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REHABILITATION WATER SUPPLY AND SANITATION LOCALITY BUZIAŞ

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Abstract: The paper presents the current situation of water and sanitation in the town Buziaş. As a consult of the analyzes carried out in this town, it was found that many faults and malfunctions occurring during the time the water and sewerage networks involve high costs of maintenance and improper operation. For an efficient exploitation and maintenance of water and sewer it is imposed the rehabilitation, which consist of replacing the pipes and channels, manholes replacement valves and sightseeing, water connections and fittings channel. These works will be done in stages, in the forehead of the prioritization criteria related sections. The aims of these measures, is to integrate in the European standards of environmental protection, sustainable development, reduce environmental impact and not last raising living standards and improving the quality of life of local residents. Continuing development of techniques and technologies worldwide and nationwide has led to the need for monitoring in water supply systems and sanitation. Case Study on the town Buzias, reveals that the use of modern and performant materials, with corresponding qualities and properties is the tool of development in the field water and sanitation networks. In the context of urban development, there has been achieved an improvement of water and sanitation through the materials and technologies used, following analysis of the results of monitoring time and choosing the best technical solution in accordance to the laws in force, regarding the terms and conditions imposed by the rules of urbanism.

Keywords: water networks, sewer networks, crashes, defects, loss of water, rehabilitation.

1.INTRODUCTION

In the context of urban development on the territory of the village Buziaş was achieved an improvement of water and sanitation, the materials and technologies used, following analysis of the results of monitoring time and choose the best technical solution in accordance with the laws in force in terms of the environment and conditions imposed by the rules of urbanism. Monitoring water distribution and sewerage networks revealed various problems that have occurred over a period of time. The results are presented and interpreted in this paper, highlighting the measures that have been taken to improve the water system, namely channel.

2. WATER AND SEWERAGE NETWORKS

Existing water systems provide water transportation to consumers by providing them required operating pressure both in normal operation and during any fire fighting. It is expected the presence of deposits and biofilm formation inside the network, because the operation without systematic cleansing.

Due dysfunction, of the organization and realization defective, sewerage reached unable by themselves to ensure minimum. This causes sewage system deposits and narrowing of the flow section. It also mentions the existence of sewerage network segments located in counter-slope.

The material used for the distribution networks in the years 1970 - 1977 were the steel component. Physical wear of materials constituting the pipes, reducing water transport active section, reducing the pressure and flow required service consumption and fire make the pipes do not match in terms of safety in operation.

These pipes have many defects caused by corrosion through cracks and punctures.

According to the table mentioned below loss of water is observed, that the number of failures that some blocks have undergone over time.

The average age of over 40 years, distribution networks, has led to numerous operational problems (damage, cracks).

The location of the water supply project will be completed in the area living on the streets of the village, at the edge properties.

All these defects on pipelines analyzed fraction are solved. Interventions by the institution authorized Buziaş village created and still creates a nuisance tenants, tourists and businesses.

The total length of the distribution network is 3920 m and 20 homes of valves.

The total length of the sewerage network pictured is 6070 m, the sewage system will mount to 130 manholes concrete pipes

Existing sewer networks intersecting route target are located in green areas, sidewalk and roadway on

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certain portions. Average age of sewerage networks is 38 years.

The material used for sewer networks during the years 1975 - 1977, is concrete. Wear and tear of materials constituting the channels, reducing waterborne active section, makes them not correspond in terms of safety in operation.

The conditions for the sewage system were inadequate streets where sewer pipes joints and shafts were sealed. Some streets have been made against the channel-slope or low slope. Domestic wastewater collectors capacity is very low, which causes frequent deposits and blockages in this area.

Table 1. Annual water loss i.e. the number of faults in mains water

Nr. crt	Street	Material	Diameter	L (m)	Observations	Number of defects			Total	Total water loss (mc)
						2011	2012	2013		
1	Primăverii	steel	100	670	Corroded, segment under reduced pressure	2	9	2	**13**	**35,500**
2	Unirii	steel	100	400	degraded, advanced corrosion	2	5	1	**8**	**11,000**
3	Bisericii	steel	50	300	corroded, segments under reduced pressure	5	1	3	**9**	**8,500**
4	6 Martie	steel	80	230	corroded, segments under reduced pressure	1	6	0	**7**	**6,000**
5	Florilor	steel	100	920	corroded, segments under reduced pressure	0	3	1	**4**	**15,300**
6	Crucii	steel	125	600	degraded, advanced corrosion	3	1	2	**6**	**11,000**
7	Republicii	steel	80	800	degraded, advanced corrosion	7	4	3	**14**	**30,000**
				3920		**20**	**29**	**12**	**61**	**117,300**

Table 2. Annual number of faults on the sewerage system

Nr. crt	Street	Material	Diameter	L (m)	Observations	Number of defects			Total
						2011	2012	2013	
1	I. Vidu	concrete	250	440	compromise	1	5	0	**6**
2	A. Iancu	concrete	250	1160	compromise	2	1	2	**5**
3	Primăverii	concrete	250	500	compromise	0	6	1	**7**
4	Florilor	concrete	200	620	compromise, undersized	3	4	2	**9**
5	Gării	concrete	200	500	compromise, undersized	4	3	5	**12**
6	Mureșan	concrete	250	350	compromise	1	4	2	**7**
7	A. Vlaicu	concrete	300	2500	compromise, oversized	2	0	3	**3**
				6070		**13**	**23**	**15**	**49**

3 MARCH. REHABILITATION

Following the analysis and monitoring of the operation while the action factors influencing the quality of networks is proposed to improve them by using best performing materials more resistant to external factors, with properties that correspond to their need, such as PE-HD PVC supply networks and sewage networks

These assumptions underlie the lead in the end to make the best decisions and take the practical technical solutions for the design, construction and maintenance thereof.

Materials currently used for water mains are steel and concrete sewer mains. They are considered outdated compared to the current level of development and technical features of modern materials.

It aims to prioritize network rehabilitation scores heating circuit, this being the selection criterion based on the achievement of the warning network.

For phasing rehabilitation of water and sanitation have been proposed certain criteria that take into

account the cost of repair, pipe materials, impact on traffic

Table 3. Average water

Nr. crt.	**Name street/area**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**Total**
0	1	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Primăverii	4	5	4	5	3	1	3	2	5	1	4	3	4	2	**46**
2	Unirii	3	5	4	3	3	1	2	2	6	1	2	4	3	3	**42**
3	Bisericii	3	5	4	3	3	1	1	2	5	1	3	4	3	2	**40**
4	6 Martie	2	5	4	2	2	1	2	3	5	1	1	4	3	2	**37**
5	Florilor	3	5	4	3	2	1	1	2	3	1	2	4	3	2	**36**
6	Crucii	2	5	4	3	1	1	2	2	5	1	2	4	2	2	**36**
7	Republicii	3	2	4	1	1	1	3	1	2	3	5	3	4	1	**34**

Table 4. Solution rehabilitation of water networks

Nr. Crt	**Street**	**Rehabilitation solution**
1	Primăverii	Replace existing steel water pipe DN100 mm with a water pipe of HDPE, 125 mm, L = 720 m
2	Unirii	Replace existing steel water pipe DN100 mm with a water pipe of HDPE, 110 mm, L = 273 m
3	Bisericii	Replace existing water pipe DN50 mm steel with a water pipe of HDPE, 110 mm, L = 318 m
4	6 Martie	Replace existing water pipe DN80 mm steel with a water pipe of HDPE, 110 mm, L = 201 m
5	Florilor	Replace existing steel water pipe DN125 mm with a water pipe of HDPE, 250 mm, L = 687 m
6	Crucii	Replace existing steel water pipe DN125 mm with a water pipe of HDPE, 125 mm, L = 82 m
7	Republicii	Replace existing water pipe DN80 mm steel with a water pipe of HDPE, 110 mm, L = 282 m

Table 5. Sanitation score

Nr. crt.	**Name street/area**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**Total**
0	1	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Ion Vidu	2	5	4	3	4	3	1	5	3	3	3	1	2	**39**
2	Avram Iancu	3	3	4	3	4	2	1	4	2	4	3	1	2	**36**
3	Primăverii	3	3	4	4	2	2	1	2	2	4	3	2	2	**34**
4	Florilor	2	3	5	4	2	2	1	2	2	3	3	2	2	**33**
5	Gării	2	5	4	3	2	1	1	2	2	4	3	1	2	**32**
6	A. Mureşan	2	5	4	3	2	1	1	3	2	4	3	1	1	**32**
7	Aurel Vlaicu	2	5	4	4	2	2	1	2	2	2	3	1	1	**31**

Table 6. Solution rehabilitation of sewerage networks

Nr. crt	Street	Rehabilitation solution
1	Ion Vidu	Replace existing water pipe Dn250 mm concrete with lead, PVC, 250 mm, L = 422m
2	Avram Iancu	Replace existing concrete water pipe DN250 mm PVC pipe, 250 mm, L = 167m
3	Primăverii	Replace existing concrete water pipe DN250 mm PVC pipe, 250 mm, L = 183m
4	Florilor	Replace existing concrete water pipe DN200 mm PVC pipe, 250mm, L = 283m
5	Gării	Replace existing concrete water pipe DN200 mm PVC pipe, 250 mm, L = 663m
6	A. Mureşan	Replace existing concrete water pipe DN250 mm PVC pipe, 250mm, L = 168 m
7	Aurel Vlaicu	Replace existing concrete water pipe DN300 mm PVC pipe, 250mm, L = 186 m

6. CONCLUSIONS

Raising the standard of living and the continual development of technique and technology has led to the implementation and follow-up of distribution networks found the need to monitor them in order to obtain results consistent with reality. This is reflected by prognoses leading ultimately to make the best decisions and take the practical technical solutions for the design, construction and maintenance thereof.

Materials used for networks (steel, iron) for concrete water mains and sewage systems are considered outdated compared to the current system development and technical characteristics of modern materials.

It proposes a series of measures to rehabilitate the networks analyzed, including the reconstruction of how the laying of networks to coordinate the plan and vertical clearances required complying with the regulations in force and also restoring sewer drain slopes elimination of counter-slope sectors by ensuring adequate transmission capacity

Through rehabilitation measures will be stepped up economic and social activities in the community targeted by the project, reducing disparities between the various towns and areas in Romania, between the villages of rural and urban areas and between Romania and other European Union member states.

In terms of socio-economic objectives of rehabilitation measures are to increase the quality of life in the community by creating a favorable health, improving social and economic situation of the inhabitants, attracting a large number of investors in the area, compliance with environmental restrictions and legislative currently imposed by national legislation.

This investment is sewage disposal network connections meteoric water, replacement of sanitary and storm sewer networks, replacement of water networks, using high-quality materials for all networks leading to increased transport capacity and durability while.

REFERENCES

[1]*Florescu Al., Istode V., Niculescu D.,* Operation Connection to the water distribution networks Bucharest 1978 Technical Publishing

[2]*Rotaru N., Tigoianu V., Pîslărașu,* Bucharest 1965 Technical Publishing

[3]*Ianculescu O., Ionescu G., Racovițeanu R.,* Matrix Publishing Caanalizări Bucharest 2001

[4]*Kainy H., Kauch E., Renner H.,*Ziedlungswasserbau und abfallwirtschaft Austria 2002

[5] ***Act 458 of 2002* - On drinking water quality and completed Act 311 of 2004

[6] ***NTPA 002 2002* - On conditions for wastewater discharge into sewerage

[7]*** Database operation and maintenance of water and sewer networks of village Buziaș - directed water channel