



SISC BULLETIN

SELF-INSURED SCHOOLS of CALIFORNIA

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TO: District Superintendents
SISC II Member Districts

FROM: Catherine Wilson Jones, CSP
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SUBJECT: Relocatable (Portable) Classrooms

The SISC Safety and Loss Control department has recently received questions regarding the purchase, use, and occupancy of portable classrooms, specifically pertaining to indoor air quality (IAQ) issues. Since we realize many of you are being pressed into either purchasing or leasing portables, the balance of this correspondence is designed to assist you in the purchase, maintenance, and safety of their operation.

A. Design

The State Department of General Services (DGS) issues specifications on "Building, Classroom, Prefabricated, Relocatable General Requirements", which outlines the DGS requirements for the State Portable Classroom Program. The demand created by the Class Size Reduction Program exhausted the available inventory of state lease program relocatable classrooms. Therefore, many school district administrators will instead obtain relocatable classrooms directly from manufacturers. Although all classroom units manufactured for California must conform to the Building Standard Code (Title 24), these standards are not specific for "portables". Hence, these relocatable units may not adhere to the DGS specifications, and their design and quality can vary.

B. Proper Placement and Inspection Prior To Occupancy

The following points that should be covered prior to occupancy are:

- Ramps - Ramps and platforms must be secured to the building. Free standing ramps/platforms can separate from the building causing a gap. In some instances, the gap can become wide enough to cause a tripping concern.

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Ramp Surfaces - Ramps should have sufficient slip resistant properties. However, the material should not be so rough as to cause injury. A student was injured after falling onto a ramp sustaining abrasions from the grate-like surface.

- Handrails - Proper handrails should be in place and secured along ramps and platforms. There have been several reported injuries to students as a result of handrail deficiencies. The most common problems are loose or missing handrails. In one instance, the electrical installation and grounding was deficient causing the handrail to become energized. When the doorknob and handrail were touched, the individual received an electric shock.
- Access Pathways - Consideration should be given to the access pathways leading to the portable. Walking surfaces should be level, free from obstructions or tripping hazards, and well lit.

C. Ventilation and Indoor Air Quality Background Information

- For the design of heating, ventilation, and air conditioning (HVAC) systems, the ASHRAE (American Society of Heating, Refrigeration and Air-Conditioning Engineers) Standard 62-1989 **Ventilation for Acceptable Indoor Air Quality** recommends 15 cubic feet per minute (cfm) per person of outdoor air for school classrooms. This value has been incorporated into the California Energy-Efficiency Building Standards. The DGS bid specifications for Relocatable Classrooms require that HVAC systems deliver a minimum of 480 cfm of total outdoor air. To achieve the ASHRAE Standard, this supply of outdoor air limits classroom occupancy in relocatable classrooms to no more than 32 persons.
- A new portable or permanent building will offgas from new furnishings and finishes for a period of several months (for volatile organic compounds) to several years (trace amounts of formaldehyde). Increased ventilation, specifically with outside air, is the appropriate method of control. Adequate ventilation can be expected to reduce emission levels in the classroom three-fold.
- Currently, there are no scientifically-based studies that substantiate that portable classrooms pose an undue risk. Therefore, with proper control and operation, district administrators need not be concerned with using portable classrooms. In fact, recent studies have indicated that portable classroom emissions are comparable to the emissions in a new home. The California Department of Health Services has a guideline level for formaldehyde (50 ppb) and an action level (above 100 ppb). These levels are for non-occupational settings and would be applicable for schools.
- Conversations with SISC's consulting Certified Industrial Hygienist revealed that it is very rare to see levels in excess of the DHS action level, even in brand new portables.

D. Ventilation and Indoor Air Quality Recommendations

Rather than air monitoring or testing portables, which is not recommended, district administrators may do the following:

- When specifying a new relocatable classroom, ensure that the HVAC system can: (a) provide the minimum outdoor air previously stated; and (b) heat and cool this outdoor air at design outdoor temperatures for the specific geographic location where each classroom is installed. Some manufacturers of relocatable units do not include outdoor air intakes in their standard classroom models. It is important that an additional “outdoor air kit” be ordered for this purpose. Further, installation of an outdoor intake must be specified as part of the exhaust system. Lack of an exhaust in an HVAC system with an outdoor air intake will result in room pressurization, reduced outdoor air flow rates, and lower efficiency of removal of pollutants from the room.
- Outdoor air must be supplied continuously when a classroom is occupied. Demand-controlled HVAC package systems often used in relocatable classrooms typically operate only when the temperature of a space is different from the thermostat’s set point (i.e., higher in the winter and lower in the summer). In order to provide a continuous outdoor air supply, it is important to ensure that the HVAC thermostats are set in the “on” or continuous mode when occupied. Instruct teachers to operate the units in the “fan” mode rather than in a temperature demand mode. In the temperature demand mode, the unit only operates when heating or cooling is needed. In the fan mode, the fan circulates air continuously and then provides heating and cooling as set by the thermostat.
- State-leased relocatable classrooms are required to have HVAC systems that are wall mounted. Units acquired from other sources can have either wall- or roof-mounted HVAC ; the cost of roof-mounted HVAC may be somewhat greater. However, some side-mounted units may be noisier, and it is important to check the noise level from HVAC operations in the relocatable classroom. If a noisy HVAC system is turned off because it interferes with classroom activities, this effects a failure of the ventilation requirement. Investigate the need to remount the ventilation unit away from the classroom. Units can be remounted on posts approximately four feet from the class and ducted over; sound lining can also be installed during the process. This can reduce the sound considerably. Cost estimates for such a process are \$500-\$1,000 per classroom.
- Prior to use of any new relocatable units by staff or students, operate HVAC systems at their maximum outdoor air intake rate continuously for several days. Similarly, provide maximum flush-out by HVAC (or open windows) for newly renovated classrooms and offices. Start this “flush-out” as soon as the HVAC system is operational and continue after furniture installation. During this period, do not recirculate return air if possible. Ventilate new classrooms continuously for a period of approximately two to three weeks.

- Before a relocatable classroom is used, be certain that the HVAC system is fully inspected. Verify that it heats and cools properly, provides the appropriate amount of outdoor air, and operates continuously when the classrooms are occupied. The space pressure of the building should be slightly positive with respect to outdoors. Check the noise level in the classroom associated with HVAC operation. Confirm that outdoor air intakes are located away from contaminant sources (e.g., bus parking, kitchen exhaust, etc.).
- Building “bake-outs”, i.e., when temperatures are increased up to 100°F in order to “artificially age” building materials, are not recommended. Their effectiveness has not been proven, and they may in fact damage parts of the HVAC system or building components.

If the ventilation units are providing outside air to the class and the unit is operated in the fan mode, district administrators should feel confident that their portable classrooms pose no greater risk than any other new building.

If you have any questions, please contact your SISC Safety representative.

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