



The Inspector

By Fire Inspector Jeremy Oxenford
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COVID-19 Occupant Loads

COVID-19 brought new challenges for our department and university leadership this year. Within our department, getting new occupancy loads for all our assembly and classroom spaces throughout campus before the start of fall semester was our biggest one. Calculating an occupancy load is one of the basic tools in every fire inspector's toolbox and should have been an easy task... or so we thought! I will outline what we did at our university to calculate a safe COVID number.

The university's initial solution for determining a safe COVID occupancy load was to base it off a percentage of the original occupancy load. Most research and public hype at the time pointed us in this direction. To accomplish this, we went to Classroom Management which, on my campus, is where all records of occupant loads for all the classroom spaces are kept. Unfortunately, we discovered most of the occupant loads they had on file were incorrect. Throughout time, many of the numbers had been altered to accommodate the needs of certain classes, and some of the older numbers were previously calculated using incorrect occupant load factors. It took time to get these numbers corrected.

But, even with corrected base occupancy numbers on hand, we found a percentage alone was not sufficient to ensure a safe occupancy. Pure percentage calculations only led to practical/useable results for a specific set of classroom conditions. Practically in most of the spaces we measured, using percentages would put students closer than 6 feet apart, which was against CDC guidelines. In the larger classrooms and assembly spaces, percentages often went the opposite way and did not make the best use of a room. Percentage calculations there left a lot of wasted space that could be filled by people without compromising safe distancing measures. The university needed a different solution to make the classroom and assembly spaces COVID safe and to better utilize what space we had.

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Figure 1: Fire Inspector Abbott Measuring for COVID Safe Distancing

The best solution we identified was to recalculate a safe COVID number using our own occupancy load factor. Our office used the CDC guidelines of 6 feet spacing around each person to create an occupant load factor of 36 (6ft x 6ft). Furthermore, the new occupant load factor had to be a net (total square footage remaining after furniture deductions) number because using a gross (total square footage) number could still put students closer than 6 feet apart. This meant our office had to physically go to every classroom and assembly space on campus to measure out all the furniture to get an accurate net number. We quickly drafted a plan to prioritize which spaces had to be measured first and to address who was going where so we could meet the fall semester deadline. Unfortunately, our office ran into some unanticipated issues while measuring out the spaces: some of the rooms were not being used as they were listed, which had to be corrected. For example, some of the listed classrooms were being used as lab spaces or had been converted to office spaces. Various campus departments also had difficulty understanding what a maximum COVID occupant load was and wanted clarification as to how we got our numbers. This forced us to temporarily halt all measuring so we could explain the numbers to them and help them feel comfortable with the numbers we calculated. At times, our office even adopted the role of interior designer and assisted with furniture arranging/removal so departments could have bigger net numbers and therefore make better use of the measured spaces!

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Figure 2: Classroom COVID Spacing

Regrettably, the COVID occupant load factor could not be used for all the classroom and assembly spaces on campus. For the spaces equipped with fixed seating, the furniture could not be rearranged or removed. In most cases, pre-spaced seating arrangements are designed assuming occupants will be well within each other's 6-foot safety zone. As a result, each seat had to be physically measured out with a tape measurer to safely place occupants a minimum of 6 feet apart. Most of the time this meant placing occupants farther than 6 feet apart which surprised many who thought more people could occupy these spaces during the pandemic. This also forced us to go through a lot of painters tape so we could keep track of which fixed seats were measured and help us add them up once we finished measuring. On the bright side, physically measured seats with visual markings made it easier for departments to understand and kept us from having to revisit these spaces later.



Figure 3: Classroom Seating with COVID Seating Markers

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With a ton of determination and patience with our university family, our office was able to calculate the needed safe COVID occupant loads before the fall semester deadline. It is our hope that 6 foot spacing coupled with the other COVID measures the university has implemented will keep our faculty, staff, and students safe and COVID free. Only time will tell!

About The Inspector



Jeremy T. Oxenford, CSHO
Fire Inspector/Plans Examiner
The University of Oklahoma



Jeremy is a fire safety inspector at the University of Oklahoma, where he works as member of the University's Fire Marshal's Office. He is responsible for conducting inspections of campus buildings and reviewing plans for University construction projects. Jeremy also serves as the primary trainer for the team and is responsible for building the University's mobile cooking unit fire inspection program. Jeremy has worked as both a structural firefighter in Eaton Colorado and as a safety official in the oilfield. He is also a military veteran who has served in both the United States Marine Corps and the Oklahoma Army National Guard. Jeremy was deployed for Operation Iraqi Freedom, Hurricane Katrina and Exercise Eager Mace. He is a Certified Safety and Health Official (CSHO) and has an A.A.S. degree in Fire Science from Aims Community College, and B.S. degree in Fire Protection and Safety Engineering from Oklahoma State University. Jeremy currently resides in Oklahoma City where he can be spotted doting over his wife and two kids. He is an avid board gamer and loves nerding out.

Please email joxenford@ou.edu or go to <http://www.ou.edu/campussafety> to contact Jeremy Oxenford.

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