

## Keola La'i Flooring Rules

(Amendment to May 2013 House Rules Section VI, B3 "Floor Specifications")

### 3. Floor Specifications

#### a) Purpose and Intent

Keola La'i is a residential building where all residents and homeowners are entitled to a reasonably quiet living environment. In multi-family residential buildings such as Keola La'i, impact noises via the floor system can be a significant source of noise complaints, lowering the quality of life for the affected homeowners. Without careful design considerations, noise from one residential unit can easily transmit to the unit directly below and possibly additional units via the floor system. The following house rules for homeowners wishing to replace their existing floors with new flooring are intended to strike a reasonable balance between constructability, cost, and sound insulation due to impact noises.

#### b) Acoustical Flooring System Definitions

- (1) Impact Noise: Impact noise is generated by impacts to the floor system and includes noise from footfall (people walking), rolling objects (carts, luggage, etc.), dropped objects, sliding objects (chairs, furniture, etc.).
- (2) Apparent Impact Insulation Class (AIIC) Sound Rating: The AIIC rating is a single-number, industry-standard rating system for assessing impact insulation, where a higher AIIC rating value signifies a greater floor/ceiling attenuation of impact noises in areas below. The testing procedures for measuring the impact sound transmission in existing buildings are described in ASTM Designation E1007, *Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures*. Determination of the AIIC rating is defined by ASTM Designation E989, *Standard Classification for Determination of Impact Insulation Class (IIC)*. The "A" for "Apparent" in the AIIC rating signifies that the testing was conducted on site (as installed in the residential unit), and not in a laboratory.
- (3) Acoustical (Resilient) Floor Underlayment: An acoustical or resilient floor underlayment is a flexible, vibration absorbing product placed under the hard surface flooring. The resilient underlayment, by acting like a small spring, absorbs some of the floor vibrations caused by impact noises and reduces the transmission of those

floor vibrations that may otherwise propagate in the building structure to the adjacent residential unit(s).

- (4) **Acoustical Sealant:** Acoustical sealant includes most forms of non-hardening sealants, such as 100% silicon caulking.
- (5) **Floor System:** The Floor System includes any building elements or components that are permanently installed above the concrete slab subfloor. Among other items the floor system includes the acoustical underlayment, floor finish, etc. The floor system would not include area rugs, mats, or temporary carpet placed over the floor finish.
- (6) **Perimeter Isolation Board:** The Perimeter Isolation Board (PIB) is an isolating strip of foam that is placed along the bottom of the wall (at the floor perimeter). The purpose of the PIB is to acoustically decouple the floor and the wall. The PIB is available from the acoustical underlayment manufacturer, often in 1" or 2" height options, any may need to be ordered as a separate item in addition to the underlayment itself.

c) Regulations

- (1) **Minimum Acoustical Performance:** The minimum acceptable acoustical performance of any flooring system within a Keola La'i residential unit is **AIIC 53**. All of the pre-approved flooring system assemblies listed in Exhibit C have been tested in the Keola La'i building and were found to meet or exceed the AIIC 53 criteria.
- (2) **Use of Non Pre-Approved Flooring System Assemblies:** The use of non pre-approved flooring assemblies is allowed. However, the homeowner must perform acceptable testing, at their expense, that the alternative assembly satisfies the minimum acoustical performance criteria (see Floor System Acoustical Testing below). Testing of the floor system can be expensive. Therefore, homeowners are encouraged to select one of the pre-approved assemblies to avoid acoustical testing costs.
- (3) **Floor System Acoustical Testing:** If required, floor system acoustical testing must be conducted in compliance with ASTM E1007 and ASTM E989. The testing shall be conducted by a qualified acoustical consultant who is a licensed Professional Engineer or Board Certified by the Institute of Noise Control Engineers (INCE). An acoustical test report, as described in the ASTM standards, must be submitted to the

Keola La'i AOA Board for any required acoustical testing. The testing procedure and guidelines includes the following:

- The homeowner shall notify the Manager in writing regarding their intent to initiate an AICC acoustical test.
  - The homeowner shall enter into an agreement with a qualified acoustical consultant to complete the testing.
  - The two homeowners (upstairs homeowner and downstairs homeowner), Manager, and acoustical consultant will agree on a date and time to conduct the testing.
  - Prior to the testing date, the homeowner shall provide the Manager with a sketch of the proposed flooring assembly. A “mock-up” of the proposed flooring assembly can be tested in lieu of installing the flooring throughout an entire room. The flooring mock-up must be at least 8 feet x 8 feet in size. The assembly of the required mock-up is shown in Figures B-1 and B-2. The homeowner is responsible for adhering to all testing requirements. The homeowner is responsible for the cost of fabricating and installing the flooring system mock-up.
  - After the field work of the acoustical test is complete, the acoustical consultant will prepare and submit an acoustical test report, as described in the ASTM standards, to the AOA Board and the homeowner. Based on the results of the test, the AOA Board or Manager will accept or reject the floor assembly. In cases where the homeowner disagrees with the test results or the interpretation of the test results, the AOA Board shall have the final say.
  - The above outlines acoustical testing when a homeowner wants to use an alternate floor system that is not pre-approved.
- (4) Flooring Repairs: It is understood that some existing floor systems in the residential units do not comply with the Keola La'i Flooring System House Rules. These rules do not require existing systems to be upgraded unless 25 or more percent of a room's floor is being repaired or replaced. Should the repaired area exceed 25% of the room floor area, 100 percent of the room floor shall be brought into compliance with the Keola La'i Flooring House Rules.
- (5) Interpretation of Flooring System House Rules: If there are any questions regarding any aspect of the House Rules for flooring system selection, options, installation, etc., the homeowner is responsible for seeking clarification from the Manager. Ignorance of the rules or a misinterpretation of the House Rules is not an excuse for

violating the rules. If the question/issue cannot be resolved by the Manager, the homeowner may seek clarification from the AOA Board of Directors. For any and all matters of discrepancy, the Keola La'i AOA Board of Directors shall have the final say.

d) Enforcement

The Keola La'i Flooring System Acoustical Rules shall be followed by all homeowners as of the effective date of the Flooring System Acoustical Rules. Any violations shall be promptly corrected by the homeowner at the homeowner's expense. The AOA Board may take action to ensure that the Keola La'i Flooring System House Rules have been properly followed. The AOA Board reserves the right to require a verification of any questionable flooring installation. If a flooring system violation is discovered, the AOA Board may levy fines and penalties against the homeowner. The procedure for resolving flooring system violations includes the following:

- (1) Upon discovery of a violation, the AOA Board shall issue a written notice of the violation to the homeowner with a demand for any and all corrections to be made within 120 days of receipt of the written notice.
- (2) Within 60 days, the homeowner shall provide documents to the Manager confirming orders or contracts for replacement flooring work indicating anticipated completion date within the original 120 deadline.
- (3) If the homeowner is not in compliance within the 120-day grace period, the homeowner may be fined \$75 per day for any time past the initial 120-day period, until the violation has been corrected to flooring acoustic standards shown below.
- (4) If the violation remains uncorrected for more than 150 days, the AOA Board may take legal action to force a resolution to the uncorrected issue. The homeowner shall pay for all reasonable court costs and attorney fees associated with this procedure.

e) Notification and Application for Flooring Replacement

All homeowners replacing any part of the flooring in their residential unit shall notify the Manager of their intent to do so and must complete and submit the Application for Flooring Renovation. Removal of existing flooring or installation of the new flooring shall not proceed until a "Notice to Proceed" is issued by the Manager. The Application for Flooring Renovation is available from the Manager and can be downloaded from the

Keola La'i website. Among other items, the application requires the following information:

- (1) Documentation of the proposed assembly, including all elements of the flooring system.
- (2) Name and contact information of the installer. The AOAO board recommends using a quality licensed contractor with a history of high quality installations.

f) Floor System Installation and Inspection

The homeowner shall notify the Manager at each stage of installation so that the flooring assembly stages can be inspected and documented with photographs. In general, each flooring system layer that is placed shall be documented with photographs prior to proceeding to the next layer. Perimeter isolation must be inspected for all flooring system layers prior to installing the floor finish. The floor trim should be installed so that it does not directly contact the floor finish. The small gap can be filled with a non-hardening acoustical sealant.

g) Neighbor Consideration

The success of the impact noise mitigation program at Keola La'i depends significantly upon the cooperation and willingness of all homeowners to adhere to the rules and use common sense. For all hard floor finish areas, the following considerations are recommended:

- All furniture legs should be cushioned with rubber, soft plastic, felt pads, or similar products to reduce dragging noises from furniture being moved.
- Where practical, area rugs and runners are helpful for minimizing impact noises.
- Do not move furniture late at night.
- Minimize walking with hard sole shoes and footwear on hard surface floors, especially during late night or early morning hours.

In the event a homeowner feels that they are being subjected to excessive noise from the unit above, the homeowner should notify the Manager who will contact the upstairs neighbor regarding the noise and recommend noise abatement steps to minimize noise to the downstairs homeowner. Due to the nature of certain impact noises, the upstairs neighbor may be unaware that they are doing something that is causing a noise issue to the downstairs neighbor. The noise issue may be resolved if both parties are aware of

the noise and cooperate in addressing the concern. Keep in mind that the Manager can only take action if there is a House Rule or By-Law violation.

h) Pre-Approved Flooring System Assemblies

For each of the pre-approved flooring assemblies drawings shown in Exhibit C, each and every floor system element mentioned herein is required, unless noted otherwise. Any modification or alternation of the specific assemblies listed will void the pre-approved status of the flooring system.

(1) Carpet and Pad Flooring Assembly

Carpet and pad flooring tends to be very effective for reducing impact sounds to the residential unit below compared to hard floor finish options, such as wood or tile. As intended for this specification, carpet and pad flooring must be permanently installed wall-to-wall. Any hard flooring borders or accents must be acoustically treated specific to the hard floor finish described herein. Temporary area rugs, pads, carpet tiles, or other similar mats are not considered part of the floor finish since these items can easily be removed. The carpet pad must have a minimum thickness of at least 5/16" and a minimum density of 6 pounds per cubic foot. Thin pile carpet that is glued directly to the concrete subfloor is not acceptable for qualification as a pre-approved floor assembly. A diagram of the pre-approved carpet and pad floor finish is shown in Figure C-1.

(2) Engineered Hardwood Flooring Assemblies

Engineered hardwood flooring consists of a multi-layer system where the top layer is a real hardwood species. Most engineered hardwood products are designed to "click" together or have a tongue and groove system that is glued together. Engineered hardwood differs from hardwood floors in that they do not require any nails, screws or other fasteners that can "short circuit" the acoustical underlayment. The minimum acceptable thickness for the engineered wood flooring is 7/16" thick. A diagram of the pre-approved engineered hardwood floor finish options is shown in Figure C-2.

Note: laminate wood floors are not equal to engineered hardwood floors. Laminate flooring is typically thinner than engineered hardwood and it more easily transmits impact noise. Therefore, laminate floors are not an acceptable alternate to the engineered hardwood floors.

Assembly	Manufacturer	Model
#1	Kinetics Noise Control <a href="http://www.kineticsnoise.com">www.kineticsnoise.com</a>	Soundmatt
#2	Pliteq <a href="http://www.pliteq.com">www.pliteq.com</a>	Geniemat RST10

(3) Hard Tile Flooring Assemblies

Hard tile flooring, although desired by many homeowners, has a very poor performance for impact noise transmission. Hard tile flooring includes ceramic, porcelain, granite, marble, terrazzo, and other similar natural stone and synthetic tiles. If the floor system is not properly installed, the resilient acoustical underlayment may allow cracks in the tile and/or grout to propagate more easily. Some brittle natural stone tiles may not be appropriate for installation on the acoustical underlayment. In some cases, a layer of cement board or a crack suppression mesh/mat may be recommended by the flooring manufacturer or installer. Any and all such products should be installed above the acoustical underlayment. The Keola La'i AOA is not responsible for any cracked flooring within the residential unit. A diagram of the pre-approved hard tile floor finish options is shown in Figure C-3.

Assembly	Manufacturer	Model
#1	Kinetics Noise Control <a href="http://www.kineticsnoise.com">www.kineticsnoise.com</a>	SR Floorboard
#2	Pliteq <a href="http://www.pliteq.com">www.pliteq.com</a>	Geniemat RST15

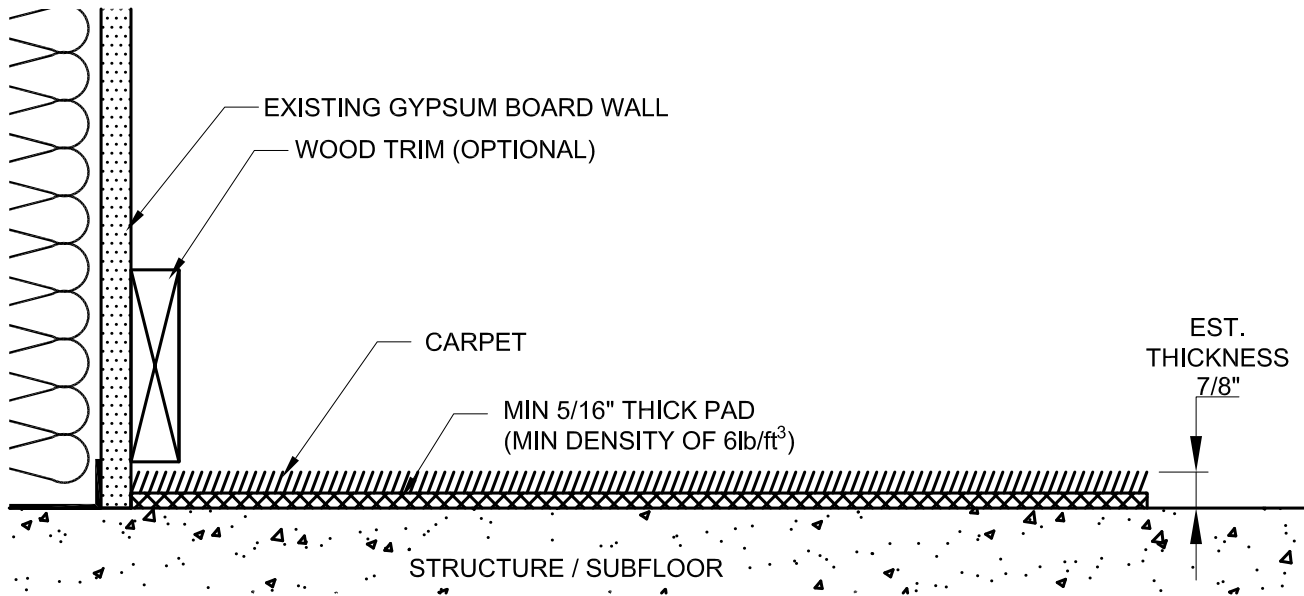
(4) Luxury Vinyl Tile (LVT) Flooring Assemblies

Solid vinyl flooring consists of printed floor finishes on a vinyl substrate and is available in tile or plank formats. The LVT flooring should consist of the following layers: Aluminum oxide wear layer, clear film, design layer, and backing layer. The minimum acceptable thickness for the LVT flooring is 1/8" thick. A diagram of the pre-approved Luxury Vinyl Tile floor finish options is shown in Figure C-4. Acoustical underlayment manufacturer information is provided in the table below.

Assembly	Manufacturer	Model
#1	Kinetics Noise Control <a href="http://www.kineticsnoise.com">www.kineticsnoise.com</a>	Soundmatt
#2	Pliteq <a href="http://www.pliteq.com">www.pliteq.com</a>	Geniemat RST10



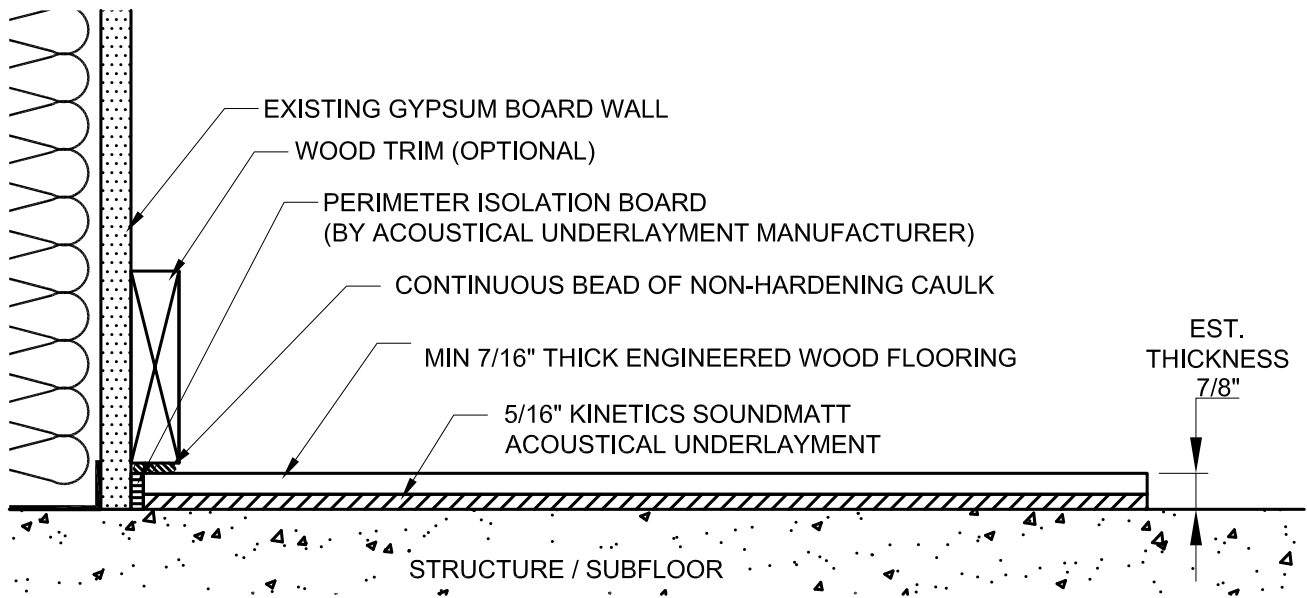
**CARPET AND PAD FLOORING: PRE-APPROVED ASSEMBLY**



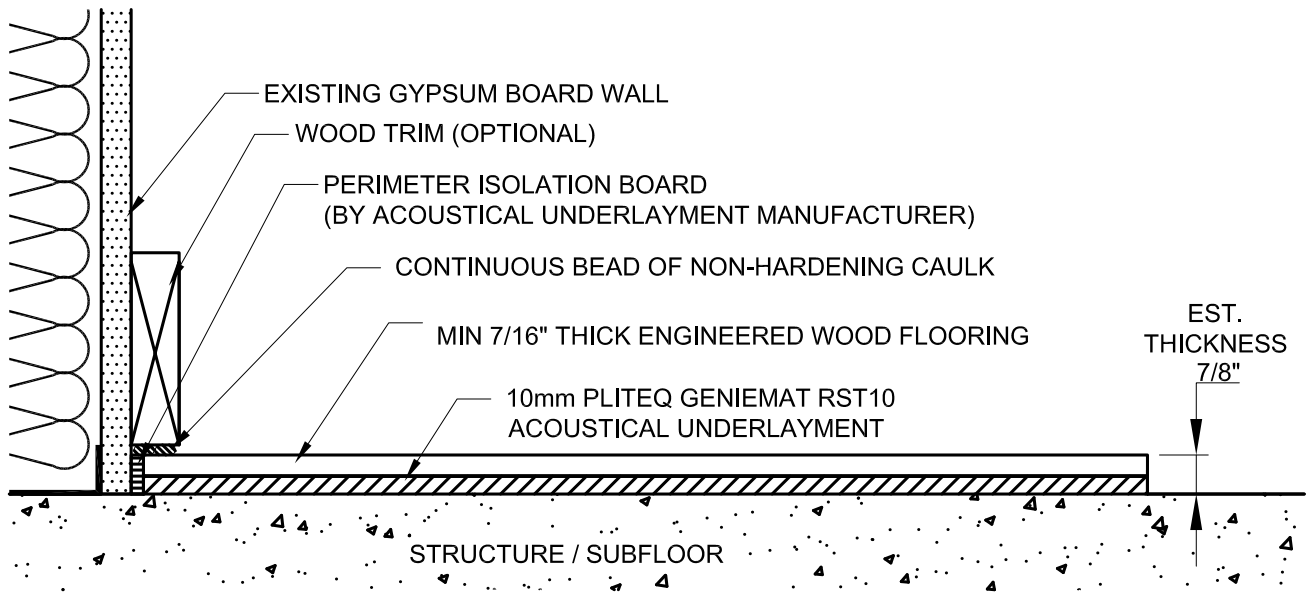
Pre-approved Assembly for Carpet and Pad Flooring		
KEOLA LAI HOUSE RULES	PROJECT NO: 15013	
SCALE: 3" = 1' - 0"	DRAWN BY: TRB	DATE: 03/24/2016

**FIGURE  
C-1**

**ENGINEERED WOOD FLOORING: PRE-APPROVED ASSEMBLY #1**



**ENGINEERED WOOD FLOORING: PRE-APPROVED ASSEMBLY #2**



Pre-approved Assemblies for Engineered Wood Flooring

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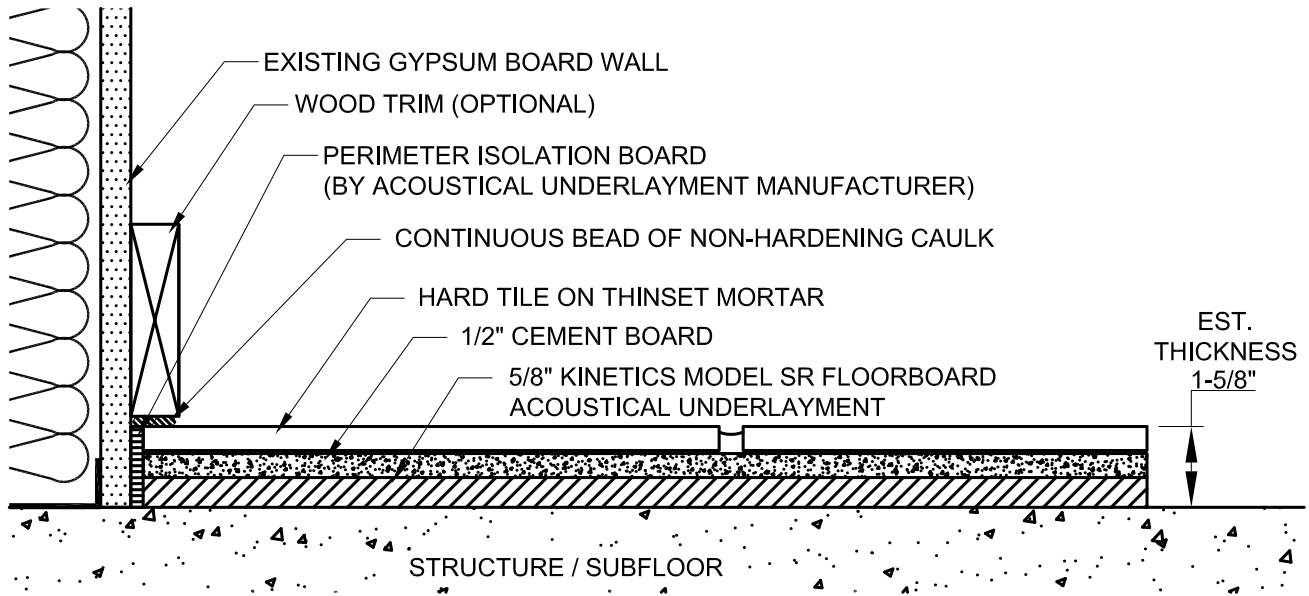
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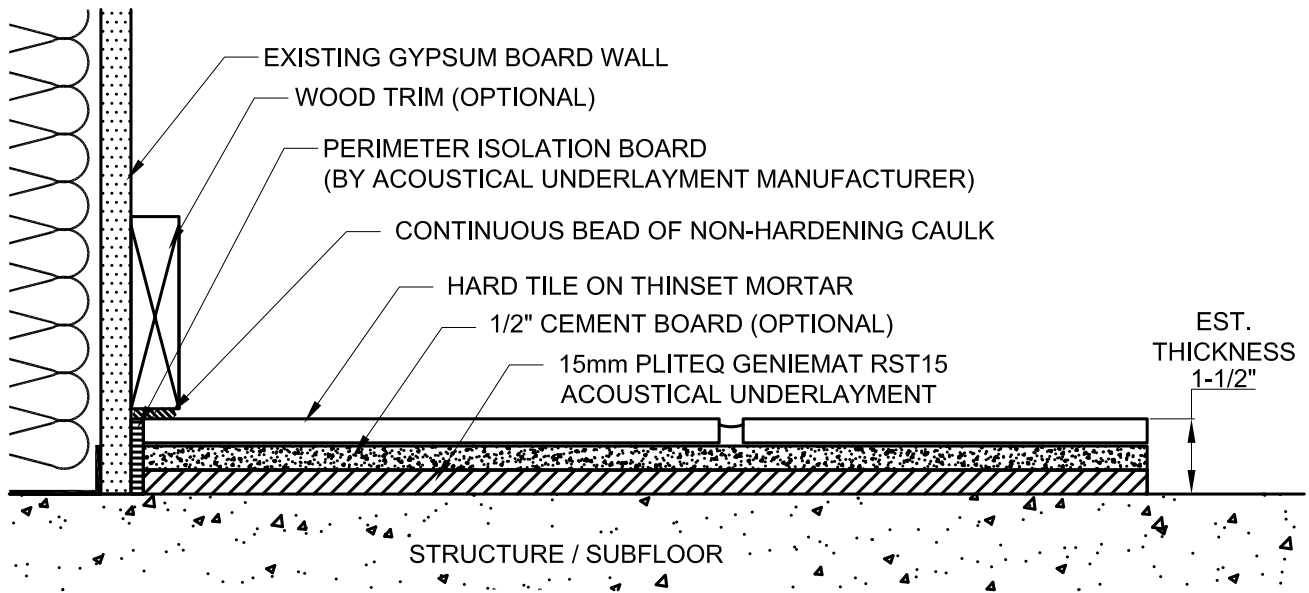
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**FIGURE  
C-2**

**HARD TILE FLOORING: PRE-APPROVED ASSEMBLY #1**



**HARD TILE FLOORING: PRE-APPROVED ASSEMBLY #2**



Pre-approved Assemblies for Hard Tile Flooring

KEOLA LAI HOUSE RULES

PROJECT NO: 15013

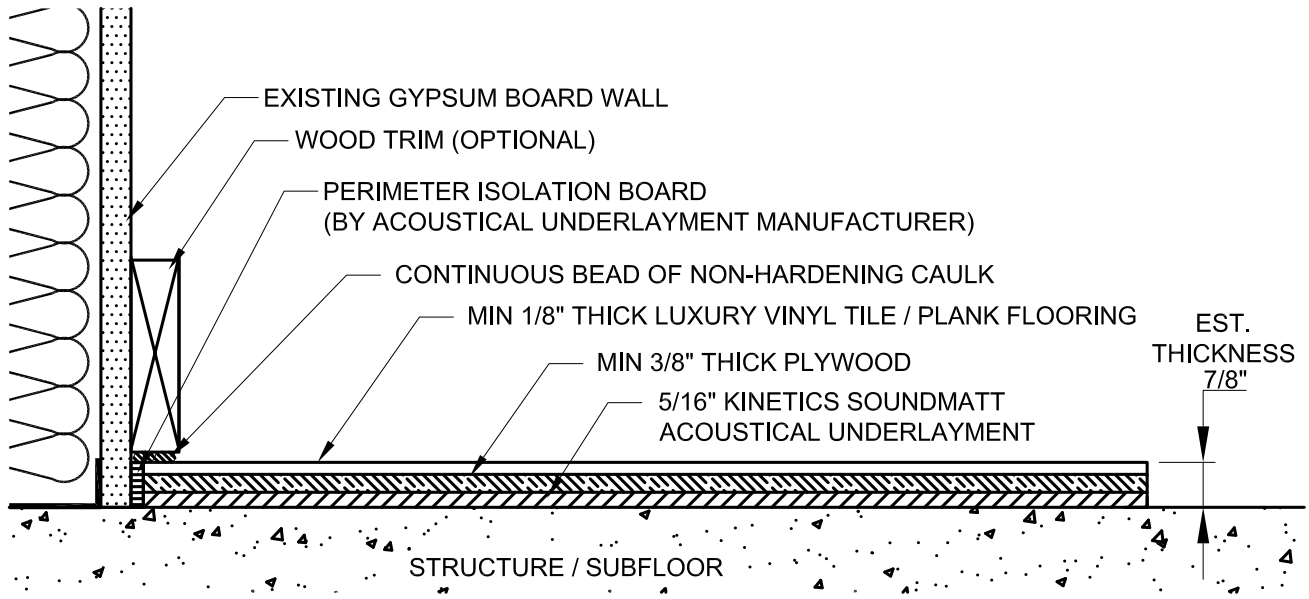
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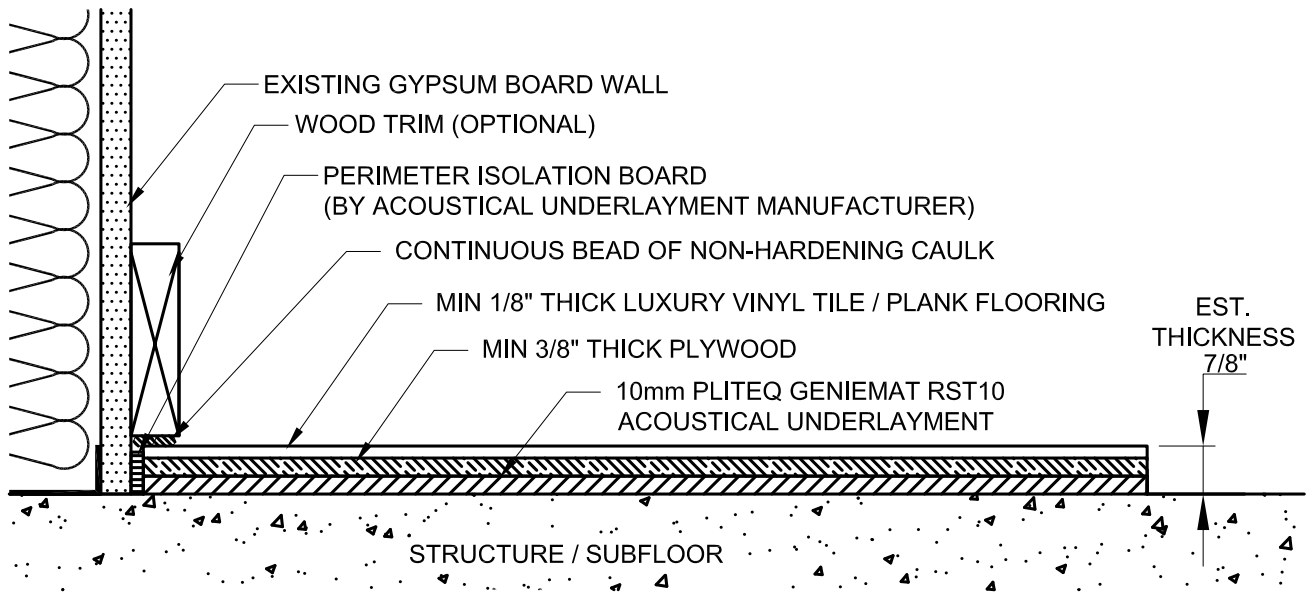
DATE: 03/24/2016

FIGURE  
C-3

**LUXURY VINYL TILE / PLANK FLOORING: PRE-APPROVED ASSEMBLY #1**



**LUXURY VINYL TILE / PLANK FLOORING: PRE-APPROVED ASSEMBLY #2**



Pre-approved Assemblies for Luxury Vinyl Tile/Plank Flooring

KEOLA LAI HOUSE RULES

PROJECT NO: 15013

SCALE: 3" = 1' - 0"

DRAWN BY: TRB

DATE: 03/24/2016

**FIGURE  
C-4**