# STOLPORTS AND THEIR USING IN THE TERMS OF SLOVAK REPUBLIC

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**Summary:** The thesis deals with the STOLPORT and its design for the selected region in Slovakia. The work addresses the history of STOLPORTs and includes their general characteristics, the different requirements for the runway, apron and obstacle surfaces, visual navigation aids, marking and electrical systems provided at STOLPORTs. The aim of this work is to point out the advantages and disadvantages, capacity and technical possibilities of its use. When selecting sites for placement STOLPORT is necessary to evaluate the geographic, environmental, meteorological, economic and other factors.

**Keywords:** STOLPORT, physical characteristics, runway, marking, design of STOLPORT, construction, operation.

## 1. INTRODUCTION

The targeted design placement of STOLPORT is selected territory surrounding Vyšný Kubín, where traffic at the STOLPORT would not prejudice the protected landscape areas. The building operator shall submit the physical characteristics of the STOLPORT and must make the operating manual and safety program to obtain permission to operate. The whole process is controlled by Traffic Authorities and the design of the STOLPORT as well as the establishment is possible only with the consent of the Ministry of Transport, Construction and Regional Development. Applicants for the construction of the STOLPORT have step by step meet all the requirements to obtain a permission from the Public Transport Authority for the establishment, construction and operation of the STOLPORT..

## 2. STOLPORT

A STOLPORT was an airport designed with STOL (Short Take-Off and Landing) operations in mind, usually for an aircraft class of its weight and size. A STOLPORT normally had a short single runway, in general shorter than 5,000 feet (1,524 m). STOLPORTs only accepted certain types of aircraft, often only smaller propeller aircraft, often with limits on the amount of fuel that can be taken. The basic document processing all data of the STOLPORT´s is the STOLPORT MANUAL Doc. AN-9150/899, for example, their definition, and general physical characteristics, electrical systems, services and the actual operation of the STOLPORT´s.

### 2.1 General characteristics of the STOLPORTs

The STOLPORT is an airport whose physical properties, visual and non-visual aids and overall infrastructure are designed to promote the safe and efficient general aviation, especially in densely populated urban areas with difficult terrain.

STOLPORT is an option in cases where the length of the runway and the location of sites for the landing and take-off do not allow the establishment of the current airport, due to the fact that in the area there are obstacles. Just as in conventional airports physical characteristics also depend on the structure and performance of the aircraft which will use that airport. Type of operation which is expected at the airport depends on available resources and facilities that are provided at the airport. Due to operational requirements Stolport can be used in all weather conditions.

### 2.2 Physical characteristics, equipment and services at the STOLPORTs

In the context of ensuring the maximum safety of airport operations, it is necessary that the individual operating parts of the STOLPORT meet the demands that are placed on these devices and surfaces. The requirements apply to:

- runway,
- length of the runway,
- stopway,
- width of a runway,
- capacity and runway surface,
- tracks and objects on the runway,
- taxiway
- aprons (size, strength of the apron).

### 2.3 Runway, Taxiway and Apron

Especially in the cases of lack of space STOLPORT can reduce the ideal orientation of the runway in the direction of the prevailing wind, but the design of the STOLPORT should aim for maximum operational advantage, and orientation track. When deciding on the orientation of the runway, the area of airspace in which the operation will work should be taken into account, especially on the approach and departure, so that obstacles or other factors in those areas could not affect the operation. The length of the runway at the STOLPORT is determined by the local operating conditions and the need to take into account the different requirements for take-off and landing. Texture of the surface of the runway at the STOLPORT requires excessive attention about the landing. The surface of the runway at the STOLPORT should be slightly rough, which ensures good braking performance of aircraft.
When designing the taxiways at the STOLPORTs the data must comply with the standards and recommended practices in accordance with ICAO Annex 14, Volume I – Aerodromes, Chapter 3rd. On the STOLPORT it is necessary to ensure aprons and develop a plan in advance for anticipated traffic at STOLPORT, as a major factor in determining the size of the apron depends on the density of the traffic on the STOLPORT.

### 2.5 Visual navigation aids

The visual navigation aids granted at the STOLPORT have two main functions:
- provide pilot with information required to make a safe air traffic to the STOLPORT and
- allow the pilot to identify the runway.

STOLPORTs, which are located in cities or in the vicinity will require special signals, lighting and other functions to be easily identifiable. Lighting the STOLPORT should ensure efficient and safe visual guidance during take-off, approach, landing and ground maneuvering and during night operation. Specifications for photometric characteristics and adjustment of the angle of the various elements of lighting at STOLPORT will vary depending on factors such as environment of the STOLPORT, ambient lighting, design types of aircraft that will be used at the STOLPORT and runway slope.

### 2.7 Sources at the STOLPORT

Primary sources of electricity are necessary for safe operation of all air navigation equipment. Secondary energy should be channeled through the standby power unit, or by an independent source from public services.

Stolport should be fenced or otherwise protected against the ingress of animals to the operational areas that would pose a danger to aircraft and to prevent access of unauthorized persons.

Each STOLPORT must provide rescue and firefighting services, the main objective is to save lives in the event of an accident or fire at the STOLPORT. A secondary aim of rescue and firefighting units is to protect property during firefighting resulting from an accident.

The STOLPORT maintenance must be treated in maintenance schedule program that includes preventive maintenance for the entire STOLPORT. Preventive maintenance is carried out with respect in order to prevent the breakdown.

## 3 PROPOSAL OF THE STOLPORT FOR THE SELECTED REGION IN SLOVAKIA

In terms of capacity and technical use of the STOLPORT, it is difficult to find a suitable site to build, because the territory of northern Slovakia consists of many national parks, protected landscape areas and a number of national nature reserves. Geographically, meteorologically, environmentally and economically appropriate proposal would place the STOLPORT at Vyšný Kubín, where construction and operation the STOLPORT should not encroach upon the protected natural areas.

The objective position of the STOLPORT at Vyšný Kubín is improving communication in districts that are difficult to reach by other means of transport, especially in the northern regions of Slovakia. According to the Law 143/1998 on civil aviation, is famous for the position of "STOLPORT" is possible only with the consent of the Ministry of Transport, Construction and Regional Development. An application to build STOLPORT at Vyšný Kubín need to be provided with airworthy-operating and building technical expertise at the STOLPORT.

### 3.1 Putting the STOLPORT at Vyšný Kubín to operation

Putting the STOLPORT in Vyšný Kubín to operation is possible only after the submission of the application for a license to operate at the STOLPORT. It is necessary that the application is accompanied by the following documents:

- noise study at the STOLPORT,
- proposition operations manual at the STOLPORT,
- security program at the STOLPORT,
- design of the protection zones at the STOLPORT,
- identity of competence,
- fees for approval of the Operations Manual at the STOLPORT,
- fees for approval of a safety program at the STOLPORT,
- fees for the issuing of a permition to operate at the STOLPORT.

After examining the application for authorization to operate at the STOLPORT at Vyšný Kubín and all necessary documents, Traffic Authority issued a decision on the authorization to operate at the STOLPORT.

After approval of building at the STOLPORT at Vyšný Kubín, Transport Ministry may begin any construction work and needs to respect all laws and regulations.

### 3.2 Operation at the STOLPORT

Utilization of the STOLPORT in Vyšný Kubín will be directed by civil domestic regular services. Stolport will be equipped with one runway with a length of 750 m, one apron on which will be available 5 aircraft stands. Traffic on the STOLPORT will be done according to the rules for visual flight rules. On the STOLPORT will take place one terminal, which is intended for passenger and domestic departures and arrivals, and to ensure passenger comfort. Directly next to the terminal will be proposed control tower, which will constitute the basic equipment for the STOLPORT operation. Whitout tower the STOLPORT operation is almost impossible.

Marking the runway on the STOLPORT as shown by STOLPORT MANUAL will be white. At the beginning of the track will be posted the license plates of the STOLPORT the direction 09 and 27. Since the VPD is reinforced, and the center line marking, which will be located between the direction 09 and 27, wherein the width of lanes will be determined to 0.30 m. At the STOLPORT in Vyšný Kubín will be established simple approach system, which will consist of a series of light signals. Next to the VPD is placed PAPI glide system. Given that STOLPORT will also serve in night mode, to contain the runway lines symmetrically over the length of the runway.

STOLPORT is also designed for night operation and because of that ther is need to ensure the lighting of the apron so all local traffic is lit on the aprone. Of course STOLPORT in Vyšný Kutbín will be compulsorily equipped with rescue and fire service, the number of rescue and fire fighting vehicles at the STOLPORT is one vehicle, because the category of the STOLPORT for ZHS will correspond with Category 3.

## 4 CONCLUSION

The establishment at the STOLPORT in the Slovak Republic is a complex and very complicated task. Because of that the STOLPORT has not yet been built in Slovakia and is not available for prescription in Slovak. One should follow the STOLPORT MANUAL - Doc. 9150 - which is issued by the International Civil Aviation Organization and the experience of the countries where STOLPORTs are established, like in Norway and the United States.

When designing the STOLPORT operator must place great emphasis on placement area of the STOLPORT and must take account of geographical conditions, its capacity and technical possibilities of a customer needs. The work analyzes the physical characteristics of the STOLPORT, visual navigation aids, electrical systems, emergency and other services provided by STOLPORT. Thesis describes the obligations of the operator of the STOLPORT, the role of the Transport Authority and the Ministry of Transport, Construction and Regional Development in the design and establishment of new STOLPORT for the selected region in Slovakia. The work is in progress of construction equipment, flight-operational assessment and putting the STOLPORT to the operation.

## 5. LITERATURE LIST

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