

Building 59 Wang Hall – NERSC Computer Floor – Subfloor Entry Procedure

The B59 computer room subfloor is classified as a Non-Permit Confined Space. The space is 3' 11" in height and has limited access and exit. The following procedures and safe work practices are required when entering the space.

The raised computer floor may become a Permit-Required Confined Space if hazards (welding, soldering, volatile compounds) are introduced.

Routine work which does not introduce an atmospheric or other hazard:

1. EHS0361 CRT Subfloor Entry Training is under development for Lab employees and Affiliates. Until the online training is available, all workers will be briefed on this subfloor entry procedure before work is authorized. Nonconstruction subcontractors must be briefed on this subfloor entry procedure by NERSC Facility Manager or designee. Construction subcontractors must complete hazard communication level confined space training, in addition to being briefed on this procedure.
2. Workers must remove tiles above the area where they will be working. If this is not possible, they must use a buddy system or notify the Control Room.
 - a. Buddy system: This is best for short term work. The buddy should remain above the floor and stay in contact with the worker under the floor. The buddy must have the equivalent training and authorization as the worker under the floor.
 - b. Control Room notification. This is best for longer term work. Sign in with the control room before entering the subfloor to perform work. You must sign out when under-floor work is completed, at the end of the work day, or when leaving the compute level. (In the latter case, you must sign back in before continuing under-floor work.) For longer work periods, communication means must be established and reliable (i.e. approved radios located in the control room).
3. Barricade the floor openings. Any fall into a floor opening could result in serious injury.
4. Personal protective equipment:
 - a. bump caps must be worn to protect from hitting your head on pipes and sharp edges. Hard hats are an acceptable alternative.
 - b. safety glasses are required to prevent dust from entering eyes
 - c. hearing protection
 - d. gloves are optional

5. Seismic safety

The CRT computer floor is a “floating floor” designed to remain stable in an earthquake. The rest of the building, including the subfloor, will move with the earthquake ground motion. Consequently, the subfloor and floating floor movement can create a hazardous situation. It is essential that anyone working under the floor remain aware of the safety issues related to motions that can occur during a large seismic event.

In an earthquake

- Carts – The floating floor is mounted on carts, wheeled structures under the floor that will support the floor. The carts ride on casters, which can move up to 18 inches in any direction in an earthquake. It is essential that you do not put your body within this distance of any cart, or put your hands on the concrete floor within this distance of the cart casters.

- Pinch points – Any location where movable equipment is close to non-moving equipment can create a pinch point if there is an earthquake. For example, the cooling water piping is attached to the concrete subfloor, and the cooling water pipes will move in relation to anything attached to the seismic, movable floor. These plumbing pipes are located near the carts. The carts will move relative to these cooling water pipes. You must not place your body between the carts and water pipes.
 - Moat plates – Blue slip plates that connect the movable floor to the fixed floor. These plates also move in an earthquake. This is the most high-risk area in an earthquake. If it is necessary to work near a moat plate, contact the NERSC Facilities Manager for assistance. If possible, access the floor at a point in the interior of the moat plate. If this is not possible, it will be necessary to remove the moat plate(s) in the area where work is needed. Special tools and assistance of the NERSC Facilities Manager are required to remove the moat plates. Do not under any circumstances get under the floor between the moat plate and the side of the building, or between two moat plates. Do not get between any movable equipment and the vertical supports (non-movable) that are located near the perimeter moat plates.
 - Stay under the floor or stay above the floor – Because the floor will move relative to the subfloor, you should not stand on the subfloor with your body in a floor opening. If you are on the floating floor, near a floor opening, get away from the opening. If necessary, roll your body away from the opening. If you are entering or exiting the subfloor space, hold on to the floor tile gridwork so that you move with the floating floor.
6. Protect equipment
 - Watch for obstructions so you do not damage equipment or yourself.
 - Do not stand on VESDA smoke detection system piping (orange PVC piping), sprinkler piping, electrical cable, power cables, data cables, or piping manifolds.
 - You can rest your weight briefly on solid structures to enter or exit the space. It is okay to step on the carts to get out of the subfloor.
 - Be aware of the water valves on the cooling pipes and do not turn the valves.
 - Likewise, do not disturb the yellow leak detection cables underneath the cooling pipes. If these are accidentally moved or damaged, report to the building manager immediately.
 - Do not place anything where it could block movement of the casters (supporting the carts) or the blue moat plates.
 7. If any atmospheric hazard is introduced, the space may become a permit required confined space. (Atmospheric hazard sources include hot work such as soldering or welding, use of chemicals, cleaners, degreasers, or anything generating dusts, fumes or mists.) See PRCS procedure.
 8. Workers must notify their work lead, or the control room, upon exit and when the work is complete. If the area was made safe by removing all floor tiles above, this is not required.

Non-routine work that introduces hazard(s):

If atmospheric hazards or other hazards (i.e. exposed electrical) are to be introduced, and the floor cannot be opened up to the extent that it is not a confined space, then the under floor space becomes a **Permit Required Confined Space (PRCS)**. In the event that any such hazards are

introduced, the Confined Space Activity Lead will need to establish the following PRCS controls in addition to the controls for non-permit entry:

1. Confined Space trained workers must be used for entry.
2. An Entry Supervisor must be assigned to prepare a daily entry permit. This permit will require an assessment of the work and include atmospheric testing.
3. A confined space Attendant must be present full time to monitor and support the work during an entry. Working alone in confined spaces is prohibited.
4. Entrants notify the Control Room of any planned entry and expected time of exit from the subfloor. Sign out in the control room is required.
5. Continuous atmospheric monitoring with a four-gas meter must be used if there are atmospheric hazards.
6. Continuous forced air ventilation must be provided if there are atmospheric hazards.
7. Communication means must be established and reliable (i.e. approved radios located in the control room).
8. Workers notify the control room upon exit and when the work is complete.

For additional information on PRCS entry:

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