READING PASSAGE 2

*You should spend about 20 minutes on **Questions 13-26** which are based on Reading Passage 2 below.*

Moles happy as homes go underground

A The first anybody knew about Dutchman Frank Siegmund and his family was when workmen tramping through a field found a narrow steel chimney protruding through the grass. Closer inspection revealed a chink of sky-light window among the thistles, and when amazed investigators moved down the side of the hill they came across a pine door complete with leaded diamond glass and a brass knocker set into an underground building. The Siegmunds had managed to live undetected for six years outside the border town of Breda, in Holland. They are the latest in a clutch of individualistic homemakers who have burrowed underground in search of tranquillity.

B Most, falling foul of strict building regulations, have been forced to dismantle their individualistic homes and return to more conventional lifestyles. But subterranean suburbia, Dutch-style, is about to become respectable and chic. Seven luxury homes cosseted away inside a high earth-covered noise embankment next to the main Tilburg city road recently went on the market for $296,500 each. The foundations had yet to be dug, but customers queued up to buy the unusual part-submerged houses, whose back wall consists of a grassy mound and whose front is a long glass gallery.

C The Dutch are not the only would-be moles. Growing numbers of Europeans are burrowing below ground to create houses, offices, discos and shopping malls. It is already proving a way of life in extreme climates; in winter months in Montreal, Canada, for instance, citizens can escape the cold in an underground complex complete with shops and even health clinics. In Tokyo builders are planning a massive underground city to be begun in the next decade, and underground shopping malls are already common in Japan, where 90 percent of the population is squeezed into 20 percent of the landspace.

D Building big commercial buildings underground can be a way to avoid disfiguring or threatening a beautiful or "environmentally sensitive" landscape. Indeed many of the buildings which consume most land -such as cinemas, supermarkets, theatres, warehouses or libraries -have no need to be on the surface since they do not need windows.

E There are big advantages, too, when it comes to private homes. A development of 194 houses which would take up 14 hectares of land above ground would occupy 2.7 hectares below it, while the number of roads would be halved. Under several metres of earth, noise is minimal and insulation is excellent. "We get 40 to 50 enquiries a week," says Peter Carpenter, secretary of the British Earth Sheltering Association, which builds

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similar homes in Britain. "People see this as a way of building for the future." An underground dweller himself, Carpenter has never paid a heating bill, thanks to solar panels and natural insulation.

F In Europe the obstacle has been conservative local authorities and developers who prefer to ensure quick sales with conventional mass produced housing. But the Dutch development was greeted with undisguised relief by South Limburg planners because of Holland's chronic shortage of land. It was the Tilburg architect Jo Hurkmans who hit on the idea of making use of noise embankments on main roads. His two-floored, four-bedroomed, two-bathroomed detached homes are now taking shape. "They are not so much below the earth as in it," he says. "All the light will come through the glass front, which runs from the second floor ceiling to the ground. Areas which do not need much natural lighting are at the back. The living accommodation is to the front so nobody notices that the back is dark."

G In the US, where energy-efficient homes became popular after the oil crisis of 1973, 10,000 underground houses have been built. A terrace of five homes, Britain's first subterranean development, is under way in Nottinghamshire. Italy's outstanding example of subterranean architecture is the Olivetti residential centre in Ivrea. Commissioned by Roberto Olivetti in 1969, it comprises 82 one-bedroomed apartments and 12 maisonettes and forms a house/hotel for Olivetti employees. It is built into a hill and little can be seen from outside except a glass facade. Patnzia Vallecchi, a resident since 1992, says it is little different from living in a conventional apartment.

H Not everyone adapts so well, and in Japan scientists at the Shimizu Corporation have developed "space creation" systems which mix light, sounds, breezes and scents to stimulate people who spend long periods below ground. Underground offices in Japan are being equipped with "virtual" windows and mirrors, while underground departments in the University of Minnesota have periscopes to reflect views and light.

I But Frank Siegmund and his family love their hobbit lifestyle. Their home evolved when he dug a cool room for his bakery business in a hill he had created. During a heatwave they took to sleeping there. "We felt at peace and so close to nature," he says. "Gradually I began adding to the rooms. It sounds strange but we are so close to the earth we draw strength from its vibrations. Our children love it; not every child can boast of being watched through their playroom windows by rabbits.

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Questions 13-20

Reading Passage 2 has nine paragraphs ***(A-I)****. Choose the most suitable heading for each paragraph from the list of headings below. Write the appropriate numbers* ***(i-xii)*** *in boxes 13 20 on your answer sheet. Paragraph A has been done for you as an example.*

NB *There are more headings than paragraphs so you will not use all of them.*

List of Headings

i	A designer describes his houses
ii	Most people prefer conventional housing
iii	Simulating a natural environment
iv	How an underground family home developed
v	Demands on space and energy are reduced
vi	The plans for future homes
vii	Worldwide examples of underground living accommodation
viii	Some buildings do not require natural light
ix	Developing underground services around the world
x	Underground living improves health
xi	Homes sold before completion
xii	An underground home is discovered

Example	*Answer*
Paragraph A	**xii**

13 Paragraph B

14 Paragraph C

15 Paragraph D

16 Paragraph E

17 Paragraph F

18 Paragraph G

19 Paragraph H

20 Paragraph I

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Questions 21-26

Complete the sentences below with words taken from the reading passage. Use ***NO MORE THAN THREE WORDS*** *for each answer. Write your answers in boxes 21-26 on your answer sheet.*

21 Many developers prefer mass-produced houses because they ...

22 The Dutch development was welcomed by ...

23 Hurkmans' houses are built into ...

24 The Ivrea centre was developed for ...

25 Japanese scientists are helping people ... underground life.

26 Frank Siegmund's first underground room was used for ...

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