

Some "experts" would laugh at such an absurd possibility. Surely we know that invading armies never come to the United States. That sort of thing only happens in Iraq, Kuwait, and Lebanon.

In any case, it is important to realize that a low-cost civil defense shelter is not a fortress. It is not secure against direct hits.

Military shelters must be stronger than civilian shelters and usually much deeper underground. This reminds me of the "bioenvironmental engineer" whom I quoted in this newsletter two years ago. You may recall that he was responsible for installing the chemical protection shelters for the United States Airforce in Europe.

When asked why these shelters are light-walled, partially above-ground structures with virtually no protection from direct hits by conventional explosives, he responded that his studies had indicated that "in the heat of battle, enemy pilots would usually not have the composure of mind to aim that accurately".

I wonder if he was watching television during the bombing of Iraq.

## SHELTER CONSTRUCTION

During the time that our local steel fabricator was making the steel assemblies for the Idaho mobile display, he was also manufacturing the assemblies for the civil defense shelter of an out-of-state church. The photos below were taken in that fabrication shop and illustrate some elements of shelter construction.

Photos are a poor substitute for the real thing, but they can be more educational than shelter engineering drawings and written descriptions.

Figure 1 shows the fabricating shop. The Idaho shelter is on the right and the church's shelter is in the rear. There is an overhead crane along the center of the shop ceiling and steel plate in the foreground from which all of the assemblies are manufactured. About ten welders work in this shop. They spend most of their time manufacturing cylindrical steel shapes from flat steel plate.

Shops like this are in operation throughout America. We already have a vast shelter building industry in operation. We are just not asking it to build many shelters.

About one third of fabrication costs are materials and two thirds are skilled labor. For that reason, it is usually more economical to build shelters inside shops like this and deliver them to the installation sites. Without cranes to handle the heavy pieces of steel, other shop conveniences, and welders who are used to fabricating this kind of equipment on a daily basis (usually for steel storage tanks), labor costs escalate rapidly.

Figure 2 shows a completed entryway assembly. Each part of this assembly was too heavy for convenient handling by hand.