
CASE STUDY

Urban GPR scanning



Real application in an urban context

Non-invasive ground-penetrating radar investigation aimed at preliminary subsurface assessment, evaluation of detected anomalies and support for operational decisions before excavation or work on underground utilities.

**PRECISION
INNOVATION
RELIABILITY**

Case summary

Urban GPR scanning

This document presents a GPR scanning case carried out in a real urban context. The objective is to clearly show the technical workflow: investigated area, site conditions, data acquisition, radargram reading and operational value of the result.

01

Context

Asphalted urban road with visible manholes, inspection chambers and rainwater collection grate.

02

Objective

Acquire a preliminary subsurface reading to identify possible anomalies and interfering underground utilities.

03

Method

Non-invasive GPR scanning and analysis of the acquired radargram through ORION software.

04

Output

Raw radargram, interpreted radargram and summary of evidence useful for operational planning.

Main result

The scan highlighted several radar responses compatible with buried linear or point elements. The detected evidence provides a useful information base for guiding further checks and reducing uncertainty before intervention.

Scanning area

Real site conditions



View of the urban area scanned: asphalt pavement, manholes and rainwater collection grate.

Area investigated

The survey was carried out on an urban street with a visible central manhole, a circular manhole and a rainwater collection grate. The surface configuration provides useful references for reading the operational context.

Site conditions

- Bituminous/asphalt pavement
- Urban context with possible linear underground utilities
- Visible surface elements useful for comparison with the GPR data



Approach

The acquisition was set as a preliminary, non-invasive subsurface check along an indicative scan line.

Operational methodology

The activity was developed according to an orderly and repeatable procedure, aimed at collecting useful data for a preliminary subsurface reading.

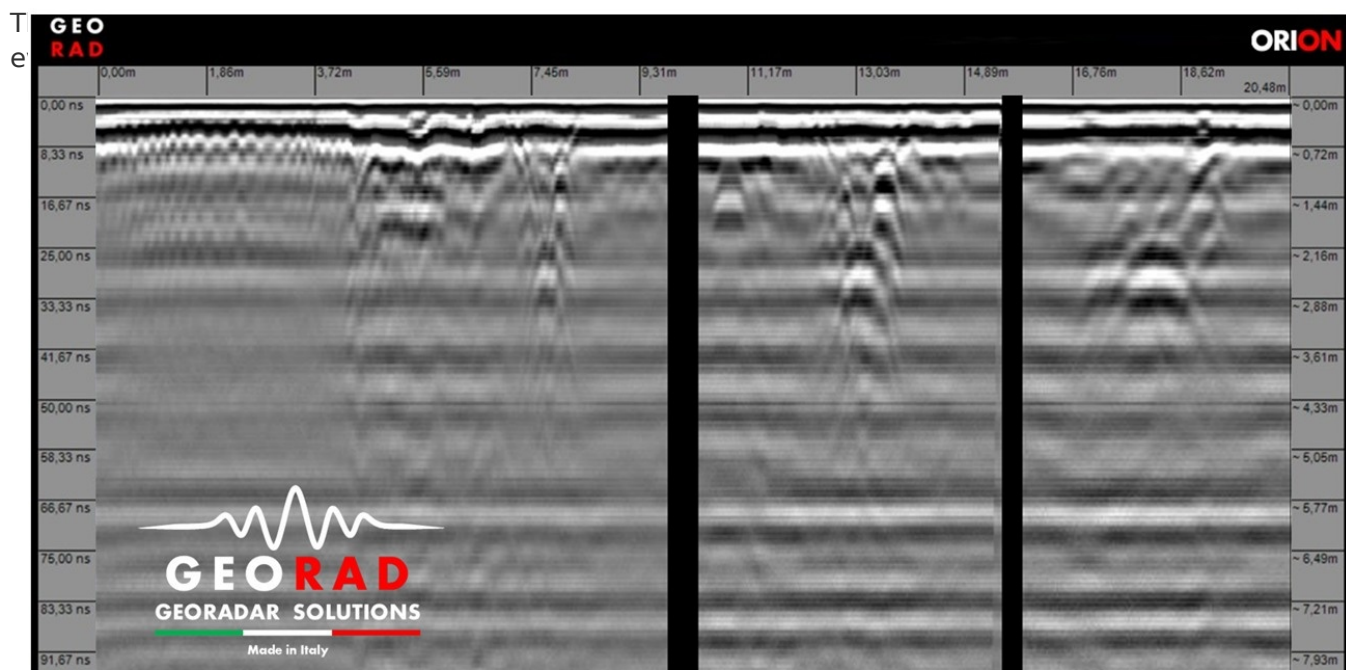
- 1 Visual inspection of the area**
Assessment of site conditions, accessibility and possible surface interferences.
- 2 Scan line definition**
Planning of acquisition lines according to the investigation objectives.
- 3 GPR acquisition**
Execution of the scan along the planned path and real-time control of the data.
- 4 Signal analysis**
Observation of reflections, discontinuities and the main radar responses.
- 5 Preliminary interpretation**
Identification of the most significant anomalies and prudent classification of evidence.
- 6 Result delivery**
Production of technical outputs and a concise summary of the operational indications.



OUTPUT PRODUCED

- Raw radargram
- Interpreted radargram

Acquired radargram



Raw radargram acquired through ORION software along the scan line.

What to observe

- Main reflections and discontinuities
- Patterns attributable to linear or point elements
- Areas of greater interpretative interest

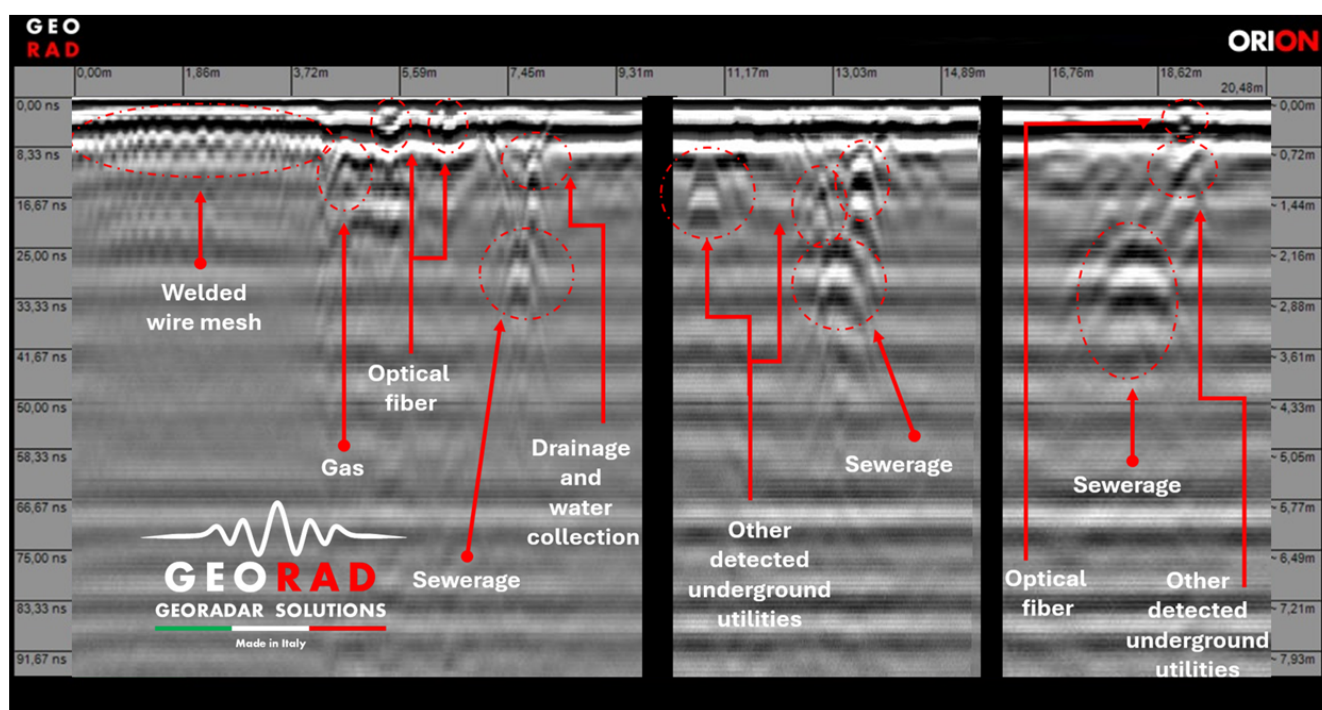


The raw radargram is acquisition data and does not by itself represent a definitive classification of the elements present.

Technical interpretation

Preliminary reading of the main anomalies

The radargram analysis highlights anomalies compatible with the possible presence of buried utilities and other discontinuities relevant to operational decision-making.



Interpreted radargram: labels highlight the principal radar responses of interest.

Key evidence

- Possible drainage or water collection lines
- Possible sewerage lines
- Possible cable ducts or service lines
- Other anomalies compatible with buried utilities

Interpretative note

The proposed classification is preliminary and should be contextualized against any further available evidence.

Reading the anomalies

Labels indicate areas of interpretative interest and probable categories, not definitive classification.

Results and operational value

Urban GPR scanning

01

What emerged from the investigation

- Presence of several anomalies consistent with buried linear elements
- Identification of priority areas for possible further checks
- Useful information base for operational planning

02

Benefits for the client

- Risk reduction before excavation
- Greater awareness during planning
- Support for technical decision-making
- Fast preliminary verification

Value of the method

The GPR investigation provides useful indications without using invasive techniques in preliminary phases. The acquired data supports planning, highlights areas requiring more attention and reduces operational uncertainty before an intervention.



Conclusions

This case study demonstrates the value of GPR scanning in an urban context as a support tool for preliminary utility checks. The non-invasive approach provides useful information for planning interventions with greater precision and less operational uncertainty.

IN SUMMARY

- Real application in an urban context
- Non-invasive acquisition
- Preliminary subsurface reading
- Concrete support for planning

GEORAD supports companies, technicians and public bodies with instrumentation, assistance and training for the correct, practical and conscious use of ground-penetrating radar.

To evaluate a GPR solution or request technical consulting:

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