery of opening shall be min. 0" (point of contact) to max. 2" (51mm). Any combination of the following types and sizes of cables may be used:
   A). 1/C-350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene jacket.
   B). 200 pair - No. 24awg (or smaller) copper conductor cable with polyvinyl insulation and jacket.
   C). 62.5/125 fiber optic cable with PVC insulation and jacket.
   D). Max. 3/C No.12awg (or smaller) METAL-CLAD cable.

3. NELSON FSP PUTTY (part # AA445) - Prior to installation of the fire bricks, min. 3/8" (10mm) thickness of putty forced into interstices of cables within the full depth of the wall. After installation of the fire bricks, min. 3/8" (10mm) additional putty applied between the interstices of cables and between the fire bricks and cables on both surfaces of the wall assembly. At point of contact location between cables and concrete, min. 3/8" (10mm) thickness of putty applied at the cables/concrete interface on both surfaces of the wall.

4. NELSON FIRE BRICKS (part # AA0834) - For reinforced concrete and solid filled concrete block wall assemblies, bricks installed centered within depth of opening with the long dimension placed horizontally. For HOLLOW-CORE block walls, bricks installed with long dimension passing through the opening from surface to surface. Bricks to completely fill the entire opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop
DWG NO. FS-0664 R0

BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
JOINT TREATMENT SYSTEM
FLOOR TO FLOOR

F Rating 4 Hr.
Nominal Joint Width - 4" (102mm)

1. FLOOR ASSEMBLY - Min. 6" (152mm) thick lightweight or normal weight concrete floor. The max. joint width at the time of installation is 4" (102mm).

2. FORMING MATERIAL - Min. 16" (406mm) width of forming material folded in half and firmly packed into opening as a permanent form. Forming material to be recessed from top surface of floor as required to accommodate the required thickness of sealant.

BACKER ROD MFG INC - ULTRA BLOCK

ALTERNATE FORMING MATERIAL - Min. 4pcf (84 kg/cubic meter) mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min. width of 5-1/2" (140mm) and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed 50% in thickness and such that the compressed bat sections are recessed from top surface of floor to accommodate the required thickness of sealant. Adjoining lengths of batt to be tightly-butted with butted seams spaced min. 36" (914mm) apart along the length of the joint.

3. NELSON CLK SEALANT (S/L or N/S) - Min. 1/2" (13mm) thickness of sealant applied within the joint, flush with top surface of floor.

Tested in accordance with:
ASTM E-1966
ANSI/UL 2079

Nelson Firestop
System No. FF-S-1036

DWG NO. FS-0665 R1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Installer:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

DATE: 11/29/06
BY: RL

Nelson Firestop
800 331-7325 Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
METALLIC PIPE

F Rating 3 Hr. T Rating 0 Hr.

(3) Pipe
(5) Sealant
(4) Forming Material
(1) Floor or Wall

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or minimum 5 in. thick reinforced lightweight or normal weight concrete wall. Floor may also be constructed of any min. 6 in. thick hollow-core Precast Concrete Units. Wall may also be constructed of any UL Classified Concrete Blocks. Maximum diameter of the opening is 6 inches.

2. NONMETALLIC SLEEVE - (Optional, not shown) Nom. 6" diameter (or smaller) Schedule 40 PVC pipe cast or grouted into the floor or wall assy., flush with both surfaces.

3. METALLIC PIPE - One metallic pipe, conduit or tubing of the following types and sizes may be used. Annular space to be 0 to 1-3/4" with pipe rigidly supported on both sides.
   (A) CONDUIT - Nominal 4" (102mm) diameter (or smaller) EMT or steel conduit.
   (B) COPPER TUBING - Nominal 4" (102mm) diameter (or smaller) Type M (or heavier) copper tubing.
   (C) STEEL PIPE - Nominal 4" (102mm) diameter (or smaller) Schedule 10 (or heavier) steel pipe.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of sealant.

5. NELSON LBS3 SEALANT - Apply to fill the annular space to a min. 1/2" (12mm) depth over the forming material. Sealant is to be installed flush to top surface of the floor or with both surfaces of the wall. Additional 1/2" bead of sealant to be applied at the surface of the floor or wall at any point contact of the pipe and the concrete. When the floor is constructed of hollow-core precast concrete units, fill material shall be applied symmetrically to both sides of the floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No.
C-AJ-1581

Project Name: ____________________________
Address: ____________________________
Installer: ____________________________
Address: ____________________________
Signature: ____________________________

DATE: 01/07/08
BY: TEP

Nelson Firestop
800 331-7325     Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
METALLIC PIPE

F Rating 3 Hr.  T Rating 0 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or minimum 5 in. thick reinforced lightweight or normal weight concrete wall. Floor may also be constructed of any min. 6 in. thick hollow-core Precast Concrete Units. Wall may also be constructed of any UL Classified Concrete Blocks. Maximum diameter of the opening is 6 inches.

2. NONMETALLIC SLEEVE - (Optional, not shown) Nom. 6" diameter (or smaller) Schedule 40 PVC pipe cast or grouted into the floor or wall assy., flush with both surfaces.

3. METALLIC PIPE - One metallic pipe, conduit or tubing of the following types and sizes may be used. Annular space to be 1/4" to 1-3/4" with pipe rigidly supported on both sides. (A) CONDUIT - Nominal 4" (102mm) diameter (or smaller) EMT or steel conduit. (B) COPPER TUBING - Nominal 4" (102mm) diameter (or smaller) Type M (or heavier) copper tubing. (C) STEEL PIPE - Nominal 4" (102mm) diameter (or smaller) Schedule 10 (or heavier) steel pipe.

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of sealant.

5. NELSON LBS3 or ES1399 SEALANT - Apply to fill the annular space to a min. 1/2" (12mm) depth over the forming material. Sealant is to be installed flush to top surface of the floor or with both surfaces of the wall. When the floor is constructed of hollow-core precast concrete units, fill material shall be applied symmetrically to both sides of the floor.

Nelson Firestop
800 331-7325    Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL
NONMETALLIC PIPE

F Rating 2 or 3 Hr.  T Rating 1 or 1 1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or minimum 5 in. thick reinforced lightweight or normal weight concrete wall. Floor may also be constructed of any min. 6 in. thick hollow-core Precast Concrete Units. Wall may also be constructed of any UL Classified Concrete Blocks. Maximum diameter of the opening is 6 inches.

2. STEEL SLEEVE - (Optional, not shown) Nom. 6" diameter (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into the floor or wall assy., flush with both surfaces.

3. NONMETALLIC PIPE - One nonmetallic pipe, conduit or tube of the following types and sizes may be used. Annular space to be 0" (point contact) to 2-1/2".
   (A) POLYVINYL CHLORIDE (PVC) PIPE - Nom 3" (76mm) diameter (or smaller) Sch. 40 cellular or solid core PVC pipe for use in closed (process or supply) piping systems. (F Rating - 3 hr., T Rating - 1-1/2 hr.)
   (B) RIGID NONMETALLIC CONDUIT - Nom 3" (76mm) diameter (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the NEC (NFPA 70).
   (C) ELECTRICAL NONMETALLIC TUBING+ - Nom 2" (51mm) diameter (or smaller) PVC tubing installed in accordance with Article 331 of the NEC (NFPA).
   (D) ACRYLONITRILE BUTADIENE STYRENE (ABS) PIPE - Nom 3" (76mm) diameter (or smaller) SCHDR 40 cellular or solid core ABS pipe for use in closed (process or supply) piping systems. (F Rating - 3 hr., T Rating - 1-1/2 hr.)

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess from top surface of floor or from both surfaces of wall as required to accomodate the required thickness of sealant.

5. NELSON LBS3 SEALANT - Apply to fill the annular space to a min. 1/2" (12mm) depth over the forming material. Sealant is to be installed flush to top surface of the floor or with both surfaces of the wall. Additional 1/2" bead of sealant to be applied at the surface of the floor or wall at any point contact of the pipe and the concrete.

 Tested in accordance with:
ASTM E-814
ANSI/UL 1479

DWG NO.  FS-0668 R0

Project Name:  
Address:  
Installer:  
Address:  
Signature:  

System No.  
C-AJ-2596

System No.  
C-AJ-2596

Date:  01/07/08

By:  TEP

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 3 Hr.   T Rating 1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick reinforced lightweight or normal weight concrete. Floor may also be constructed of any minimum 6" thick UL Classified hollow-core precast concrete units. Wall may also be constructed of any UL Classified concrete blocks. Maximum diameter of the opening is 6 inches (152mm).

2. NONMETALLIC SLEEVE - (Optional, not shown) Norn. 6" diameter (or smaller) Sch 40 PVC pipe cast or grouted into the floor or wall, flush with the floor or wall surfaces.

3. CABLES - Aggregate cross-sectional area of the cable bundle in the opening to be maximum 45% of the cross-sectional area of the opening. Minimum separation between the cables and the periphery of the opening is 1/4". Maximum annular space between the cables and the periphery of the opening is 2". Cables to be rigidly supported on both sides of the opening. The following types and sizes of cables may be used:

   (A) Max. 1/C 350 kcmil cable with crosslinked polyethylene (XLPE) jacket.
   (B) Max. 400 pr. No. 24 AWG cable with PVC insulation and jacket.
   (C) Max. 3/C No. 2/0 AWG aluminum conductor SER cable with PVC insulation and jacketing.
   (D) Max. 3/C No. 12 AWG copper conductor cable with PVC insulation and jacket (Romex).
   (E) Max. RG59/U copper conductor coaxial cable with fluorinated ethylene insulation and jacket.
   (F) Max. 62.5/125 fiber optic cable with PVC insulation and jacket.
   (G) Max. RG/6 No. 18 AWG copper conductor CATV coax cable with PVC insulation and jacket.
   (H) Max. 4/C No. 2/0 AWG copper conductor, steel, aluminum or metal clad cable (MC cable).

4. FORMING MATERIAL - Tightly pack min. 4pcf (64 kg/cubic meter) mineral wool batt insulation to fill the annular space to a min. 4" (102mm) depth, and recess from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of sealant.

5. NELSON LBS3 SEALANT - Apply to fill the annular space to a min. 1/2" (12mm) depth over the forming material. Sealant is to be installed flush to top surface of the floor or with both surfaces of the wall. When the floor is made from hollow-core precast concrete units, the fill material shall be installed symmetrically on both sides of the floor.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

System No. C-AJ-3289

DATE: 01/07/08
BY: TEP

Nelson Firestop
800 331-7325   Fax: 918 627-2941
Tulsa, Ok.
1. WALL ASSEMBLY - Constructed in the manner specified in the U300, U400 or V400 series designs as shown in the UL Fire Resistance Directory. Max. diameter of opening is 6" (152mm).
2. FLEXIBLE METALLIC CONDUITS - One or more 1-1/4" (32mm) diameter, (or smaller) steel flexible metallic conduits. Annular space between penetrants is 0" (point of contact) to 2" (51mm). The annular space between the through penetrants and periphery of opening shall be min. 0" (point of contact) to 2" (51mm).
3. NELSON LBS3 or ES1399 SEALANT - Apply sealant within the annular space to a min. 5/8" (16mm) depth. Apply flush with both surfaces of the wall. At point of contact, a min. 1/2" (10mm) diameter bead of sealant shall be applied at the gypsum board/through penetrant interface on both surfaces of the wall. Additional sealant shall be forced into interstices of through penetrants to max. extent possible.

Note: For 2 hr. rated wall, foam backer rod may be used to set depth of sealant. The hourly F and T Rating of the system is dependant on the fire rating of the wall assembly.
CONCRETE FLOOR OR WALL CABLE TRAY

F Rating 2 Hr.  T Rating 3/4 Hr.

(1) Floor
(2) Cable Tray
(3) Cables
(4) Putty
(5) Fire Brick

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall. Max. area of the opening is 168 sq. in., with a max. dimension of 26" (711mm). Wall may also be constructed of any UL Classifed Concrete Blocks.

2. CABLE TRAY - Max. 24" wide x 4" deep, steel or aluminum, open ladder cable tray. The annular space between the cable tray and periphery of opening shall be min. 6" (point of contact) to 2" (51mm).

3. CABLES - Max. 26% cable fill of cable tray in any combination of:
   A). 1/C-350 lpsmil (or smaller) copper conductor cable with PVC insulation and jacket material.
   B). 200 pair No. 24 awg (or smaller) copper conductor cable with PVC insulation and jacket.
   C). 62.5/125 fiber optic cable with PVC insulation and jacket.
   D). Max. 3/C No. 12 awg (or smaller) METAL-CLAD cable.

4. NELSON FBP PUTTY (part # AA445) - Prior to installation of the fire brick, min. 3/8" (10mm) thickness of putty forced into interstices of cables and between cables and cable tray within the full depth of the cavity. After installation of the fire brick, min. 3/8" (10mm) additional putty applied between the interstices of cables and cable tray, between the fire brick and cables and between cable tray and fire brick on both surfaces of the wall or floor assembly. At point of contact between cable tray and wall, a min. 3/8" (10mm) thickness of putty applied at the cable tray/concrete interface on both surfaces of the wall or floor.

5. NELSON FIRE BRICKS (part # AA834) - For reinforced concrete and solid filled concrete block wall assemblies, fire brick installed centered within depth of opening with the long dimension placed horizontally. For hollow core block walls, fire bricks installed with long dimension passing through the opening from surface to surface. Fire brick to completely fill the opening.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-4088

DWG NO. FS-0672 R0

Project Name: __________________________ Address: __________________________
Installer: __________________________ Address: __________________________
Signature: __________________________

DATE: 10/27/08  BY: TEP

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.
CONCRETE FLOOR OR WALL CABLES

F Rating 2 Hr.  T Rating 1/2 Hr.

1. FLOOR or WALL ASSEMBLY - Min. 4-1/2" (114mm) thick lightweight or normal weight concrete floor or wall, or CMU block wall. The max. diameter of the opening is 4" (102mm).

2. CABLES - Max. 22% cable fill of aggregate cross sectional area of opening.
   The following types and sizes of cables may be used:
   (A) max. 200 pair No. 24 AWG or smaller communication cable with PVC insulation.
   (B) max. 62.5/125mm fiber optic cable with PVC insulation.
   (C) max. 3/c No. 12 AWG or smaller metal clad cable,

3. NELSON FSP Putty - Prior to installation of Plug, min. 3/8 in. (10mm) thickness of putty forced into interfaces of cables within the full depth of the opening. After installation of Plug, min 3/8 in (10mm) thickness applied between intesfaces of cables and between cables and plug on both surfaces of floor or wall.

4. NELSON FIRE PLUG - Sized to fit opening. Plug to be friction fitted into opening, flush with the top surface of floor or both surfaces of the wall. Cut to accommodate cable bundle.

Tested in accordance with:
ASTM E-814
ANSI/UL 1479

Nelson Firestop

System No. C-AJ-3290

| Project Name: | ___________________________ |
| Address:      | ___________________________ |
| Installer:    | ___________________________ |
| Address:      | ___________________________ |
| Signature:    | ___________________________ |

DWG NO. FS-0673 R0

DATE: 10/22/08
BY: RCE

Nelson Firestop
800 331-7325  Fax: 918 627-2941
Tulsa, Ok.