



## MASON INDUSTRIES, Inc.

*Manufacturers of Vibration Control Products*

350 Rabro Drive 2101 W. Crescent Ave., Suite D  
Hauppauge, NY 11788 Anaheim, CA 92801  
631/348-0282 714/535-2727  
FAX 631/348-0279 FAX 714/535-5738  
Info@Mason-Ind.com Info@Mason-Ind.com

## Floating Floors for High Impact Areas Including Weightlifting and Cross Fit Gyms

DATE: 8-13-15

DRAWING NO. WA-1397

Weightlifting gyms and cross fit gyms can be a real problem, with high impact loads that are difficult to isolate with traditional floating floors. Recently we have been working with several sound consultants, utilizing a special design double floor system for these troublesome areas.

Mason Industries always recommends the use of a professional sound consultant to analyze the actual situation and make the best recommendation for the actual installation. Installation conditions such a structure type, location, and required performance are critical and can only be addressed by a sound consultant.

The design that we have been using is based on results of tests that we did a few years ago. We did the testing after several standard floor installations did not perform very well in weightlifting areas. We found that a FS Spring 4" concrete floor topped with an EAFM double layer plywood floor topped with typical 1" commercial weightlifting area rubber pad worked. The best explanation is that the EAFM wood floor protects the concrete floor and springs from the initial sharp impact by spreading the impact effect out, then the concrete floor and springs provide the required impact isolation and sound attenuation. The EAFM floor and FSN floor did not work separately even with added layers of rubber pads. The combination seems to be the answer.

If the floor is going over an occupied area we have been using a 2" nominal deflection FS Spring 4" thick concrete floor with 2" airgap topped with 0.3" nominal deflection 2" tall EAFM mounts and (2) 3/4" layers of plywood and a 1" rubber pad. Total required height is 10-1/2".

If the floor is going over a parking area or other less noise sensitive area (or slab on grade) we have been using a 2" nominal deflection FS Spring 4" thick concrete floor but with only 1" airgap topped with 0.15" nominal deflection 1" tall EAFM mounts with (2) layers of 3/4" plywood and a 1" rubber pad. Total height is 8-1/2". In a few cases we reduced the plywood to (2) layers of 1/2" plywood and located the mounts closer than normal at 16" OCBW to get the height down to the architect's absolute maximum 8".

We do not recommend individual 10' x 10' small area floors because they will be unstable with 2" springs. Instead we recommend installing the floor in the entire room so the added floor mass provides stability for several weightlifters, spotters and admirers. For smaller gym areas the FS spring deflection can be reduced to 1" for added stability, especially in less critical areas.

The specification and detail are included on the following pages.



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### COMBINATION FS SPRING JACK-UP SYSTEM AND EAFM WOOD FLOOR FOR HIGH IMPACT AREAS

#### Scope of Work:

1. Isolate concrete floating floors from the building structure by means of jack-up spring isolators in areas shown on the drawings.
2. Isolate wooden floating floors from the building by means of rubber isolators in areas shown on the drawings.

#### Intent:

1. The floating floor system shall consist of a 4" thick concrete slab isolated from and supported 2" above the structural slab by resilient spring isolators within cast iron housings designed to jack up the floor after pouring on the sub-floor.
2. Floating floor shall also include a wood floor consisting of a double layer of 3/4" plywood on 2" tall rubber isolators.
3. Springs and rubber isolators shall be selected for loading during normal operation of the floor. Springs and rubber isolators shall have overload capacity to handle structural requirements without damage. Concrete floor shall be designed to handle structural requirements without damage.
4. The floating floor system shall be isolated from adjoining walls and curbs by means of perimeter isolation board.
5. The floating floor shall be restrained horizontally by curbs or other restraints designed to withstand the horizontal seismic forces.

#### Performance Requirements:

1. FS spring shall be selected for 1.5" deflection and maximum frequency of 2.5 Hz at normal operating loads. EAFM rubber isolators shall be selected for 0.2" deflection and maximum frequency of 8 Hz at normal operating loads.

#### Floor System Construction Procedure:

1. The setting of all isolation materials and lifting of the concrete floor shall be performed under the supervision of the isolation manufacturer. The setting of the rubber isolators and construction of the wood floor shall be under the supervision of the isolation manufacturer.
2. Cement perimeter isolation board around all walls and up to the full height of overall floor.
3. Cover entire floor area with 6 mil polyethylene sheeting and carry sheeting up over perimeter isolation board.
4. Place spring isolator castings on a maximum of 48" centers in strict accordance with the approved drawings prepared by the isolation manufacturer.
5. Place reinforcing as shown on the drawings and pour floor monolithically.
6. Raise floor 2" by means of the isolator threaded sleeves and replace covers.
7. Locate 2" tall EAFM rubber isolators per manufacturer's layout drawing.
8. Lay the first 3/4" layer of plywood down with mounts at the edges using plywood clips to join sheets.



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9. Lay the next row of plywood down so the joints are staggered 48" and the plywood is snug against the perimeter neoprene sponge.
10. Lay the second layer of 3/4" plywood down with the joints offset 16" in both directions in relation to the first layer.
11. Attach the second layer of plywood to the first by means of 1-1/2" long flat head wood screws on 16" centers in both directions, using wood glue between layers of plywood.
12. Apply floor finish as shown on the drawings.

### Submittals:

1. Detailed product drawings including load and deflection curves of all isolators.
2. Drawing or drawings showing floor layout and:
  - a. Dead, live and concentrated loads.
  - b. Isolator sizes, deflections and locations.
  - c. Size type, elevation and spacing of concrete reinforcement.
  - d. Calking details.
  - e. Floating floor and wall construction procedure.

### Quality Assurance:

1. Floating floor system components shall be designed and fabricated by a manufacturer with at least five years of experience in at least fifty similar installations.
2. The floating floor isolation materials shall be installed and the floor shall be raised under the supervision of the isolator manufacturer.

### Site Conditions:

1. If site conditions are unsatisfactory for the proper installation of the floating floor, the work will not proceed until the condition has been corrected in a manner acceptable to the isolation manufacturer. The sub-floor must have the same pitch as the top of the floating floor or special provisions made for isolator housings of different height.

### Sequencing and Scheduling:

Coordinate work with other trades and coordinate scheduling with the construction supervisor to minimize delays.

### Products:

1. Casting or weldments consisting of an internally threaded outer housing complete with lugs to support the reinforcing system. The inner inverted cup shaped housing shall be externally threaded. The springs are compressed and the floor lifted by turns of the internal housing. Springs shall be seated in neoprene cup and housing shall have removable cover plates. Spring diameters shall be no less than 0.8 of the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Isolators shall be Mason Industries Type FS.
2. LDS Rubber Isolators: 2" tall molded rubber mount compounded to Mason Industries LDS specification shall be Mason Industries Type EAFM.



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3. Bond Breaker Material: (1) layer of 6 mil polyethylene sheeting.
4. Perimeter Isolation material: Minimum 1/2" thick neoprene sponge shall be Mason Industries Type NS.
5. Perimeter Caulking Compound: Non-hardening, drying or bleeding. Troweling or pouring grade. Caulking compound shall be Mason Industries Type CC-75.

### Execution:

Installation: Install the floating floor systems according to the installation and adjustment procedures and drawings submitted by the isolator manufacturer and approved by the architect.

### Detail:

