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ANALYSIS OF THE APPLICATION OF ROADWAY CONSTRUCTIONS IN THE LOCAL NETWORK ROADS

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SUMMARY

This work's searching subject are Banovici's local roads which represent mutually dependent municipality or town traffic system that is connected to regional or motorway road system, and uncategorized roads which represent every traffic area that is not categorized as public road.Also it gives a view of local and uncategorized roads but those that are built using macadam and flexible (asphalt) road construction with given advantages and disadvantages of present built flexible constructions.This work also contains a maintenance review of macadam and flexible (asphalt) road constructions with given road maintenance costs annually. Road dimensioning construction has been done, optimal thickness and road construction level type has been obtained.

The guideline method for designing and maintaining roads in B&H is the one by which dimensioning has been made considering the same embrace more familiar dimensioning methods but demanding more input details.These details start with traffic burden, groundwork capacity, project road characteristics, traffic burden estimate as well as other factors that have impact on traffic burden. Concerning given results, using parallel analyses the most optimal solution of local and uncategorized road traffic construction has been defined for a price of 1m2, so the specific conclusions have been made.

Keywords: *traffic construction, analisys, dimensioning, method*

INTRODUCTION

The content of this paper is focused on the network of local and unclassified roads of the Banovici municipality and data on their equipment in terms of travel elements and the condition of roads made of macadam (period till 2006). Even today when a large number of local and unclassified roads are asphalted .

The motive of this research is also to make the dimensioning of the pavement construction, the optimal thickness and type of pavement structure, the advantages and disadvantages of the current condition of asphalt pavement structures. Comparative analyzes will define and select the most optimal solution, cost price per 1m2 of pavement construction of local and unclassified roads, and a cost price will be established from the aspect of maintenance of roads made from macadam to constructed flexible pavement construction.

REVIEW OF LOCAL AND UNCLASSIFIED ROADS MUNICIPALITY BANOVICI

The Municipality of Banovici and all local community communities are interconnected with a network of local and unclassified roads that pass through the inhabited areas of the municipality. The length of the road network in the area of the municipality is 194,924 km, in which reconstruction and maintenance of Municipality Banovici each year allocates significant funds.

By the decision of the Municipal Council, at the proposal of the Department for Spatial Planning, Housing and Communal Affairs, the categorization of roads in the area of Banovici municipality was adopted. By the same, the local roads comprise 23.03% of the road network, or 44.89 km of which 37.25 km is asphalted [1,2,3,4].

LOCAL ROADS

The adopted categorization of local roads in the area of Banovici municipality was also determined by the Decision on categorization of local roads and streets in the town of Tuzla and the municipalities of Tuzla Canton [1].

UNCATEGORIZED ROADS

Uncategorized roads of the Banovici municipality are all the roads that make up the internal network of all local communities directly or indirectly connected to the locally categorized roads of the Banovici municipality as well as one part of the mentioned Regional roads that pass through the area of Banovici municipality.

According to the data collected by the Planning, Development and Entrepreneurship Department of the unclassified road, there are 66.94% of the road network, ie 130.484 km of which 24.41 km of roads (1.00 km unpaved) and 106.074 km of other unclassified roads, of which 63.414 km are asphalted . The main division of local and uncategorized roads in the area of Banovici municipality was carried out on road maintenance, on macadam and asphalted roads of the Banovici municipality, and an overview of unclassified roads will be shown through the macadam and asphalted roads of Banovici municipality [1,4].

COMPARATIVE ANALYSIS

Results Sizing Flexible And Solid Pavements

One of the motives of this research was to make the dimensioning of the pavement construction, to show the optimal thickness and type of pavement layers, and to define and select the most optimal solution and the cost price of 1m2 of pavement construction of the local and unmarked road.

This research has led to the optimization of the solutions and the application of the contemporary pavement construction of local and non-categorized roads, and for the adopted parameters, the dimensioning of the rigid and flexible structures of the pavement was carried out according to the method given in the BiH Design and Maintenance Guidelines. [2,3,5].

In this chapter, a comparative analysis of the obtained results was performed, where the thickness of the obtained pavement layers was compared, the comparison of the cost of one square meter of all the layers obtained by the mentioned method was also performed.

The end goal of this paper is a comparative analysis of the dimensioning of flexible and rigid pavement constructions and the proposal for the application of the most favorable variant of contemporary pavement structures to the network of local and unclassified roads.

Figure 1. shows a comparative analysis of the thickness of the essential foam layer of flexible hull structures and concrete slab of rigid cargo constructions. With the diagram it can be concluded that the bituminous layer was obtained with a thickness of 8.00 cm while the concrete slab was obtained with a thickness of 14.00 cm.

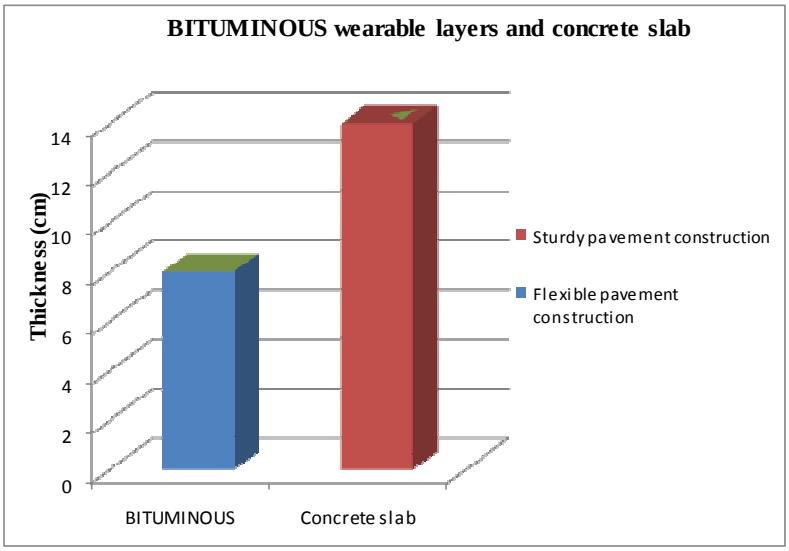

Figure 1. Comparison of the thickness of Bituminous layers and concrete slabs according to the valid guideline method

Figure 2 shows a comparative analysis of the thickness of the tampon layer of flexible carriageways and rigid carriageways. With the diagram it can be concluded that the tampon layer in flexible carriageway constructions was obtained with a thickness of 41.00 cm, while in rigid carriageway constructions a thickness of 34.00 cm was obtained

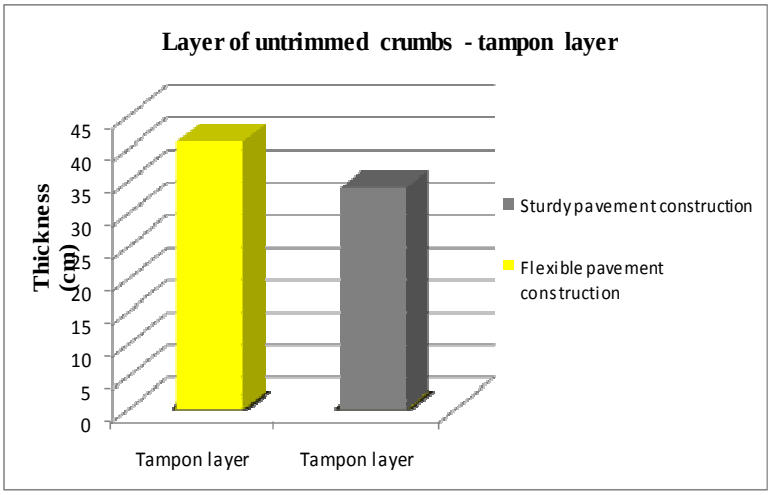

Figure 2. Comparison of the thickness of the tampon layer of flexible and rigid conveying structures

Figure 3. shows a comparative analysis of the cost of cost (m2) of the bitumenable foam layer of flexible pavement structures and concrete slab of rigid cargo constructions. With the diagram it can be concluded that the bituminous layer obtained with a thickness of 8,00 cm has a cost of 28,00 KM / m2, while the concrete slab obtained at a thickness of 14,00 cm has a cost of 37,80 KM / m2.

Figure 4. shows a comparative analysis of the cost price (m2) of the tampon layer of flexible carriers and rigid carriageways. With the diagram it can be concluded that the tampon layer at flexible pallets of 41.00 cm thick has a cost of 10.25 KM / m2, while the tampon layer for rigid carriageways is

obtained with a thickness of 34.00 cm + 5-6 cm of bitumenized crushed stone aggregate or pebbles cost of 10,00 KM / m2.

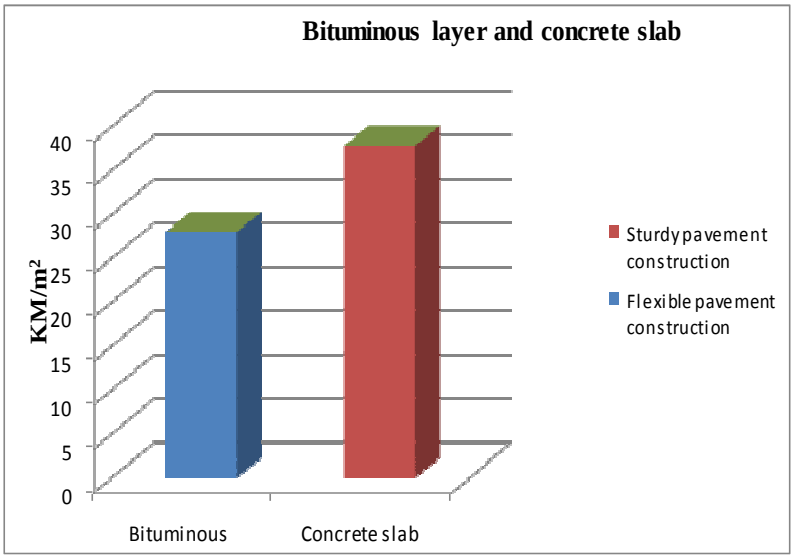

Figure 3. Comparison of the cost price (m2) of the Bituminous layer and the concrete slabs obtained according to the valid guideline method

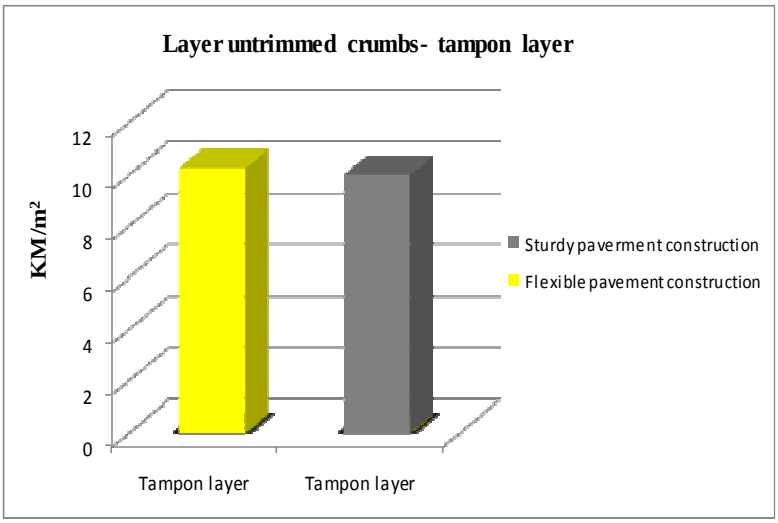

Figure 4. Comparison of the Cost of Cost (m2) of the Tampon Layer of Flexible and Sturdy Constructions

FLEXIBLE COLLECTIVE STRUCTURES PRICES IN RELATION TO THE CUTTING STRUCTURE ON THE BASIS OF DIMENSION RESULTS

Since asphalt (flexible) and rigid pavement dimensions as an example of an unassigned road in the housewarming Strazbenica are taken into account, only the dimensioning is done based on the same input parameters. The estimate of the cost of costing one in relation to the other caravan construction I took the width of the pavement 3.50 m in length of 100 m which is a total of 350 m2 of pavement construction. [2,6,7].

With the diagram shown in Figure 5, it can be concluded that the flexible cargo construction with the price of 13.387,50 KM or 38.25 KM / m2, cheaper than the rigid cargo construction for 3.342,50 KM or 9.55 KM / m2 whose price with the same input parameters 16.730,00 KM or 47.80 KM / m2.

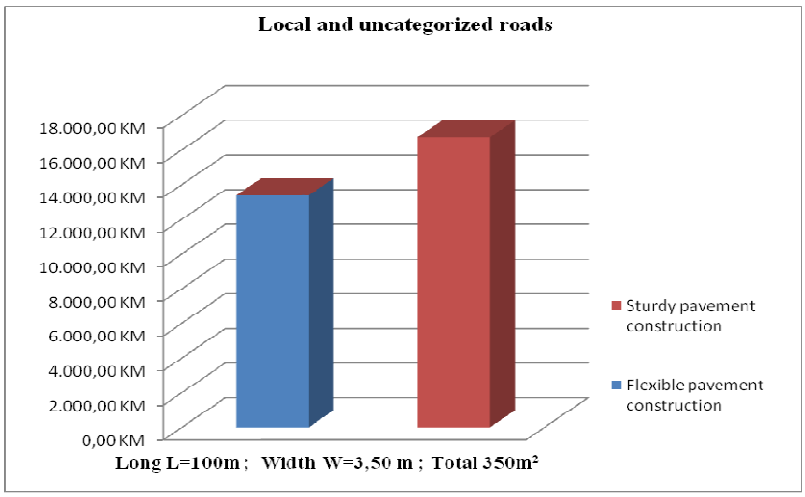

Figure 5. Comparison of cost of cost of flexible and sturdy construction

With the diagram shown in Figure 5, it can be concluded that the flexible cargo construction with the price of 13.387,50 KM or 38.25 KM / m2, cheaper than the rigid cargo construction for 3.342,50 KM or 9.55 KM / m2 whose price with the same input parameters 16.730,00 KM or 47.80 KM / m2.

MAINTENANCE CHARGING PRICES OF MACADAMS AND ASPHALT CURRENT CONSTRUCTIONS FOR A PERIOD OF 10 YEARS

Based on the prepared and presented cuts and pre-estimates of works, services and materials required for maintenance, it was established that for the maintenance of asphalted roads in the area of Banovići municipality for 2016 was allocated about 125.000,00 KM while for maintenance of macadam roads about 70.000,00 KM which in total about 195.000,00 KM. Given that in 2016 in the area of Banovići municipality the length of asphalted roads was 106,734.00 m, and the macadam 68,640.00 m, it can be concluded that for asphalt pavement constructions per meter is obliged to allocate about 1.17 KM while for maintenance of macedonian caravans per meter is about 0,98 KM. [1,4,7,8,9,10,11]

In 2006, in Banovići municipality, the length of paved roads amounted to 63,374.00 m and macadamatic 112,000.00 m. It can be concluded that in 2007, about 74,147.58 KM was allocated for the maintenance of asphalt pavements, while for the maintenance of macadamic pavement construction amounted to about 109.760,00 KM, which is a total of 183.907,58 KM.

It is important to note that for the period of 10 years, ie from 2007 until 2016, the municipality of Banovići has annually allocated about 500.000,00 KM for the reconstruction and asphalting of roads, or about 4,000.00 meters per year asphalted annually, Figure 6.

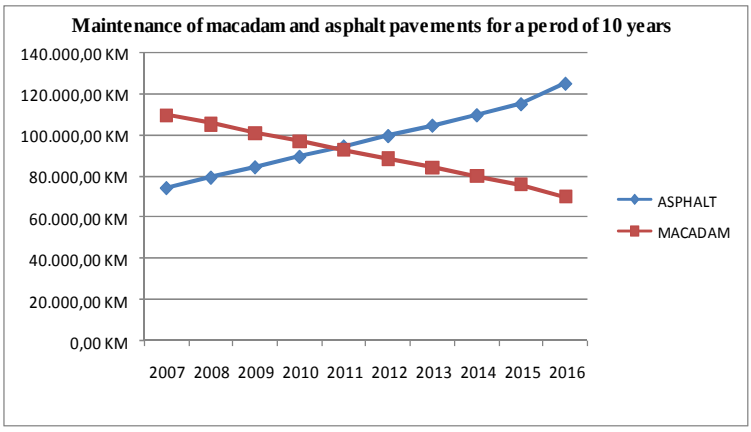

Figure 6. Costs of maintenance of macadam and asphalt pavement constructions

With the diagram shown in Figure 6. it can be concluded that the price of asphalt road maintenance since 2007 is constantly increasing due to the constant construction of asphalt roads, while the cost of maintenance of macadam roads is constantly decreasing.

CONCLUSION

After the conducted comparative analysis, the aim was to make the choice of the most favorable and most acceptable construction in terms of cost per 1 m2 of pavement construction.

The analysis was considered on a one square meter of road with a width of 3.50 m. For a clearer comparison of the price of the cost of the construction of the cargo construction of one in relation to the other I took a length of 100 m with a total surface of 350 m2.

One of the goals was to point to the advantages and disadvantages of constructed flexible cargo constructions and the cost of maintenance of macadamatic and flexible carriageway constructions.
After the analysis and comparison of the results obtained, the following conclusions were reached:
Flexible pavement construction is the most favorable or most economical type of pavement construction with price based on 350 m2 of considered cargo construction of 13.387,50 KM or unit price 38.25 KM / m2, cheaper than rigid pavement construction for 3.342,50 KM or 9.55 KM / m2 whose price with the same input parameters is 16.730,00 KM or 47.80 KM / m2

One of the goals was also to determine the cost of maintaining macadam roads in relation to asphalted roads for a period of 10 years, which is being done. Based on the prepared and presented cuts and estimates of works, services and materials needed for maintenance, it was concluded that for maintenance of asphalted roads in the area of Banovići municipality is allocated about 1.17 KM / m while for maintenance of macadam roads it is about 0.98 KM / m '.

In 2007, about 74.147,58 KM was allocated for maintenance of asphalted roads, while for maintenance of macadamatic cargo constructions was allocated about 109.760,00 KM, which is a total of 183.907,58 KM.

In the year 2016, for asphalted roads, about 125,000.00 KM was allocated, while for maintenance of macadam roads about 70.000,00 KM, totaling about 195.000,00 KM.

For the aforementioned period, ie for 10 years, for maintenance of asphalted roads was allocated about 975.228,06 KM, while for maintenance of macadamous cargo constructions was allocated about 904.865,90 KM, which is a total of 1.880.093,96 KM.

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