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Legacy report on the 1997 Uniform Building Code™

DIVISION: 09—FINISHES
Section: 09840—Acoustical Barriers

ACOUSTICORK® SOUND CONTROL UNDERLAYMENT

AMORIM INDUSTRIAL SOLUTIONS
26112 110TH STREET
POST OFFICE BOX 25
TREVOR, WISCONSIN 53179

1.0 SUBJECT

AcoustiCORK® Sound Control Underlayment.

2.0 DESCRIPTION

2.1 General:

AcoustiCORK Sound Control Underlayment is a cork composite material used to reduce both impact and airborne noise in applications where hard-surface floors are used. AcoustiCORK, when used in various floor-ceiling assemblies as described in Table 1, has minimum Impact Insulation Class (IIC) of 50 and Sound Transmission Class (STC) of 50, as specified in Appendix Chapter 12, Division II, of the 1997 Uniform Building Code™ (UBC). AcoustiCORK material is available in two thicknesses: 6 mm (0.24 inch) and 13 mm (0.51 inch). The 6 mm version is available in 48-inch-wide (1219 mm) rolls that are 100 lineal feet (33.53 m) long, and in 48-inch-wide (1219 mm) sheets that are 72 inches (1828 mm) long. The 13 mm version is available in 24-inch-wide-by-36-inch-long (610 mm by 914 mm) sheets. Rolls are 21 inches (533 mm) in diameter and weigh 105 pounds (47.63 kg) per roll. Material density is between 11.4 and 13 pounds per cubic foot (182.4 and 208.2 kg/m³).

2.2 Materials:

Materials used in conjunction with AcoustiCORK for various floor-ceiling assemblies as described in Table 1 are discussed in Sections 2.2.1 through 2.2.6.

2.2.1 Overlay Materials:

2.2.1.1 Wonderboard: One-half-inch-thick (12.7 mm) glass mesh mortar units weighing 3.0 pounds per square foot (14.65 kg/m²), covered under evaluation report ER-5771.

2.2.1.2 Hardibacker Board: Seven-sixteenths-inch-thick (11.1 mm) fiber-reinforced cementitious units weighing 3.3 pounds per square foot (16.11 kg/m²), covered under evaluation report NER-405.

2.2.1.3 Gypcrete 2000: One-and-five-eighths-inch-thick (41.3 mm) poured-on material with a density of approximately

110 pounds per cubic foot (1762 kg/m³), manufactured by Maxxon, Inc., covered under evaluation report ER-3433.

2.2.1.4 Mortar Setting Bed: One-and-one-half-inch-thick (38 mm) portland cement and sand combination mortar bed.

2.2.2 Isolation Barriers—Perimeter Isolation Barrier: Six-millimeter-thick by 2-inch-wide (51 mm) AcoustiCORK material manufactured by Badger Cork, Trevor, Wisconsin, used in conjunction with an acoustical sealant.

2.2.3 Adhesives: Dritac 6000 as used in System Number 6 (see Table 1).

2.2.4 Setting Materials: C-Cure MultiCure 905 thin-set mortar, or Bonsal flexible multipurpose thin-set mortar, or Summitville S-1000 MP dry latex thin-set mortar, or Summitville S-2000 quick set mortar.

2.2.5 Grouts:

- 1. W.R. Bonsal polymer modified sanded grout.
2. Hydroment #96710 ceramic tile grout.
3. Summitville Polychrome S-710 sanded grout.

2.2.6 Acoustical Sealants: Mortite Dense Mastic.

2.3 Installation:

AcoustiCORK may be used as a sound control underlayment in conjunction with concrete subfloors and wood joist floor systems. A perimeter isolation barrier must be installed at the perimeter of the subfloor and around all protrusions to inhibit sound transmission between floors and walls. The AcoustiCORK rolled material is then installed with the crown of the material "up" (the labeled side down, facing the subfloor). Joints are butted tight and the AcoustiCORK must be in tight contact with the perimeter isolation barrier. If an overlay, such as a 1 1/4-inch (31.7 mm) mortar setting bed or a 1 1/2-inch (38 mm) lightweight concrete topping, is used, it is reinforced with 2-inch-by-2-inch No. 16/16 gage (51 x 51 MW 280 x MW 280) steel welded wire mesh. A 4-mil-thick (0.102 mm) polyethylene film or Type 15 felt is required when using mortar setting bed or lightweight concrete overlays. Cementitious backer boards described in Sections 2.2.1.1 and 2.2.1.2 may also be used as overlays. The floor systems may have any floor overlay materials noted in Figures 1 through 6.

When Maxxon's Gyp-Crete 2000 (ER-3433) is used as an overlay, the following installation instructions are followed:

Subfloor must be prepared in accordance with the manufacturer's installation instructions. AcoustiCORK must

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be installed as noted above and sealed by means of one the following:

1. Three coats of Gyp-Crete floor primer diluted 1:1 with water and sprayed at a rate of 300 square feet per gallon (2.454 m²/liter) per coat, with primer film between coats.
2. Three coats of Gyp-Crete surface conditioner diluted 1:1 with water and sprayed at a rate of 300 square feet per gallon (2.454 m²/liter) per coat, with primer film between coats.

When a cementitious backer unit is used, as in Section 2.2.1.1 or 2.2.1.2, the following installation instructions must be followed: Cementitious backer units shall be placed perpendicular to the AcoustiCORK sound control underlayment, with 1/4-inch (6.4 mm) gap between units. With the units gapped, a 2-inch-wide (51 mm) high-strength fiberglass tape is applied to the bottom of each unit, to join the units. Gap joints are filled with acrylic modified portland cement mortar to the top of the joint. Another 2-inch-wide (51 mm) strip of fiberglass tape is applied over the top of the joint. A thin coat of acrylic-modified portland cement mortar is troweled over the joint to ensure a smooth and flat surface for installation of the tile. Cementitious backer units are allowed to cure for a minimum of 48 hours.

For further installation details, refer to the manufacturer's instructions and Table 1.

2.4 Identification:

Each roll of AcoustiCORK is identified with a label that bears the word "AcoustiCORK" and that states that the product is to be installed with the crown up.

3.0 EVIDENCE SUBMITTED

Reports of tests in accordance with ASTM Standards E 90, E 336, E 413 and E 492; product brochures; installation instructions; and a quality control manual.

4.0 FINDINGS

That the sound-rated assemblies using AcoustiCORK underlayment described in this report have minimum STC and IIC ratings of 50 and comply with Appendix Chapter 12 Division II, of the 1997 *Uniform Building Code*TM, provided the product is installed in accordance with this report and the manufacturer's instructions.

This report is subject to re-examination in two years.

TABLE 1—SOUND RATED FLOOR/CEILING ASSEMBLIES USING 6-MILLIMETER AND 13-MILLIMETER ACOUSTICORK

SYSTEM NUMBER	SUBFLOOR	ISOLATION BARRIER	INSTALLATION METHOD	OVERLAY	FINISHED FLOOR	CEILING ASSEMBLY
1	5/8-inch-thick plywood nailed to 2-inch-by-10-inch wood joists spaced 16 inches on center.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose on 5/8-inch plywood subfloor.	One layer of 1 1/2-inch-thick, 111.6-pound-per-cubic-foot Gyp-Crete 2000 poured over a layer of 15-pound felt paper.	8-millimeter-thick TOPFLOOR urethane-coated, genuine oak parquet flooring glued to the Gyp-Crete 2000 overlay.	The floor joist cavities are filled with 3 1/2-inch-thick, R-11 fiberglass insulation batts. 25 gage resilient channels spaced 24 inches on center are attached directly to the joists with 1.23-inch, Type W screws. A single layer of 5/8-inch-thick, USG Type SCX drywall is attached directly to the resilient channel with 1-inch-long, Type S, bugle head wallboard screws spaced 12 inches on center. The drywall joints are taped and sealed with USG joint compound.
1	5/8-inch-thick plywood nailed to 2-inch-by-10-inch wood joists spaced 16 inches on center.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose on the 5/8-inch plywood subfloor.	One layer of 1 1/2-inch-thick, 111.6-pound-per-cubic-foot Gyp-Crete 2000 poured over layer of 15-pound felt paper.	3/8-inch-thick laminate floor plank.	The floor joist cavities are filled with 3 1/2-inch-thick, R-11 fiberglass insulation batts. 25 gage resilient channels spaced 24 inches on center are attached directly to the joists with 1.23-inch, Type W screws. A single layer of 5/8-inch-thick, USG Type SCX drywall is attached directly to the resilient channel with 1-inch-long, Type S, bugle head wallboard screws spaced 12 inches on center. The drywall joints are taped and sealed with USG joint compound.
2	4-inch-thick wire-reinforced concrete slabs.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose directly on the concrete slab subfloor.	One layer of 16-inch-thick Hardibacker glass mesh mortar units placed directly over the 6-millimeter AcoustiCORK underlayment.	6-inch-by-6-inch-by-1/4-inch-thick glazed ceramic tiles by United States Ceramic Tile Co., set with Summitville S-2000 quick-setting mortar and grouted with W.R. Bonsal polymer-modified sanded tile grout.	1/4-inch-by-1 1/2-inch split drive pins are driven into a 1/4-inch hole located in the bottom of the concrete slabs. Pins are located 48 inches on center and are used to tie 12 gage wire for the suspended ceiling. The hanger wires are tied to allow for a nominal 9-inch plenum depth from the bottom of the slabs to the top of the ceiling. Cold-rolled steel channels are tied to the hanger wires and twelve 24 gage, galvanized steel DWC channels are saddle-tied perpendicular to the cold-rolled channels with double strands of 24 gage tie wire. A layer of 5/8-inch-thick, Type X wallboard is attached to the DWC channels. The joints between the wallboard sheets are taped and covered with joint compound. The plenum between the subfloor and ceiling contains a single layer of 3 1/2-inch-thick, R-11 unfaced fiberglass insulation.
2	4-inch-thick wire-reinforced concrete slabs.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose directly on the concrete slab subfloor.	One layer of 1 3/8-inch-thick mortar bed consisting of 1 part portland cement and 6 parts sand mixture reinforced with a wire mesh over single layer of 15-pound felt paper.	6-inch-by-6-inch-by-1/4-inch-thick quarry tile by Summitville, set with Summitville S-1000 MP dry latex thin set mortar and grouted with Summitville Polychrome S-710 sanded joint filler.	1/4-inch-by-1 1/2-inch split drive pins are driven into a 1/4-inch hole located in the bottom of the concrete slabs. Pins are located 48 inches on center and are used to tie 12 gage wire for the suspended ceiling. The hanger wires are tied to allow for a nominal 9-inch plenum depth from the bottom of the slabs to the top of the ceiling. Cold-rolled steel channels are tied to the hanger wires and twelve 24 gage, galvanized steel DWC channels are saddle-tied perpendicular to the cold-rolled channels with double strands of 24 gage tie wire. A layer of 5/8-inch-thick, Type X wallboard is attached to the DWC channels. The joints between the wallboard sheets are taped and covered with joint compound. The plenum between the subfloor and ceiling contains a single layer of 3 1/2-inch-thick, R-11 unfaced fiberglass insulation.

(Continued)

TABLE 1—SOUND RATED FLOOR/CEILING ASSEMBLIES USING 6-MILLIMETER AND 13-MILLIMETER ACOUSTICORK—(Continued)

SYSTEM NUMBER	SUBFLOOR	ISOLATION BARRIER	INSTALLATION METHOD	OVERLAY	FINISHED FLOOR	CEILING ASSEMBLY
3	6-inch-thick, wire-reinforced concrete slabs.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid over 15-pound roofing felt directly on the concrete slab subfloor.	None.	6-inch-by-6-inch-by- $\frac{1}{4}$ -inch-thick, standard grade glazed ceramic tile.	$\frac{1}{4}$ -inch-by- $1\frac{1}{2}$ -inch split drive pins are driven into a $\frac{1}{4}$ -inch hole located in the bottom of the concrete slabs. Pins are located 48 inches on center and are used to tie 12 gage wire for the suspended ceiling. The hanger wires are tied to allow for a nominal 9-inch plenum depth from the bottom of the slabs to the top of the ceiling. Cold-rolled steel channels are tied to the hanger wires and twelve 24 gage, galvanized steel DWC channels are saddle-tied perpendicular to the cold-rolled channels with double strands of 24 gage tie wire. A layer of $\frac{5}{8}$ -inch-thick Type X wallboard is attached to the DWC channels. The joints between the wallboard sheets are taped and covered with joint compound. The plenum between the subfloor and ceiling contains a single layer of $3\frac{1}{2}$ -inch-thick, R-11 unfaced fiberglass insulation.
4	6-inch-thick, wire-reinforced concrete slabs.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose over a 6 mil plastic vapor barrier laid directly on the concrete slab subfloor.	One layer of $2\frac{3}{32}$ -inch CDX plywood.	$\frac{3}{4}$ -inch-thick strip oak flooring nailed to the CDX plywood.	$\frac{1}{4}$ -inch-by- $1\frac{1}{2}$ -inch split drive pins are driven into a $\frac{1}{4}$ -inch hole located in the bottom of the concrete slabs. Pins are located 48 inches on center and are used to tie 12 gage wire for the suspended ceiling. The hanger wires are tied to allow for a nominal 9-inch plenum depth from the bottom of the slabs to the top of the ceiling. Cold-rolled steel channels are tied to the hanger wires and twelve 24 gage, galvanized steel DWC channels are saddle-tied perpendicular to the cold-rolled channels with double strands of 24 gage tie wire. A layer of $\frac{5}{8}$ -inch-thick Type X wallboard is attached to the DWC channels. The joints between the wallboard sheets are taped and covered with joint compound. The plenum between the subfloor and ceiling contains a single layer of $3\frac{1}{2}$ -inch-thick, R-11 unfaced fiberglass insulation.
5	$\frac{5}{8}$ -inch-thick plywood nailed to 2-inch-by-10-inch wood joists spaced 16 inches on center.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose on the $\frac{5}{8}$ -inch plywood subfloor.	One layer of $\frac{7}{16}$ -inch-thick Glascrete glass mesh mortar units placed directly over the 6-millimeter AcoustiCORK underlayment.	6-inch-by-6-inch-by- $\frac{1}{4}$ -inch-thick glazed ceramic tiles by United States Ceramic Tile Co., set with latex modified Portland thin set mortar and grouted with Hydroment Ceramic Tile Grout.	The floor joist cavities are filled with a 3-inch layer of USG Thermafiber SAFB insulation. 25 gage resilient channels spaced 24 inches on center are attached directly to the joists with 1.23-inch Type W screws. A single layer of $\frac{5}{8}$ -inch-thick USG Type SCX drywall is attached directly to the resilient channel with 1-inch-long, Type S, bugle head wallboard screws spaced 12 inches on center. The drywall joints are taped and sealed with USG joint compound.
5	$\frac{5}{8}$ -inch-thick plywood nailed to 2-inch-by-10-inch wood joists spaced 16 inches on center.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose on the $\frac{5}{8}$ -inch plywood subfloor.	One layer of $1\frac{1}{2}$ -inch-thick mortar bed, reinforced with a wire mesh over a single layer of 15-pound felt paper.	6-inch-by-6-inch-by- $\frac{1}{4}$ -inch-thick glazed ceramic tiles by United States Ceramic Tile Co., set with C-Cure Multi-Cure 905 thin set mortar and grouted with Hydroment #96710 Ceramic Tile Grout.	The floor joist cavities are filled with a 3-inch layer of USG Thermafiber SAFB insulation. 25 gage resilient channels spaced 24 inches on center are attached directly to the joists with 1.23-inch Type W screws. A single layer of $\frac{5}{8}$ -inch-thick USG Type SCX drywall is attached directly to the resilient channel with 1-inch-long, Type S, bugle head wallboard screws spaced 12 inches on center. The drywall joints are taped and sealed with USG joint compound.

(Continued)

TABLE 1—SOUND RATED FLOOR/CEILING ASSEMBLIES USING 6-MILLIMETER AND 13-MILLIMETER ACOUSTICORK—(Continued)

SYSTEM NUMBER	SUBFLOOR	ISOLATION BARRIER	INSTALLATION METHOD	OVERLAY	FINISHED FLOOR	CEILING ASSEMBLY
5	$\frac{5}{8}$ -inch-thick plywood nailed to 2-inch-by-10-inch wood joists spaced 16 inches on center.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose on the $\frac{5}{8}$ -inch plywood subfloor.	One layer of 1 $\frac{1}{2}$ -inch-thick 111.6-pound-per-cubic-foot Gyp-Crete 2000 poured over a layer of 15-pound felt paper.	6-inch-by-6-inch-by- $\frac{1}{4}$ -inch-thick quarry tile by Summitville, set with Bonsal flexible multi-purpose thin set mortar and grouted with Summitville sanded tile grout.	The floor joist cavities are filled with 3 $\frac{1}{2}$ -inch-thick, R-11 fiberglass insulation batts. 25 gage resilient channels spaced 24 inches on center are attached directly to the joists with 1.23-inch Type W screws. A single layer of $\frac{5}{8}$ -inch-thick USG Type SCX drywall is attached directly to the resilient channel with 1-inch-long, Type S, bugle head wallboard screws spaced 12 inches on center. The drywall joints are taped and sealed with USG joint compound.
6	6-inch-thick, wire-reinforced concrete slabs.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose over a 6 mil plastic vapor barrier laid directly on the concrete slab subfloor.	None.	7.9-millimeter-thick parquet flooring glued directly to the 6-millimeter AcoustiCORK.	$\frac{1}{4}$ -inch-by-1 $\frac{1}{2}$ -inch split drive pins are driven into a $\frac{1}{4}$ -inch hole located in the bottom of the concrete slabs. Pins are located 48 inches on center and are used to tie 12 gage wire for the suspended ceiling. The hanger wires are tied to allow for a nominal 9-inch plenum depth from the bottom of the slabs to the top of the ceiling. Cold-rolled steel channels are tied to the hanger wires and twelve 24 gage, galvanized steel DWC channels are saddle-tied perpendicular to the cold-rolled channels with double strands of 24 gage tie wire. A layer of $\frac{5}{8}$ -inch-thick, Type X wallboard is attached to the DWC channels. The joints between the wallboard sheets are taped and covered with joint compound. The plenum between the subfloor and ceiling contains a single layer of 3 $\frac{1}{2}$ -inch-thick, R-11 unfaced fiberglass insulation.
6	6-inch-thick, wire-reinforced concrete slabs.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 6-millimeter AcoustiCORK laid loose over 6 mil plastic vapor barrier laid directly on the concrete slab subfloor.	None.	14-millimeter-thick floating wood floor manufactured Universal Flooring Limited, set directly on the 6-millimeter AcoustiCORK.	$\frac{1}{4}$ -inch-by-1 $\frac{1}{2}$ -inch split drive pins are driven into a $\frac{1}{4}$ -inch hole located in the bottom of the concrete slabs. Pins are located 48 inches on center and are used to tie 12 gage wire for the suspended ceiling. The hanger wires are tied to allow for a nominal 9-inch plenum depth from the bottom of the slabs to the top of the ceiling. Cold-rolled steel channels are tied to the hanger wires and twelve 24 gage, galvanized steel DWC channels are saddle-tied perpendicular to the cold-rolled channels with double strands of 24 gage tie wire. A layer of $\frac{5}{8}$ -inch-thick Type X wallboard is attached to the DWC channels. The joints between the wallboard sheets are taped and covered with joint compound. The plenum between the subfloor and ceiling contains a single layer of 3 $\frac{1}{2}$ -inch-thick, R-11 unfaced fiberglass insulation.
7	6-inch-thick wire reinforced concrete slabs.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 0.24-inch AcoustiCORK laid loose directly on subfloor concrete slab with flooring manufacturer's recommended vapor barrier.	None.	0.56-inch-thick prefinished engineered wood floating floor set directly on the 0.24-inch AcoustiCORK.	No sound-rated ceiling assembly.
8	8-inch-thick precast concrete slabs.	Sealed at the perimeter walls with Mortite dense mastic.	One layer of 0.50-inch-thick AcoustiCORK underlayment sheets laid over 15-pound building felt.	None.	0.31-inch-thick glazed ceramic tile set with accelerated latex modified thin-set mortar and grouted with polymer enhanced grout.	No sound-rated ceiling assembly.

For SI: 1 inch = 25.4 mm, 1 pound = 0.454 kg, 1 pound per cubic foot = 16 kg/m³, 1 mil = 0.025 mm.

1. System designations refer numerically to figures in this report.

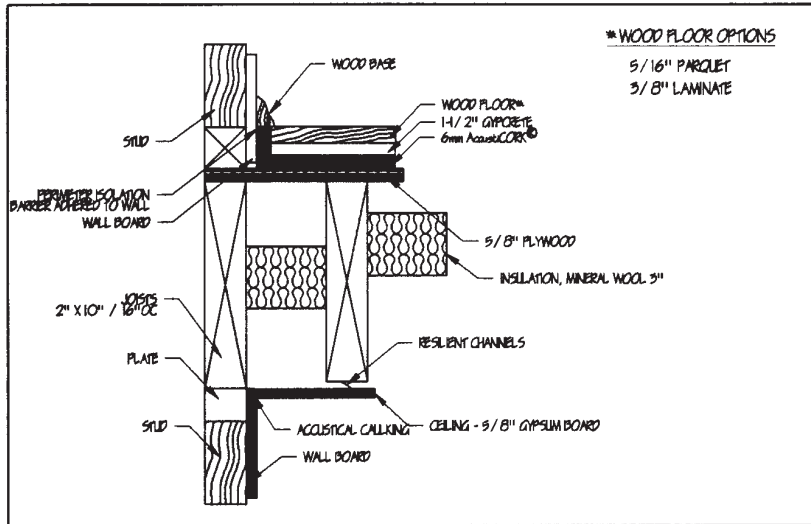


FIGURE 1

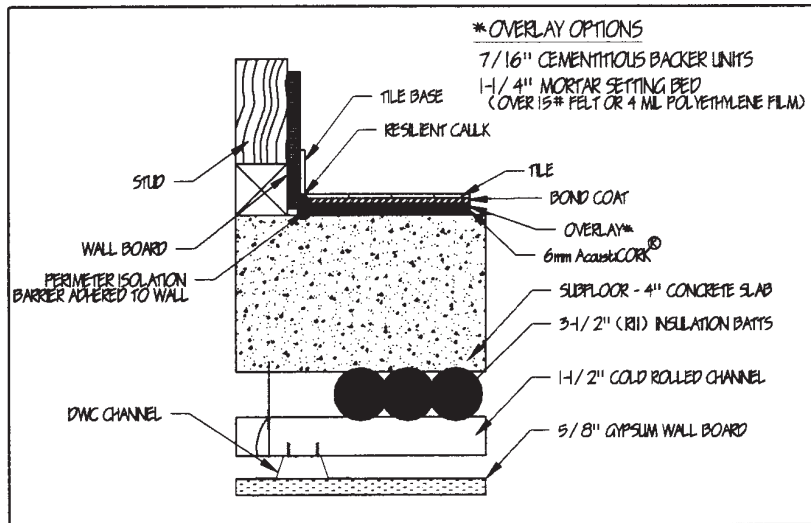


FIGURE 2

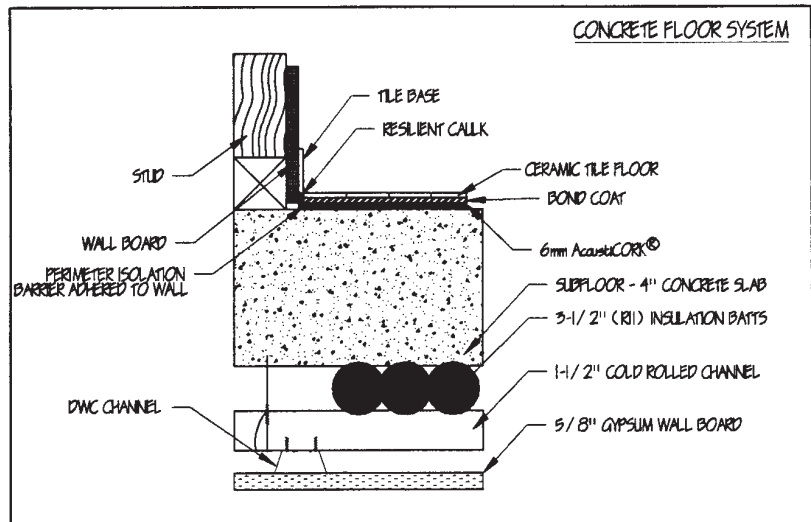


FIGURE 3

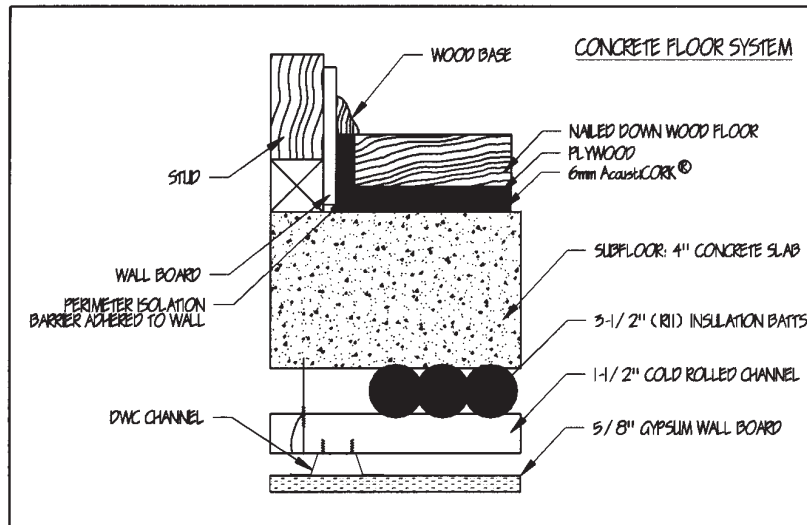


FIGURE 4

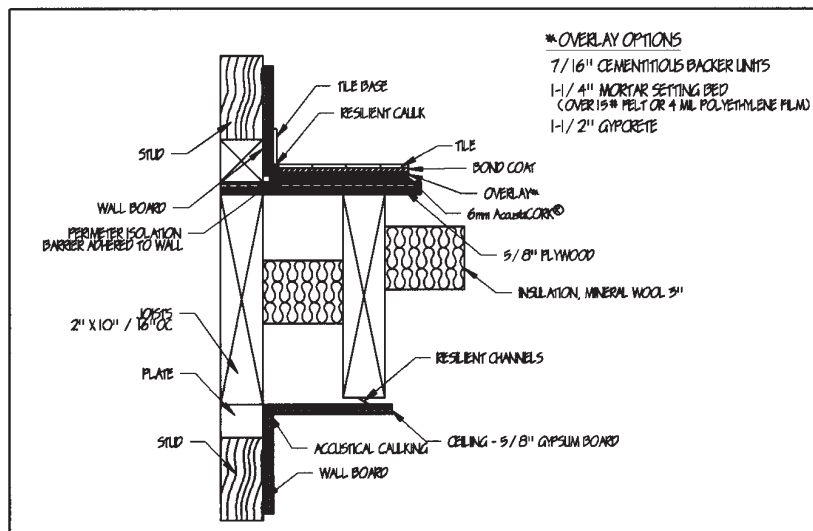


FIGURE 5

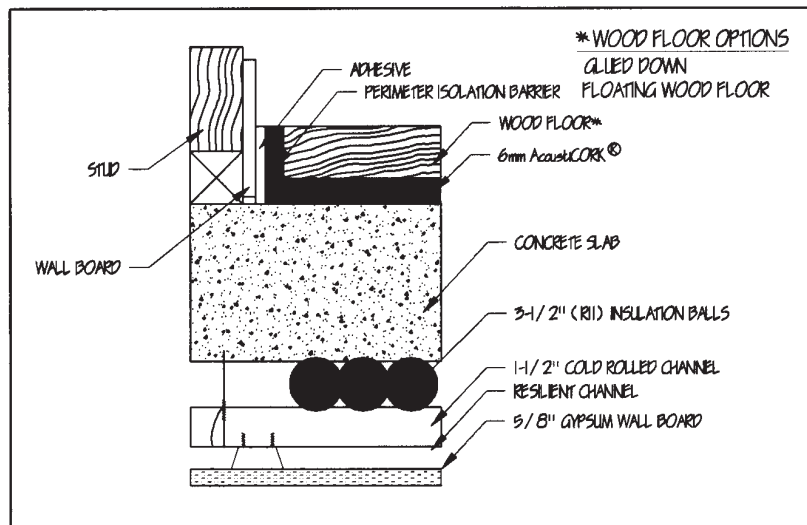
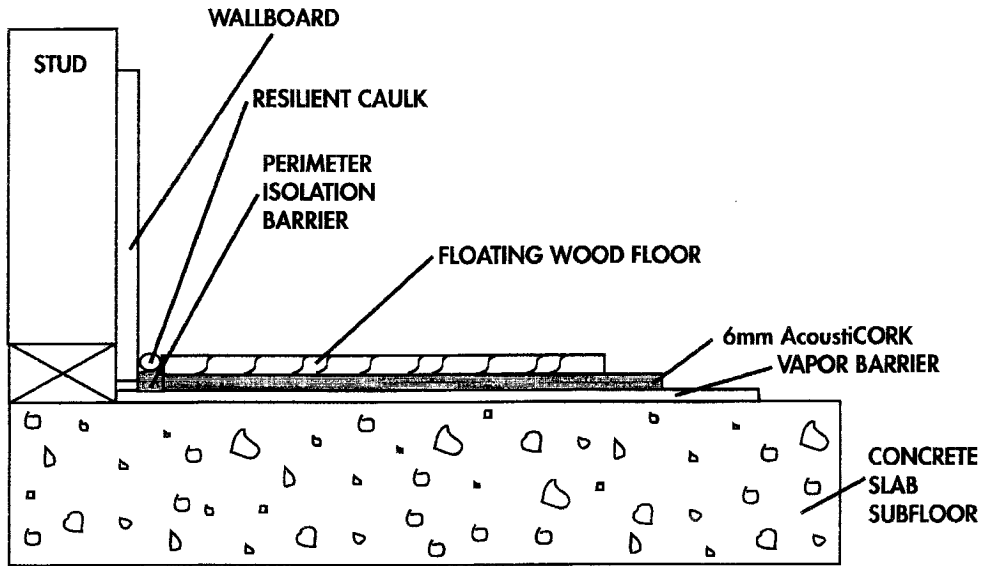


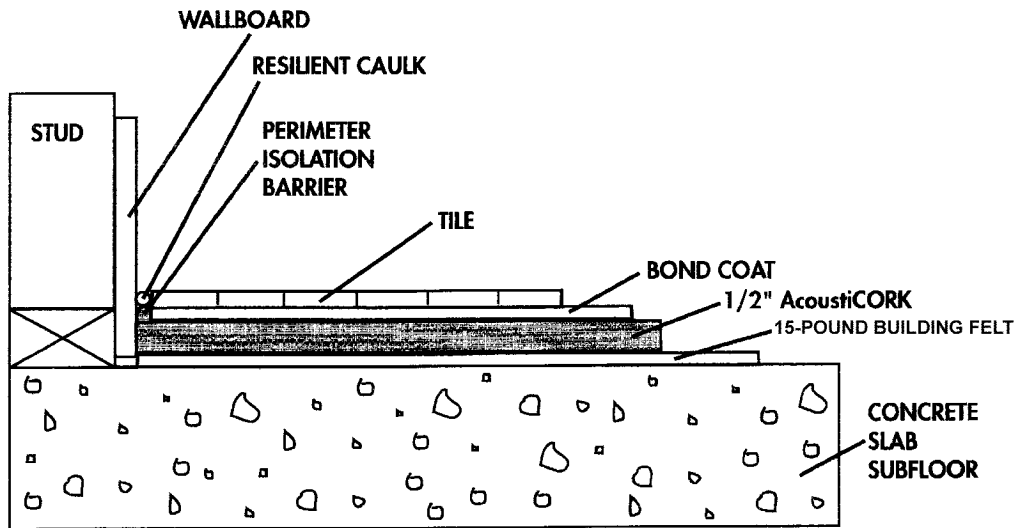
FIGURE 6



Floating Wood Floors on a Concrete Slab

NOTE: NOT DRAWN TO SCALE

FIGURE 7



Tile Floors on a Concrete Slab without Suspended Ceiling

NOTE: NOT DRAWN TO SCALE

FIGURE 8