MONITORING OF BRIDGES FOR CALIBRATION OF LOAD MODELS

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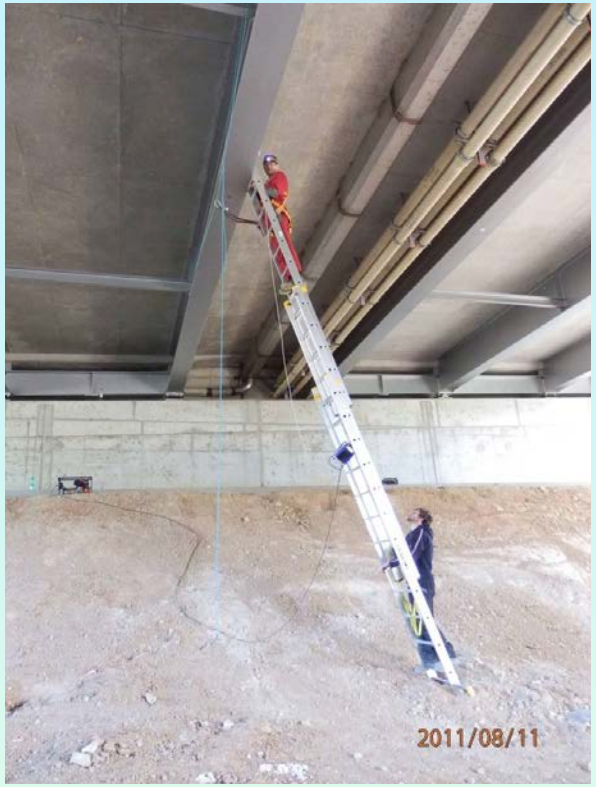
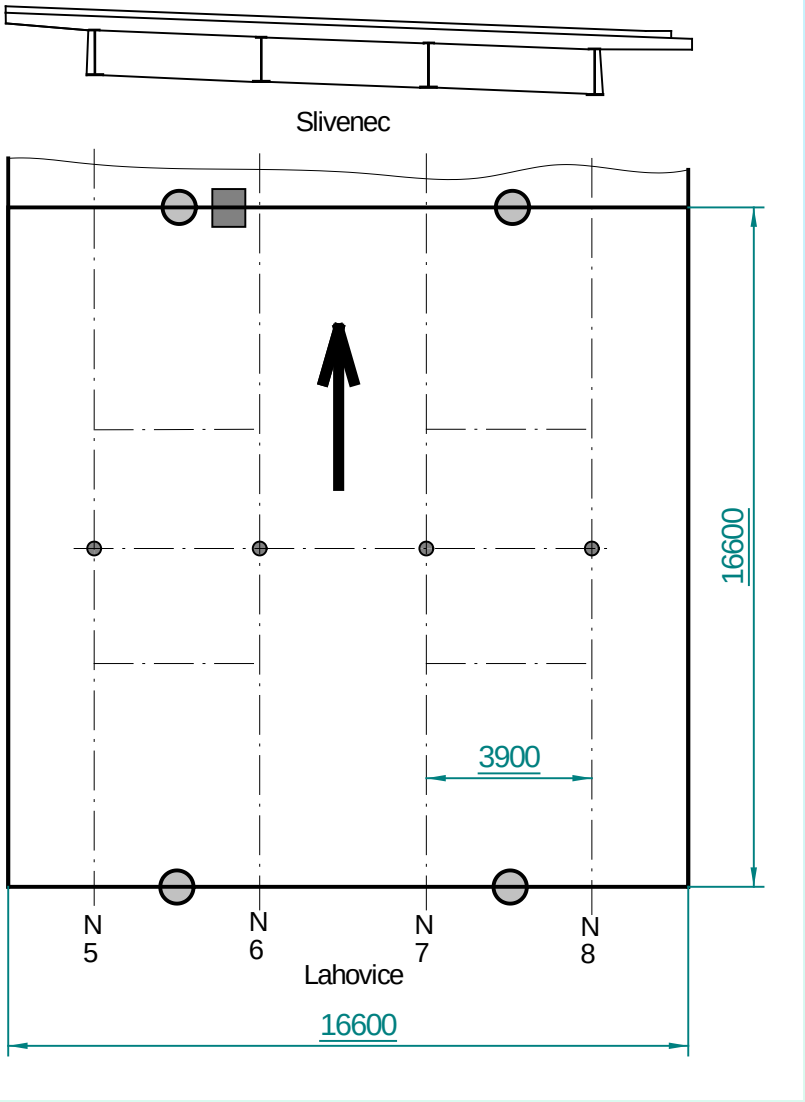
COST Action TU 1402 Quantifying the Value of Structural Health Monitoring

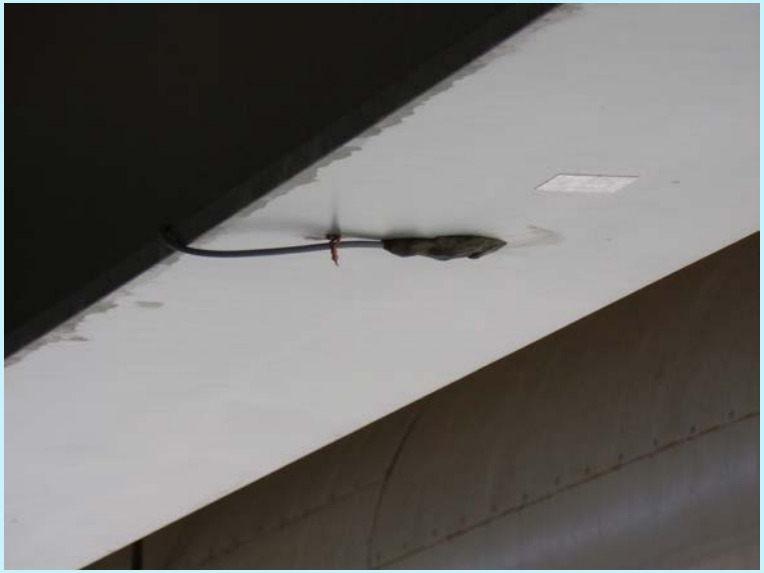
Introduction - motivation

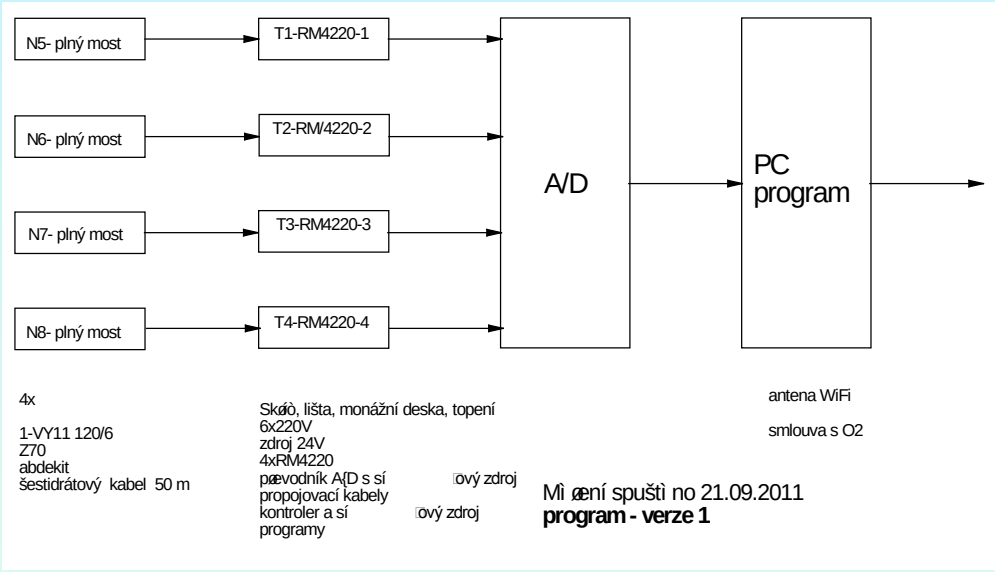
- Implementation of Eurocodes for bridge design
- Need for further calibration of NDPs for traffic models
- Proposal for Amendment of National Annex to EN 1991-2



System of monitoring

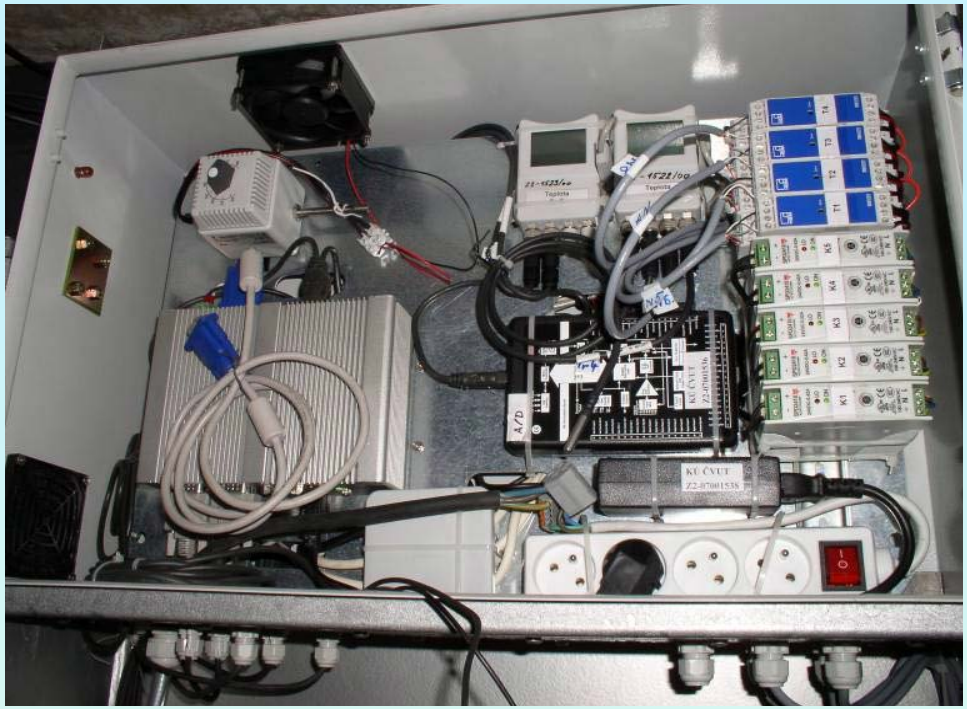






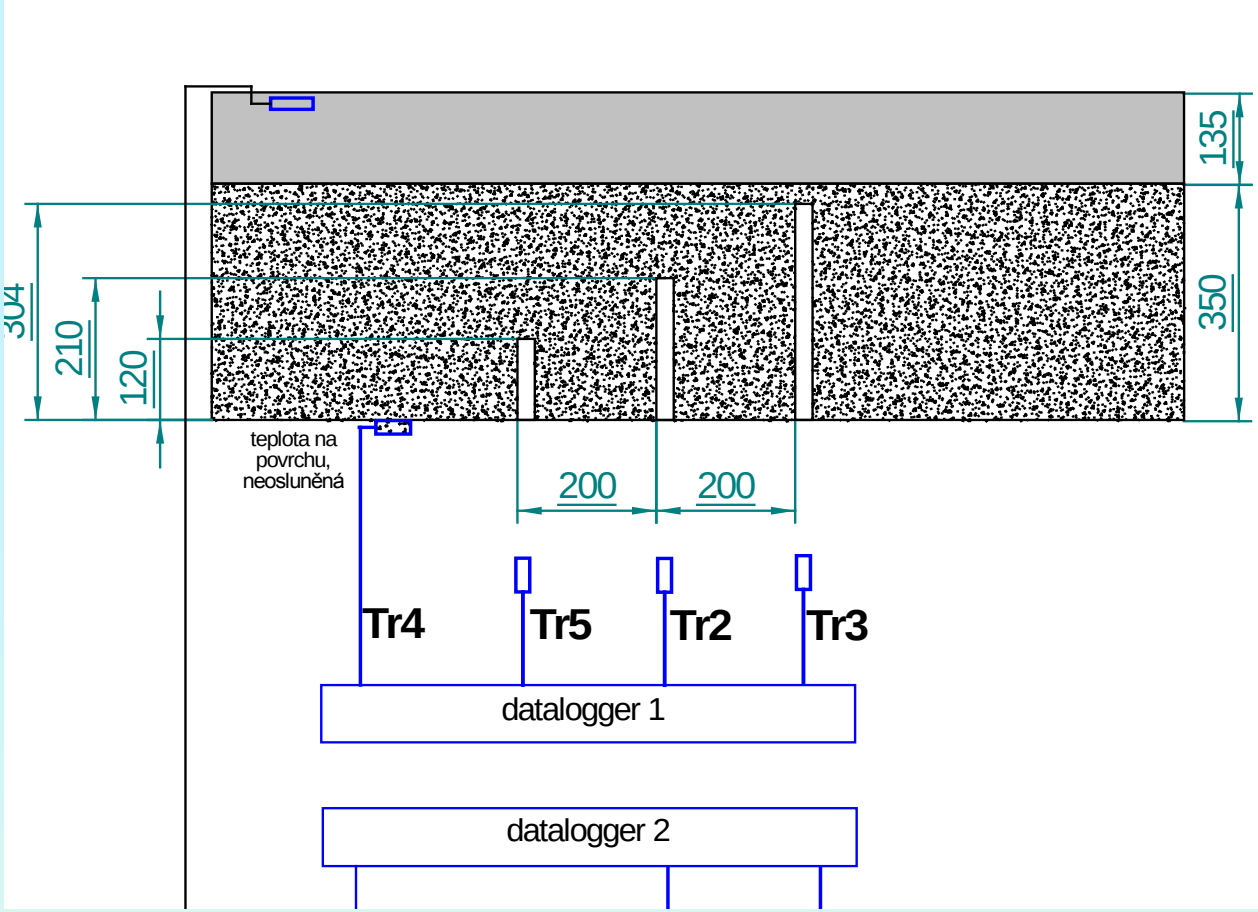
Control unit

location of the unit



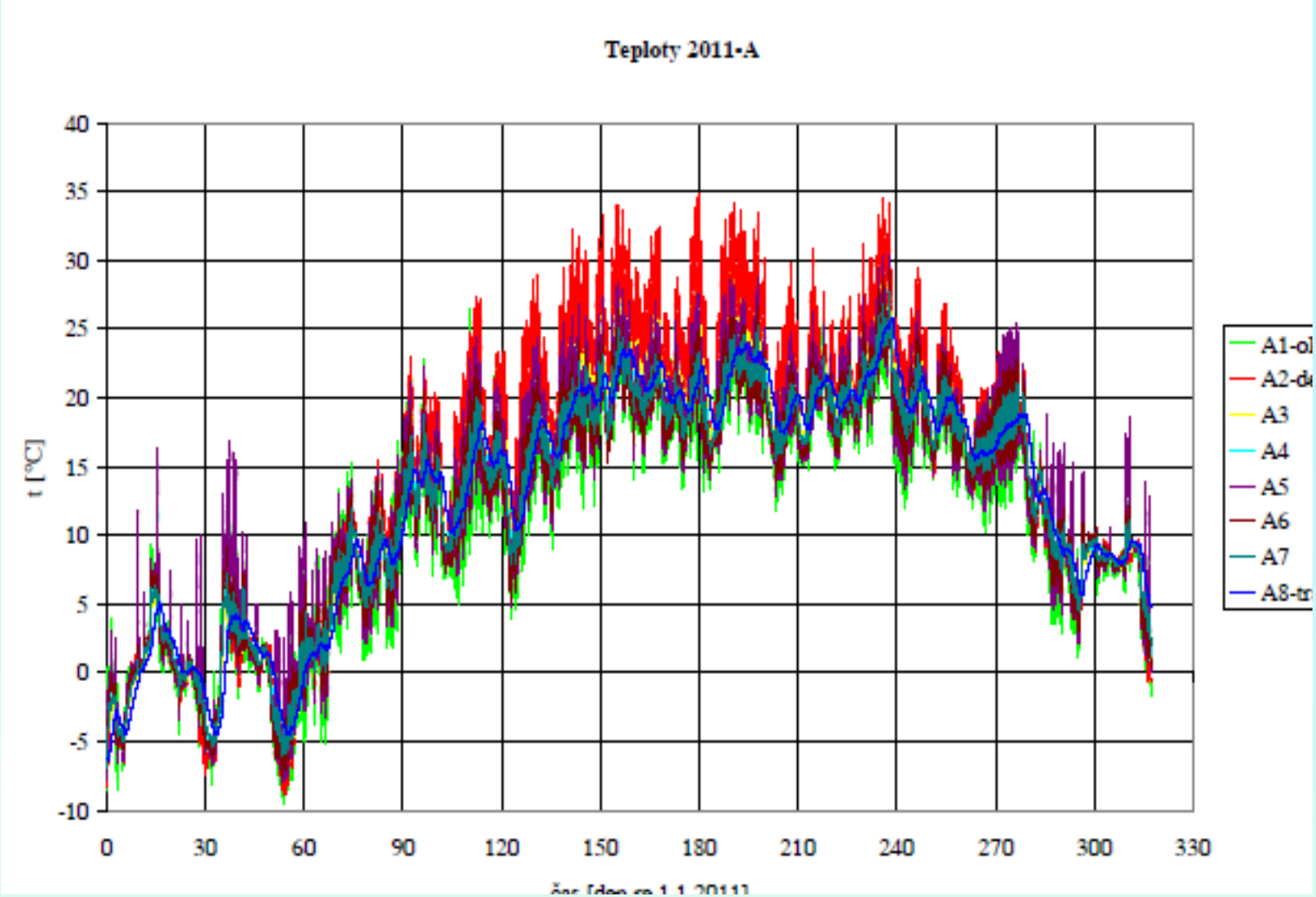
detail view into the control unit

System for measurements of temperatures

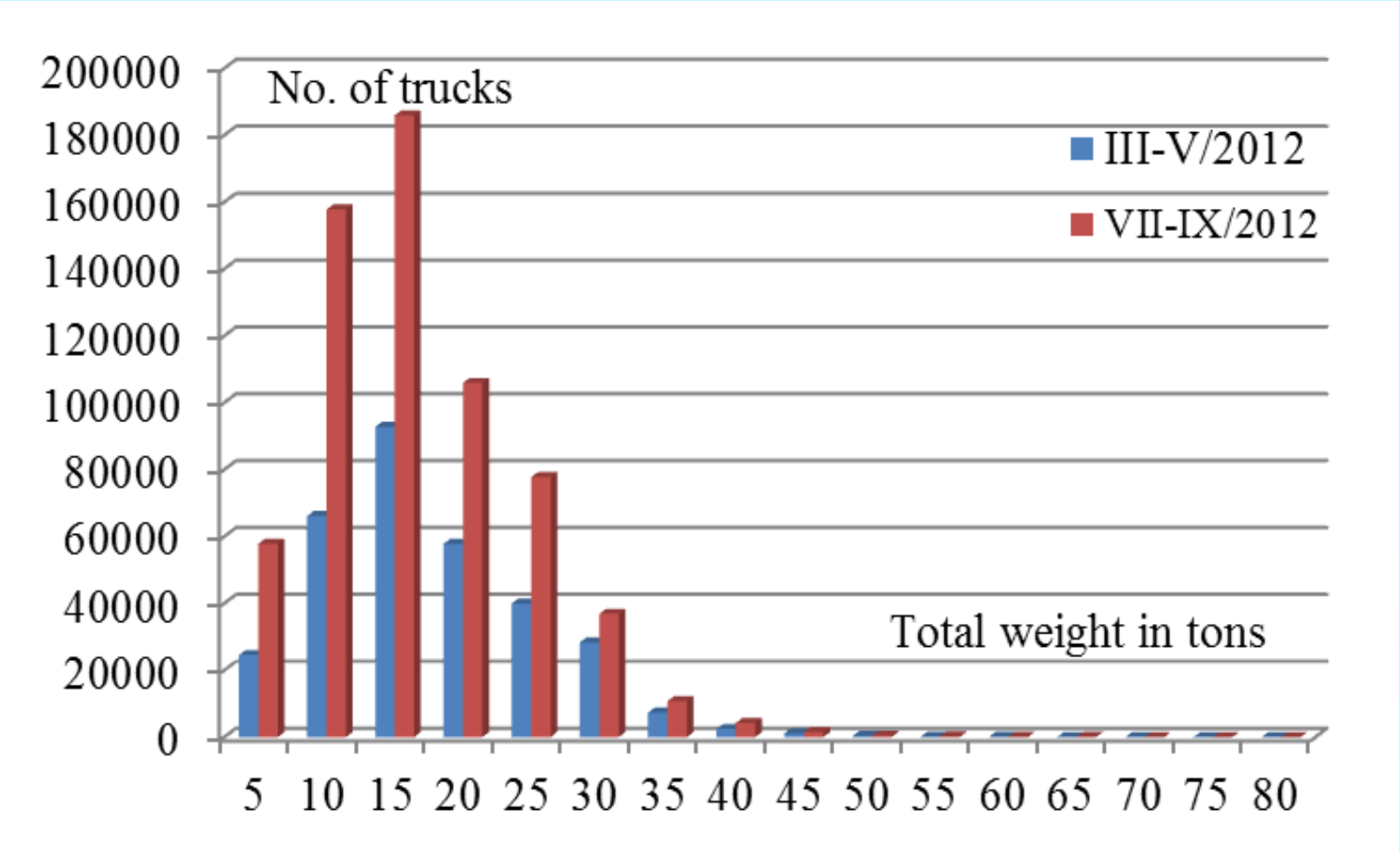


Monitoring of uniform and difference temperature components

Monitoring of temperatures



Assessment of traffic loads



Histogram of a number of vehicles with respect to their total weight considering spring and summer 2012.

Analysis of Load Model 1

Country	Adjustment factors				National selection of LM3
	α_{Q1-3}	α_{q1}	α_{q2}	α_{qn}	
Austria	1	1	1	1	Highways 3000/200
Czech Rep.	0,8	0,8	0,8	0,8	-
- 1st road group	**1**	**1**	**2,4**	**1,2**	1800/200, 3000/240
France, Italy	1	1	1	1	Not defined
Germany	1	1,33	2,4	1,2	Not defined
Finland	1	1	1	1	UDL
UK	1	0,61	2,2	2,2	SV 80,100,196, SOV 250,350,450,600
Netherlands	1	1,15	1,15	1,15	≤ 200 kN
	1,15	1,4	1,4	1,4	

Concluding remarks

- The road traffic and temperatures were monitored and evaluated in two Bohemian bridges from 2011 to 2013.
- Motivation – the first national selection of NDPs for bridge road models did not comply with requirements of current Czech traffic.
- Recalibrated adjustment factors and special vehicles are recommended in the Amendment of National Annex to EN 1991-2.
- Application of the new model LM3 (1800/200, 3000/240) for bridge design has increased the bearing capacity of bridges for the transport of heavy industrial devices or might serve also for military or other purposes.


Thank you for your attention