

LIGO Laboratory / LIGO Scientific Collaboration

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LIGO

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LIGO Installation Cleanrooms Specification

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SCOPE AND OBJECTIVES

This specification covers the minimum requirements for the design, materials, fabrication and delivery of softwall installation cleanrooms for use at LIGO Observatories.

INTERFACE REQUIREMENTS

Proper design and construction will provide a low particle count, as well as practical cleanroom facilities. The cleanroom will be located within a building of ISO 7 environment. There will be three fully garbed workers performing work in the cleanroom daily.

REQUIREMENTS

The frame should be constructed of structural material as deemed appropriate by the manufacturer to satisfy conditions of use. Frame will further contain such supports, bracing, and corner reinforcement as required to maintain structural integrity.

Heavy-duty casters with a foot-actuated locking mechanism shall be attached to the support legs to facilitate placement of cleanrooms. Casters should be **ROBUST ENOUGH** to allow the repeated movement of fully-loaded cleanrooms on hard flooring without caster or joint failure. Caster of vendor choice should be submitted for physical inspection and approval prior to delivery.

Personnel should be able to move the cleanrooms short distances within the same room without requiring the use of heavy machinery or compromising the structural integrity of the room.

The cleanrooms should have anti-static strip curtains on all 4 sides of the room. Large equipment will be moved in and out of the room through multiple sides. See EQUIPMENT DATA below.

The cleanroom should have HEPA blower/filter units required to maintain an ISO 5 environment per ISO 14644-1. See EQUIPMENT DATA below.

In addition to HEPAs, cleanroom compatible lighting should be included in the ceiling grid system. The lighting should achieve a minimum illumination level of 50 foot-candles at 30 inches above the floor. See EQUIPMENT DATA below.

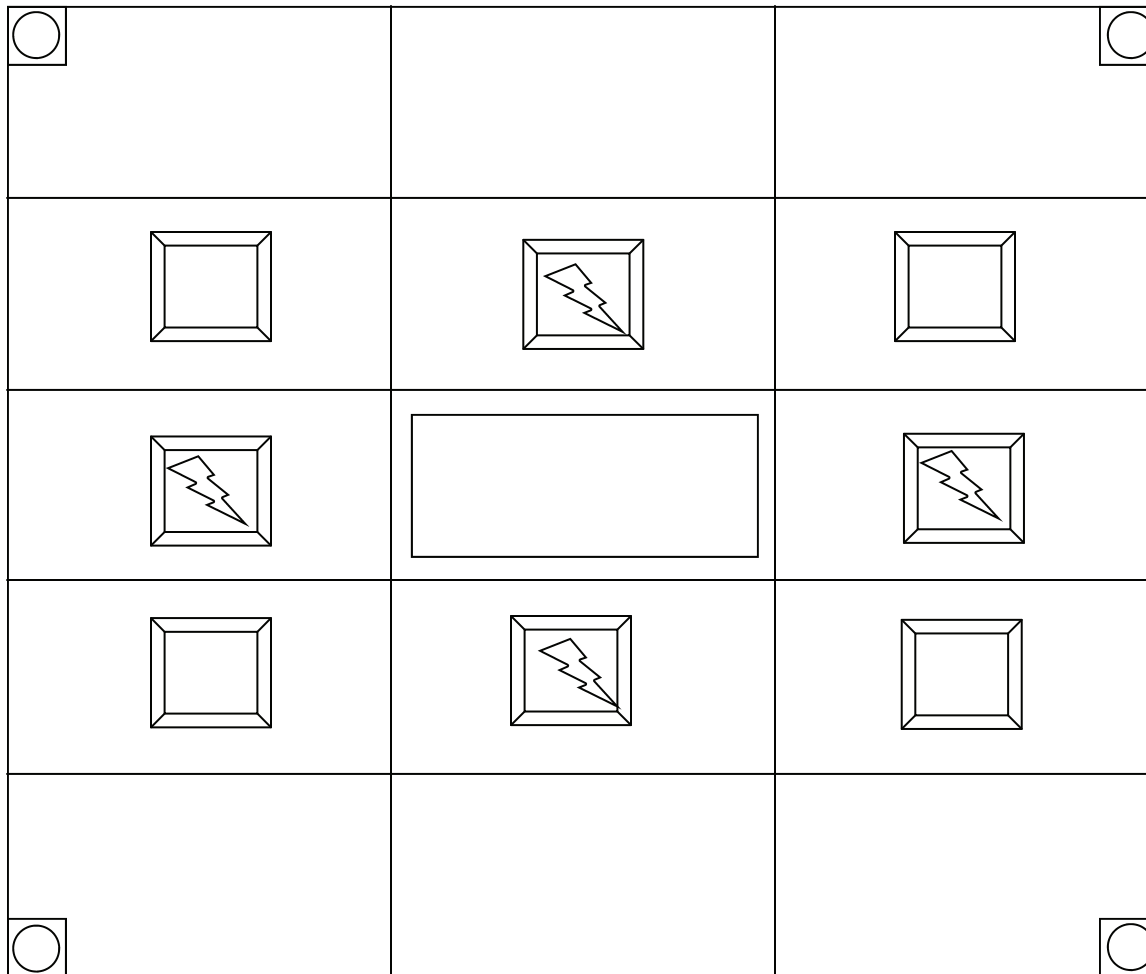
EQUIPMENT DATA

1. 2 ft. x 4 ft. HEPA Fan/Filter Module
 - A. Fan/Filter module shall be UL listed.
 - B. Fan/Filter Module to have prefilter section. Ductwork collars are not permitted.
 - C. Filter to be HEPA type with 99.99% efficiency on 0.3 μ m particle size.
 - D. Fan motor to be wired for 110 VAC.
 - E. Fan motor to have local speed control mounted on Fan/Filter Module. Speed control to have adjustment range of 50% of fan speed to 100% of fan speed or better.
 - F. Fan/Filter Module to have 10' extension cord with 5-15P male plug.
 - G. Fan/Filter Module to be constructed of either aluminum or stainless steel, or other cleanroom compatible material.
 - H. Fan/Filter Module shall be capable of being mounted in a cleanroom ceiling grid-system.

2. 2 ft. x 4 ft. and 1.5 ft. x 4 ft Fluorescent Lighting Fixtures
 - A. Lighting Fixture shall be UL listed.
 - B. Lighting Fixture to be wired for 110 VAC.
 - C. Fixture to have Energy saving lights.
 - D. Lighting Fixture shall be mounted in clean room ceiling grid system.
 - E. Lighting fixture to have 10' extension cord with 5-15P male plug.
 - F. Lighting fixture shall be capable of being mounted in a cleanroom ceiling grid-system.

3. Cleanroom strip curtains
 - A. Anti-static strip curtain type wall shall be used on all 4 sides of clean room.
 - B. Strip curtains should be between 10" and 14" wide with appropriate overlap.
 - C. Strip curtains should be made from 60 mil thick, clear, fire-retardant PVC material.
 - D. Strip curtains should be attached to structure frame with fasteners or semi-permanent equivalent (not "Dual Lock" or "Uni-Lock" type).




LIGO TYPE A Installation Cleanroom (End SEI Test Stand)



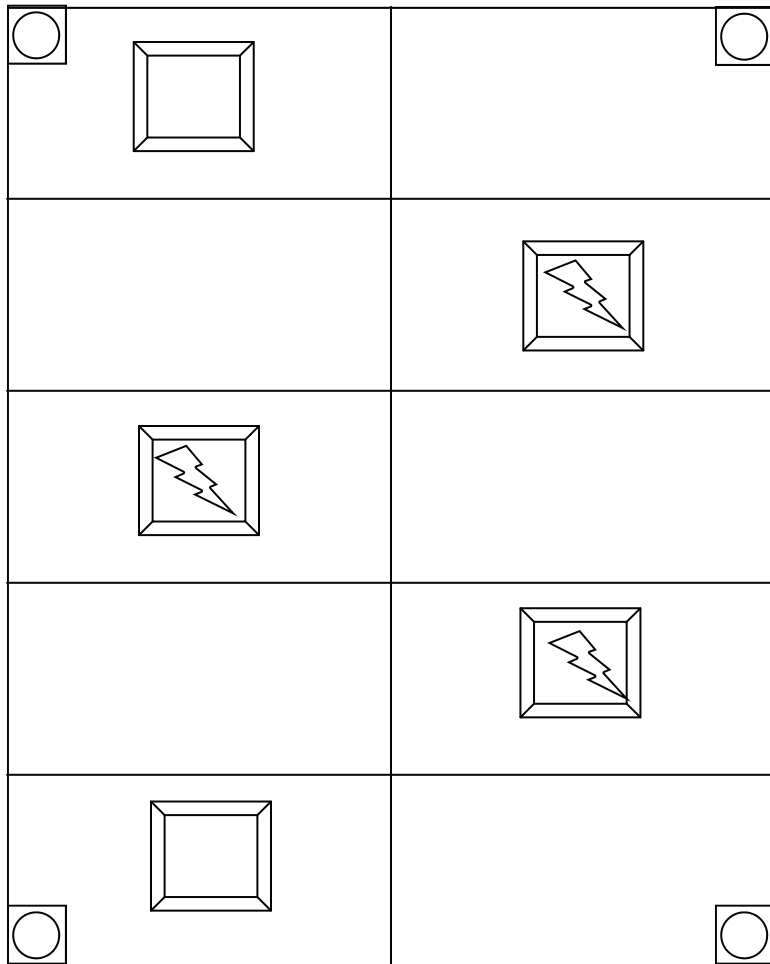
Description

- Dimensions: 10' x 12' footprint, +/-3"
- 14' interior height, +6", -0"
- 2' x 4' opening (filled with an appropriate tile) in the ceiling for crane hook insertion.
- Must be able to accommodate "nesting" of Type B Cleanroom.

Key

-  2x4 HEPA FFU
-  2x4 FFU with light
-  Leg with caster




LIGO TYPE B Installation Cleanroom (VEA Work Space)



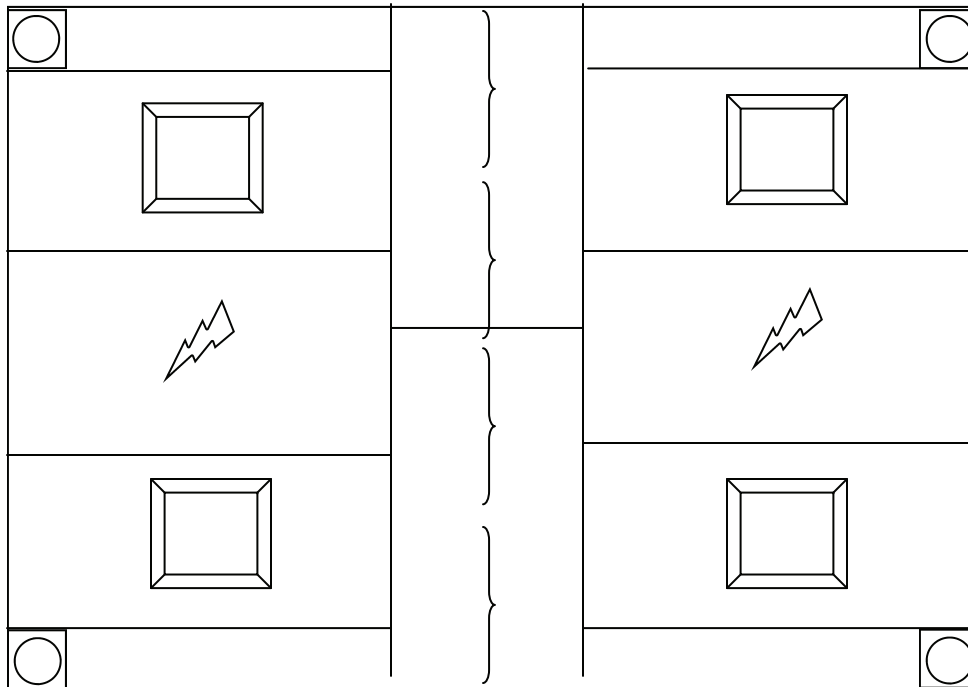
Description

- Dimensions: 8' x 10' footprint, +/-3"
- 9' interior height, +/-3"
- Must be able to "nest" under Type A Installation Cleanroom

Key

-  2x4 HEPA FFU
-  2x4 FFU with light
-  Leg with caster

LIGO TYPE C Installation Cleanroom (Garbing-Staging)



Description

-Dimensions:

7' x 10' footprint, +/-3"

8' interior height, +/-6"

-Partition with interior softwall curtain that separates the cleanroom into two 5' x 7' rooms.

Key



2x4 HEPA FFU



2x4 Light

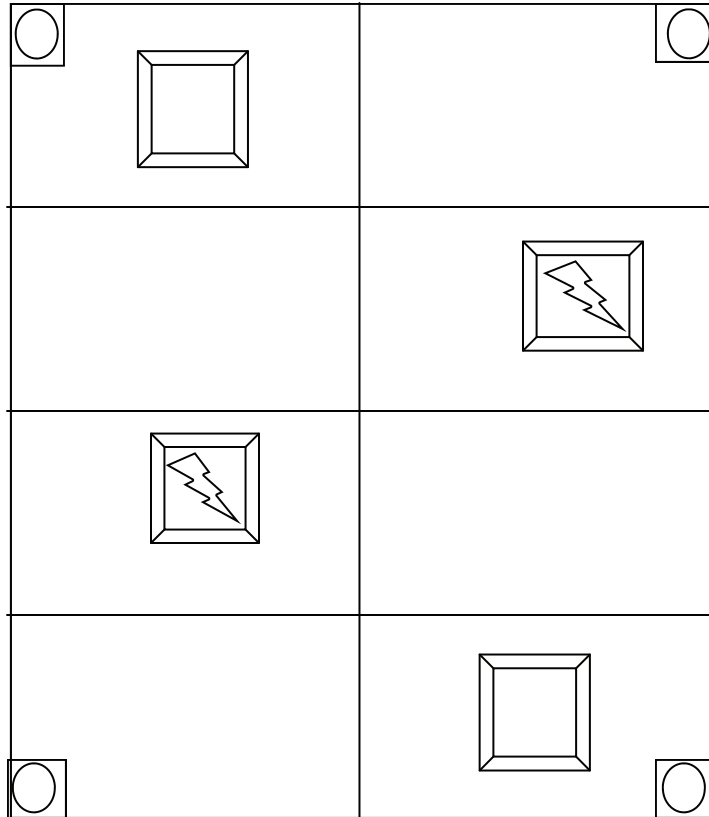


Leg with caster



Partition

LIGO TYPE D Installation Cleanroom (Buffer)



Description Type D

-Dimensions:

8'6" x 7'3" footprint, +/- 3"

8' interior height, +/- 6"

Key



2x4 HEPA FFU



2x4 FFU with light

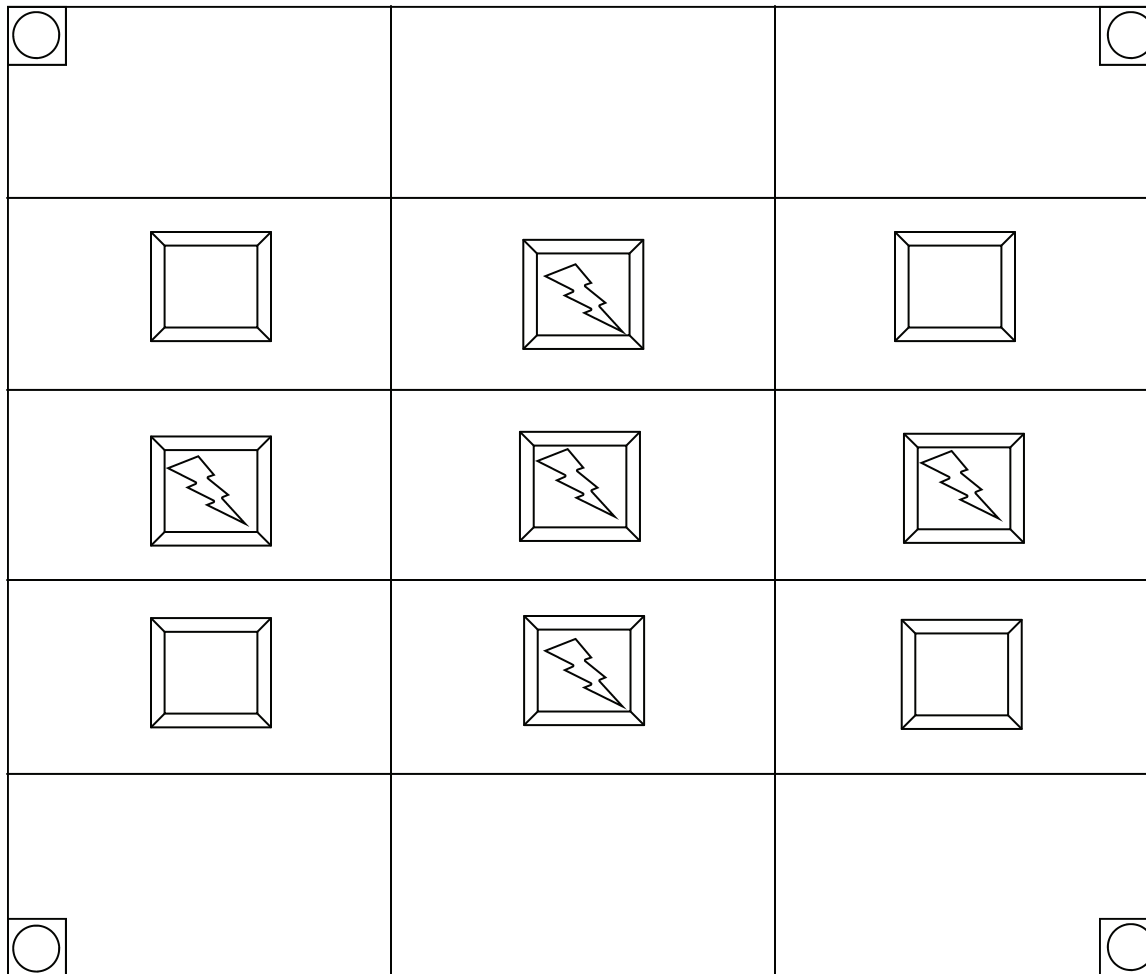


Leg with caster




LIGO TYPE E Installation Cleanroom (Fiber Welding)

Description Type E

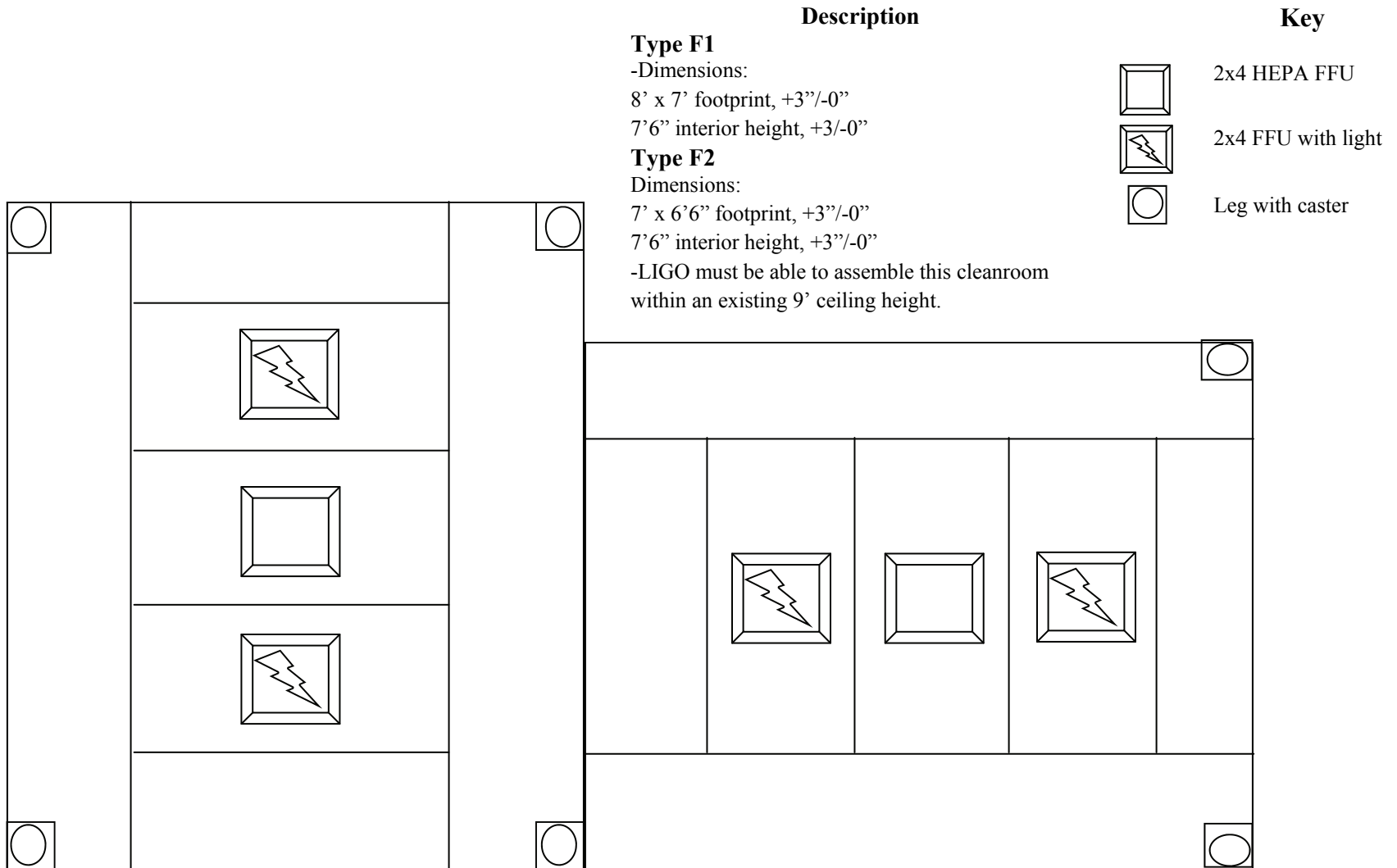
- Dimensions: 10' x 15' footprint, +3"/-0"
- 7'6" interior height, +3", -0"
- LIGO must be able to assemble this cleanroom within an existing 9' ceiling height.



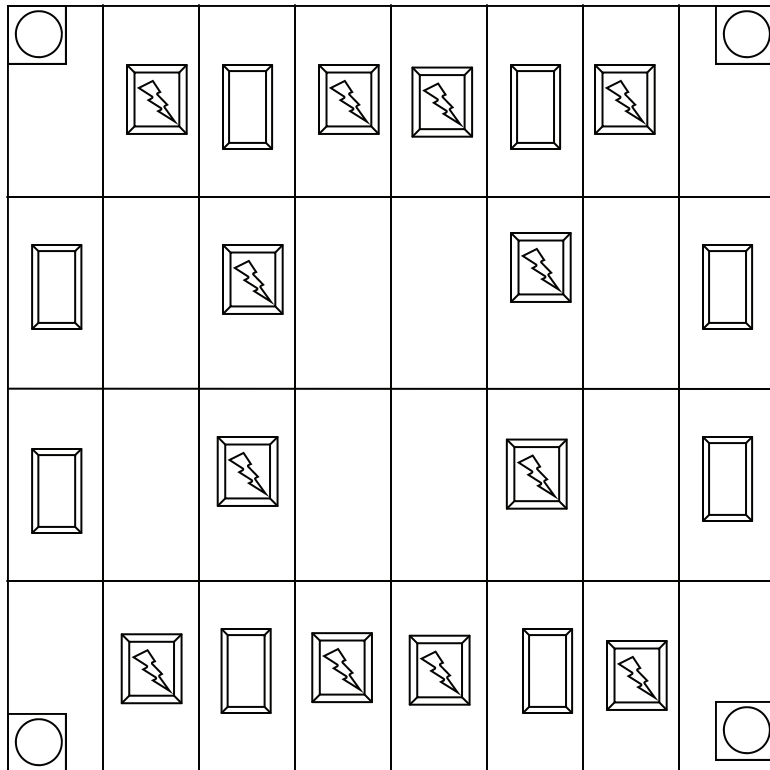
Key

-  2x4 HEPA FFU
-  2x4 FFU with light
-  Leg with caster

LIGO TYPE F Installation Cleanroom (Trans-Mon Suspension followed by Arm Length Stabilization)






LIGO TYPE G Installation Cleanroom (Vertex SEI Test Stand)



Description

-Dimensions: 16' x 16' footprint, +/-3"
14' interior height, +6", -0"

Key

-  2x4 HEPA FFU
-  2x4 FFU with light
-  Leg with caster