

# DEEP UNDERGROUND CHALLENGE

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## OFFICIAL REVIEW REPORT

Project: SOLEDAR

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### 1. Project Description

Soledar, a city in Ukraine, is considered as entirely inhabitable, destroyed by war. But below the ground where old salt mines exists, there is a chance for new life. According the authors, there is about 300 km of tunnels below the ground, and about 53 km<sup>2</sup> of underground area.

Authors provides the use of salt anywhere as possible, even for furniture, and exploit the fact, that water does not affect the salt properties, for adjusting the humidity. The parts of destroyed city will be used as construction materials for new object, as filling in gabions, for example.

The facility is designed as 15 minutes city, with initially 10.000 inhabitants, which can be expanded to 150.000 and more. The facility provides three main levels-a residential cluster, and public and industrial cluster on levels from 50 to 200 m.

The above ground residential sets are circularly shaped, up to 4 floors high, and is a mix of a public and private elements, connected by pedestrian-n streets. Some of the elements are covered by soil.

Connection to the underground is established via elevators in shafts. Daylight to the residential cluster is provided by shaft of 16 m excavation.

Second level of the facility is provided for entertaining, manufacturing and offices. This level also includes the communication between elements, by underground tunnels, provided for walking, cycling and clean transportation.

The final level provides place for industry and farming.

### 2. Evaluation by Criteria

Criterion	Assessment
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Relevance to the Deep Underground Concept	The project provides the underground facility follow several ideas, providing by Deep underground Concept.
Geology	<p>Soledar is located in industrial region Donbas in eastern Ukraine. The city was highly important for its salt mining industry. In geological meaning Soledar is a part of East European Craton, with its southern part—the Ukrainian Shield—comprising some of the oldest crustal rocks, over 2.5 billion years old, dating to the Archean and early Proterozoic eras.</p> <p>Stratigraphic sequence starts with pre – Permian (Archean and early Proterozoic) rock which are overlain with Lower Permian sediments. These layers contain salt (Slavyanska Group) and consists of halite, gypsum, anhydrite, dolomite, and marls. The layer is approximately 120-150 m thick.</p> <p><b>Soledar Mine</b></p> <p>The salt deposits at Soledar are of Permian age (~250 million years old), formed through the evaporation of seawater in an arid, shallow marine basin. These processes produced thick halite layers, later buried and preserved.</p> <p>Salt deposit is ideal material not only by its mechanical properties, but also because it can be easily excavated and shaped.</p>
Sustainability	The project provides reuse of material of destroyed objects and excavated material in several ways.
Benefit to the Community	The proposal envisions an huge underground facility at the place a

	destroyed city, which greatly benefit the community.
Use of Modern Technologies	This project provides use of several modern construction techniques.
Feasibility of Construction	Underground space already exist and can be extended and reshaped.
Quality of the Design	The design contend the detailed description and explanation video.
Quality of the Presentation	The project consists of a description sheet poster with comments, and explanation video. All submitted material clearly communicates the author's ideas and intentions.

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### 3. Conclusions

After war there is always a rebuild. It can be performed in traditional way, by rebuilding what once was, or to do something completely different, and rebuild the city in most sustainable way possible, using what is there, in completely new way.

This project shows that this is not just possible, but probably the only chance for that area to be rebuilt one day.

The project follows several ideas of Deep Underground Concept, like communication system, above surface/below surface facilities connection, farming underground and more, but not for construction of new facilities, but for expanding and reconstruction of existing salt mines.

For this reason, the jury grants this project a first award.