

LDS JACK-UP SYSTEMS FOR ROOFS

PART 1 -GENERAL

1.01 Description

1. Scope of Work

1. Isolate floating roofs from the building structure by means of LDS isolators under plywood panels and perimeter isolation as shown on the drawings.

If sound barrier walls are used, add the following:

2. Build sound barrier walls on the floating floors.

2. Substitution of Materials

1. Substitute materials shall meet or exceed the "quality" of the products which are listed in these Specifications. Submit samples and test reports by an independent laboratory for consideration on this project.

1.02 Design

1. Intent

1. The floating roof shall consist of a 4"(100mm) thick concrete slab isolated from and supported 21/2"(62mm) above the waterproof structural slab by resilient LDS isolators covered by plywood panels that form the pouring surface.
If sound barrier walls are used, add the following:
Sound barrier walls consisting of 6"(150mm) filled concrete block (Barrier wall construction can be changed when writing specification) shall rest on the floating floor.
2. The floating roof slab shall be isolated from adjoining walls and curbs by means of perimeter isolation.
3. Any floor drains, piping, conduit and duct penetrations must not short circuit the isolation system.
4. Any equipment on the roof shall be mounted on housekeeping pads or directly on the floating roofs as shown on the drawings, and installed so as not to damage the roof's waterproofing.
5. In seismic zones the floating floor shall be restrained horizontally by curbs or walls designed to withstand the horizontal seismic forces. Solid bridge bearing LDS pads shall be interspersed between perimeter isolation to withstand the seismic forces with a maximum deflection of 0.2"(5mm). When perimeter cannot be used for seismic constraint, intersperse horizontal restraints within floor system.
6. In seismic zones 2, 3 and 4 or equivalent A_v , the floor shall be protected by embedded double acting resilient floor snubbers set in opposition to the overturning moments at the equipment snubbers in all locations where the center of gravity of major equipment is high.

2. Performance Requirements

1. The floating roof system shall have a minimum rating of STC 79 and INR+17 as verified by an independent laboratory in prior tests.

3. Floor System Construction Procedure

1. The setting of all isolation materials shall be performed by or under the supervision of the isolation manufacturer.

2. Set and waterproof any drains and lower pipe seals in keeping with waterproofing specifications.
3. Cement perimeter isolation around all walls, columns, curbs, etc.
 1. In seismic zones intersperse the perimeter isolation with bridge bearing quality LDS pads the thickness of the perimeter isolation.
4. Place individual LDS isolators on the sub-floor at a maximum spacing of 24"(600mm) in strict accordance with the approved drawings prepared by the isolation manufacturer. Additional reinforcement must be detailed on isolation manufacturer's drawings when required. If sound barrier isolation walls are used, add the following:
Perimeter isolators shall be selected to support the wall weight in addition to the perimeter of the floating roof.
5. In seismic zones provide anchorage for the double acting resilient vertical snubbers to the structural slab. Snubber anchor bolts must be in close proximity to the mechanical snubbers restraining any high center of gravity equipment to withstand the overturning moments generated by the machinery snubbers and prevent failure of the floating floor.
6. Cover isolators with 1/2"(12mm) AC plywood. Isolators shall be located under joints and joints staggered. Connect plywood at abutting edges and corners with 16 gauge steel junction plates.
7. Cover the plywood with polyethylene sheeting and carry it up the walls past the perimeter isolation.
8. Place seismic snubber housings on anchor bolts that protrude from the structural floor and through the plywood.
9. Place reinforcing as shown on the drawings and pour floor monolithically.
10. After the concrete has hardened, caulk all perimeter isolation. If sound barrier walls are used, add the following:
11. Construct block walls on the floating floor being careful that mortar does not drop behind the walls.
12. Perimeter roofing shall be done to allow for 0.5"(12mm) of downward movement without leakage.
13. In seismic zones adjust the double acting snubbers after machinery is in place to provide a maximum up and down clearance of 0.125"(3mm).

4. Submittals

1. Detailed product drawings and load /deflection curves of all isolators and in seismic zones double acting floor snubbers.
2. AASHTO Test Reports on all properties in table 2.01 A from an accredited independent laboratory for all rubber durometers used.
3. Dynamic stiffness test from an accredited independent laboratory at 5, 10 and 15 Hz, showing dynamic stiffness does not exceed 1.4.
 1. Isolation frequency not to exceed 9 Hz at stated deflection.
4. Acoustical test data from an independent laboratory showing a minimum STC of 79 and a minimum INR of 17 using a 4"(100mm) concrete floating floor, a 6"(150mm) structural floor and a 2"(50mm) air gap.

5. A drawing or drawings showing:
 1. Dead, live and concentrated loads.
 2. Isolator sizes, deflections, frequencies and locations and in seismic zones, locations of seismic snubbers.
 3. Any drain and penetration locations.
 4. Size, type, elevation and spacing of concrete reinforcement.
 5. Caulking details.
 6. Floating floor and wall construction procedure.

1.03 Quality Assurance

1. Floating roof system components shall be designed and fabricated by a manufacturer of at least ten years experience in one hundred similar floating floor installations.
2. The floating roof isolation materials and panel board forms shall be installed under the supervision of the isolator manufacturer.

1.04 Site Conditions

1. If site conditions are unsatisfactory or raise questions about the 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 roof or special provisions made for isolator housings of different height.

1.05 Sequencing and Scheduling

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

PART 2 -PRODUCTS

2.01 Isolators

1. Cylindrical LDS mountings with a diameter no less than 0.9 of the 2" (50mm) height. Isolators are molded to the following LDS AASHTO bridge bearing specification. Maximum durometer 60. Deflections shall not exceed 0.3"(7.5mm) nor the frequency 10Hz. Isolators shall be Mason Industries Type EAFM.

Table 1. AASHTO BRIDGE BEARING SPECIFICATIONS FOR POLYISOPRENE

ORIGINAL PHYSICAL PROPERTIES			TESTED FOR AGING			OZONE	COMPRESSION SET	LONG TERM CREEP
Duro- meter Shore A	Tensile Strength (min)	Elongat. at Break (min)	Hard- ness (max)	Tensile Strength (max)	Elongat. at Break (max)			
Tests: ASTM D-2240 & D-412	ASTM D-573			ASTM D-1149		25 pphm in air by Vol. 20% Strain 100°F	ASTM D-395 22hrs/158°F Method B	ISO8013 168 hrs
40±5	2000 psi	500%	+10%	-25%	-25%	No Cracks	25%(max)	5%(max)
50±5	2250 psi	450%	+10%	-25%	-25%	No Cracks	25%(max)	5%(max)
60±5	2250 psi	400%	+10%	-25%	-25%	No Cracks	25%(max)	5%(max)
70±5	2250 psi	300%	+10%	-25%	-25%	No Cracks	25%(max)	5%(max)

NOTE: 40 Durometer is not included in AASHTO Specifications. Numbers are Mason standard.

2. In seismic zones double acting resilient cast in floating floor snubbers shall consist of a ductile iron housing locked into the floating floor. The housing shall have a

removable cover plate to provide access to the adjustment of clearances in both the up and down directions of the resilient stops. Resilient stops shall be attached to a restraining bolt attached to the structural floor with an approved anchor. Double acting snubbers shall be Mason Industries Type SFFS.

2.02 Plywood Cover Material

1. Provide one (1) layer of 6 mil (0.15mm) polyethylene sheeting over the plywood.

2.03 Perimeter Isolation

1. Minimum 3/4"(20mm) thick PVC foam, density 7 lbs/ft³ average. PVC foam shall be Mason Industries P7.
2. In seismic zone perimeter isolation shall be interspersed with 3/4"(20mm) thick, 60 durometer LDS bridge bearing pads the height of the perimeter material. Bridge bearing pad shall be made to the same AASHTO specifications, as shown for the EAFM mountings and sized for a maximum deflection of 0.2"(5mm) at maximum earthquake forces. Interspersed pads shall be Mason Industries Type LDS-BBP.

2.04 Perimeter Caulking Compound

1. Non-hardening, drying or bleeding. Troweling or pouring grade. Caulking compound shall be Mason Industries Type CC-75.

2.05 Floating Floor Drains

1. Floating roof drains shall be selected by the architect. A hole large enough to allow passage of the drain piping shall be left in the structural roof. Drain piping shall be suspended from combination spring and LDS hangers with a minimum of 1"(25mm) static deflection for 40 feet (12 meters) from the attachment point as shown on the drawings.
2. Floor drains shall be (Architects preference).

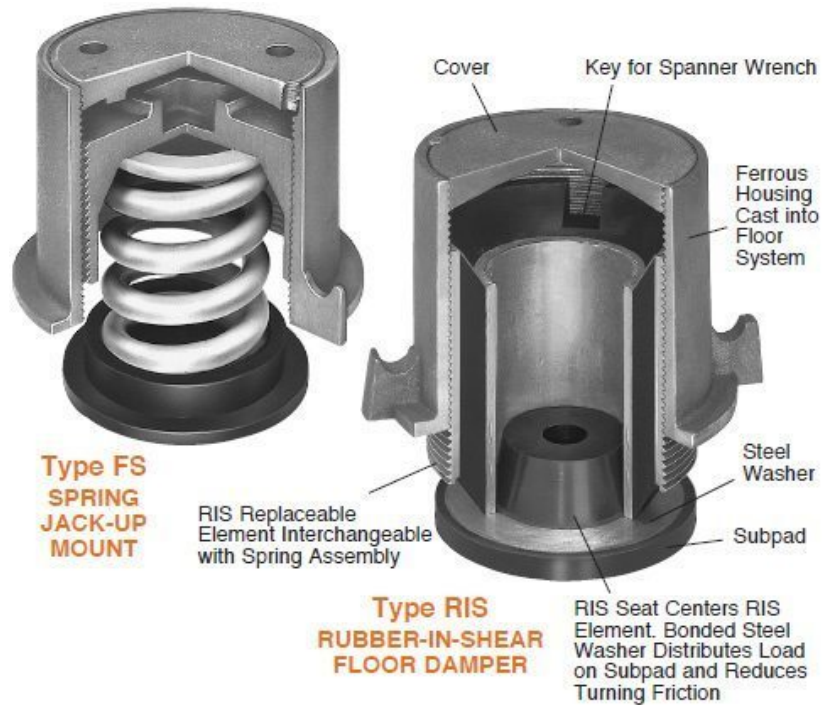
2.06 Plywood

1. Type AC exterior grade 1/2"(12mm) thick.

PART 3 - EXECUTION

3.01 Installation

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



The damping provided by the air under spring supported floors is normally adequate to limit motion. Occasionally, particularly in small aerobic rooms, rhythmic exercises amplify floor motion so additional damping is desirable. The RIS (rubber-in-shear) element solves this problem. Elements are interchangeable with FS springs and can be installed in existing housings if needed or included in the design stage in supplementary locations. Damping rate is controlled by hardness, material and number of dampers.