Annex II: Relevant geological information found on geological surveys

Hereafter, available information obtained from geological surveys carried out in the study area is presented. The location of these works is specified in ¡Error! No se encuentra el origen de la referencia..

1. Terme Antica Querciolaia (TAQ)

Few years ago the Terme Antica Querciolaia thermal springs enlarged its services adding a covered kneipp walk, a particular walking path with hydrotherapy features. The used healing techniques were developed by Sebastian Kneipp (1821-1897). Before the construction, a geological report has been carried out\(^1\). The relevant information for this thesis consist in a 30m deep borehole (Table 1).

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Stratigraphy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 6,5</td>
<td>Travertines (Tcs or f1b)</td>
</tr>
<tr>
<td>6,5 - 30</td>
<td>Jaspers (DSD)</td>
</tr>
</tbody>
</table>

Table 1. Borehole stratigraphy (pozzo 5).

![Geological section](image)

**Key:** Quaternary deposits: **PO1** - Sands and silty sands marron-pink with granules, locally jasper and travertine intercalations; **Tcs** (f1b): Pale travertines, stratified, stromatolites. Marine Pliocene deposits: **Psa** (PLIs): Yellow silty sands and sandstone poorly cemented; **Pcg** (PLib): Polymictic conglomerates and pebbles poorly selected. Pre-neogen Tuscan succession: **DSD**: Jaspers; **POD**: Posidonomya marls.

2. North Rapolano (NR)

Another geological survey was carried out at North of Rapolano Terme urban area before the construction of residential habitations. The pertinent information for the work is summarised by a borehole (Figure 2). As well, a seismic down-hole test carried out up to 30 meters deep which gives $V_{S30}$ ranging between 325 m/s and 383 m/s.

![Figure 2. North Rapolano borehole information. (left) Schematic borehole; (right-up) Soil description and classification; (right-down) Samples characteristics.](Image)

2 Studio di Geologia Alessandro Lorenzini, ‘Indagine Geologica E Sismica Relativa Al “Progetto Realizzazione Di Un Fabbricato Di Civile Abitazione All’interno Del Lotto B Del Piano Di Lottizzazione "I PIANI" - CTO2 a Rapolano Terme”’, February 2013.
3. **West Rapolano boreholes (S6 and S7)**

It has been possible to retrieve the log records from two boreholes which location is precised in Figure 3.

![Figure 3. West Rapolano boreholes: S6 (left) and S7 (right).](image)

**Borehole S6**

- **0 (240,0)** Agricultural terrain (0.6m thick).
- **0.6 (289,4)** Sandy and pebbly silts, cemented by travertines (1.6m thick).
- **2.2 (286,3)** Yellowish sands with gastropods, lacustrine system (4.3m thick).
- **5.5 (282,5)** Peat on the top gradually changing to grey-blackish clays.
- **9.0 (280,0)** Grey silty clays, few oxidated dark-brown levels.
- **12.5 (276,5)**

**Stratigraphy**  
Depth (elevation)

**Borehole S7**

- **0 (290.0)**
- **0.6 (289.4)**
- **2.2 (286.3)**
- **5.5 (282.5)**
- **9.0 (280.0)**
- **12.5 (276.5)**

- **Bright-brown and whitish travertines, friable (9.1m thick).**
- **Bright-brown sands, partially silty. At the bottom, sands are cemented and some thin travertine levels are present (4.2m thick).**
- **Bright-brown travertines, very friable (5.3 m thick).**
- **Clays, partially silty, intercalated with sands levels, one travertine level (around 19.5 and 21m deep). The bottom is composed by gravels and a silty-sandy matrix (4.3m thick).**
- **Bright-grey travertines, very friable, more compact between 25 and 28m deep (17m thick).**
4. South Rapolano (SR)

A geological survey carried out at Rapolano South \(^3\) contains information about a shallow borehole of 15 meters deep (Figure 4).

\[\text{Figure 4. South Rapolano Borehole stratigraphy and SPT results.}\]