Condominial Sewerage Systems for the Federal District of Brazil

CAESB - Water and Sewerage Company of Brasília

1998

Brasília - Brazil

Eng. Klaus Dieter Neder - Superintendence of the Expansion of Sewerage Systems at the Water and Sewerage Company of Brasilia. - e–mail - **kneder@wom.com.br**

Eng. Pery Nazareth – Directory of Sewerage Systems at the Water and Sewerage Company of Brasilia. - e–mail - **perynazareth@zaz.com.br**

CONTENTS

BRASILIA'S WASTEWATER TREATMENT PLANTS - TRYING TO MAKE AFFORDABLE TECHNOLOGY REALITY.

Condominial Sewerage Systems for the Federal District of Brazil

SUMMARY

INTRODUCTION

Caesb, the company responsible for the water supply and sewerage for Brasilia, a 2.000.000 inhabitants city, capital of Brazil, aims to deliver basic sanitation to 100% of its urban population. Developing sewerage systems that will enable to meet the demands made by constantly increasing urbanization is a great challenge for the company, mainly because of the lack of resources that is characteristic of developing countries. This situation has forced the planners to look for low cost solutions, as the only way to achieve the 100% coverage mark. The creation of sewerage systems, including the treatment of the sewage, using technologies adapted to today's Brazilian reality, is one of the main objectives of Caesb. In recent years the company has been applying and developing sewerage systems that try to make the most of the available resources.

In that way, Caesb has developed a methodology for the development and construction of sewerage systems, which has led to the servicing of large sections of the city population in a short space of time. At the same time, the technology has kept in mind its mission to optimize current projects and works, always keeping implementation costs as low as possible. For this reason Caesb adopted the condominial sewerage system, developing a procedure for its implementation, that includes all stages of the undertaking: planning, financing, bidding, tariffs and technical aspects, right up to the actual implementation. All this has had to be done within the restrictions of time and resources, without loosing sight of the fundamental questions about the installation of the system.

WHAT IS THE CONDOMINIAL METHODOLOGY ?

Many confuse the Condominial Methodology with a set of technical, social and institutional rules that establish how a condominial system should look like, the size, depth and location of the pipes, what is right, what is wrong. Some times people forget that the basic idea of the condominial system is a democracy model. A model were the people have the right to understand, discuss and to choose the system they want. Once the people understand about the system, discuss about the system and choose a solution, they should be respected. From us, the "specialists" that sit at this side of the table, it is expected that all alternatives are presented, technical, social and institutional alternatives, with their positive and negative points, and of course, their correspondent cost. Let the people have their choice, even if it is for a conventional solution. The model that is presented in this paper is not THE Condominial model, it is a condominial model that was used in Brasilia and that represents the result of our experience. The

rules and technical details that are presented should be taken as an example of how things can be done, but it isn't the only way things can be done. The important thing is the democracy idea, discussing, understanding, choosing and being responsible for the choice and its consequences.

THE CONDOMINIAL SYSTEM IN BRASILIA

The Condominial System of sewage collection has been adopted by Caesb because, as described in the bulk of this paper, it provides a low cost wastewater collecting network, and at the same time, makes community participation a key part of the implementation process. With this participation and the use of appropriate technologies, it can lead to engineering solutions that fit in with existent resources, allowing to achieve the 100% aimed coverage. At Caesb, in Brasilia, the system was used as a pattern solution, covering all areas of the city, with the same rules, independently of the economic situation of the population covered.

At Caesb, users' participation occurs in all the phases of the process, from its installation to the operation of the system. The participation begins with the decision of the engineering solution to be adopted for the condominial branch, sharing it with the technicians of Caesb, reaching the participation in the costing of the enterprise. For this, Caesb has introduced a tariff policy that tries to reflect the characteristics of the condominial system, both in terms of the connection fee and in relation to the tariff for the use of the system. On the one hand, the connection fee aims to reflect the real cost of installing the condominial branch, as chosen by the users. On the other, the tariff for the use of the system tries to reflect the user's participation in its operation, since in the internal branches the responsibility for maintenance lies with the users, giving them the right to a reduction in the tariff paid.

CAESB'S METHODOLOGY AND RESULTS

In the methodology employed by Caesb there is no distinction made between the project phases and the installation work: it is just an integrated process. This is because the location and exact depth for the public networks will only become known after community mobilization, when the executive project for the condominial branches is made. This way, the executive project is developed throughout the construction of the networks, when a project team stays on site, making the location and the depth of the system compatible with the condominial branches defined by the users. All physical interference's are considered by the planners themselves, who then adjust the plan and details of the networks in accordance with the overall conception of the system.

The procedure now adopted by Caesb is the result of more than 8 years of using the condominial system in Brasilia, not as a special project, but as the normal solution employed by the company. During this time the system was continually developing, allowing the city to reach the highest rates of sewage collection service in the whole country. The methodology proved to be capable of meeting the objectives of the company, allowing it to service a project population of 1 134 574 (with about 121 000 homes already linked to the system), through the installation of 1 328 498 m of condominial branches and 667 485 m of public networks. The average per capita cost was approximately US $27 (Exchange rate R$1,20 = US1,00). These costs, along with the use of appropriate technology for sewage treatment, have allowed the installation of

complete sewerage systems at a cost of about US $65 per inhabitant serviced, which probably represents the lowest cost likely to be found in a public works project. The whole condominial program along it's 8 years life time, was financed by several national or international agencies, using the normal available financing lines witch exist for conventional sewerage systems. This task was made easier due to the low cost's involved. One must remember that Caesb has got a fast partial return of the investments cost's, due to the user's payment of the connecting fee, witch represents around 25 – 30% of the cost of the system. This fee is normally paid divided in 10 monthly quotas, and allows new investments in the system.

LESSONS LEARNED

During its years of putting the condominial system into practice on a grand scale, perhaps the most important lesson that Caesb has learnt is that its success depends on involving all the areas of the company that are connected to the task in hand, thus getting a result that truly addresses the objectives of the system. This involvement demands complete understanding of the system by everybody in the project, so that each one has a precise idea of their importance in the system and of the contribution that their work will make to the process as a whole.

It's also important to remember that the implementation of a condominial system doesn't just involve the participation of the community and of a community mobilization group, but that it also involves a great number of professionals within the company, who make the enterprise viable. Caesb has tried to root the philosophy of the condominial system in the daily life of the company, getting the various areas of the company to involve themselves in the experience of making the system work. So the work was carried out using the normal structure of Caesb, trying to avoid the creation of an isolated group linked to a specific project—thus avoiding lack of continuity.

As a company with a strong tradition in the area of basic sanitation, with a good technical and managerial base, Caesb managed to implement the system without great organizational difficulties, although it had to overcome some bad will initially—from a few technicians who viewed the system with distrust. Although in its initial phase the system originated from a policy decision made by the directors of the company, it gradually became assimilated into the technical group, and is now a solution that the whole company considers a pattern.

Caesb's experience demonstrates that it is possible to implement large-scale condominial systems, with limited finance and tight deadlines. However, you first need a well-established company structure and a management team that oversees all activities involved.

SYSTEM PERFORMANCE

The operation of the systems implanted up to now has indicated that there is no difference in maintenance frequency between the condominial and conventional systems. This can be interpreted as significantly favorable to the condominial system since, while the conventional system is operating in older areas of the city, which have good urban conditions and services for a higher-income population, the condominial system has been applied in expanding areas of the city, where normal urbanization is

virtually non-existent, the population is low income and less used to this type of service. This being so, one would expect a larger number of interventions in the condominial system, which has not been the case.

Another positive aspect verified during maintenance of the condominial system is that the cost of interventions effected has been lower than that in the conventional system. This is because of the way the condominial system is constructed, where interventions are made more easily, and because of the maintenance technology itself. The experience obtained in Brasilia overturns the general view that condominial systems need more maintenance than conventional ones: rather, they need the same or less.

CONCLUSION

This work presents the experience gained in Brasilia using condominial sewerage systems on a large scale, with emphasis on the methodology developed. It tries to tackle all the key phases in the process of implementing the system, from the initial conception of the plans, including even their charging policy and maintenance, and presents the practical results obtained from systems that have already been operating for several years. These results proved that the condominial sewerage can be employed in a large scale program, as a pattern solution in a public company, allowing very low investments costs and normal operational performance. The achievement of these goals depends on a well-established company structure and a management team that oversees all activities involved, with a view that truly addresses the objectives of the system.

Acknowledgments

This work relied on the collaboration of the following engineers: César Rissoli, Maria Martinelli, Antônio Brito, Carlos Daidi Nakazato, Humberto José de Almeida, Maurício Luduvice, Ricardo Bernardes, Marcos Montenegro, Hermes de Paula, José Carlos Melo and all the others that took part in the history of the Condominial system at Caesb.