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Steel stud wall analysis

With the Okalahoma City Bombing a new urgency was created for the need to do research in the area of blast resistant building. With the turn of the century a ever greater threat appear with a need for more improve building resistance. The National Explosion Research Center located at the University of Missouri - Columbia is the forefront of explosion research at the academia level. The project portion of the project undertaken was compiling the years of research and creating a computerized engineering design tool that allows an engineer the ability to design a blast resistant steel stud wall for a structure. The program is called Steel Stud Wall Analysis Code (SSWAC). SSWAC takes the specific user wall inputs and applies a calculated blast against the wall. The program contains 7088 lines of written code, 1233 lines of calculation, 14 user windows, and 184 global variables. SSWAC uses a single degree of freedom model that models a steel stud during the blast load. A single degree of freedom model is similar to a force that is applied to a mass that is attached to a spring. The mass is the unit area of the wall. The force is the blast load and the spring is the calculated resistance of the steel stud. The program inputs the different wall types selected and uses their unit weights to calculate the total unit mass. The idea of this program is to use a heavy wall with a less than ridge beam. The weight acts a way to lessen the force applied to the wall. The more mass there is the force, just using the Law of Conservation of Momentum.