

PROPOSAL FOR TECHNOLOGY OF IMPROVISED SHELTERS DESIGN IN CONDITIONS OF THE CZECH REPUBLIC

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Abstract: This paper deals with the possibilities of effective development of sphere of population's concealment against the influence of mass destruction weapons and other extraordinary events in the Czech Republic. In relation to legislative changes (The concept of population protection by the year 2013 until the year 2020) the paper analyses bases for building improvised shelters processing and creation of a standard for their designing. Created standard presents a model for other self-governing units utilisable in terms of crisis management.

Key words: Protection of population, improvised shelters

1. INTRODUCTION

In connection with legislative changes in the Czech Republic (CR), especially approval of the population protection concept by the year 2013 until the year 2020, several new issues arose in the area of the population protection by the concealment in the CR. Those are mainly: limited maintainance and construction, and construction works in permanent shelters. The new concept of the population protection mainly rely on the concealment of people against influences of mass destruction weapons and other dangerous substances in improvised shelters. The fact that formerly nobody makes provisions for improvised shelters, remains as a task. This is why supporting documentation for designing and preparation of improvised shelters do not exist in the CR and in most of other countries (Kovarik 2006).

Within the scope of the cooperation with the state administrative body of the county borough Zlin, we are partly trying to solve this problem. The point is that the creation of the rating and designing standard for improvised shelters must be done. The proper instrument for planning and administration of the population protection by concealment must be also created.

2. INITIAL FACTS AND ASSUMPTIONS

During the proposal, requirements for construction, equipment, protective and other properties of improvised shelters were made in agreement with a valid legislation. However, legislation does not provide sufficient and relevant information and other sources are to be used along with our own findings. These are primarily:

- Dead (cancelled) standards and legal adjustments - above all Civil protection standards, row 4 and 6 (CO-6-1/c, SCOS Tech-4-4/1 a SCOS Tech-4-4/2) – Permanent shelters construction and designing;
- Investigation of places intended for building improvised shelters;
- Physical measurements of places intended for building improvised shelters and their structures;
- Calculation of buildings' protective factors.

While making standards, the method of analysis and synthesis was used on available information. This method was

properly completed by results of own research based on measurements, calculations and field researches.

3. STANDARD FOR IMPROVISED SHELTERS DESIGN AND EVALUATION

The main scientific contribution to our work is the creation of integrated standards for the improvised shelters design and evaluation.

The standard is an essential part of the control and planning system for the population protection by the concealment. It contains all the information necessary for designing construction works, needed values calculations and concealment planning (Hegar 2005).

The standard consists of two parts:

- Full standard – contains most of the information. It is used for improvised shelters design, required calculations and planning of the population protection by concealment. After it is fulfilled and processed, it is stored in a safety place and not admitted to the public.
- Reduced standard – contains information for readiness of improvised shelters - construction works, equipments etc. It is provided to people who ensure construction works and readiness of the shelter – the document is available to the public.

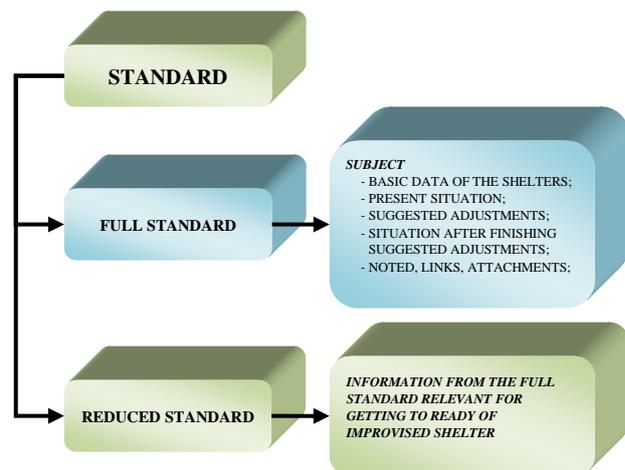


Fig. 1. Structure of a standard for an evaluation of improvised shelters

3.1 Structure of the full standard

The full standard is processed to clarify and simple fulfilment of the check list. Its structure is formed by following areas:

a) Primary data of the shelter-executor-owner

- Address
- Person(s) responsible
- Registration number of the shelter
- Created by
- Location of shelter on a map
- Use of the shelter
- Determination of the shelter
- Utilization
- The type of the shelter
- Time to get ready (time made)
- Operation time

b) Present situation without alterations (Janecek et al 1978; Hegar 2006)

- TTD (technical and tactical data) of shelter
- Place proportion (size of rooms)
- Shelter's layout (setup)
- Photo documentation
- Engineering structure (type, material, calculations of protective features' values)
- Potential sources of risks in the shelter's surrounding
- Shelter's equipment

c) Suggested (proposed) alterations

- Required material
- A list of suggested alterations
- Work procedure
- Minimal alterations
- Optimal alterations
- Installed equipment – material
- Time schedule for performing shelter's alterations

d) Situation after finishing the suggested (proposed) alterations

- TTD of shelter
- Place size: vents area + eventual changes of proportions emerged
- Engineering structure (type, material, calculations of protective features' values)

e) Notes, attachments, references to related documents etc.

The standard is made in MS Word and MS Excel, which enable an effective usage in business administration (Broz 2009). It is supplemented by interactive plans, maps and software tools for automated calculations.

3.2 Methods of receiving information and fulfilment process of the standard

Information is received in several ways. One way is to study project documentation of buildings and premises intended for improvised shelters adjustment. Next, physical measurements of these premises are used. In some cases, where there is no possibility of discovering needed data, an estimation is used. Estimated data is based on ascertained facts and practical experiences. The fulfilment of the standard uses estimated data correction coefficient to reduce possible errors.

4. CONTRIBUTION

The main benefit of this work is the creation of the standard allowing introduction to structured system. This issue was not yet solved in the area of the population protection by the concealment in improvised shelters with regard to the public service. Thanks to the cooperation with the city of Zlin, the benefit is also expected as a practical application of discovered

findings with their utilization in the population protection in the CR.

5. CONSEQUENTIAL ACTIVITIES

The first step in a solution of the population protection by the concealment dilemma is to create an optimized standard, which further consequent actions:

- Investigation and evaluation of particular premises suitable for improvised shelters building in the statutory town of Zlin.
- Proposal of required building alterations in provision of adequate protective properties of an improvised shelter.
- Logistic provision of building alterations – ensuring work force, contract arrangements to ensure these works and construction material.
- Ensuring contract agreements about the usage of premises in peacetime, property rights etc.

After evaluation of particular premises and proposal for required alterations, a work on the implementation of produced data into the GIS network of Zlin will begin. This implementation will ensure a great improvement of efficiency in planning and control of population protection. Consequently, the functionality of the system will be examined by testing procedure. In case of positive results, the system will be offered to other self-governing units in the CR.

6. CONCLUSION

The introduced project is in the implementation phase, presently. The results demonstrate a successful development and a real usage thanks to the city of Zlin. Attained results are to be further developed and it is necessary to realize planned activities.

The main problem is financial demandingness of the population protection by the concealment. This is why it is necessary to make the methodology effective at the most and simplify it so that the improvised shelters designing and planning require minimum of financial resources. This is the main aim of our further research and work.

7. ACKNOWLEDGEMENT

This paper is supported by the Internal Grant Agency at TBU in Zlin, project No. IGA/46/FAI/10/D. Evaluation of the present state of the permanent and improvised shelters in the area of statutory town Zlin and ORP Zlin.

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