



Semi-underground houses and their role in the building of sustainable urban landscape

Filiberto Lembo

University of Basilicata - Potenza, Faculty of Engineering, D.A.P.I.T., Potenza, Italy (filiberto.lembo@unibas.it)

Within ever more wide-spread cultural approach which is aimed to re-debate terms of relationship of the man and his environment, and to re-formulate economics, agriculture, industry, service industry and executive activities in terms of sustainability, a change is needed for the re-invention of settlement typologies. They can't more be these of historical city, for new energetic and ecologic objectives.

They are not sufficient passive houses devices (hyper-insulation and heat recovering from fresh air) to grant settlements "zero energy balance"; it is necessary to establish a virtuous relation interchange with surrounding environment (sun, wind, atmospheric dampness, rain, vegetation, soil).

Semi-underground typologies can carry out an effective response to these requirements, both in the carrying out of new buildings, and in the re-use (both in infilling and in rebuilding) of existing urban settlements. And more, they can be very useful in the refurbishment of existing building complexes.

They have been under investigation many case study which make an example, with different functions (residential [single-family or multifamily, terraced or hillside, or shallow atrium - courtyard]), non residential (offices, recreational, commercial, parking), with different geometry (dimensions and scale of project, fenestration arrangement, ground surface relationship), in different site features and climatic conditions (prevailing summer or winter design), and with different project features, enforcing most up-to-date strategies, chiefly passive, for plants.

It result from it a rich picture of possibilities of augmenting, through analytical design criteria, indoor and outdoor environment quality level and quality of life itself in low-rise, high density settlements, improving accessibility of public transport, integration between urban functions, integration with urban context and landscape, ecological continuity; decreasing resources consumptions and environmental charges, with directions which optimize Service Quality in respect to the traditional way of building, and can go from almost complete elimination of mechanical plants to the complete Building Automation and Control System.