

## DEPARTMENT OF CONCRETE STRUCTURES AND BRIDGES

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### II. EQUIPMENT

## II.1 Teaching and Research Laboratories

The Department has a separate laboratory facility located in the Trnávka - UNI research complex. We are able to test specimens made from

- concrete (reinforced, prestressed)
- steel
- wood
- mortar

The laboratory is accredited for testing basic concrete mechanical properties.

The maximum size of the samples or structures for testing is up to 12 m in length and 4 m in height.

## II.2 Special Measuring Instruments and Computers

The Department has a computer centre equipped with personal computers and an HP plotter, scanner and INTERNET connection. The teaching process is supported by state-of-the-art CAD-FEM systems.

The laboratory facility has:

- compression - testing machines with a loading capacity from 1.0 N to 6,000 kN
- tension - testing machines with a loading capacity from 1.0 N to 500 kN,
- a reinforced testing slab with anchorage holes (one hole has a 500 kN loading capacity, and the distance between the holes is 750 mm),
- a hydraulic loading system with hydraulic jacks (250 kN – 2,000 kN; the working pressure is 20 MPa),
- a stress gauge measuring PC centre with 64 channels with 4 wire connections,
- a universal measuring PC centre with 100 channels for stress gauges and 20 channels for displacement sensors.

## III. TEACHING

### III.1 Graduate Study

#### Obligatory subjects

Subject	Semester	Hours Per Week		Lecturer
		Lectures	Seminars	
Design of Concrete and Masonry Members	4	3	2	J. Bilčík, Ľ. Fillo
Concrete and Masonry Members	5	2	1	Ľ. Fillo, J. Bilčík
Reinforced Concrete Structural Members	6	3	3	Š. Gramblička J. Halvoník
Reinforced Concrete Structural Systems	6	3	3	I. Harvan, M. Čabrák
Concrete Structures I	6	3	2	I. Hudoba
Concrete Structures	6	3	2	J. Bilčík
Concrete Structures II	7	2	2	I. Hudoba

Prestressed Concrete	7	2 - 2	I. Harvan
Concrete Bridges	8	3 - 2	Ľ. Bolha
Reinforced High-Rise and Long-Span Structures	8	2 - 1	A. Iyad
Special Problems in Concrete Structures I	9	2 - 2	J. Cesnak
Lifespan and Repair of Concrete Structures	10	2 - 2	J. Bilčík, M. Chandoga
High-Rise Concrete Structures	10	2 - 2	Š. Gramblička
Realization of Concrete Structures	10	2 - 2	I. Hudoba, M. Chandoga
Preparation of the First Degree Thesis	10	0 - 10	F. Hájek
Special Problems in Concrete Structures II	10	2 - 1	I. Harvan

### Optional Subjects

Subject	Semester	Hours Per Week		Lecturer
		Lectures	Seminars	
CAD in Concrete Structures	7	2 - 1		J. Šoltész
Precast Concrete Structures	7	2 - 1		M. Čabrák
Masonry Structures	10	2 - 2		M. Čabrák
Time-Dependent (Rheological) Effects in Concrete Structures	9	2 - 2		Ľ. Bolha
Special Concrete Structures	9	2 - 2		F. Hájek, M. Chandoga
Failure of Concrete Structures	10	2 - 2		J. Cesnak
Experimental Testing of Concrete Structures	10	2 - 2		V. Priechodský

### Recommended subjects

Subject	Semester	Hours Per Week		Lecturer
		Lectures	Seminars	
Flat Plate Slabs	8	2 - 2		F. Hájek
Composite Structures	9	2 - 2		Š. Gramblička

## **IV. RESEARCH TARGETS**

The research activities of the Department are targeted at new design methods for reinforced, prestressed and composite structures, methods of renovation of building structures and bridges and utilisation of high-performance and fibre concrete for concrete structures and precast elements.

## **V. RESEARCH PROJECTS**

1. Effect of the Time Factor on Design Methods and Renovation of Building Structures (2000-2002). Head of Project: J. Bilčík
2. Design analysis of RC flat slabs prestressed by unbounded tendons and reinforced by dispersed steel fibers (2001-2003). Head of VEGA Project (1/8329/01): Ľ. Fillo

## **VI. COOPERATION**

## VI.1 Cooperation in Slovakia

1. Cooling Towers Bohunice
2. VUIS - Bridges
3. ZIPP Bratislava
4. SSC Bratislava
5. Slovak Chamber of Civil Engineers
6. Doprastav Bratislava
7. Slovak Academy of Science
8. VVÚPS-NOVA Bratislava
9. VUJE Trnava
10. VUEZ Levice
11. Ministry of Foreign Affairs of the Slovak Republic
12. Nuclear Regulatory Authority of the Slovak Republic
13. Slovak Electric Power Company
14. SLOVALCO Corp.

## VI.2 International Cooperation

1. Czech Concrete Association
2. *fib* - TG 1.1 Design Applications – L.Fillo Task group member
3. Klokner Institute ČVUT Prague, Czech Republic
4. Faculty of Civil Engineering, VUT Brno, Czech Republic
5. ETH - Laboratory for Building Materials, ETH Zürich, Switzerland
6. Institut für Baustatik und Konstruktion, ETH Zürich, Switzerland
7. Baustoffinstitut, TU Munich, Germany
8. Institut für Massivbau und Baustofftechnologie, University of Leipzig, Germany
9. Katedra Budowy Mostow Politechniki Slaskiej, Gliwice, Poland
10. Department of Civil and Materials Engineering, University of Illinois at Chicago, USA
11. RIB Bausoftware, Stuttgart, Germany
12. Deutscher Ausschuss für Stahlbeton, Berlin, Germany
13. Betosan, s.r.o., Prague, Czech Republic
14. Siemens, A.G.
15. Seidl & Partners, G.m.b.H., Regensburg, Germany
16. European Commission, DG Research, Brussels, Belgium
17. Imperial College for Science, Technology and Medicine, London, U.K.
18. St. Paul University, Brussels, Belgium
19. Fachhoch Schule Braunschweig – Wolfenbütel, Germany
20. Institut für Massivbau, TU Darmstadt, Germany

### VI.2.1 Visitors to the Department

- Univ.Prof.Dipl. - Ing. Dr.-Ing. M.Eng. Johann Kollegger, Vienna University of Technology, Austria
- Prof. Ing. J. Procházka, PhD., ČVUT Prague, Czech Republic

### VI.2.2 Visits of Staff Members and Postgraduate Students to Foreign Institutions

L. Fillo – Meeting of TG 1.1 *fib* Madrid 20-23 Nov. 02

## VII. THESES

### VII.1 Graduate Theses

No.	Student's Name	Title	Supervisor
1.	Blahová Ingrid	Slovak Insurance Company Building: Cast-in-Place RC Construction with Shear Walls	I. Harvan
2.	Natšín Vladimír	Tax Office Building: Cast-in-Place RC Wall Construction	I. Harvan
3.	Valach Pavol	Hotel Poprad: Cast-in-Place RC Wall Construction	I. Harvan
4.	Hrnčiar Erik	Realization Project – Part: Statics-Multifunctional Sectional Block of Flats	M. Čabrák
5.	Macák Peter	Realization Project – Part: Statics-Hotel	M. Čabrák
6.	Meško Patrik	Realization Project – Part: Statics - Housing Construction at Terrace - Building	M. Čabrák
7.	Borzovič Viktor	Multifunctional Building: Cast-in-Place RC Construction	I. Abrahoim
8.	Grešlík Pavol	Hotel: Cast-in-Place RC Wall Construction	I. Abrahoim
9.	Šikyňová Anna	Autosalon, Rožňavská St.: Cast-in-Place RC Construction	I. Abrahoim
10.	Kurina Tomáš	Bridge from Precast Concrete Built by Free Cantilever Method	Ľ. Bolha
11.	Meždej Gabriel	Prestressed Railway Bridge at km 24,599 at Pezinok - Šenkvice Track Section	J. Halvonik
12.	Michálek Patrik	Flat Slab Structure	F. Hájek
13.	Pavelka Radoslav	Multi-Span Bridge Built from Prestressed Precast Beams Coupled with Monolithic Reinforced Concrete Slab	Ľ. Bolha
14.	Varga Miroslav	Underground Large-Capacity Garage Equipped with Water Fire Tank	Š. Gramblička

## VIII. OTHER ACTIVITIES

### VIII.1 Special Lectures

- [1] FILLO, L.: Concrete High-Rise Building Subjected to Impact of Aircraft. Faculty of Civil Engineering SUT Bratislava. 10 April 2002

## VIII.2 Commercial Activities for Firms and Institutions

1. Cesnak, J.: Statical Assessment of Reinforced Concrete Floor for INTERFRUCT Trenčín
2. Fillo, L. - Halvoník, J.: Load Capacity of Road Bridges
3. Hudoba, I. – Bartók, A.: Construction Stages of Load-Bearing Reinforced Concrete Structure of Germination Silos and Technical Procedure for the Casting Design
4. Hudoba, I.: Assessment of the Construction Failure of the Laboratory Building at SLOVACO Corp.
5. Hudoba, I.: Evaluation of the Service Life of Fibre-Reinforced Containers

## IX. PUBLICATIONS

### IX.1 Journals

- [1] BAJZA, A. – HUDOBA, I.: Concrete Technology in Former Eastern European Countries: Challenges and Opportunities, Material Sciences of Concrete, The American Ceramic Society, Cement and Concrete – Trends and Challenges, pp. 45–56
- [2] BELLOVÁ, M.: Masonry Structures without Reinforcement Subjected to Lateral Load. Projekt a stavba, Vol. 4, 2002, No.12, pp. 24-26 (in Slovak)
- [3] BILČÍK, J. - HUDOBA, I.: Investigation of Concrete Structures Damaged by Cracks, Beton, Technologie, Konstrukce, Sanace, No.2, 2002, pp. 46-49 (in Slovak)
- [4] BÚCI, M. – HUDOBA, I.: Reinforced Concrete Structure of the Malt Germination Silos at the Hurbanovo Brewery, National Report of the Slovak Republic for *fib* 2002 Osaka Congress, Inžinierske stavby 2002, pp. 52–56
- [5] FABO, P. - JAROŠEVIČ, A. - CHANDOGA, M.: Health Monitoring of Steel Cables, National Report of the Slovak Republic at First *fib* Congress 2002, Osaka, Inžinierske stavby 3/50, 2002, pp. 45-51
- [6] GRAMBLIČKA, Š.- HALVONIK, J.: Reinforced Concrete and Prestressed Concrete Traction Poles, Journal: Project and Construction, Bratislava December 2002 (in Slovak)
- [7] HUDOBA, I.: Fibre-Reinforced Concrete – Structural Material of the Future, EUROSTAV 7/2002, pp. 8–10 (in Slovak)

### IX.2 Books and Textbooks

- [1] FILLO, L. et al.: Eurocodes 2-4-6 for the Design of Building Structures. ES SUT 2002, 386 pp. (in Slovak)

### IX.3 Conferences

- [1] BARTÓK, A.: Analysis of Design of Locally Supported Flat Slabs for Punching According to prEN 1992-1-1 and STN 73 1201. In: Proceedings of the Concrete Days 2002, Bratislava September 2002, pp. 49-54 (in Slovak)
- [2] BELLOVÁ, M.: Methods of Increasing the Load-Bearing Capacity of Masonry Walls of Buildings. In: Proceedings of the Concrete Days 2002 Conference, Bratislava 2002, pp. 123-126 (in Slovak)

- [3] BELLOVÁ, M.: Principles of Reinforcement of Members According to Eurocode. In: Proceedings of the Concrete Days 2002 Conference, Bratislava 2002, pp. 463-468 (in Slovak)
- [4] BILČÍK, J.: Application of High-Strength Concrete. In: Proceedings of International Conference on Technology, Construction and Control of Concrete Structures, Prague 2002, pp. 145-152 (in Slovak)
- [5] BILČÍK, J.: Failures of Concrete Surfaces in Hydraulic Structures. In: Proceedings of the Concrete Days 2002, Bratislava September 2002, pp. 347-352 (in Slovak)
- [6] BILČÍK, J.: Characteristics of Materials by prEN 1992-1-1. In: Proceedings of the Eurocode 2 – 4 - 6 Seminar, Bratislava 2002, pp. 28-39 (in Slovak)
- [7] BILČÍK, J.: Failures in Hydraulic Structures. Lecture at the SIKA Seminar: Failures of Concrete Surfaces in Hydraulic Structures, Bratislava 2002
- [8] BILČÍK, J. – HUDOBA, I.: Contemporary Trends in the Development of Concrete Structures. In: Proceedings of symposium at Concrete Days 2002, Bratislava, pp. 21–31 (in Slovak)
- [9] BILČÍK, J. - BENKO, V. - FILLO, Ľ.: Ageing of Concrete for the Disposal of Nuclear Waste. In: IABSE Symposium, Melbourne 2002, pp. 400-406
- [10] BOLHA, Ľ.: Deflections of Lafranconi Bridge after 10 Years. In: Proceedings of the 1st Bridge Conference. Faculty of Civil Engineering TU Košice. 13 -15 March 2002, pp. 281-288 (in Slovak)
- [11] BOLHA, Ľ.: Floor Slabs Made of Reinforced Concrete – Bubble Deck System. In: Proceedings of Concrete Days 2002, Bratislava September 2002, pp.79–84 (in Slovak)
- [12] ČABRÁK, M.: Reliability of Building Structures. In: Proceedings of Conference on Theory and Structures of Buildings, Bratislava 2002, pp. 31-42 (in Slovak)
- [13] ČABRÁK, M.: Design of Masonry Structures According to European Standards - Contemporary State. In: Proceedings of symposium at Concrete Days 2002, Bratislava 2002, pp. 469-473 (in Slovak)
- [14] ČABRÁK, M. - SZABAD, Z.: Static Behavioural Analysis of the External Masonry Load-Bearing Walls of Buildings. In: Proceedings of symposium at Concrete Days 2002, Bratislava 2002, pp. 118-122 (in Slovak)
- [15] ČABRÁK, M.: Failures of External Masonry Walls of Buildings Due to Incorrect Static Design. In: Proceedings of Conference on Failures of Building Structures, Bratislava 2002, pp. 34-40 (in Slovak)
- [16] ČABRÁK, M. - SZABAD, Z.: Possibilities of Utilization of Bed Joint Reinforcements in Masonry Load-Bearing Members. In: Proceedings of Conference on Masonry and Combined Structures, Prague 2002, pp. 35-40 (in Slovak)
- [17] ČABRÁK, M.: Static Problems in the Design of Masonry Structures in Terms of Standardization of Their Contemporary State. In: Proceedings of conference on Static-Structural and Building-Physical Problems of Building Structures, Tatranská Lomnica 2002, pp. 85-90 (in Slovak)
- [18] ĎURČO, M. - ŠOLTÉSZ, J. - HALVONIK, J.: Modeling and Analysis of Difficult Construction Joints, In: Proceedings of 1st International Bridge Conference, Faculty of Civil Engineering TU Košice, 13 - 15 March 2002, pp. 191-196 (in Slovak)

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- [21] FILLO, L.: Prestressing. In: Design of Concrete Structures under Eurocode 2. Prague, Brno 2002, pp. 46-53 (in Slovak)
- [22] FILLO, L.: Analogical Strut and Tie Models. In: Design of Concrete Structures under Eurocode 2, Prague, Brno 2002, pp. 87-95 (in Slovak)
- [23] FILLO, L.: Design of Concrete Structures by Strut and Tie Models. In: Proceedings of Concrete Days 2002, Bratislava September 2002, pp. 313-318 (in Slovak)
- [24] FILLO, L.- HALVONIK, J: European Codes for the Design of Concrete Structures and Bridges. In: Proceedings of Bridges 2002, Košice, 2002, pp. 27-32 (in Slovak)
- [25] GRAMBLIČKA, Š.- HALVONIK, J.: Reinforced Concrete and Prestressed Concrete Traction Poles. In: Proceedings of Concrete Days 2002, Bratislava, September 2002, pp. 91-96 (in Slovak)
- [26] HÁJEK, F.: Static Damage to T-06-ZT System of Panel Buildings. In Proceedings of conference on Theory and Structures of Buildings (in Slovak)
- [27] HÁJEK, F.: Strengthening Concrete Elements of Prefabricated Buildings by Reconstruction. In: Proceedings of Concrete Days 2002, Bratislava September 2002, pp. 443-447 (in Slovak)
- [28] HALVONIK, J.: Fatigue, Seminar: Eurocodes 2, Czech Concrete Society, Prague, Brno, September 2002 (in Slovak)
- [29] HALVONIK, J.: Concrete Made of Lightweight Aggregates, Seminar: Eurocodes 2, Czech Concrete Society, Prague, Brno, September 2002 (in Slovak)
- [30] HALVONIK, J.: Basis of Design, Seminar: Eurocodes 2-4-6, Faculty of Civil Engineering of STU Bratislava and CVUT Prague, Bratislava, October 2002 (in Slovak)
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- [33] HALVONIK, J.- SCHMUCK, J.- ĎURČO, M.: Railway Viaduct in Senkvica Relaying – Pretensioned Alternative. In Proceedings of Concrete Days 2002, Bratislava, September 2002, pp.169-174 (in Slovak)
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- [35] HARVAN, I. – SURMOVÁ, M.: Post-Tensioned Flat Slab. 7th Scientific Conference. Technical University Košice, May 2002 (in Slovak)
- [36] HARVAN, I. – SURMOVÁ, M.: Design of Concrete Cross Section According to EN 1992-1. Concrete Days 2002. In: Proceedings of Concrete Days 2002, Bratislava September 2002, pp. 55-59 (in Slovak)



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- [38] HRUŠKA, M. - KARABA, F. - CHANDOGA, M. - JAROŠEVIČ, A.: Rehabilitation of the External Prestressing on the Belá Viaduct. In: Proceedings of Concrete Days 2002, Bratislava, September 2002, pp. 423-428 (in Slovak)
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- [41] CHANDOGA, M. – ZVARA, J.: Some Results of Long-Term Monitoring of the Lafranconi Bridge. In: Proceedings of Conference of the First Bridge Conference, Košice, 2002, pp. 273-281 (in Slovak)
- [42] CHANDOGA, M. – ČERNĀNSKÝ, L.: Construction and Design of Some New PROJSTAR CH Anchorages. In: Proceedings of Concrete Days 2002, Bratislava, September 2002, pp. 297-304 (in Slovak)
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- [45] CHANDOGA, M. - ĎURIŠ, D. - HALVONIK, J.: Experimental Investigation of Match-Cast Joints with a Single Shear Key. In: Proceedings of Concrete and Concrete Structures, Žilina 2002, pp. 173-178
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- [50] KRÁLIK, J. – CESNAK, J.: Design for Impact Protection of Reinforced Concrete Structures in the Reactor Container Building, V2-Jaslovské Bohunice. In: Proceedings of Concrete Days 2002, Bratislava September 2002, pp. 307–312 (in Slovak)
- [51] ROJKO, L.: Application of Fiber-Reinforced Concrete in the Escape Gallery of the Visnove Tunnel. In: Proceedings of Concrete Days 2002, Bratislava, September 2002, pp. 103-108 (in Slovak)

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