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ESR-1522

Reissued 09/2018
This report is subject to renewal 09/2020.

DIVISION: 09 00 00—FINISHES

SECTION: 09 80 00—ACOUSTIC TREATMENT

REPORT HOLDER:

ECORE INTERNATIONAL, INC.

EVALUATION SUBJECT:

SOUND CONTROL UNDERLAYMENT, 2mm, SOUND CONTROL UNDERLAYMENT, 5mm, SOUND CONTROL UNDERLAYMENT, 10mm, and QT3006.3W UNDERLAYMENTS

"2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence"

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1.0 EVALUATION SCOPE

Compliance with the following code:

2015 and 2012 *International Building Code*® (IBC)

Property evaluated:

Sound transmission

2.0 USES

Sound Control Underlayment, 2mm, Sound Control Underlayment, 5mm, Sound Control Underlayment, 10mm, and QT3006.3W are membrane underlayments that are used as components in sound control rated floor-ceiling assemblies.

3.0 DESCRIPTION

3.1 Underlayments:

Sound Control Underlayment, 2mm, Sound Control Underlayment, 5mm, Sound Control Underlayment, 10mm, and QT3006.3W underlayments are flat or dimpled, resilient mat membranes manufactured from post-consumer and post-industrial rubber. When installed as described in Section 4.0, the sound-rated assemblies described in this report provide a minimum Sound Transmission Class (STC) of 50 and/or a minimum Impact Insulation Class (IIC) of 50 as required in Section 1207 of the IBC. The weights and dimensions of the underlayments are set forth in Table 1.

3.2 Perimeter Isolation Strip:

QT Perimeter Isolation Strip is produced in nominal 3 inch (76 mm) wide by 0.24 inch (6 mm) thick strips.

4.0 INSTALLATION

4.1 General:

Areas to receive Sound Control Underlayment, 2mm, Sound Control Underlayment, 5mm, Sound Control Underlayment, 10mm, and QT3006.3W underlayments must be weather-tight and maintained at a minimum uniform temperature of 50°F (10°C) for 48 hours prior to, during and after installation. The underlayments are permitted to be installed over concrete, approved self-leveling materials and wood. Wood structural panels, including plywood and oriented stranded board (OSB), must comply with Chapter 23 of the IBC. The floor must be free from movement and have at least 18 inches of ventilated air space below. Structural concrete must comply with Chapter 19 of the IBC. The concrete must be fully cured, dry, clean, smooth, level, and free of solvents, paint, wax, oil, sealers, alkaline salts and curing and hardening compounds. The manufacturer's published installation instructions must be available at the jobsite at all times during installation. All assemblies must be sealed around the entire perimeter with membrane or perimeter isolation strip.

4.2 Perimeter Isolation Strip:

The perimeter isolation strips are adhered with ECORE International E-Grip III adhesive on the walls at the perimeter of the subfloor and around any protrusions, as isolators to break the sound transmission path between floors and walls. The isolation strips must be installed in accordance with ECORE International installation instructions.

4.3 Assembly 1 (Assembly Meets the Minimum 50 Rating for IIC):

A description of the assembly, from the top down, is as follows:

- One layer of 6-inch-by-6-inch-by-$^{1}/_{2}$-inch (152 mm by 152 mm by 12.7 mm) unglazed quarry tile installed using polymer-modified thin-set mortar [JAMO Multipurpose Flex (see ICC-ES report ESR-1413)] and polymer-modified cement grout mixtures.
- One layer of Sound Control Underlayment, 5mm.
- One layer of Hacker's FIRM-FILL 2010 gypsum concrete [1.9 cubic feet (0.05 m^3) of sand per 80-pound (36.3 kg) bag of gypsum, or 1.9 mix].
- One layer of QT3006.3W underlayment.
- $^{5}/_{8}$-inch-thick (15.9 mm) tongue-and-groove plywood subfloor fastened to wood I-joists with 6d common nails spaced 12 inches (305 mm) on center in the field and 6 inches (152 mm) on center at joints and perimeter.
- 2-by-10 wood I-joists spaced 16 inches (406 mm) on center.
- Unimast RC Deluxe resilient furring channel at 24 inches (610 mm) on center, screwed to the I-joists.

- Paper-faced, $3^1/_2$-inch-thick (89 mm), R-11 glassfiber insulation fitted between joists.
- Two layers of $^5/_8$-inch-thick (15.9 mm) Type C wallboard attached 12 inches (305 mm) on center to furring with $1^1/_8$-inch-long (29 mm) Type S screws. The wallboard joints must be taped and sealed with joint compound.

4.4 Assembly 2 (Assembly Meets the Minimum IIC Rating of 50):

A description of the floor/ceiling assembly, from the top down, is as follows:

- One layer of $^3/_4$-inch-thick (19.1 mm) red oak tongue-and-groove flooring boards nailed to $^3/_4$-inch-thick (19.1 mm) plywood.
- One layer of Hacker's FIRM-Fill 2010 gypsum concrete [1.9 cubic feet (0.05 m^3) of sand per 80-pound (36.6 kg) bag of gypsum, or 1.9 mix].
- One layer of 3-mil-thick (0.08 mm) poly liner sheet.
- One layer of QT3006.3W underlayment.
- One layer of No.15 felt paper.
- $^{19}/_{32}$-inch-thick (15.1 mm) tongue-and-groove plywood subfloor fastened to wood joists with 6d common nails spaced 12 inches (305 mm) on center in the field and 6 inches (152 mm) on center at joints and perimeter.
- 2-by-10 wood joists spaced 16 inches (406 mm) on center with 1-by-4-inch (25.4 by 102 mm) wood cross-bracing.
- Unimast RC Deluxe resilient furring channel at 24 inches (610 mm) on center, screwed to the wood joists.
- Paper-faced, $3^1/_2$-inch-thick (89 mm), R-11 fiberglass insulation.
- One layer of $^5/_8$-inch-thick (15.9 mm) Type X gypsum wallboard attached 24 inches (610 mm) on center to furring with $1^1/_8$-inch-long (29 mm) Type S screws. The wallboard joints must be taped and sealed with joint compound.

4.5 Assembly 3 (Assembly Meets the Minimum 50 Rating for IIC):

A description of the assembly, from the top down, is as follows:

- One layer of 0.56-inch-by-5-inch-by-88-inch (14.2 mm by 127 mm by 2200 mm) Schiffsboden Mahogany finish tongue-and-groove flooring planks.
- One layer of Sound Control Underlayment, 2mm underlayment.
- 8-inch-thick (203 mm) reinforced concrete slab.
- Suspended ceiling system consisting of $^5/_8$-inch-thick (15.9 mm) Type X gypsum wallboard attached, with $1^1/_8$-inch-long (29 mm) Type S screws spaced 12 inches (305 mm) on center, to suspended Rigid X ceiling grid system.
- 10-inch-deep (254 mm) plenum with $3^1/_2$-inch-thick (89 mm), R-11 glassfiber insulation.

4.6 Assembly 4 (Assembly Meets the Minimum IIC Rating of 50):

A description of the floor/ceiling assembly, from the top down, is as follows:

- One layer of 6-inch-by-6-inch-by-$^1/_2$-inch (152 mm by 152 mm by 12.7 mm) unglazed quarry tile installed using standard grout mixtures.
- Two layers of Sound Control Underlayment, 5mm.
- 6-inch-thick (152 mm) reinforced concrete slab.

4.7 Assembly 5 (Assembly Meets the Minimum IIC Rating of 50):

A description of the floor/ceiling assembly, from the top down, is as follows:

- One layer of 6-inch-by 6-inch-by-$^1/_2$-inch (152 mm by 152 mm by 12.7 mm) unglazed quarry tile installed using polymer-modified thin-set mortar [JAMO Multipurpose Flex (see ICC-ES report ESR-1413)] and polymer-modified cement grout mixtures.
- One layer of Hacker's FIRM-Fill 2010 gypsum concrete [1.9 cubic feet (0.05 m^3) of sand per 80-pound (36.3 kg) bag of gypsum, or 1.9 mix].
- One layer of QT3006.3W underlayment.
- $^5/_8$-inch-thick (15.9 mm) tongue-and-groove plywood subfloor fastened to wood I-joists with 6d common nails spaced 12 inches (305 mm) on center in the field and 6 inches (152 mm) on center at joints and perimeter.
- One layer of $^1/_2$-inch-by-4 foot-by-8 foot (12.7 mm by 1219 mm by 2438 mm) square-edged plywood subfloor nailed at 24 inches (610 mm) on center with 6d common nails.
- 2-by-10 wood I-joists spaced 16 inches (406 mm).
- Unimast RC Deluxe resilient furring channel at 24 inches (610 mm) on center, screwed to the I-joists.
- Paper-faced, $3^1/_2$-inch-thick (89 mm), R-11 glassfiber insulation fitted between joists.
- Two layers of $^5/_8$-inch-thick (15.9 mm), Type C gypsum wallboard attached 12 inches (305 mm) on center to furring with $1^1/_8$-inch-long (29 mm) Type S screws. The wallboard joints must be taped and sealed with joint compound.

4.8 Assembly 6 (Assembly Meets the Minimum IIC Rating of 50):

A description of the floor/ceiling assembly, from the top down, is as follows:

- One layer of $^3/_4$-inch-thick (19.1 mm) red oak tongue-and-groove flooring nailed to $^3/_4$-inch-thick (19.1 mm) plywood.
- One layer of Hacker's FIRM-Fill 2010 gypsum concrete [1.9 cubic feet (0.05 m^3) of sand per 80-pound (36.3 kg) bag of gypsum, or 1.9 mix].
- One layer of QT3006.3W underlayment.
- $^5/_8$-inch-thick (15.9 mm) tongue-and-groove plywood subfloor fastened to wood I-joists with 6d common nails spaced 12 inches (305 mm) on center in the field and 6 inches (152 mm) on center at joints and perimeter.
- One layer of $^1/_2$-inch-by-4-foot-by-8 foot (12.7 mm by 1219 mm by 2438 mm) square-edged plywood subfloor nailed at 24 inches (610 mm) on center with 6d common nails.
- 2-by-10 wood I-joists spaced 16 inches (406 mm).
- Unimast RC Deluxe resilient furring channel at 24 inches (610 mm) on center, screwed to the I-joists.
- Paper-faced, $3^1/_2$-inch-thick (89 mm), R-11 glassfiber insulation.
- Two layers of $^5/_8$-inch-thick (15.9 mm) Type C wallboard attached 12 inches (305 mm) on center to furring with $1^1/_8$-inch-long (29 mm) Type S screws. The wallboard joints must be taped and sealed with joint compound.

4.9 Assembly 7 (Assembly Meets the Minimum IIC Rating of 50):

A description of the floor/ceiling assembly, from the top down, is as follows:

- One layer of $^{3}/_{4}$-inch-thick (19.1 mm) red oak tongue-and-groove flooring nailed to $^{3}/_{4}$ inch-thick (19.1 mm) plywood.
- One layer of Hacker's FIRM-Fill 2010 gypsum concrete [1.9 cubic feet (0.05 m^3) of sand per 80-pound (36.3 kg) bag of gypsum, or 1.9 mix].
- One layer of 3-mil-thick (0.08 mm) poly liner sheet.
- One layer of Sound Control Underlayment, 5mm.
- One layer of Type 15 roofing felt paper.
- $^{19}/_{32}$-inch-thick (15.1 mm) tongue-and-groove plywood subfloor fastened to wood joists with 6d common nails spaced 12 inches (305 mm) on center in the field and 6 inches (152 mm) on center at joints and perimeter.
- 2-by-10 wood joists spaced 16 inches (406 mm) on center with 1-by-4-inch wood cross-bracing.
- Unimast RC Deluxe resilient furring channel at 24 inches (610 mm) on center, screwed to wood joists.
- Paper-faced, $3^{1}/_{2}$-inch-thick (89 mm), R-11 glassfiber insulation fitted between joists.
- One layer of $^{5}/_{8}$-inch-thick (15.9 mm) Type X gypsum wallboard, attached 24 inches (609 mm) on center to furring with $1^{1}/_{8}$-inch-long (29 mm) Type S screws. The wallboard joints are taped and sealed with joint compound.

4.10 Assembly 8 (Assembly Meets the Minimum 50 Rating for IIC):

A description of the assembly, from the top down, is as follows:

- One layer of 24-inch-by-24-inch-by-$^{3}/_{4}$-inch (610 mm by 610 mm by 19.1 mm) stone tile installed using standard mortar and grout mixtures.
- One layer of Hacker's FIRM-Fill 2010 gypsum concrete [1.9 cubic feet (0.05 m^3) of sand per 80-pound (36.3 kg) bag of gypsum, or 1.9 mix].
- One layer of 3-mil-thick (0.08 mm) poly liner sheet.
- One layer of QT3006.3W underlayment.
- One layer of Type 15 roofing felt paper.
- $^{19}/_{32}$-inch-thick (15.1 mm) tongue-and-groove plywood subfloor fastened to wood joists with 6d common nails spaced 12 inches (305 mm) on center in the field and 6 inches (152 mm) on center at joints and perimeter.
- 2-by-10 wood joists spaced 16 inches (406 mm) on center with 1-by-4-inch wood cross-bracing.
- Unimast RC Deluxe resilient furring channel at 24 inches (610 mm) on center, screwed to wood joists.
- Paper-faced, $3^{1}/_{2}$-inch-thick (89 mm), R-11 glassfiber insulation fitted between joists.
- One layer of $^{5}/_{8}$-inch-thick (15.9 mm) Type X gypsum wallboard, attached 24 inches (609 mm) on center to furring with $1^{1}/_{8}$-inch-long (29 mm) Type S screws. The wallboard joints are taped and sealed with joint compound.

4.11 Assembly 9 (Assembly Meets the Minimum IIC Rating of 50):

A description of the floor/ceiling assembly, from the top down, is as follows:

- One layer of Hacker's FIRM-Fill 2010 gypsum concrete [1.9 cubic feet (0.05 m^3) of sand per 80-pound (36.3 kg) bag of gypsum, or 1.9 mix].
- One layer of 3-mil-thick (0.08 mm) poly liner sheet.
- One layer of QT3006.3W underlayment.
- One layer of Type 15 roofing felt paper.
- $^{19}/_{32}$-inch-thick (15.1 mm) tongue-and-groove plywood subfloor fastened to wood joists with 6d common nails spaced 12 inches (305 mm) on center in the field and 6 inches (152 mm) on center at joints and perimeter.
- 2-by-10 wood joists spaced 16 inches (406 mm) on center with 1-by-4-inch wood cross-bracing.
- Unimast RC Deluxe resilient furring channel at 24 inches (610 mm) on center, screwed to wood joists.
- Paper-faced, $3^{1}/_{2}$-inch-thick (89 mm), R-11 glassfiber insulation fitted between joists.
- One layer of $^{5}/_{8}$-inch-thick (15.9 mm) Type X gypsum wallboard, attached 24 inches (609 mm) on center to furring with $1^{1}/_{8}$-inch-long (29 mm) Type S screws. The wallboard joints are taped and sealed with joint compound.

4.12 Assembly 10 (Assembly Meets the Minimum 50 Rating for Both STC and IIC):

A description of the assembly, from the top down, is as follows:

- One layer of $^{1}/_{8}$-inch-thick (3.2 mm) vinyl tile flooring attached by troweling adhesive over the entire surface of the underlayment.
- One layer of Sound Control Underlayment, 2mm underlayment attached by troweling adhesive over the entire surface of the polyethylene sheet.
- One layer of 2-mil-thick (0.05 mm) polyethylene sheet adhered to the reinforced concrete slab.
- 6-inch-thick (152 mm) reinforced concrete slab.

4.13 Assembly 11 (Assembly Meets the Minimum 50 Rating for IIC):

A description of the assembly, from the top down, is as follows:

- $^{1}/_{2}$-inch-thick (12.7 mm) bamboo flooring.
- One layer Sound Control Underlayment, 5mm.
- 6-inch-thick (152 mm) reinforced concrete slab.

4.14 Assembly 12 (Assembly Meets the Minimum 50 Rating for IIC):

A description of the assembly, from the top down, is as follows:

- $^{3}/_{32}$-inch-thick (2.4 mm) vinyl sheet flooring.
- One layer of Sound Control Underlayment, 5mm.
- 6-inch-thick (152 mm) reinforced concrete slab.

4.15 Assembly 13 (Assembly Minimum 50 Rating for Both STC and IIC):

A description of the assembly, from the top down, is as follows:

- $^{1}/_{4}$-inch-thick (6.4 mm) porcelain tile set in a bed of mortar and finished using standard mortar and grout mixtures.
- One layer of Sound Control Underlayment, 10mm attached by troweling adhesive over the entire surface

of the polyethylene sheet.

- One layer of 2-mil-thick (0.05 mm) polyethylene sheet adhered to the reinforced concrete slab.
- 6-inch-thick (152 mm) reinforced concrete slab.

4.16 Assembly 14 (Assembly Minimum 50 Rating for Both STC and IIC):

A description of the assembly, from the top down, is as follows:

- $^{1}/_{2}$-inch-thick (12.7 mm) engineered wood flooring.
- One layer of Sound Control Underlayment, 2mm.
- 6-inch-thick (152 mm) reinforced concrete slab.

4.17 Assembly 15 (Assembly Minimum 50 Rating for Both STC and IIC):

A description of the assembly, from the top down, is as follows:

- $^{3}/_{32}$-inch-thick (2.4 mm) vinyl tile attached by troweling adhesive over the entire surface of the polyethylene sheet.
- One layer of 2-mil-thick (0.05 mm) polyethylene sheet adhered to the gypsum concrete.
- 1-inch-thick (25.4 mm) of Hacker Industries, Inc. Firm-Fill 3310 gypsum concrete [2 cubic feet (0.0566 cubic meters) of sand per 80-pound (36.3 kg) bag of gypsum, or 2.0 mix].
- One layer of 2-mil-thick (0.05 mm) polyethylene sheet.
- One layer of Sound Control Underlayment, 2mm .
- $^{23}/_{32}$-inch-thick (18.3 mm) tongue and groove OSB subfloor fastened to wood trusses with flooring adhesive and 6d common nails spaced 12 inches (305 mm) on center.
- 4-by-16 open web trusses spaced 16 inches (406 mm) on center.
- Paper-faced, $3^{1}/_{2}$-inch-thick (89 mm) R-13 fiberglass insulation fitted between joists.
- RC Deluxe™ steel resilient furring channel at 16 inches (406 mm) on center, screwed to wood joists.
- $^{5}/_{8}$-inch-thick (15.9 mm) Type X gypsum wallboard, attached 12 inches (305 mm) on center to furring with 1-inch-long (25.4 mm) Type S bugle head screws. The wallboard joints are taped and sealed with joint compound.

4.18 Assembly 16 (Assembly Minimum 50 Rating for STC):

A description of the assembly, from the top down, is as follows:

- 1-inch-thick (25.4 mm) of Hacker Industries, Inc. Firm-Fill 3310 gypsum concrete [2 cubic feet (x cubic meters) of sand per 80-pound (36.3 kg) bag of gypsum, or 2.0 mix].
- One layer of 2-mil-thick (0.05 mm) polyethylene sheet.
- One layer of Sound Control Underlayment, 2mm.
- $^{23}/_{32}$-inch-thick (18.3 mm) tongue and groove OSB subfloor fastened to wood trusses with flooring adhesive and 6d common nails spaced 12 inches (305 mm) on center.
- 4-by-16 open web trusses spaced 24 inches (610 mm) on center.
- Paper-faced, $3^{1}/_{2}$-inch-thick (89 mm) R-13 fiberglass insulation.
- RC Deluxe™ steel resilient furring channel at 16 inches (406 mm) on center, screwed to wood joists.
- $^{5}/_{8}$-inch-thick (15.9 mm) Type X gypsum wallboard attached 12 inches (305 mm) on center to furring with 1-inch-long (25.4 mm) Type S bugle head screws. The wall board joints are taped and sealed with joint compound.

4.19 Assembly 17 (Assembly Minimum 50 Rating for Both STC and IIC):

A description of the assembly, from the top down, is as follows:

- $^{1}/_{4}$-inch-thick (5.9 mm) laminate wood floor.
- 1-inch-thick (25.4 mm) of Hacker Industries, Inc. Firm-Fill 3310 gypsum concrete [2 cubic feet (x cubic meters) of sand per 80-pound (36.3 kg) bag of gypsum, or 2.0 mix].
- One layer of 2-mil-thick (0.05 mm) polyethylene sheet.
- One layer of Sound Control Underlayment, 2mm.
- $^{23}/_{32}$-inch-thick (18.3 mm) tongue and groove OSB subfloor fastened to wood trusses with flooring adhesive and 6d common nails spaced 12 inches (305 mm) on center.
- 4-by-16 open web trusses spaced 24 inches (610 mm) on center.
- Paper-faced, $3^{1}/_{2}$-inch-thick (89 mm) R-13 fiberglass insulation.
- RC Deluxe™ steel resilient furring channel at 16 inches (406 mm) on center, screwed to wood joists.
- $^{5}/_{8}$-inch-thick (15.9 mm) Type X gypsum wallboard attached 12 inches (305 mm) on center to furring with 1-inch-long (25.4 mm) Type S bugle head screws. The wall board joints are taped and sealed with joint compound.

5.0 CONDITIONS OF USE

The Sound Control Underlayment, 2mm, Sound Control Underlayment, 5mm, Sound Control Underlayment, 10mm, and QT3006.3W underlayments described in this report comply with, or are suitable alternatives to what is specified in, the code listed in Section 1.0 of this report, subject to the following conditions:

5.1 The products must be installed in accordance with this report, the manufacturer's published instructions and the IBC. In the event of conflict between the manufacturer's instructions and this report, this report governs.

5.2 The underlayments must not be installed on subfloors made of particleboard, chip board, Masonite or Lauan.

5.3 The use of the products as a component of fire-resistance-rated assemblies is outside the scope of this report.

5.4 The products are manufactured in Lancaster, Pennsylvania and York, Pennsylvania with quality control inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Manufacturer's published installation instructions.

6.2 Reports containing results of testing performed in accordance with ASTM E492.

6.3 Reports containing results of testing performed in accordance with ASTM E90.

6.4 Quality control documentation.

7.0 IDENTIFICATION

7.1 The underlayments are labeled with the ECORE International name and address, the product name, and the evaluation report number (ESR-1522).

7.2 The report holder's contact information is the following:

ECORE INTERNATIONAL, INC.
715 FOUNTAIN AVENUE
LANCASTER, PENNSYLVANIA 17601
(717) 295-3400
www.qtsoundcontrol.com

TABLE 1—DIMENSIONS OF ECORE INTERNATIONAL'S QT UNDERLAYMENTS

PROPERTY	MEMBRANE TYPE			
	Sound Control Underlayment (FLAT)			QT-Resilient Base Mat (DIMPLED)
	Sound Control Underlayment, 2 mm	Sound Control Underlayment, 5mm	Sound Control Underlayment, 10 mm	QT3006.3W
Thickness (inch)	0.079	0.2	0.39	0.24/0.12
Roll dimensions (width × length) (inches × feet)	48 × 75	48 × 30	48x15	54 × 30
Weight (pounds per square foot)	0.34	0.75	1.5	0.6
Weight per roll (pounds)	120	90	90	90
Assembly	3, 11, 15, 16, 17, 18	1,4,7,10, 12, 13,	14	1,2,5,6,8,9

For **SI:** 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.45 kg, 1 psf = 4.88 kg/m^2.