

# HISTORIC ROAD CONSTRUCTION

Survey using a pulseEKKO IV 100 MHz GPR in step mode. Note the large marker stone in the background. The muddy path is the cattle walkway.



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The whole investigation was completed in 3 to 4 hours with digital data recorded for future data evaluation.

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## Overview

The location of a historic Viking route in Denmark was not well defined. In many places where a road foundation was constructed, the road base was placed in soft peaty soil. The road material was then pushed into the soft soil by the constant traffic, leaving no surface expression.

## Problem

Danish archeologists studying the area wished to determine the old route of the road and precisely determine the construction practice. Further there are likely more marker stones of historic significance in the immediate area.

There is now no surface expression of the old road since the building material have been pushed into the peaty soil and overgrown.

## GPR Contribution to Solution

Using a pulseEKKO IV with 100 MHz antennas, a series of transects were run parallel to a stream to assess if there was a significant subsurface structure. A major structure was found and then profiles were run along the axis of the feature.

The resulting transects showed that material had been pushed down 3 to 4 m into the peat. Strong layering was visible at points along the road axis. A number of localized targets suggestive of marker stones were observed.

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The pulseEKKO IV system used in the original survey two decades ago has been superseded by the pulseEKKO PRO which can be deployed in the same way but has many advanced features and enhancements.

In hind sight, the route for the road was obvious. The cattle

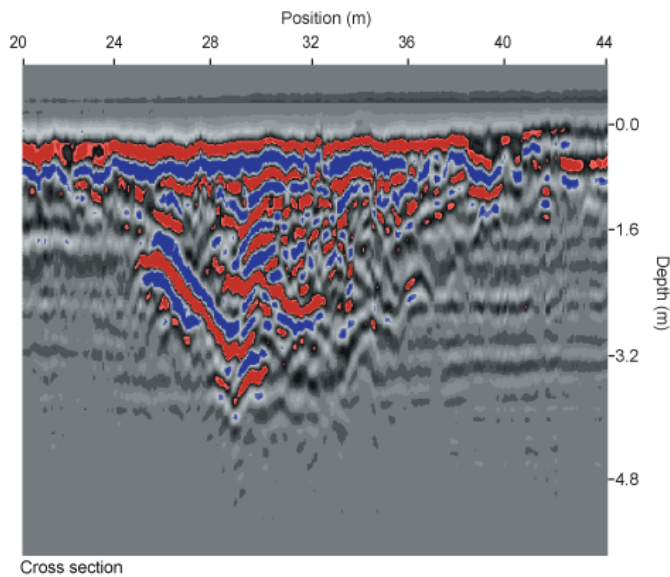
in the pasture used it daily in their traverses to and from the stream as that area of the pasture provided better footing.

## Results & benefits

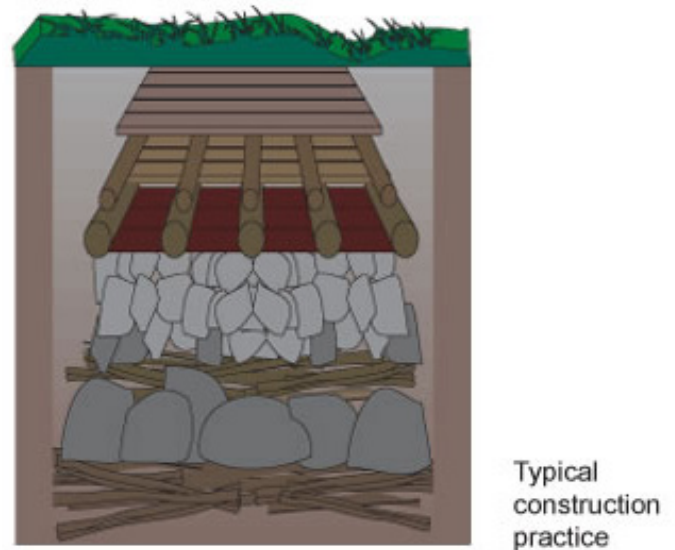
This archeological investigation demonstrates the power of GPR. Some key benefits are:

- Simple-to-use portable GPR equipment enables rapid subsurface investigations
- Real-time data display allows immediate site evaluation and survey adjustment to focus on items of interest.
- when legally permitted, immediate excavation can yield ground truth to corroborate and extend GPR interpretations
- low frequency GPR is very helpful when dealing with high loss environments as this site showed
- digital data recording has allowed the raw GPR data to be saved for further analysis to this day

GPR responses vary greatly depending on the target being sought and the host material. GPR response variability can be challenging to new GPR users. When learning about GPR, the best practice is to review several similar case studies to develop an understanding of variability. Check for other insightful information on the resources tab to learn more. Use Contact Us or Ask-the-Expert to reach our Application Specialists who can help you tap into Sensors & Software's vast array of technical information.



This survey located and defined the internal structure of a 600 year old Viking road in Denmark.



Road construction consisted of laying rocks and timber to stabilize the peat.

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