SOLUTIONS

ScanTubes®

Sites
WATCH OVER YOUR STRUCTURES

Photogrammetric 3D capture and inspection of tube-shaped civil structures

ScanTubes® enabes to survey vertically or horizontally erected tube-shaped civil structures to perform an automated 360° high resolution pictures and extract the 3D geometry via a photogrammetric process.

The system is pushed on a railway or roadway dolly or is hanged to a cable end. It dynamically captures pictures using 12 calibrated digital industrial cameras, up to a 5 km/h speed.

Application

Visual inspection and geometry of road tunnels, rail tunnels, ventilation shafts, mine shafts inner parts of piers, silos, chimneys, wells, penstocks…

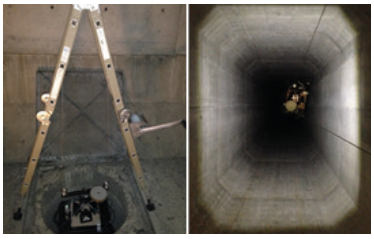
Features

Tube diameter: 0.5 m to 25 m
Rail dolly: standard track gauge of 1435 mm w/o shortcut (adjustable to others track gauges)
Detection threshold: 0.05 mm @ 2 m, 0.2 mm @ 6 m, 0.4 mm @ 10 m
Longitudinal registration accuracy: 0.1 m
Structure lenght: horizontal > no limitation / vertical > 800 m
Speed: horizontal > 5 km/h / vertical > 0.5 km/h
Lighting: flash lights (no hazard for eyes)
Weight: <40 kg (without dolly)

Outcomes

Geo-registered 360° panoramics
Geo-registered orthophotography
Geo-registered 3D models, using photogrammetric processes
Scale maps of defects (cracks, corrosions…)

ScanTubes by SITES



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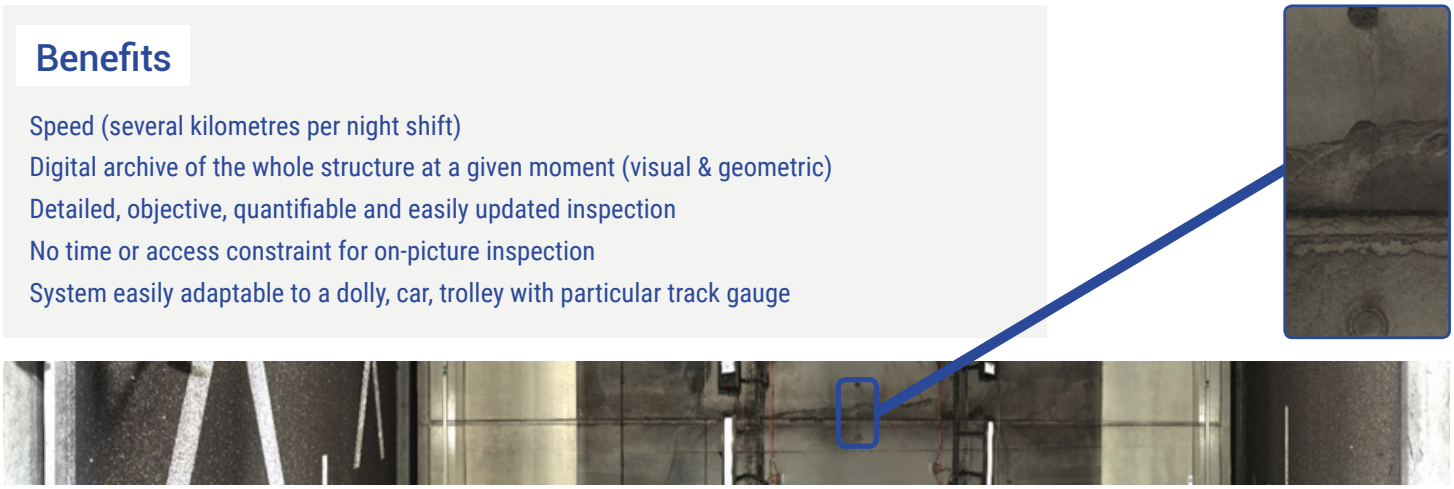
Benefits

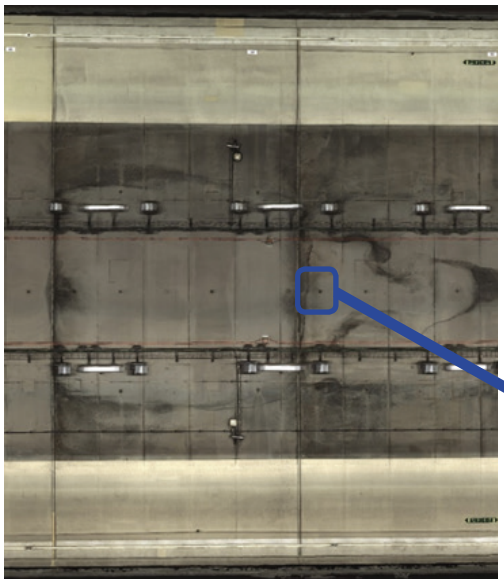
Speed (several kilometres per night shift)
Digital archive of the whole structure at a given moment (visual & geometric)
Detailed, objective, quantifiable and easily updated inspection
No time or access constraint for on-picture inspection
System easily adaptable to a dolly, car, trolley with particular track gauge



Panoramic of a tunnel section (diameter 12 m) – Zoom at the top of the vault

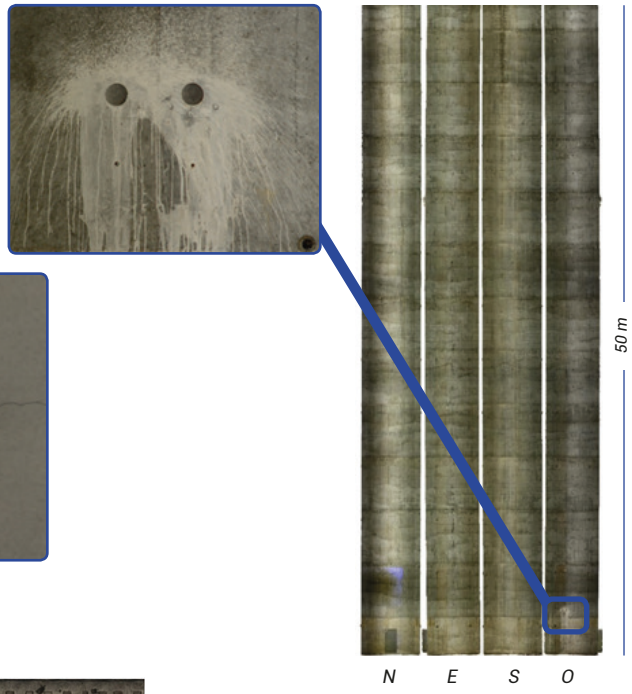
Orthophotography

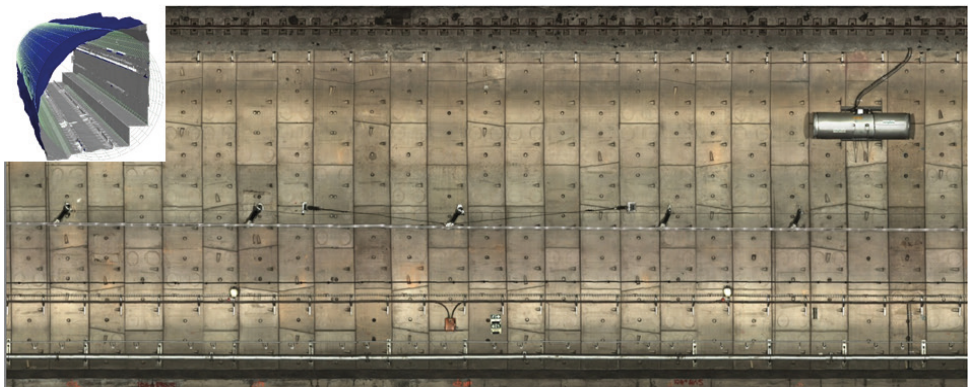
Based on the pictures and 3D models, a scaled full resolution geo-registered orthophotography covering the whole structure is generated. This orthophotography is the based for the scaled digital inspection.



Cylindrical orthophotography of a 20m section of a road tunnel

Elevation of North, East South, West of a bridge pier





Cylindrical orthophotography of a precasted elements of a railway tunnel

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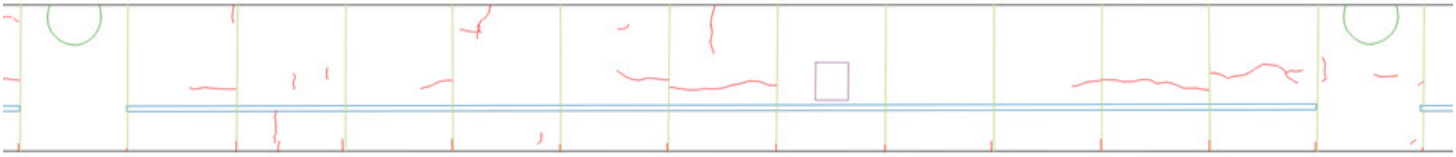
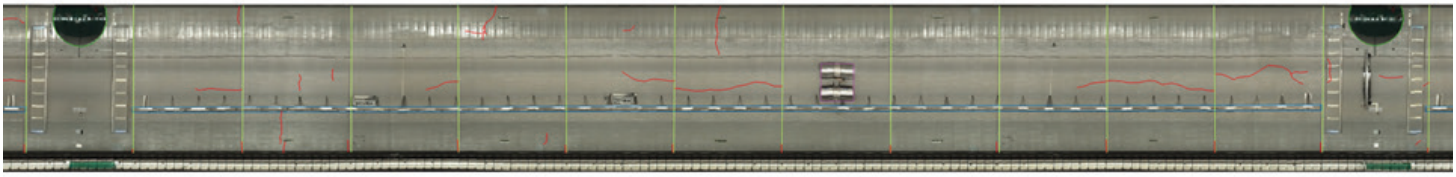
Inspection

Defects reported on CAD software (AutoCAD) and/or GIS (ArcGIS, Qgis)
Measurement of length, width and surfaces
Recordings into a database
Statistics (indicators, distribution, density…)

Cylindrical orthophotography of a road tunnel



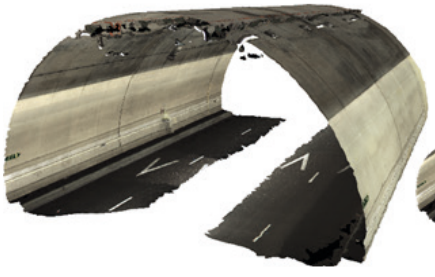
Defect mapping under GIS or CAD environment generated from the orthophotography



Overlay of defects / orthophotography

3D model

Scaled 3D reconstruction based on points clouds and photogrammetric picture processing
No need of 3D scanner. The system works on naturally textured surfaces (in case of uniform surface such a fleshly painted facings, contact us)
Overall accuracy: centrimetric, local accuracy: millimetric



3D textured model of 12 m-diameter tunnel section

3D textured model of a bridge pier inner facing: 4x4 m square section, 50 m depth