14th International Research/Expert Conference
"Trends in the Development of Machinery and Associated Technology"
TMT 2010, Mediterranean Cruise, 11-18 September 2010

IGNEOUS AND LIME UNITS THE PAVEMENT

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ABSTRACT
The paper show the results of geological and experimental study of qualitative characteristics of multiple volcano origin *(spiliti, diabase) and limestone aggregate in asphalt concrete. Objective of the determination of influential parameters of drainage finishes pavement structure. The obtained parameters are positive.*
Key words: drainage, final layer of pavement .spiliti, diabase, limestone

1. INTRODUCTION

Aim is to define the value of the final layer of pavement drainage with emphasis on safety in road traffic compared to the lifetime and durability of the road tires due to increased sewer abrasive surface, in relation to the implementation of the various units of volcano origin and sedimentary rocks [1]. We examined five samples of asphalt mixtures with 18 representative areas, each of which is obtained as the average value of five measurements. The legality and impact of relevant safety in operation are determined by the method of blasting. The samples subjected to laboratory testing asphalt concrete mixtures with specifying the basic characteristics of the asphalt composition important for roughness. Obtained numerical values of tests of asphalt mixtures and roughness are particularly subjected to analysis on the basis of which the results on the benefits of asphalt mixture in terms of service drainage road safety in road traffic.

2. DETERMINATION OF SURFACE

Representative homogeneous part of the final layer of pavement makes a representative area, and roadway surface presents the same characteristics of the final layer of protection. Request for homogeneity stems becomes from the need for economical mass of coating recipe.

3. MAKING SAMPLE ON ROAD CONSTRUCTION

In preparing the sample on the road is included heterogeneous road surface which includes a representative range of variables most influential and important feature for smooth traffic flow with satisfied security. In order to identify differences in the types and formed part of the five samples of asphalt mix and: bitumen layers BNS-22 asphalt, asphalt concrete AB 11 made especially of volcano origin and limestone aggregates, and AB 16 made particularly of volcano origin and especially of limestone aggregate.
Making the sample was carried out:
• Specify the same amount of sandy aggregate fractions 25.12 cm3, with a maximum grain size up to 2 mm.
• Determination of representative samples were conducted in the glass gauge gauged by Civil Engineering Institute in Sarajevo, to whose is particularly marked division fill sand, and precisely determined masses of representative samples.

4. RESEARCH RESULTS

In the study, carried out the experimental study of physical and mechanical properties of natural aggregates of volcano origin rocks and limestone, their one axial compressive strength, resistance to abrasion and dry density from several deposits in Bosnia and Herzegovina [1,2] table 1.

*Table 1.*The results of the previous examination of samples of stone: limestone, diabase and spiliti

No.	Type of research	Unit Measures	Results					
			limestone deposits Stupari		Diabase bearing deposits Ribnica		spiliti Vares	
			2002 year	2003 year	2000 year	2003 year	2003 year	2004 year
1.	Compressive strength	average value hydro-saturated condition (MPa)	145,06	130,05	227,31	171,19	194,13	184,19
		The average value of the dry condition (MPa)	169,60	138,06	318,09	209,92	238,41	219,06
2.	Density with pores and cavities kg/m3	kg/m^3	2751	2696	2872	2801	2829	2791
3.	Resistance to abrasion and grinding	$cm^3/50\ cm^2$ medium	14,46	13,40	5,99	8,80	10,00	9,10

4.1. Blasting methods

This method is determined by the roughness on the measured amounts of sand, natural granulation, with a maximum grain size up to 2 mm. Blasting procedures determined by the mean depth of pavement surface texture with the spreading of a certain amount of fine sand in the manner specified standard (Figure 1).

Sand in the glass gauge with the diameter of 20 mm and height of 80 mm planed curtain in the form of a circular road surface. The beans are kept in the hollows of unevenness on the surface of pavement. Analysis of the results of roughness show that the amount of sand taken increases with increasing roughness, which has direct drainage impact on the final layer of pavement, with their relationships do not stand in the administrative scale with skid resistance. [5,6].

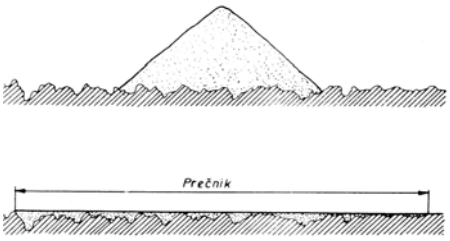

Figure 1. Sheme view of the proceedings

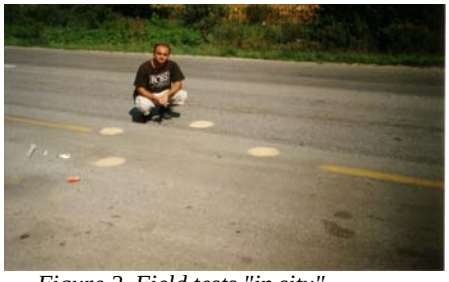

Figure 2. Field tests "in situ"

4.2. Place the field

Test which was taken representative sample, determined visually on the basis of macroscopic appearance on the main road M4 Doboj-Tuzla. Central sample taken in the middle of road construction, while the other four taken to one meter on all four sides of him. Representative indicator

of medium-thick texture of the surface of a representative DT gives the arithmetic mean of the five sites examined and the following relation:

$$DT=\frac{1}{5}\sum_{i=DT}^{n} DT_{0} \qquad [6]$$

where: DT - medium texture thickness (mm)
i = 1 - initial coefficient
n = 5 (number of experiments)
In order to identify differences in the types and composition of asphalt mixtures composed of three samples with different deposits, as follows:
- Asphalt concrete produced Limestone from the slot, "Stupar. a binder BIT 40/200 (AB 11, AB 16, BNS 22), was experimentally treated with 30 experiments.
- Asphalt concrete produced from deposits of spilita "Vares, a binder BIT 40/200 (AB 11s, 16s AB) experiments were treated with 45 experiments.
- Asphalt concrete made of diabase from the slot "Ribnica, a binder BIT 40/200 (AB 11, AB 16), experiments were treated with 15 experiments.

The parameters of granule metric composition of the laboratory tests were taken from previous analysis and control to the extent necessary to make its findings as the results of previous tests crushed aggregate fractions taken from the certificate of existing asphalt concrete. The procedure tests "in situ" consisted of taking samples from the above representative prepared mixture into the glass gauge, the standard defines a volume of 25.12 cm^3 previously cleaned with an asphalt surface, (sl.2). On the asphalt surface cleansed spread sand, taken by the previous procedure, which is shown in Figure 1 and 2. Obtained results of the final layer of pavement roughness, in the course of these investigations are given in tables 2.3 and 4, [1,2,3].

Table 2. Test results for asphalt concrete made of diabase from the slot "Ribnica."

Sample	*Distance from the edge of pavement*	*Average value of the test method blasting*					*Average value (mm)*	*air temperature ° C*	*asphalt temperature ° C*
R-1	*1,00*	*1,28*	*1,22*	*1,29*	*1,17*	*1,22*	*1,23*	*30,40*	*38,20*
R-2	*1,00*	*1,88*	*1,75*	*1,69*	*1,87*	*1,88*	*1,80*	*30,40*	*38,20*
R-3	*1,00*	*1,48*	*1,44*	*1,84*	*1,22*	*1,14*	*1,43*	*32,40*	*38,60*

Table 3. Test results for asphalt concrete made from spiliti from the slot "Vares“

Sample	*Distance from the edge of pavement*	*Average value of the test method blasting*					*Average value (mm)*	*air temperature° C*	*asphalt temperature° C*
V-1	*1,00*	*1,15*	*1,09*	*1,17*	*1,06*	*1,10*	*1,11*	*30,00*	*32,80*
V-2	*1,00*	*1,40*	*1,46*	*1,43*	*1,49*	*1,37*	*1,43*	*29,20*	*33,90*
V-3	*1,00*	*1,35*	*1,20*	*1,30*	*1,15*	*1,25*	*1,25*	*32,30*	*42,50*
V-4	*1,00*	*1,43*	*1,33*	*1,39*	*1,38*	*1,37*	*1,38*	*33,70*	*43,50*
V-5	*1,00*	*0,96*	*1,05*	*1,34*	*1,25*	*1,15*	*1,15*	*29,70*	*31,20*
V-6	*1,00*	*0,89*	*0,99*	*1,15*	*1,22*	*1,11*	*1,08*	*37,00*	*45,80*
V-7	*1,00*	*1,50*	*1,22*	*1,36*	*1,16*	*1,36*	*1,33*	*28,80*	*31,20*
V-8	*1,00*	*1,10*	*1,16*	*1,08*	*1,12*	*1,14*	*1,12*	*29,40*	*31,80*
V-9	*1,00*	*2,05*	*2,31*	*1,84*	*1,86*	*1,92*	*1,98*	*29,40*	*31,80*

5. CONCLUSION

Genesis of rock masses from the slot whose aggregates used for making asphalt masses in this study has a crucial importance and direct impact on the roughness and drainage pavement. With the appearance of the Phenomenon of "first moisture" condensation rainfall origin or type of stone aggregate has a direct impact on asphalt concrete drainage. When the final layer of asphalt pavement wet road surface variation was found in the depth of the texture of granulated limestone to the rocks.

Pavement roughness and texture depth on the wet roads of the limestone is much lower compared to the Driveway of volcano origin units. Different types of asphalt concrete made of aggregate from the same deposits gave different values of pavement roughness. Types of asphalt concrete with small-grained structure gives better results drainage final pavement layer and thus increase safety when driving in traffic.

Table 4 Test results for asphalt concrete made from limestone from the slot, "Stupari"

Sample	*Distance from the edge of pavement*	*Average value of the test method blasting*					*Average value (mm)*	*air temperature ° C*	*asphalt temperature° C*
S-1	*1,00*	*1,22*	*1,00*	*1,14*	*1,18*	*1,04*	*1,10*	*34,50*	*44,30*
S-2	*1,00*	*1,20*	*1,03*	*1,09*	*1,16*	*0,88*	*1,07*	*31,10*	*38,90*
S-3	*1,00*	*1,48*	*1,45*	*1,40*	*1,39*	*1,44*	*1,43*	*34,10*	*41,10*
S-4	*1,00*	*1,59*	*1,77*	*1,69*	*1,57*	*1,67*	*1,66*	*35,70*	*44,30*
S-5	*1,00*	*1,98*	*1,94*	*2,09*	*2,05*	*2,28*	*2,07*	*29,50*	*32,20*
S-6	*1,00*	*1,46*	*1,40*	*1,42*	*1,44*	*1,39*	*1,42*	*29,50*	*35,50*

Examining experimental results obtained show that the best parameters of the depth of asphalt-concrete textures and drainage obtained by applying fine grained volcano origin units. Specifically, the greatest depth and texture of the best studied drainage roads gave the type of asphalt concrete AB 16s, made up of aggregates volcano origin, spiliti origin and from the slot, "Vares. Obtained parameters of texture and depth of asphalt concrete drain aging BNS 22 made origin of limestone aggregate are less favorable.

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