

Video number 13: Quality of Living Underground

People lived underground in the past — in caves or artificial underground constructions, like Derinkuyu in Turkey. Some believe that 20,000 people lived there.

We can't expect people to live in such caves, but modern technology can change the underground facility into a modern home, office, or other structure where people can live and work comfortably.

Let's see what we need in order to change an underground facility into something useful.

Here are two facilities we proposed in previous videos: an underground office and a flat in the molehill.

Let's take a look at the office.

The first thing, which is not what we are used to, is the wall's shape, which is circular. We are mostly used to straight walls. This can be very annoying because we are used to walking close to the walls, and we use them to maintain balance. What can we do about it?

The proposed technology would shape the walls in very different ways. One possible solution is to shape some boundaries in straight lines. The other solution is to shape furniture to fit the tunnel walls.

The next problem is the colour of rock walls, which can be very dark or change from place to place. This could be very nice to see from time to time, but we are used to living in places that are generally brighter. The obvious solution is painting with bright colours, but a lot can be achieved with smart lighting, making an underground room a cosy place.

Temperature underground should be relatively constant, but it depends on depth. The temperature ideal for living is between 20-25 degrees Celsius, which is the permanent temperature 500-1,000 meters below ground level. On other levels, a constant warming or cooling method should be provided.

This means that constant warming or cooling should be provided. This should be controlled, along with humidity and fresh air, with air supply from the surface. Cooling and heating systems shouldn't differ greatly from those we are used to in multi-storey houses, offices, or industrial halls.

If you live underground, there is one thing that is necessary for quality of life and cannot be ensured easily: daylight. Staying underground for several days or months under the influence of artificial light could seriously damage health.

So, is there a technique that will bring some daylight deep underground?

Actually, there is.

Daylight can be transferred via cables from a surface daylight collector to underground daylight transmitters.

This is an expensive solution that has technical limitations, but it ensures at least some daylight.

There are other options, too.

Artificial or fake windows can be installed on walls to simulate the environment we are used to. There is also a simulation of sunlight available called virtual sunlight.

Things are a bit different when we are talking about molehills. The walls are straight but curved, which is not a very unusual combination, so it shouldn't be a problem. Everything else is similar to the underground version.

But it's still underground, not on the surface. So, why we should live, work, and travel underground, if there are other options?

We talked about money, the use of natural materials, and storage potential, but there are other reasons to live underground as well. If you live in a molehill such as this, you have instant access to unspoiled nature, where you can send kids to play without the danger of being hit by a car. Also, your workplace could be minutes away, as your starting station to other places, which can be accessed by foot or several types of transport. And you can get your energy, heat, and food from the underground, too.

Let's conclude that living underground has its disadvantages, but most can be fixed or minimized with modern technology. For example, for people from Coober Pedy in Australia, where it is extremely hot, life is already easier underground than on the surface.