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 Lectures Seminars	Lecturer
Concrete and Masonry Members	4	2 - 2	Ľ. Fillo
Reinforced and Prestressed Concrete Members	5	3 -2	Ľ. Fillo
Reinforced Concrete Structural Members	5	3 - 3	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	4 - 1	Ľ. Bolha
High-Rise and Long-Span Concrete Structures	9	2 - 2	I. Abrahoim
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
Reinforced Concrete Building Networks	7	2 - 1	F. Hájek
Special Problems in Concrete Structures II	10	2 - 1	I. Harvan
Reinforced Concrete Members	1	6	A. Bartók
Reinforced Concrete Structures	1	12	A. Bartók
World Language – English: CAD–FEM Computer – Aided Design of Concrete and Steel Structures	7	2	J. Šoltész
Reinforced Concrete Structures	8	1 - 1	J. Šoltész

Optional Subjects

Subject	Semester	Hours Per Week Lectures	Seminars	Lecturer
Structural Analysis of Reconstructed/Retrofitted Structures	10	2	1	J. Šoltész
Precast Concrete Structures	7	2	1	M. Čabrák
Masonry Structures	10	2	2	M. Čabrák
Time-Dependent (Rheological) Effects of Concrete Structures	9	2	2	Ľ. Bolha
Concrete Bridges	9	2	2	Ľ. Bolha
PC Structural Analysis – FEM Models	1	4		A. Bartók
Special Concrete Structures	9	2	2	F. Hájek, M. Chandoga
Flat Plate Slabs	9	2	2	F. Hájek
Experimental Testing of Concrete Structures	10	2	2	V. Priechodský

Recommended subjects

Subject	Semester	Hours Per Week Lectures	Seminars	Lecturer
Composite Structures	9	2	2	Š. Gramblička
CAD–FEM Computer – Aided Design of Concrete and Steel Structures	9	1	2	J. Šoltész

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. Theoretical Basis for Utilisation of New Materials in the Design and Renewal of Concrete Structures (2003 – 2005). Head of Project: J. Bilčík
2. VEGA – Locally Supported Prestressed Slabs – Analysis of Punching: A. Bartók
3. Fillo, et al: Theoretical and Experimental Analysis of RC Flat Slabs Prestressed by Unbonded Tendons and Reinforced by Dispersed Steel Fibres

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. Nuclear Regulatory Authority of the Slovak Republic
12. Slovak Electric Power Company
13. Vertical, Ltd.

VI.2 International Cooperation

1. Czech Concrete Association
2. *fib* - TG 1.1 Design Applications – Ľ. Fillo, member of Task Group
3. CEN TC 250-SC2 Concrete Structures – Ľ. Fillo, representing SK
4. Klokner Institute ČVUT Prague, Czech Republic
5. Faculty of Civil Engineering, VUT Brno, Czech Republic
6. ETH - Laboratory for Building Materials, ETH Zürich, Switzerland
7. Institut für Baustatik und Konstruktion, ETH Zürich, Switzerland
8. Baustoffinstitut, TU Munich, Germany
9. Institut für Massivbau und Baustofftechnologie, University of Leipzig, Germany
10. Katedra Budowy Mostow Politechniki Slaskiej, Gliwice, Poland
11. Department of Civil and Materials Engineering, University of Illinois at Chicago, USA
12. RIB Bausoftware, Stuttgart, Germany
13. Deutscher Asschuss für Stahlbeton, Berlin, Germany
14. Betosan, s.r.o., Prague, Czech Republic
15. Siemens, A.G.
16. Seidl & Partners, G.m.b.H., Regensburg, Germany
17. European Commission, DG Research, Brussels, Belgium
18. Imperial College for Science, Technology and Medicine, London, U.K.
19. St. Paul University, Brussels, Belgium
20. Fachhoch Schule Braunschweig – Wolfenbütel, Germany

21. Institut für Massivbau, TU Darmstadt, Germany

VI.2.1 Visitors to the Department

1. prof. Hugo Corres Peiretti – University of Madrid
2. Dr.-Ing. Richard Seidl, Seidl&Partner GmbH, Boelckestrasse 40, 93051 Regensburg, Germany

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

1. Bilčík, J. – Klokner Institute ČVUT Prague, Czech Republic, November 28 – 30, 2003
2. Surmová, M. – TU Vienna, October - December 2003

VII. THESES

VII.1 Graduate Theses

No.	Student´s name	Title	Supervisor
1.	Plevka Ivan	RC Structure of a Multi-Storey Garage	J. Bilčík
2.	Meszáros Csaba	Building of "Slovenska sporitelna" in Poprad Prestressed Flat Slab	I. Harvan
3.	Genzor František	Monolithic Slab-Wall Construction of Administration Building	I. Harvan
4.	Olivová Katarína	Hotel Tula in Banska Bystrica. Monolithic Slab-Wall Construction With Skeleton-Type Lower Floor	I. Harvan
5.	Mittas Marián	Hotel: Cast-in-Place RC Wall Construction	I. Abrahoim
6.	Bolcarovič Marek	Multifunctional Building: Cast-in-Place RC Construction	I. Abrahoim
7.	Herrmannová Estera	Autosalon: Cast-in-Place RC Construction	I. Abrahoim
8.	Blaško	Prestressed Railway Bridge	J. Halvoník
9.	Chlepko Peter	Tall Building with a Circular Shape – Structural Dynamic Analysis	A. Bartók
10.	Tvrdoň Pavol	Tall Building - Structural and Dynamic Analysis	A. Bartók
11.	Bednár Boris	Cast in Situ Reinforced Concrete Cylindrical Structure of Germination Silos	I. Hudoba
12.	Nedeliak	Underground Reinforced Concrete Retentional Water Tank	I. Hudoba
13.	Štaffen Martin	High-Rise Building – Composite Steel-Reinforced Concrete Structures	Š. Gramblička
14.	Papierniková A.	Reconstruction of Structures of a Shopping Center	J. Šoltész
15.	Munka M.	Design of Egg-Shaped Prestressed Concrete Digester	J. Šoltész

VIII. OTHER ACTIVITIES

VIII.1 Special Lectures

[1] HALVONÍK, J.: "Science, Research, Theory and Standards": Experiences from the First *fib* Congress in Osaka 2002, Žilina, March 2003

[2] HALVONÍK, J.: "Fatigue": Seminar on "Eurocodes 2", Czech Concrete Society, Prague, October 2003

[3] HALVONÍK, J.: "Prestressed Concrete": Seminar on "Eurocodes 2", Czech Concrete Society, Prague, October 2003

[4] HALVONÍK, J.: "Shear and Service Limit States in EC2": Lecture to Slovak Chamber of Civil Engineers, Bratislava, December, 2003

[5] HUDOBA, I.: The Principles of Providing and Confirming an Evaluation of Concrete Work, Seminar for the Slovak Road Agency Authorities, Liptovský Ján, 19.11.2004

VIII.2 Commercial Activities for Firms and Institutions

1. Bilčík, J.: Evaluation of the State and Proposed Repair of Cooling Towers Nos. 103 and 104 at the J.Bohunice Nuclear Power Plant
2. Bolha, Ľ.: Expert Opinion on Collapse of Internal Ledge on Bridge No. D2-130
3. Bolha, Ľ.: Loading Test of Prestressed Concrete Bridge S0-11 over Galvaniho Street
4. Halvoník, J.: Design of Pre-Tensioned Bridge Beams DPS-VP24, 27 with a length of 24 m and 27 m
5. Hudoba, I.: Evaluation of the Service Life of Fibre-Reinforced Concrete Containers

IX. PUBLICATIONS

IX.1 Journals

[1] BILČÍK, J.: Repair of Cracks in Concrete Structures. Building Year Book 2003, Jaga 2003, (in Slovak)

[2] GRAMBLIČKA, Š.: Composite Steel-Concrete Structures for Large-Span Buildings, Projekt a stavba Nos. 5-6, 2003, pp. 32-35

[3] GRAMBLIČKA, Š.: Reinforced Concrete and Composite Steel-Reinforced Concrete Columns, Stavba No. 10, 2003, pp. 54-57

[4] BELLOVÁ, M.: Assessment of the Approximate Calculation: • Auxiliary Factor η for the Determination of the Value k_{et} Coefficient, Expressing the Effect of Long-Lasting Action; • Buckling Factor φ of a Masonry Structure (Expert Opinion), Projekt a stavba, Vol. 5, 2003, No. 1, pp. 13-14 (in Slovak)

IX.2 Books and Textbooks

[1] BILČÍK, J. – DOHNÁLEK, J.: Repair of Concrete Structures, Jaga 2003, 151 pp. (in Czech)

[2] HARVAN, I. - ABRAHOIM, I.: Selected Articles from Concrete Constructions. Textbook. Slovak University of Technology in Bratislava, Faculty of Civil Engineering, 2003, 90 pp. (in Slovak)

[3] HARVAN, I.: Monolithic Concrete Frameworks. Basis of Building Constructions. 86 pp. (in Slovak). In: Gašparík Jozef, et al.: Practical Information about Technical Conditions in Construction. Verlag Dashofer Bratislava, 2003.

IX.3 Conferences

[1] BILČÍK, J.: Methods and Materials for the Repair of Cracks in Concrete. In: Proceedings of Repair of Concrete Structures, Bratislava 2003, pp. 47 – 54 (in Slovak)

[2] BILČÍK, J.: Modern Methods of Strengthening Columns, Repair 2003, Brno, pp. 120 – 125 (in Slovak)

[3] HARVAN, I. – ABRAHOIM, I.: Statical Analysis of Panel Building Walls Applied to the Restoration of Housing Stock. In: Restoration of Concrete Constructions, Bratislava, June 2003, pp. 65-68 (in Slovak)

[4] HARVAN, I.: Design of Reinforcement of Basket-Capital Basis. In: Static Analysis of Hall Structure, Piestany, March 2003, pp. 19-26 (in Slovak)

[5] CHANDOGA, M. – JAROŠEVIČ, A.: Reconstruction of Concrete Bridges Using External Tendons. In: Proceedings of 21st Conference Awarie Budowlane, Szczecin – Miedzyzdroje, May 20-23, 2003

[6] CHANDOGA, M.: Monolithic Concrete Bridges. In: Post-Congress Colloqium Fib, ŽU Žilina

[7] CHANDOGA, M.: Prestressing Material and Devices. In: Post-Congress Colloqium Fib, ŽU Žilina

[8] CHANDOGA, M.: New Trends in External Prestressing. In: Post-Congress Colloqium Fib, ŽU Žilina

[9] CHANDOGA, M. – ČERŇANSKÝ, L.: Durability of Grouted Tendons. In: Proceedings of 9th Seminar of Slovak Bridge Experts, kúpele Nimnica, 10.-12.6.2003, pp. 4-18

[10] CHANDOGA, M.: Prestressing and Grouting of Post-Tensioned Tendons. In: Proceedings of Seminar for Road Inspector of SSC, Liptovský Ján, September 18-20, 2003, pp. 57-67

[11] ČABRÁK, M. - ROUSEKOVÁ, I. - GILÁNYI, L.: Brick Element Specifications for the CE Mark. In: Proceedings of International Conference on Building Materials and Testing 2003. Štrbské Pleso, 2003, pp. 158-160 (in Slovak)

[12] ČABRÁK, M.: Fire Design of Load-Bearing Building Structures. In: Proceedings of Conference on Defects in Building Structures. Bratislava, 2003, pp. 68-72 (in Slovak)

[13] LLOYD, G.M. – WANG, M. – HALVONÍK, J.: Bootstrap Analysis of Long-Term Global and Local Deformation Measurements of the Kishwaukee Bridge; 4th International

Workshop on Structural Health Monitoring, Stanford University, Canada, USA, September 2003, 9 pp.

[14] HALVONÍK, J. - SCHMUCK, J. - MAŤAŠČÍK, M.: Composite Alternative to Galvaniho Street Bridging in Bratislava, Proceedings of the 2d Conference on Prefabrication and Precast Elements 2003, Pardubice, September 2003, pp. 174-180

[15] HALVONÍK, J.: Lightweight Aggregated Concrete, "Eurocodes 2" Seminar, Czech Concrete Society, Prague, October 2003

[16] KRIŽMA, M. – JERGA, J. – ROJKO, Ľ. – CHVÍĽA, M.: Deformation Characteristics of Sprayed Concrete. 5th Conference (with international participation) on Static-Constructional and Building-Physics Problems of Constructions. Tatranská Lomnica, November 2003

[17] HÁJEK, F.: Defects in T-06B – ZTB Panel Building System. Proceedings of Symposium on Repair of Concrete Structures, Bratislava 2003

[18] HÁJEK, F.: Damage to a Swimming Pool as a Consequence of the Rising of the Danube´s Water Level. Proceedings of Symposium on Defects in Building Structures, Bratislava 2003

[19] HÁJEK, F.: Specific Features of the Diagnosis of Construction Defects Resulting from Explosions. Proceedings of Symposium on Defects in Building Structures, Bratislava 2003

[20] HUDOBA, I. – GREŠLÍK, P.: High Performance Fibre-Reinforced Concrete Container for Storing Radioactive Waste, In: Prefabrication and Precast Concrete Units 2003, Pardubice, September 2003, ČR, pp. 121-125

[21] HUDOBA, I.: Smart Concrete, In: Experiences of the 1st *fib* Congress – Osaka 2002, Žilina 2003, pp. 65-71

[22] HUDOBA, I.: Hybrid Cementitous Composites, In: Experiences of the 1st *fib* Congress – Osaka 2002, Žilina 2003, pp. 56-64

[23] GRAMBLIČKA, Š. – VALACH, P.: Design of Composite Steel-Reinforced Concrete (SRC) Columns. In: Quality and Reliability in the Building Industry, Levoča 2003, pp. 203-208 (in English)

[24] GRAMBLIČKA, Š.: Composite Steel-Reinforced Concrete Structures for Halls. In: Statics of Halls, Piešťany 2003, pp. 83-90

[25] GRAMBLIČKA, Š.: Additional Openings in Walls and Floors of Panel Buildings. In: Reconstruction of Concrete Structures, Bratislava 2003, pp. 59-64

[26] FILLO, Ľ.: Prestressing. In: Design of Concrete Structures under Eurocode 2, Prague, 10/2003, pp. 45-53

[27] FILLO, Ľ.: Analogical Strut and Tie Models. In: Design of Concrete Structures under Eurocode 2, Prague, 10/2003, pp. 93-99

[28] ŠOLTESZ, J.: Structural System of Shopping Centers under Seismic Impact, In: Statics of Beam-Column Framed Structures, Piešťany 2003, pp. 31-41