Technology

Government plans life after the blast

The Home Office's working party on domestic nuclear shelters in Britain has produced plans for five different structures. The prototype shelters constructed at the Home Defence College at Easingwold, near York, were unveiled last week to coincide with the release of two official publications.*

The working party, which has been under increasing pressure to publish its recommendations, included staff from the Home Office, the Department of the Environment, the Atomic Weapons Research Establishment and the United Kingdom Land Forces. The group faced the unenviable task of designing a range of structures which had to be cheap enough for most people to afford, and yet effective enough to increase significantly the occupants' chances of survival. One problem is that as a shelter's design becomes increasingly sophisticated, its cost rises more sharply than its effectiveness.

Despite these difficulties, the Home Secretary, William Whitelaw, promised last August that advice on structures which could afford "improved protection at relatively low cost" would be forthcoming by the end of the year. Each shelter in the official range represents an attempt to fulfil this promise—albeit a few weeks late—by making a compromise between protection and price. At the bottom end of the range there is a trench shelter "of nominal cost", a deluxe concrete shelter is almost, but not quite, compatible with the minimum requirements of the Swiss authorities. But the trench is one order of magnitude less effective against blast and fallout than the concrete model, which could cost as much as £10 000.

When you buy or build your own shelter—even one recommended by the government—you get only what you pay for. That is why Patrick Mayhew, the newly-appointed minister with special responsibility for civil defence, reluctantly conceded last week that the wealthier would have a better chance of survival.

People who choose an official shelter will want to know what they can expect for their money. A structure's effectiveness can be measured in terms of its resistance to blast and the factor by which it can reduce the intensity of gamma radiation from fallout—the protective factor. The blast rating is related directly to an area around the centre of a nuclear blast. Inside this area, the shelter would suffer damage but its occupants would not necessarily be killed. The protective factor indicates the maximum dose of radiation which might be absorbed by the occupants.

To compare the Home Office's recommended shelters, data can be presented to show what happens to the shelters in a nuclear war (see table) making the following assumptions—a 1 megatonne air burst, fallout arriving at the shelter after 40 minutes, and an absorbed radiation dose from fallout in the region of the shelter of 400 rem per hour, seven hours after the burst.

Type 1a in the Table—which might be described as a down-market dug-out—is a slit trench in a garden (assuming one is available). Soil is excavated to a depth of at least 45 cm and the trench is surrounded on all sides by walls made of rolls of soil held in place by carpets or sheets of plastic.

Type 1b—the up-market dug-out—is a roomier trench of dimensions 2·5 m x 2·5 m x 45 cm, above which is installed a tent-shaped framework made of steel scaffold poles. The roof is made of plywood and the structure is buried under 45 cm of soil. Type 2 is a modified Morrison shelter (of the type used in the Second World War) which is installed in a ground-floor room. It is a cuboidal steel cage with a plate roof and mesh walls, surrounded by bricks. Its volume of 2·8 cu.m is supposed to accommodate two adults and two children.

Type 3—the blue-collar bunker—is a modified Anderson shelter. It is a cylindrical corrugated steel enclosure which is semi-submerged and covered with at least 1 m of soil. The volume of the living area is about 8 cu.m, into which it is possible to cram up to six people.

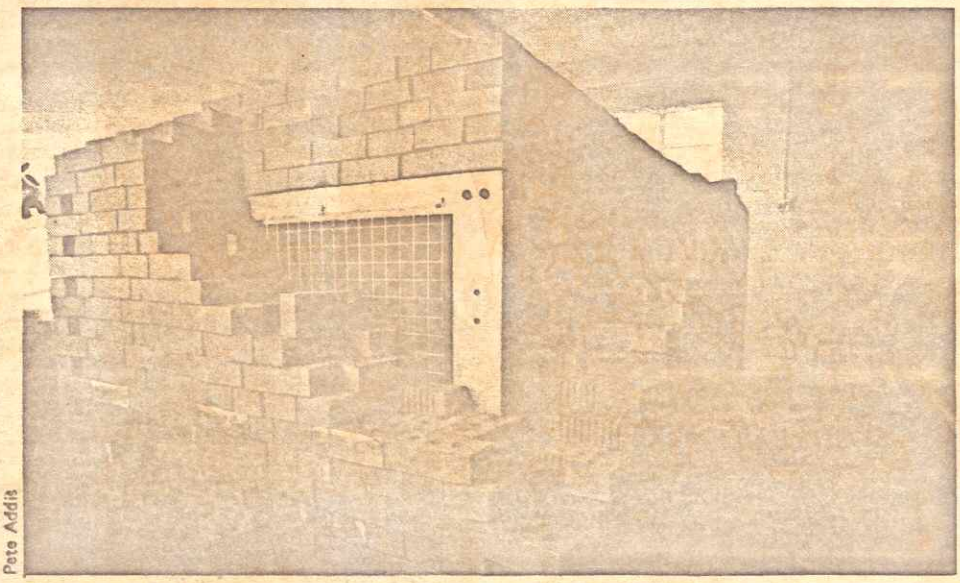
Type 4—the white-collar bunker—is a cuboidal reinforced concrete shelter designed along Swiss lines. The dimensions of the living area are 2·4 x 2·4 x 2 m and it holds six people, allowing each about 40 per cent more room than type 3. The concrete roof, walls and floor are 25 cm thick and the partition wall between the stairs, which lead up to a plywood hatch, and the living area is 40 cm thick.

For enthusiasts who might be tempted to rush out and start building right away, Mayhew emphasised that the government is not advising people to equip themselves with one of these shelters, because it does not regard nuclear war as probable. The Home Office guidance is intended for those who might wish to take out "extra insurance" against the "appalling effects of a widespread nuclear attack upon the United Kingdom".

"It is surely right," Mayhew said, "to take whatever action is practicable to minimise and relieve the suffering which would follow if, in spite of our best endeavours, a nuclear attack should happen." When it was pointed out that such action currently amounted to government spending of only £45 million a year on civil defence, compared with £5000 million on Trident missiles, the minister explained that he saw the two as complementary. □

Buyers' guide to nuclear shelters

	Shelter type			
	1a and 1b	2	3	4
Cost	Up to £250	£800–£1100	£900–£1800 plus	£6000–£10 000
Blast overpressure (kPA)	10	42	77	105
Minimum protective factor	40	70	200	300
Blast rating compared with best Swiss shelters	1/30	1/8	1/4	1/3
Maximum area in which blast exceeds shelter rating (sq.km)	900	110	60	40
Maximum radiation dose in two weeks (rem)	400	230	80	50



Pete Addis

One of the government's recommended shelters (type 2)—just the job for houses with basements

*"Domestic Nuclear Shelters—Technical Guidance (HMSO £5·50) is a 128-page manual which explains the operational requirements for shelters and gives detailed building instructions. Domestic Nuclear Shelters (HMSO £0·50) is a short booklet for those who cannot face metric units or such a sizeable contribution to the government's coffers.