

THE RESIDENCE HALLS

Jane Kerlinger

The University Residence Halls, units 1, 11, and 111, provide housing for about 2500 students. Located at the south end of campus (FIGURE 1), the units are in the heart of the student residential section--amongst apartments, sororities, fraternities and rooming houses. The concentration of students in the dorms poses a real concern for their safety during an earthquake as well as a concern for property damage. It was with this in mind that the residence halls--rooms, lounges, dining facilities and exits--were examined and evaluated.

The similarity between the units is striking. Completed in 1960, 1961, and 1965 respectively, each includes four five-story buildings that surround a central dining, recreation and administration complex. In a recent survey of buildings on campus, the dorms were rated good or very good, while all three dining commons rated poor.⁶ They are fully reinforced concrete structures, yet are heavily dominated by glass in the dining rooms and on the ground level of each residence hall. Windows in the residence are 1/4 inch plate glass unless the window is in a door or next to a door, in which case it must be safety glass. The floor plans--entrances, elevators and rooms--are nearly identical from one unit to the next. Thus, results from one building can be extended to the whole system.

One distinctive aspect of construction is the efficient use of space. At ground level there is a large main lounge used for recreation and study. Also on this floor is a smaller study lounge and a maintenance room to store janitorial supplies. At one end of the building there is an elevator and stairwell used to reach the rooms. In addition, the stairwell opens onto the street for use in case of fire or other emergency. On the above floors, four lounges with balconies alternate with three laundries and two kitchenettes. The number of rooms range from twelve to fifteen, depending on the floor. The dining, recreation and office complex have two levels. On top are the kitchen and two large dining rooms. The lower level has a large recreation room, dish room, unit office, mail room, storage and maintenance rooms.

Damage suffered in the residence halls during the Santa Barbara earthquake serves as a model to detect hazards on other campuses.¹⁹ Fortunately, classes were not in regular session and the only people in the dorms were outside for a barbeque. Shattered glass, which broke both inwards and outwards, was the most serious danger. The glass in the lounges, which is larger than that in the individual rooms, had broken in the majority of cases. Smaller windows shattered also. A sizable number of doors jammed and anyone injured inside the room would have had trouble seeking help. Not surprisingly, ceiling tiles and light fixtures came down.

Results

Individual Rooms

Students who are in the dorms when the earthquake strikes will most likely be in their rooms. Although the rooms vary widely according to individual arrangement, each room is shared by two students and has identical furniture--two beds, two desks, two dressers, two foot lockers, two wall lights and a mounted bookcase. And each student brings the necessities of dorm living--plants, stereos, TVs, and numerous books. With limited space and a preponderance of possessions, many rooms need to be earthquake-proofed. These rooms have many hazardous features similar to those in offices on campus, such as insecure lighting and shelving. These common features are treated more thoroughly in the introduction.

Windows run nearly the length of each room. These windows do not have safety glass, rather it is DSB--double strength, B-quality. Many windows will probably shatter and send glass flying. About half the rooms have beds directly under the windows and many of the rest have a desk under the windows. Unfortunately, this is all but unavoidable because of the cramped quarters.

Each room has a wall-mounted bookcase situated in front of the door loaded with heavy books, glasses, and bottles. An earthquake could knock the contents to the floor temporarily blocking the door from opening into the room. Some bookcases need to be re-secured, for if they fell, exit would surely be impeded. Heavy objects overhead, including plants directly over beds and desks, are likely to come down during moderate shaking. Because of the fragility of the ceiling tiles from which heavy pots hang, this is a very serious and important hazard to consider. Several rooms were found to have expensive equipment piled high. Stereos are often on dressers, for example. These will certainly fall in a very large earthquake unless secured.

Lounges and Recreation Rooms

Each residence hall has four floor lounges with balconies in addition to a main lounge. Students usually study, watch TV, or just relax in the floor lounges. These usually have at least one sturdy table, several lounge chairs and a couch which can be used as a safe place to hide from falling objects. There are two exits both of which are kept unlocked. Sliding glass doors from floor to ceiling run the length of the room and open onto a balcony.

The main lounge, which is on the ground floor, poses different problems. It is several times the size of the floor lounges, with large plate glass windows extending the height and length of the room. Exit is through one door except during large gatherings when two other exits are unlocked. Although not heavy enough to injure one, the acoustical tiles might come down. Heavier ventilation gratings were found to be loose. Game tables are not secured and stereo speakers hang from the ceiling. The furniture does not lend itself to protection from breaking

plate glass, or falling ceiling tiles and ventilation gratings. All of the tables are too low to get underneath and the cushions on the couches are attached.

The recreation room located under the dining commons is rarely used save for large social functions. Except for numerous candy and coke machines, the room is barren of furniture. As in the main lounge, ventilation gates and lighting fixtures were found loose. For security, the candy and coke machines have been partially barred and braced.

Hallways, Stairways and Emergency Exits

Because the residence halls are necessarily concerned with fire hazards, both hallways and stairways are kept clear and would remain free of debris after an earthquake. Fire extinguishers found on each floor have been inspected and kept up to date. The emergency exit situated at the opposite end of the hall from the stairwell is unlocked for exit but is locked from the outside, making re-entry impossible. Security reasons have prompted this, but the panicky person who unwisely went out the door might be locked outside amidst flying glass. No emergency or auxiliary lighting is available in the hallways or stairways should the power fail.

The Dining Facilities

Three areas were surveyed in the dining commons--the dining room, the kitchen, and the dish room.

The entire dining room is surrounded from floor to ceiling with 1/4 inch plate glass. Depending on the meal, there are one or two doors open for entrance and exit. One of several emergency exits was found chained. Typically, the refrigerators are built-in and pose no hazard, but most other equipment, i.e., milk machines, buffet stands, drinking fountains and coke machines were not secured.

The same holds true for the kitchen area. Grills, ventilation hoods, floor mixes, garbage disposals and the ice machine were all unbolted. Pots and pans, storage racks and small equipment are in loose storage. In addition there were loose ventilation gratings and ceiling tiles over the lunchlines. Battery operated emergency lighting is in the stairwell.

Downstairs, trays of dishes come through on trayveyors to be sent through the dish washing machine. Glass, cup and dish racks are all loose and would crash down during an earthquake. The dishwasher should be securely bolted down, for earthquakes can wrench the massive equipment from its setting.

Miscellaneous

Laundry rooms on the second, sixth and eighth floors generally have two washers and dryers and a sink. Neither washers nor dryers were secured.

Kitchenettes on the third and seventh floors have stoves, refrigerators and one has an oven. Very little is stored in the kitchen. The fire extinguisher is located on the wall behind the stove and sink area. In case of a fire or heavy smoke, the fire extinguisher would be difficult to locate.

Downstairs near the dishroom, there are many storage rooms. Inspection of Unit II in February 1979 showed that shelving was not bolted and had heavy supplies stored high. By May 1979, Unit I had placed bands of elastic across similar shelving to prevent objects from falling and plans were made to secure the free-standing shelves.

Earthquake Awareness Day

Earthquake Awareness Day, a campus-wide event in April 1979, was important for increased involvement in seismic safety in the residence halls. As a result of one of the workshops held during the event, the need for auxiliary lighting was emphasized. Emergency plans in the event of an earthquake were also developed, in which the staff reports to the office before going back into the residence halls to check for injuries and property damage. Custodians have been shown where and how to turn off water and electricity either for a specific building or for the whole unit.

Food service also developed plans as a result of Earthquake Awareness Day. A survey of possible hazards was made throughout all residence hall kitchens. In a debilitating earthquake, the residence halls have been designated feeding sites. Two contingency plans have been proposed. If steam and electricity are available, then relief can be carried out at the dorms. Otherwise, if steam and electricity have failed, Edwards Field, at the west end of campus (FIGURE 1), will be set up as a temporary kitchen.

Recommendations

The residence halls are unique in that they are self-supporting from payment of room and board. Appropriations for seismic safety can be made on a more direct basis without competing with all other buildings on campus for a multitude of different projects. The auxiliary lighting so badly needed in the stairwells can be funded from a unit-wide fund. Other improvements such as the seismic strips are made available directly from the operating budget.

Ideally, available funds to remedy all hazardous condition should exist. Realistically, priorities must be made first to protect personal safety and then to mitigate unnecessary property damage.

Pamphlets distributed within the residence halls could inform students of ways to remedy hazards. Plants, furniture, shelves and heavy objects all can be re-arranged to maximize personal safety within the rooms. Shards of glass would be caught if curtains were closed at night. Loose or unbolted overhead fixtures--ventilation gratings, lighting fixtures and ceiling tiles

should be resecured and bolted. Obviously, serious injuries can be reduced if falling objects and breaking windows are avoided. The history of past earthquake damage has shown that it is important to determine the structural safety of the emergency exit stairs and the balconies.

Bookcases, candy machines, washers and dryers, and heavy equipment in the kitchen and maintenance rooms should be checked and secured or bolted. Fire extinguishers should be readily accessible because fires controlled in the first five minutes generally can be contained without the aid of the fire department. Those fire extinguishers found in the kitchenettes would be difficult to reach in an emergency.

Knowing what to do during an earthquake can save lives. Earthquake drills would be an effective means to prepare students for what to do during an earthquake. A planned earthquake drill could be easily incorporated into the schedule of fire drills held throughout the year.

Being in one of the nine-story residence halls during an earthquake will be frightening. The halls will be besieged with shattering glass, falling objects and panicked students. Property damage will be costly unless equipment is properly bolted. Yet, much of this can be remedied by some very simple means. Hopefully this paper has not served as a prophecy of doom, but rather as an awakening to the problems and hazards that are omnipresent in earthquake country.