

GeoRadar Division

GPR Solution for Bridge Deck Surveying



GPR Applications on Bridge Deck

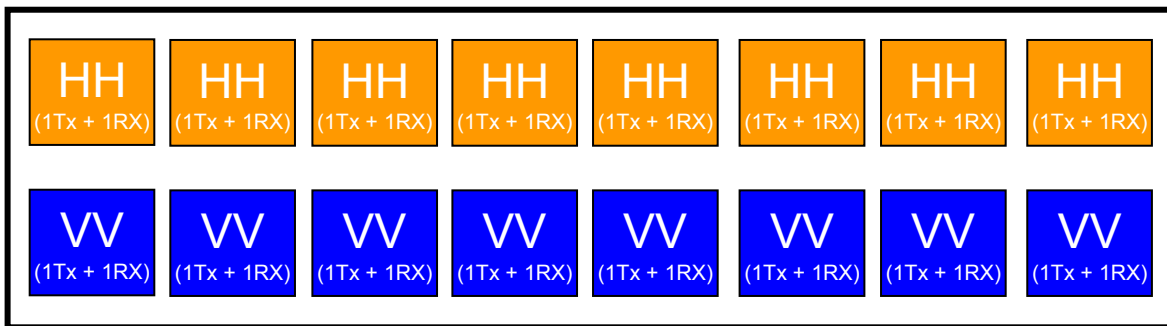
- Measure pavement and concrete slab thickness
- Locate deck slab and protective concrete damages
- Map drainage and other buried pipes
- Determine reinforcement cover depth
- Detect moisture damages



GPR configuration for bridge deck surveying: RIS Hi-Bright

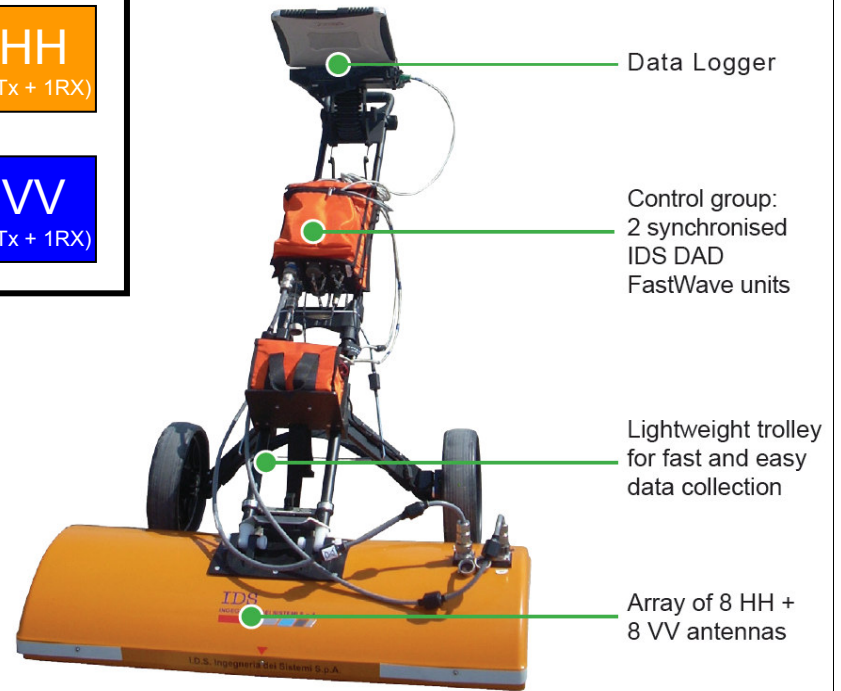
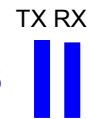
RIS Hi-Bright Antenna architecture

System Composition



VV = polarization of the antenna modules

HH = polarization of the antenna modules



RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (1/9)



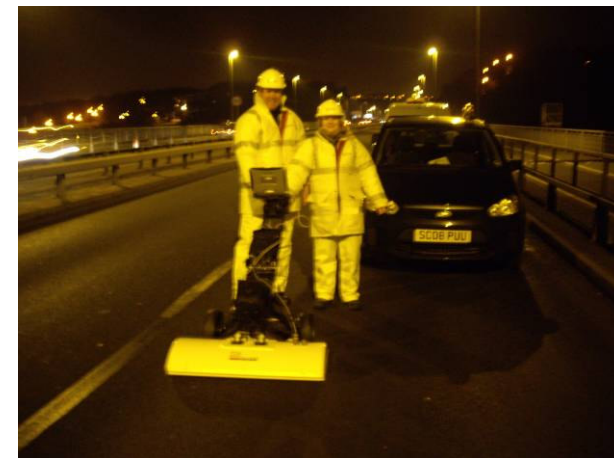
Forth Road Bridge (UK)

GPR survey on the Forth Road Bridge (United Kingdom) to evaluate:

- moisture deterioration in different areas of the bridge;
- deterioration expansion with the depth;
- detection of the different rebar layers.



Areas investigated with Hi-Bright GPR

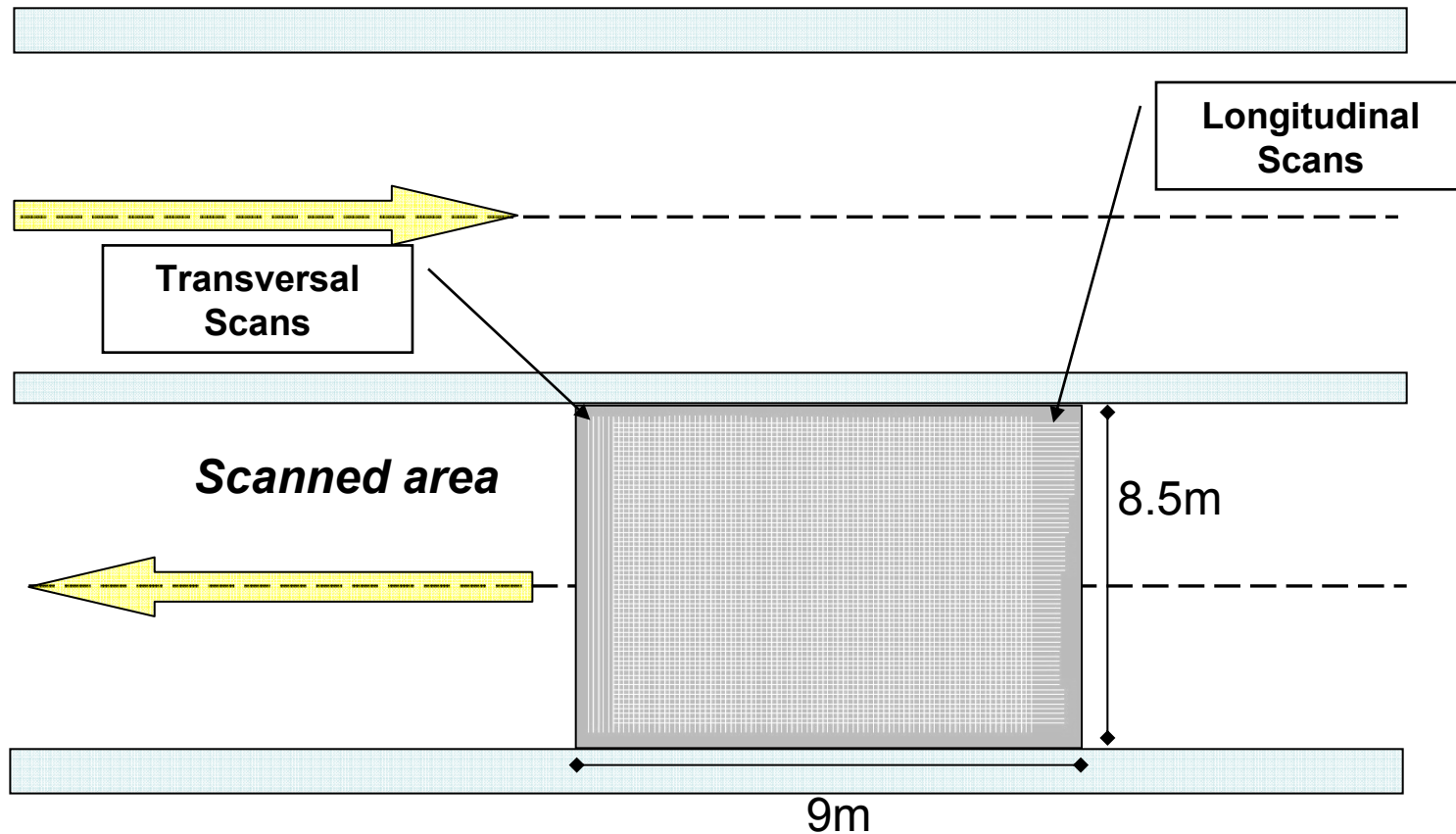


RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (2/9)



Test Area 1- Viaduct

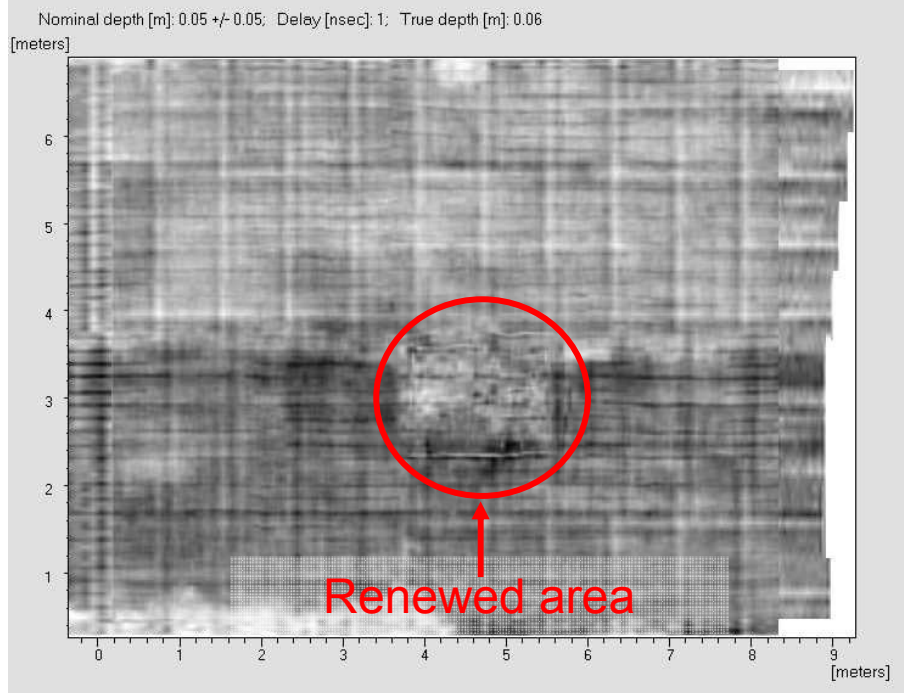
Acquisition grid (Transversal and Longitudinal Scans)



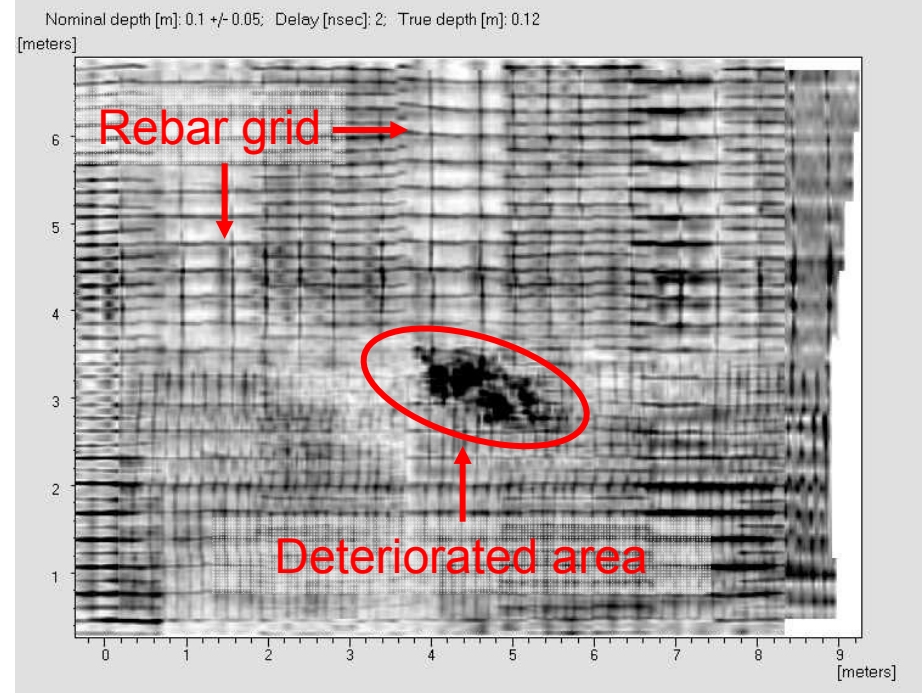
RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (3/9)

Results on test Area 1:

- monitoring of the expansion of the deteriorated area in the depth
- rebar detection



Horizontal cut at 5 cm from the asphalt

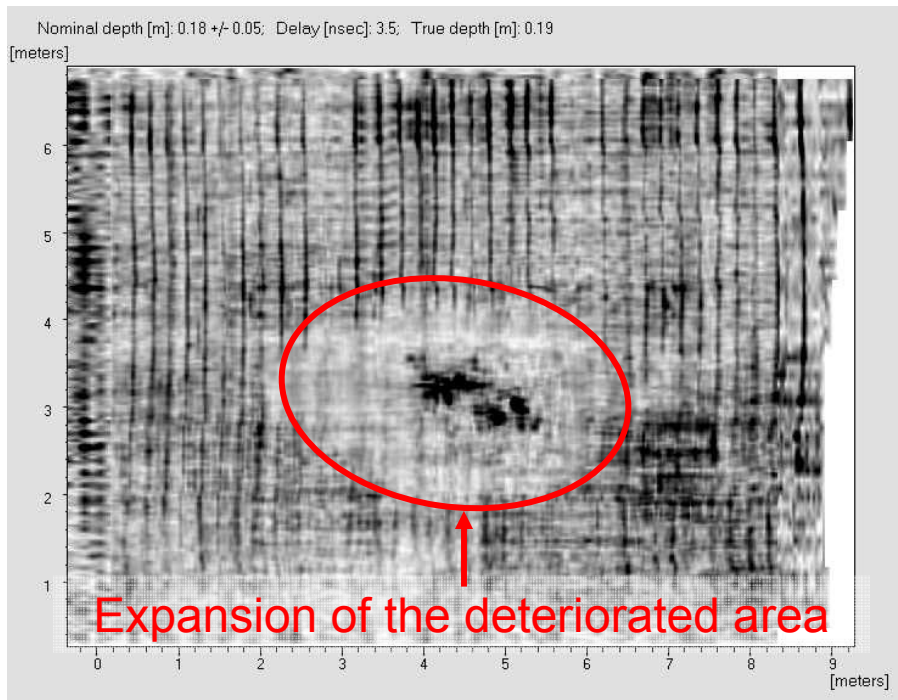


Horizontal cut at 10 cm from the asphalt

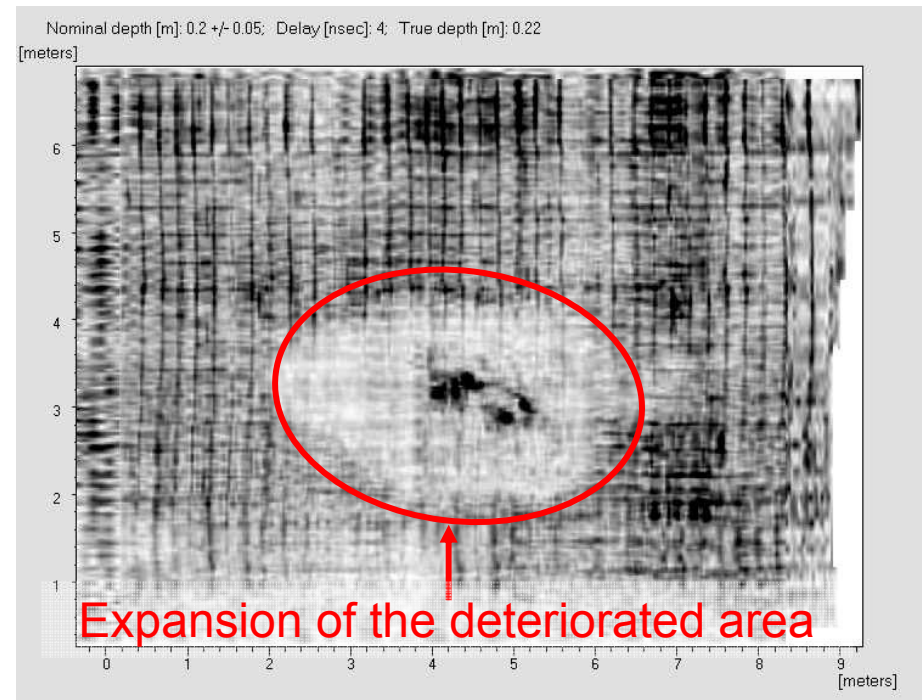
RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (4/9)

Results on test Area 1:

- monitoring of the expansion of the deteriorated area in the depth



Horizontal cut at 18 cm from the asphalt

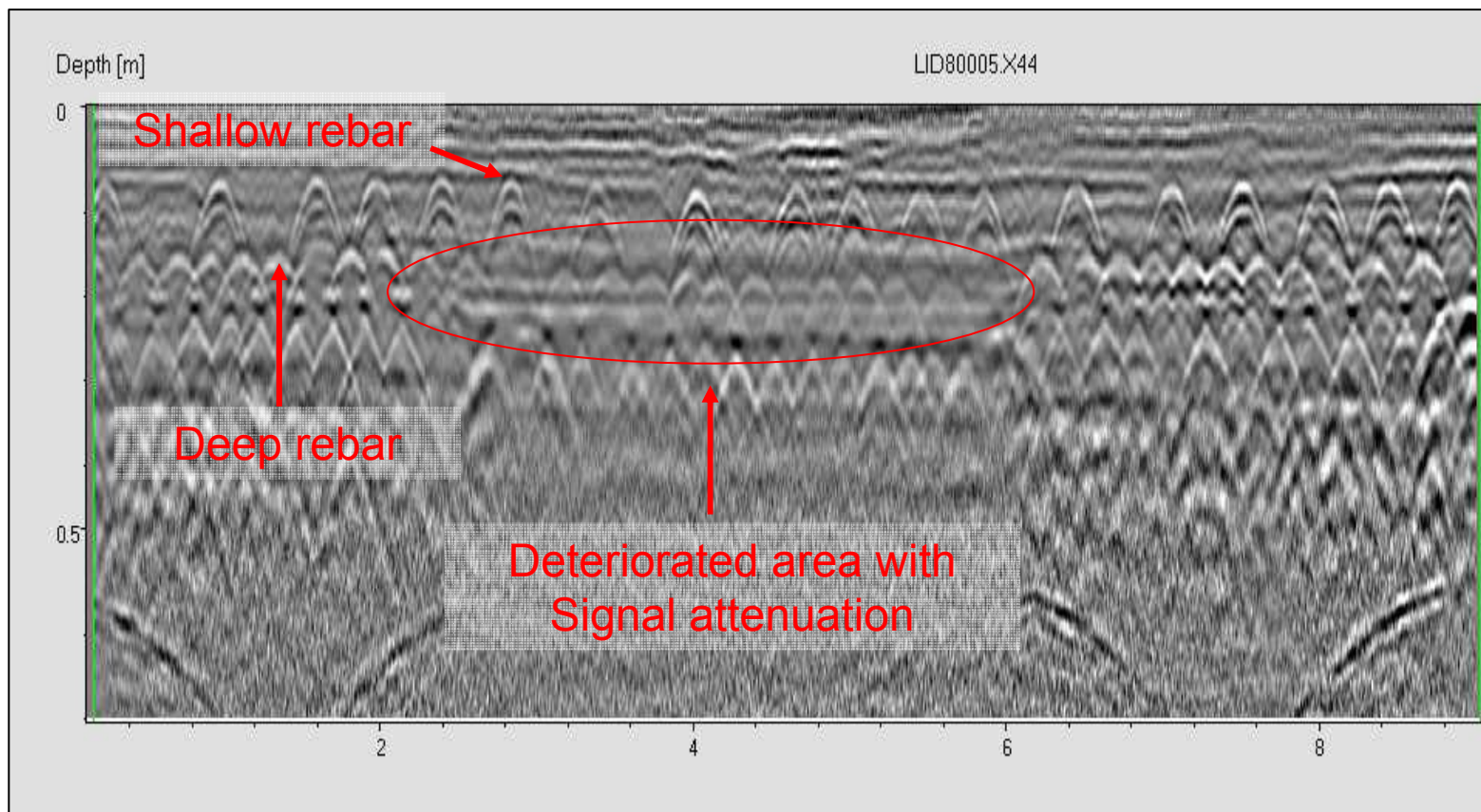


Horizontal cut at 20 cm from the asphalt

RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (5/9)

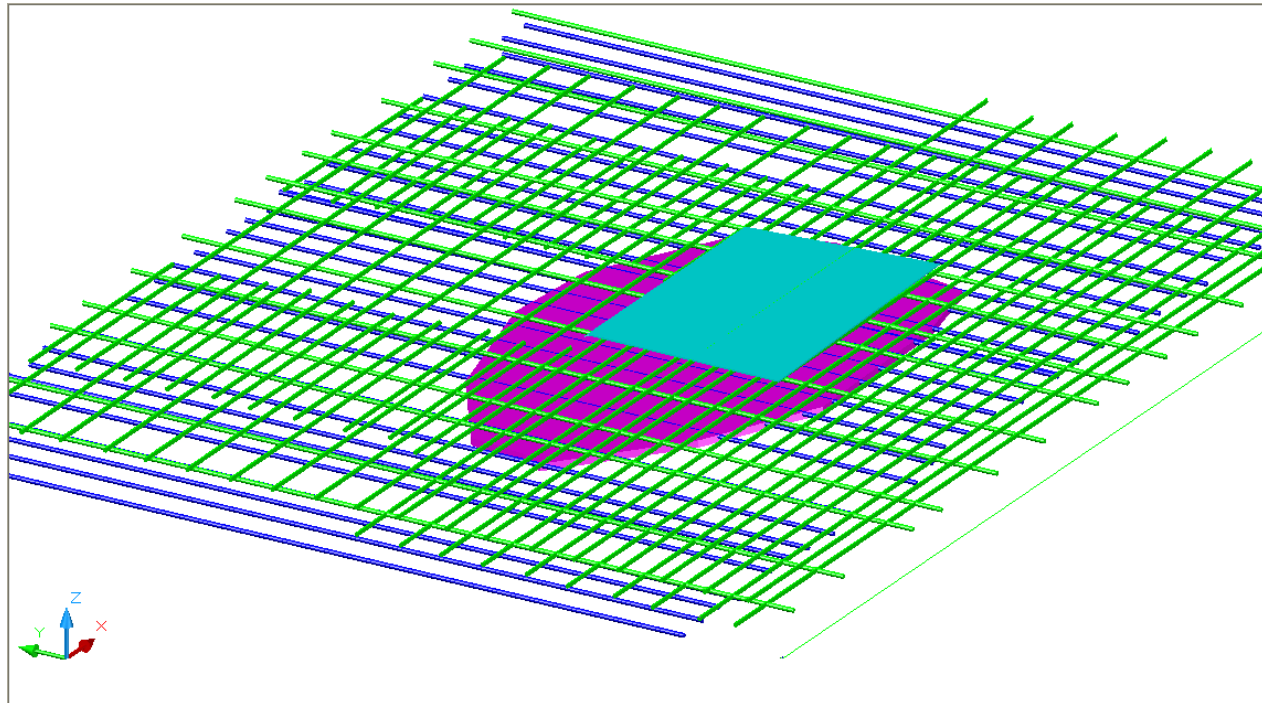
Results on test Area 1:

- Different rebar layers detection on a longitudinal radar section



RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (6/9)

Test Area 1: 3D CAD with the detected structures and anomalies



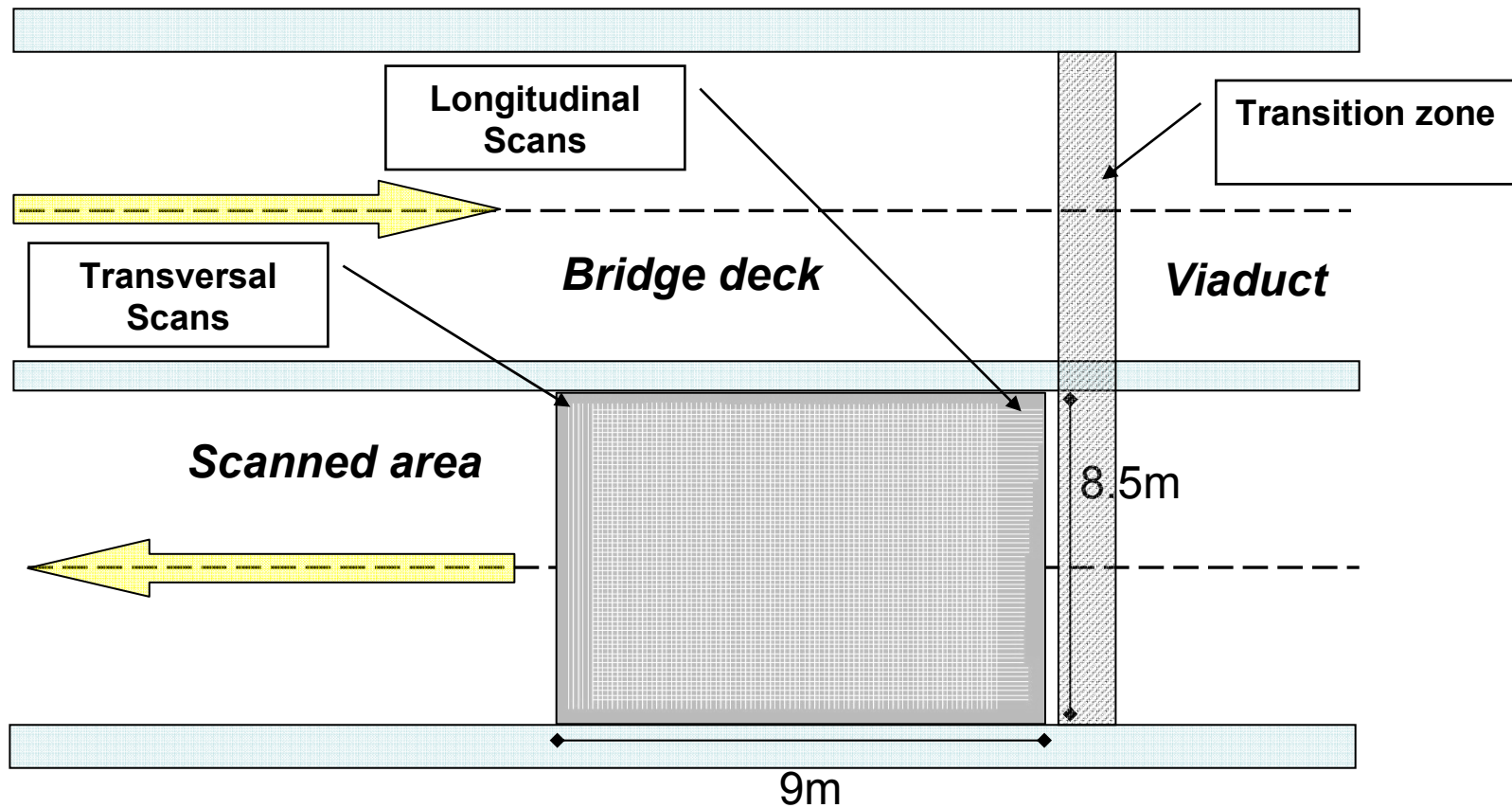
Legend:

- shallow rebar (green)
- deep rebar (blue)
- renewed area (light blue)
- deteriorated volume (pink)

RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (7/9)



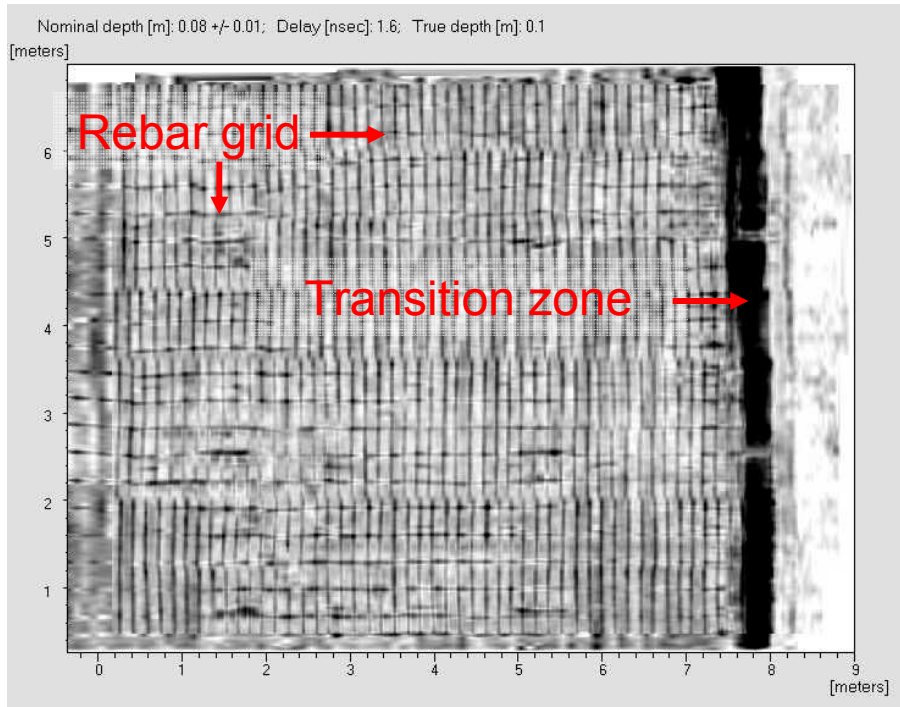
Test Area 2- Bridge deck Acquisition grid (Transversal and Longitudinal Scans)



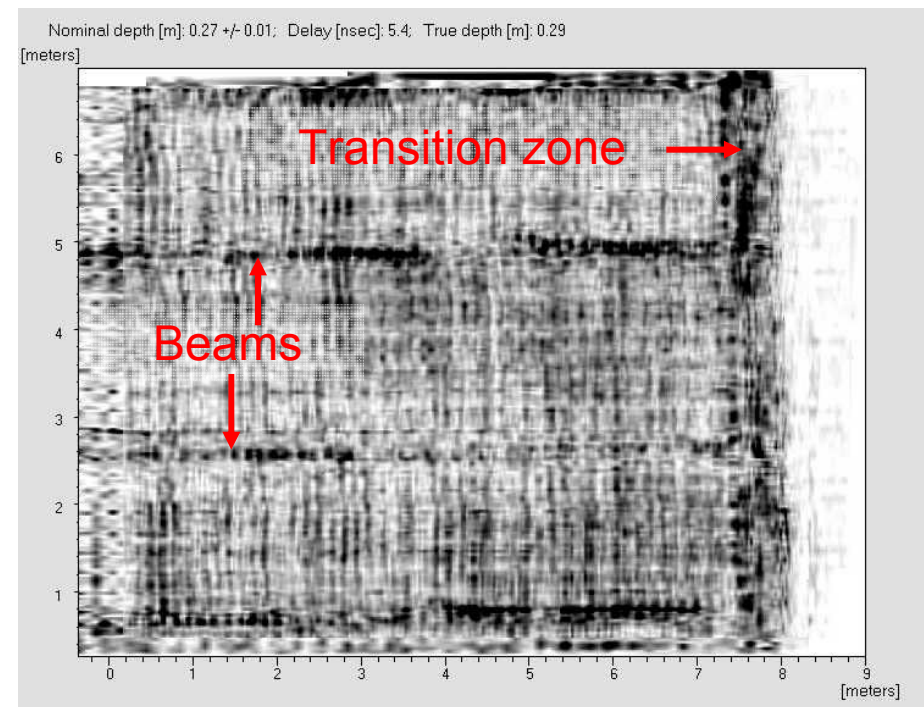
RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (8/9)

Results on test Area 2:

- detection of the transition zone (viaduct-bridge deck)
- rebar detection
- beams detection



Horizontal cut at 8cm from the asphalt



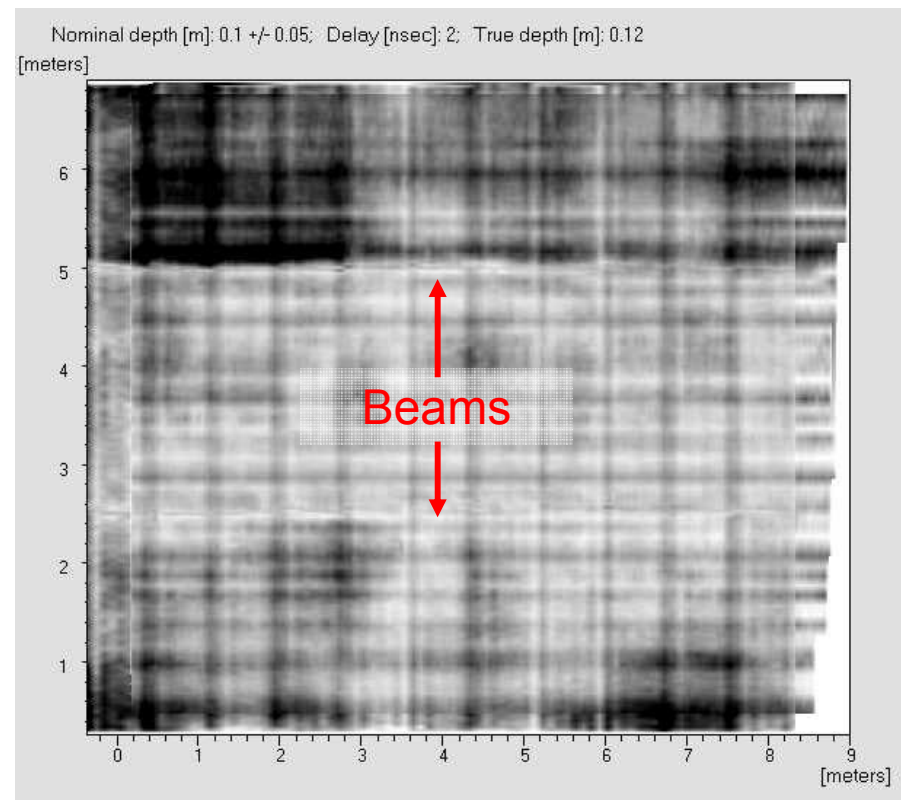
Horizontal cut at 27 cm from the asphalt

RIS Hi-Bright SURVEY ON THE FORTH ROAD BRIDGE (9/9)



Results on test Area 3 - Bridge deck:

- beams detection



Horizontal cut at 10 cm from the asphalt