

Non-destructive technologies for the maintenance of underground utilities.

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Summary

Public administrations have to guarantee and improve the utilities performance, while minimizing the financial and environmental costs, by means of methods and tools which optimize the process itself in order to carry out constant improvements within the level of the services delivered as well as of the infrastructure sustainability.

In such a context, the development of non-destructive technologies for mapping, diagnosis and rehabilitation of underground infrastructures assumes a relevant role since the need to operate interventions on existing infrastructures – minimizing at the same times the impact on urban functions and environment – find in these ones a satisfactory answer. In the present contribution, we will describe the main non-destructive diagnosis technologies in order to map a network as well as to develop its diagnostic process.

Keywords: Sustainability, infrastructures, underground, planned maintenance, non-destructive technologies.

1. Introduction

In Italy, as well as all over the industrialized world, the development processes have already caused a substantial slowing down in the expansion of the industrial systems and buildings, so that the preservation of means of production, buildings and infrastructures has assumed a very important role.

Such a change can be applied within a context of increasing sensibility towards the themes of environment respect and life quality, strictly linked to an evolution in the demand for economical and environmental quality and sustainability of services, especially in the public ones - the public benefits provided by public utilities (state, region, etc.) or by private bodies on behalf of public administrations – requiring integrated distribution and coordination and usually representing the infrastructure core of a modern country.

In such a scenery, the urban underground has been progressively recognized as physical place where to activate intervention policies and behavior rules which are consistent with the principles of environmental sustainability and economical and social practicability. A real resource to be used in a rational way, being always conscious of the limits of its consumption.

2. Planned maintenance of utilities

Our cities growth pattern asks for reflecting on the fact that almost half of the existing urban asset was realized at least fifty years ago, and such asset is not characterized by building quality and accurate study, but it is instead subjected to important obsolescence and degradation phenomena which need to be contrasted.

Moreover, the citizens’ higher attention to life quality, health and environmental sustainability involves new levels of exigency related to the low performance of urban asset. It is then increasing a new and significant need of renewal in order to replace or requalify those infrastructures which