



Traun Bridge W4 Steyrermühl

The bridge object is part of the A1 highway and was constructed in 1959. It is composed of 10-spans (reinforced concrete) and has a total length of 240.45 m. A comprehensive dynamic analysis on the present bridge object was conducted by means of BRIMOS[®] Structural Health Monitoring.

As the bridge structure – related with the driving direction Salzburg – was removed (blown) in 2010, the impact of this blasting on the remaining structure (driving direction Vienna) was evaluated in order to ensure its structural safety and operability. The investigation was focused on the primary load-bearing structure (arch).

In 2005 referential dynamic BRIMOS[®] measurements at both load-bearing structures were performed by VCE. Based on these measurements the structural behaviour was analysed in detail. Along with the simultaneously conducted conventional bridge inspection (according to RVS 13.71) this investigation supported the determination and localization of problem zones based on the measured dynamic behaviour of the structure.

In the course of these initial investigations an additional study (consisting of preliminary design, numerical simulation & cost estimation) was elaborated and evaluated concerning different possibilities of structural adaptation due to an aspired enlargement of the bridge's deck width.

Time series for the purpose of comparison:

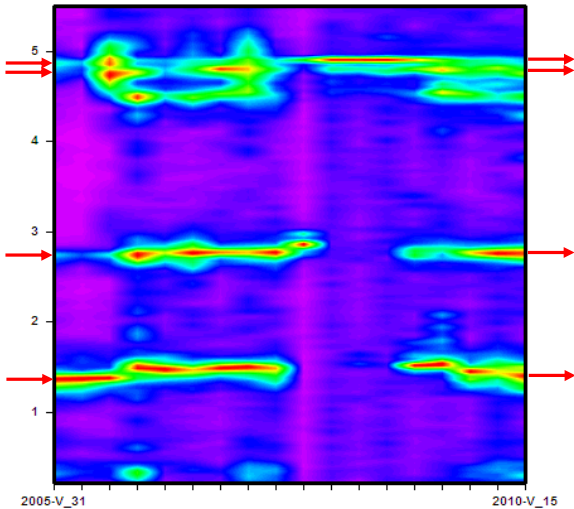
- Regular traffic 2005
- Regular traffic 2010 (saturday evening & night)
- Closed bridge immediately before and after the blasting (sunday morning)
- Regular traffic 2010 (sunday morning)

- Client: ASFINAG Bau Management GmbH
- Location: Steyrermühl, Upper Austria
- Checking Period: 2005 - 2010
- Services: Visual Inspection
Dynamic Measurements (under heavy freight traffic and bridge blasting)
Static Recalculation and cost estimation for different enlargement alternatives
Integral Life Cycle Analysis

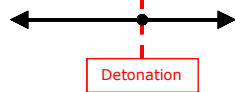
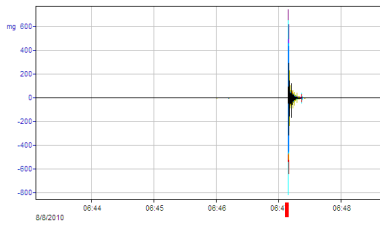
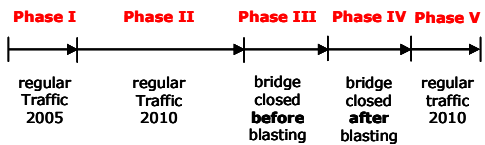




research bridges railways tunnelling monitoring technology management international

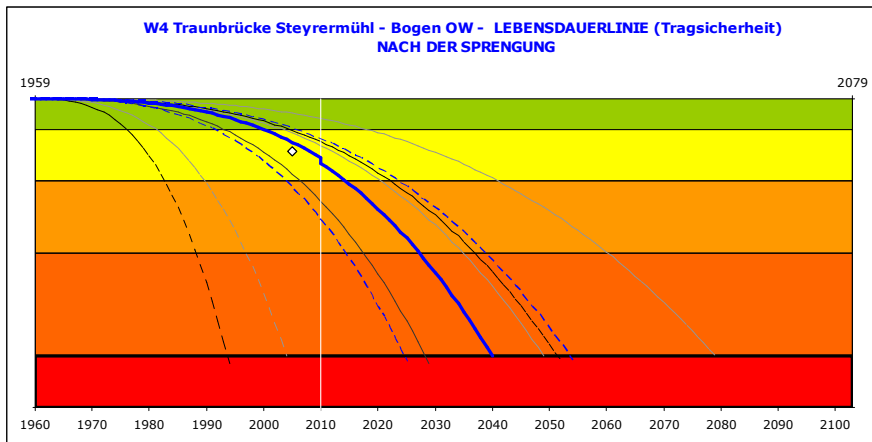


Progression of **measured structural stiffness patterns 2005-2010** (0.2-5.5 Hz) including exposure to bridge blasting and response to heavy freight traffic before and after this exceptional loading case – driving direction Vienna



The prevailing investigation (measurement 2010) was the first follow-up measurement after the initial dynamic measurement with BRIMOS® in 2005.

Measurements at selected single bridge locations (HOT SPOTS) enabled a comprehensive documentation and quantification of the bridge's decisive structural behaviour and possible changes respectively. A direct comparison after 5 years of structural service life shows the progression of the calculated life cycle curve (bridge deck under the influence of traffic load and the bridge blasting) from 1959.



Life - Cycle Analysis including the influence of the exceptional loading case of bridge blasting

BRIMOS® Services conducted:

- | | | | | |
|------------------------------|--|--|---|---|
| Lifecycle Management: | <input checked="" type="checkbox"/> Condition Assessment | <input checked="" type="checkbox"/> Condition Monitoring | <input checked="" type="checkbox"/> Rehabilitation Planning | <input type="checkbox"/> Quality Control |
| | <input checked="" type="checkbox"/> Lifetime Assessment | <input type="checkbox"/> Traffic Analysis | <input type="checkbox"/> Environmental Influences | <input checked="" type="checkbox"/> Risk Assessment |
| Special Measurements: | <input type="checkbox"/> Attendant Monitoring | <input type="checkbox"/> Noise and Vibrancy | <input checked="" type="checkbox"/> Deflection Measurements | <input type="checkbox"/> Seismics |