

Deliverable D2.6

Adapted well point technique and subsequent field evaluation for the installation

WP 2

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Dissemination Level

PU	Public	
CO	Confidential, only for members of the consortium (including the Commission Services)	X
CI	Classified, as referred to in Commission Decision 2001/844/EC	

Publishable summary

The D2.6 “*Adapted well point technique and subsequent field evaluation for the installation*”, is a confidential document delivered in the context of WP2, *Task 2.6: Adaptation of well point technique*. In this task, only this deliverable is foreseen, at the end of the task activities.

For construction sites where deep well dewatering is not suitable, the well point dewatering system is an effective and economical way to reduce the level of the water table to below the required excavation level. The well point system is constituted by a series of tubes inserted into the ground at a distance of about 6-8m, all around the excavation area. Usually, after their utilisation, the well point systems are removed from the ground and the equipment can be exploited for new installations. The basic idea developed in the Task 2.6 is to exploit the well point systems by maintaining and adapting the equipment in order to develop shallow coaxial heat exchangers linked to a ground source heat pump as a closed loop system.

In addition, given that the basic idea is to re-use an installation already used in the building site, the adaptation of the well point system was supposed to be very cheap and suitable to be applied in the urban areas, also thanks to the limited dimensions of the excavation machines used. Nevertheless, the length of these probes is very limited (down to about 10 m), therefore it is necessary to check the real energetic performances and benefits of this kind of installation by testing it. For this reason, a pilot site was foreseen at the CNR – ISAC premises in Padova (Italy) where the well point installation provide heating and cooling to a testing building by means of two Heat pumps. The system is completed with a dedicated monitoring system, in order to evaluate the energetic performances of the tested ground heat exchangers.

During the development of the Task, first of all we performed a general survey about the diffusion of the well point systems in all the countries around Europe (each partner in its Country), and about the most used materials, geometries (diameters, depth of installation) and installation techniques (type of ground, size of the machines, costs). This survey was performed in order to check the parameters affecting the installation of these kinds of GSHEs.

Based on the local stratigraphy, the simulations run by UNIPD-DII provided the sizing of the well point system by indicating the number, the length and the geometry (external and internal diameters) of the co-axial probes, in order to provide the requested heat transfer between the ground and the building.

Currently the pilot facility installation has not been completed due to several difficulties caused by the authorization processes provided by the local administration and to the coronavirus prohibitions to perform activities in building sites.

The heat exchangers are made of different materials (carbon steel and stainless steel) and treated with different methods, in order to test their thermal exchange performance and durability in terms of corrosion. The installation procedure applied will indicate the potentials and risks of this kind of installations in the urban context (to be used in Task 6.3 and in the market analysis Task 7.3).

The installation of this system at the pilot facility n.1 in CNR will provide data about its efficiency by means of a dedicated advanced monitoring system. In addition, while installing the heat

exchangers in the pilot facility, the resolutions of the possible issues encountered during the installation help to achieve TRL 7.