

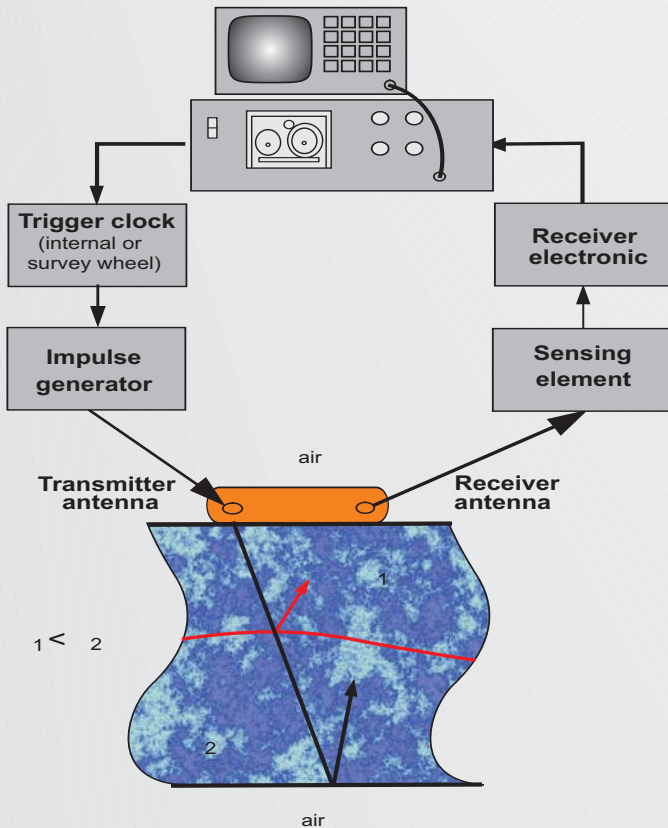
# Non-Destructive Testing in Civil Engineering



## Impulse Radar as a Tool for Structural Analysis

**IMPULSE RADAR** is used to localize internal structures in brickwork and concrete as: tendon ducts in concrete elements, reinforcement, voids, pipes, thickness determination of layered structures, etc..

### The principle

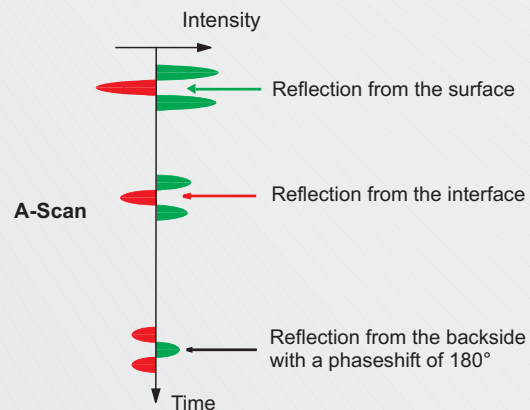


Controlled by a **clock** a very short electrical impulse is generated by an **impulse generator** and is emitted into the building structure by an **antenna**. The emitted impulse will be partially reflected from the **interfaces** of materials with different dielectric properties.

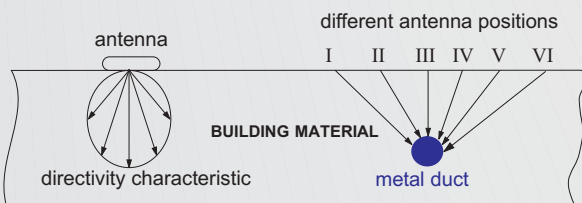
These reflected impulses are received by the **receiving antenna**, recorded by a **sensing element** and preamplified by the **receiver electronic**.

The received impulse intensity will be recorded and assigned to the travelling time (**A-scan**).

With the travelling time and the knowledge of the velocity the position of the reflector can be determined.



### The evaluation



Due to the **opening angle** of the antenna, the transmitted impulse is already reflected even if the antenna is not directly above the reflector. This leads to a typical **hyperbola** which is shown in the figure to the right.

The intensity of the recorded signal will be encoded with different colors or shades of grey. Including many such single scans (**A-Scan**) into one picture, a **B-Scan** is obtained. The data are recorded on a digital tape for further evaluation and documentation.

